SEQUENCE LISTING

<110> The Trustees of the University of Pennsylvania

<120> Simian Subfamily B Adenoviruses SAdV-28, -27, -29, -32, -33, and -35 and Uses Thereof

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cat aat gtg atg acc aag tgc acc atg cac ata ggt ggt cgc agg gga       3119
His Asn Val Met Thr Lys Cys Thr Met His Ile Gly Gly Arg Arg Gly
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gctaccggac ccgtgagctt gaacctgaaa gagagttcaa cagaatcaat ttcggtatcg 8689

ttgacggcgg cttgcctcag gatctcttgc acgtcgcccg agttgtcctg gtaggcgatc 8749

tcggccatga actgctcgat ttcttcctcc tgaagatctc cgcggcccgc tctctcgacg 8809

gtggcagcaa ggtcgttgga gatgcgaccc atgagttgag agaatgcatt catgcccgcc 8869

tcgttccaga cgcggctgta gaccacggcc ccctcgggat ctctcgcgcg catgaccacc 8929

tgggcgaggt tgagctccac gtggcgggtg aagaccgcat agttgcatag gcgctggaag 8989

aggtagttga gtgtggtggc gatgtgctcg gtgacgaaga aatacatgat ccatcgtctc 9049

agcggcattt cgctgacatc gcccagggct tccaagcgct ccatggcctc gtagaagtcc 9109

acagcgaagt tgaaaaactg ggagttgcgc gcggacacgg tcaactcctc ctccagaaga 9169

cggatgagat cggcgatggt ggcgcgcacc tcgcgctcga aagcccccgg gatttcttcc 9229

tcctcctctt ctatctcttc ttccactaac atctcttctt cctcttcagg cgggggcgga 9289

ggaggagggg gcgcgcggcg acgccggcgg cgcacgggca gacggtcgat gaatctttca 9349

atgacctctc cgcggcggcg gcgcatggtc tcggtgacgg cgcggccgtt ctccctgggt 9409

ctcagagtga agacgcctcc gcgcatctcc ctgaagtggt gactgggtgg ctctccgttg 9469

ggcagggaca gggcgctgat gatgcatttt atcaattgtc ccgtagggac tccgcgcaag 9529

gacctgatcg tctgaagatc cacgggatct gaaaaccttt cgacgaaagc gtctaaccag 9589

tcgcaatcgc aaggtaggct gagcaccgtt tcttgcgggc gggggttctc tcttccttct 9649

ccttcctcat catctcggga gggtgagacg atgctgctgg tgatgaaatt aaaataggca 9709

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taatcgttgc aggtgcgcac caggtactgg tagccgatga gaaagtgcgg cggtggctgg 10189

cggtagaggg gccatcgctc tgtagccggg gctccggggg cgaggtcttc cagcatgagg 10249

cggtggtatc cgtagatgta cctggacatc caggtgatcc cggaggcggt ggtggacgcc 10309

cgagggaact cgcgcactcg gttccagatg ttgcgcagcg gcatgaagta gttcatggta 10369

ggcacggtct ggccagtaag gcgggcgcag tcattgatgc tctatagaca cggagaaaac 10429

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gaaagcgatg agcggctcgc ctccgtggcc tggaggaacg tgaacgggtt gggtcgcggt    10489

gtaccccggt tcgagacaca agccaagcga gcacaactcg ggccggccgg agccgtggct    10549

aacgtggtat tggcgatccc gtctcgaccc agccgacgaa tatccaggat acggagtcga    10609

gtcgttttgc tgcttgttgc tttttcctgg acgggagcca gtgccgcgtc aagctttaga    10669

acgctcagtt cacggggccg ggagtggctc gcgcccgtag tctggagaat caatcgccag    10729

ggttgcgttg cggtgtgccc cggttcgagt cttagcgtgg cccggatcgg ccggtttccg    10789

cggcaagcga gggtttggca gccccgtcat ttctaagacc ccgccagccg acttctccag    10849

tttacgggag cgagccctct ttttttttgt ttttgtcgcc cag atg cat ccc gtg      10904
                                              Met His Pro Val
                                                  635

ctg cga cag atg cgc ccc cag caa cag gtc cct tct cag caa cag cag      10952
Leu Arg Gln Met Arg Pro Gln Gln Gln Val Pro Ser Gln Gln Gln Gln
        640                 645                 650

cag cca caa aag gct ctt cct gct cct gct cct gca act act gca gtc      11000
Gln Pro Gln Lys Ala Leu Pro Ala Pro Ala Pro Ala Thr Thr Ala Val
    655                 660                 665

gca gcc gtg tgc ggc gcg gga cag ccc gcc tat gat ctg gac ttg gaa      11048
Ala Ala Val Cys Gly Ala Gly Gln Pro Ala Tyr Asp Leu Asp Leu Glu
670                 675                 680                 685

gag ggc gag gga ctg gcg cgc ctg ggt gca cca tcg ccc gag cga cac      11096
Glu Gly Glu Gly Leu Ala Arg Leu Gly Ala Pro Ser Pro Glu Arg His
                690                 695                 700

ccg cgg gtg caa ctg aaa aag gac tct cgc gag gca tac gtg ccc cag      11144
Pro Arg Val Gln Leu Lys Lys Asp Ser Arg Glu Ala Tyr Val Pro Gln
            705                 710                 715

cat aac ctg ttc agg gac agg agc ggc gag gag ccc gag gag atg cga      11192
His Asn Leu Phe Arg Asp Arg Ser Gly Glu Glu Pro Glu Glu Met Arg
        720                 725                 730

gcc tcc cgc ttt aac gcg ggt cgc gag ctg cgc cac ggt ctg gac cga      11240
Ala Ser Arg Phe Asn Ala Gly Arg Glu Leu Arg His Gly Leu Asp Arg
    735                 740                 745

aga cgg gtg ctg cgg gac gag gat ttc gag gtc gat gaa gtg aca ggg      11288
Arg Arg Val Leu Arg Asp Glu Asp Phe Glu Val Asp Glu Val Thr Gly
750                 755                 760                 765

atc agc ccc gct agg gca cat gtg gcc gcg gcc aac ctg gtc tcg gcc      11336
Ile Ser Pro Ala Arg Ala His Val Ala Ala Ala Asn Leu Val Ser Ala
                770                 775                 780

tac gag cag acc gtg aag gag gag cgc aac ttc caa aaa tca ttt aac      11384
Tyr Glu Gln Thr Val Lys Glu Glu Arg Asn Phe Gln Lys Ser Phe Asn
            785                 790                 795

aac cat gtg cgc acc ctg atc gcc cgt gag gaa gtg act ctg ggt ctg      11432
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Asn His Val Arg Thr Leu Ile Ala Arg Glu Glu Val Thr Leu Gly Leu
        800                 805                 810

atg cac ctg tgg gac ctg atg gaa gct atc acc cag aac ccc act agc      11480
Met His Leu Trp Asp Leu Met Glu Ala Ile Thr Gln Asn Pro Thr Ser
    815                 820                 825

aaa ccc ctg acc gct cag ctg ttt ctg gta gtg caa cat agc agg gac      11528
Lys Pro Leu Thr Ala Gln Leu Phe Leu Val Val Gln His Ser Arg Asp
830                 835                 840                 845

aat gag gca ttc agg gag gcg ctg ctg aac atc acc gag ccc gag ggg      11576
Asn Glu Ala Phe Arg Glu Ala Leu Leu Asn Ile Thr Glu Pro Glu Gly
                850                 855                 860

aga tgg ttg tat gat ctg atc aat atc ctg cag agt att ata gtg cag      11624
Arg Trp Leu Tyr Asp Leu Ile Asn Ile Leu Gln Ser Ile Ile Val Gln
            865                 870                 875

gaa cgt agc ctg ggt ctg gct gag aaa gtg gca gcc atc aac tac tcg      11672
Glu Arg Ser Leu Gly Leu Ala Glu Lys Val Ala Ala Ile Asn Tyr Ser
        880                 885                 890

gtc ttg agc ctg ggc aag tac tac gct cgc aag atc tac aag acc ccc      11720
Val Leu Ser Leu Gly Lys Tyr Tyr Ala Arg Lys Ile Tyr Lys Thr Pro
    895                 900                 905

tac gtg ccc ata gac aag gag gtg aag ata gat ggg ttt tac atg cgc      11768
Tyr Val Pro Ile Asp Lys Glu Val Lys Ile Asp Gly Phe Tyr Met Arg
910                 915                 920                 925

atg act ctt aaa gtg ctg act ctc agc gac gat ttg ggg gtg tac cgc      11816
Met Thr Leu Lys Val Leu Thr Leu Ser Asp Asp Leu Gly Val Tyr Arg
                930                 935                 940

aac gac agg atg cac cgc gcg gtg agc gcc agc agg agg cgc gag ctg      11864
Asn Asp Arg Met His Arg Ala Val Ser Ala Ser Arg Arg Arg Glu Leu
            945                 950                 955

agc gac aga gaa ctt atg cac agc ttg caa aga gct ctg acg ggg gca      11912
Ser Asp Arg Glu Leu Met His Ser Leu Gln Arg Ala Leu Thr Gly Ala
        960                 965                 970

ggg acc gat ggg gag aac tac ttt gac atg ggg gca gac ttg cag tgg      11960
Gly Thr Asp Gly Glu Asn Tyr Phe Asp Met Gly Ala Asp Leu Gln Trp
    975                 980                 985

caa cct agc cgc agg acc ctg gac gcg gca ggg  tgt gag ctt cct tac     12008
Gln Pro Ser Arg Arg Thr Leu Asp Ala Ala Gly  Cys Glu Leu Pro Tyr
990                 995                 1000                1005

gtg gaa gag gtg gat  gaa ggc gag gag gag  gag ggc gag tac ctg        12053
Val Glu Glu Val Asp  Glu Gly Glu Glu Glu  Glu Gly Glu Tyr Leu
                1010                1015                1020

gaa gac tgatggcgcg acccgtattt ttgctag atg gaa cag  cag gca ccg       12104
Glu Asp                             Met Glu Gln  Gln Ala Pro
                                                1025
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gac ccc  gca atg cgg gcg gcg  ctg cag agc cag ccg  tcc ggc att       12149
Asp Pro  Ala Met Arg Ala Ala  Leu Gln Ser Gln Pro  Ser Gly Ile
    1030                 1035                 1040

aac tcc  tcg gac gat tgg acc  cag gcc atg caa cgc  atc atg gcg       12194
Asn Ser  Ser Asp Asp Trp Thr  Gln Ala Met Gln Arg  Ile Met Ala
    1045                 1050                 1055

ctg acg  acc cgc aac ccc gaa  gcc ttt aga cag caa  ccc cag gcc       12239
Leu Thr  Thr Arg Asn Pro Glu  Ala Phe Arg Gln Gln  Pro Gln Ala
    1060                 1065                 1070

aac cgc  ctt tcg gcc atc ctg  gag gcc gta gtt cct  tcc cgc tcc       12284
Asn Arg  Leu Ser Ala Ile Leu  Glu Ala Val Val Pro  Ser Arg Ser
    1075                 1080                 1085

aac ccc  acc cac gag aag gtc  ctg gcc atc gtg aac  gcg ctg gtg       12329
Asn Pro  Thr His Glu Lys Val  Leu Ala Ile Val Asn  Ala Leu Val
    1090                 1095                 1100

gag aac  aag gcc atc cgt ccc  gat gag gcc ggg ctg  gta tac aat       12374
Glu Asn  Lys Ala Ile Arg Pro  Asp Glu Ala Gly Leu  Val Tyr Asn
    1105                 1110                 1115

gcc cta  ttg gag cgc gtg gcc  cgc tac aac agc agc  aac gtg cag       12419
Ala Leu  Leu Glu Arg Val Ala  Arg Tyr Asn Ser Ser  Asn Val Gln
    1120                 1125                 1130

acc aac  ctg gac cgg atg gtg  acc gat gtg cgc gag  gcc gtg tct       12464
Thr Asn  Leu Asp Arg Met Val  Thr Asp Val Arg Glu  Ala Val Ser
    1135                 1140                 1145

cag cgc  gag cgg ttc cag cgc  gat gcc aac ttg ggg  tcg ctg gtg       12509
Gln Arg  Glu Arg Phe Gln Arg  Asp Ala Asn Leu Gly  Ser Leu Val
    1150                 1155                 1160

gcg ctg  aac gcc ttt ctc agc  acc cag cct gcc aac  gtg ccc cgc       12554
Ala Leu  Asn Ala Phe Leu Ser  Thr Gln Pro Ala Asn  Val Pro Arg
    1165                 1170                 1175

ggc cag  caa gac tat aca aac  ttt cta agt gca ctg  aga ctc atg       12599
Gly Gln  Gln Asp Tyr Thr Asn  Phe Leu Ser Ala Leu  Arg Leu Met
    1180                 1185                 1190

gta acc  gaa gtc cct cag agc  gag gtg tac cag tcc  gga cca gac       12644
Val Thr  Glu Val Pro Gln Ser  Glu Val Tyr Gln Ser  Gly Pro Asp
    1195                 1200                 1205

tac ttc  ttc cag acc agc aga  cag ggc ttg cag aca  gta aac ctg       12689
Tyr Phe  Phe Gln Thr Ser Arg  Gln Gly Leu Gln Thr  Val Asn Leu
    1210                 1215                 1220

agc cag  gct ttc aag aac cta  aag ggg ctg tgg gga  gtg cat gcc       12734
Ser Gln  Ala Phe Lys Asn Leu  Lys Gly Leu Trp Gly  Val His Ala
    1225                 1230                 1235

cca gta  gga gat cgc gcg acc  gtg tct agc ttg ctg  acc ccc aac       12779
Pro Val  Gly Asp Arg Ala Thr  Val Ser Ser Leu Leu  Thr Pro Asn
    1240                 1245                 1250
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tcc cgc  cta ctg ctg ctg ctg  gtt gcc ccc ttc act  gat agc ggt       12824
Ser Arg  Leu Leu Leu Leu Leu  Val Ala Pro Phe Thr  Asp Ser Gly
    1255                 1260                 1265

agc atc  gac cgc aac tcc tac  ttg ggc tac ctg ctg  aac ttg tat       12869
Ser Ile  Asp Arg Asn Ser Tyr  Leu Gly Tyr Leu Leu  Asn Leu Tyr
    1270                 1275                 1280

cgc gag  gcc ata gga cag agc  cag gtg gac gag cag  acc tac caa       12914
Arg Glu  Ala Ile Gly Gln Ser  Gln Val Asp Glu Gln  Thr Tyr Gln
    1285                 1290                 1295

gaa atc  acc caa gtg agc cgc  gcc ctt ggt cag gaa  gat acg ggc       12959
Glu Ile  Thr Gln Val Ser Arg  Ala Leu Gly Gln Glu  Asp Thr Gly
    1300                 1305                 1310

agt ttg  gaa gcc acc ttg aac  ttc ttg ctg acc aac  cgg tcg cag       13004
Ser Leu  Glu Ala Thr Leu Asn  Phe Leu Leu Thr Asn  Arg Ser Gln
    1315                 1320                 1325

aag atc  cct cct cag tat gcg  ctt acc gcg gag gag  gag cgg atc       13049
Lys Ile  Pro Pro Gln Tyr Ala  Leu Thr Ala Glu Glu  Glu Arg Ile
    1330                 1335                 1340

ctg aga  tat gtc cag cag agc  gtg gga ctg ttc ctg  atg caa gag       13094
Leu Arg  Tyr Val Gln Gln Ser  Val Gly Leu Phe Leu  Met Gln Glu
    1345                 1350                 1355

ggg gcg  acc cct agt gcc gcg  ctg gac atg aca gcc  cga aac atg       13139
Gly Ala  Thr Pro Ser Ala Ala  Leu Asp Met Thr Ala  Arg Asn Met
    1360                 1365                 1370

gag ccc  agc atg tat gcc agt  aac cgg cct ttc atc  aac aaa ctg       13184
Glu Pro  Ser Met Tyr Ala Ser  Asn Arg Pro Phe Ile  Asn Lys Leu
    1375                 1380                 1385

ctg gat  tac ctg cac agg gcg  gcc gcc atg aac tct  gat tat ttc       13229
Leu Asp  Tyr Leu His Arg Ala  Ala Ala Met Asn Ser  Asp Tyr Phe
    1390                 1395                 1400

acc aat  gct atc ctc aac ccc  cac tgg ctg ccc ccg  cct gga ttt       13274
Thr Asn  Ala Ile Leu Asn Pro  His Trp Leu Pro Pro  Pro Gly Phe
    1405                 1410                 1415

tac acg  ggc gag tac gac atg  ccc gac ccc aat gac  ggg ttt ctg       13319
Tyr Thr  Gly Glu Tyr Asp Met  Pro Asp Pro Asn Asp  Gly Phe Leu
    1420                 1425                 1430

tgg gac  gat gtg gac agc agc  ata ttc tcc ccg cct  cct ggt tat       13364
Trp Asp  Asp Val Asp Ser Ser  Ile Phe Ser Pro Pro  Pro Gly Tyr
    1435                 1440                 1445

aac act  tgg aag aag gaa ggg  ggc gat aga aga cac  tct tcc gtg       13409
Asn Thr  Trp Lys Lys Glu Gly  Gly Asp Arg Arg His  Ser Ser Val
    1450                 1455                 1460

tcg ctg  tcc ggg tcg agg ggt  gct gcc gct gcg gtg  ccc gag gct       13454
Ser Leu  Ser Gly Ser Arg Gly  Ala Ala Ala Ala Val  Pro Glu Ala
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    1465                1470                1475

gca agt  cct ttc cct agc ctg  ccc ttt tct ctg aac  agc gtg cgc       13499
Ala Ser  Pro Phe Pro Ser Leu  Pro Phe Ser Leu Asn  Ser Val Arg
    1480                1485                1490

agc agt  gaa ctg ggg aga ata  acc cgc ccg cgc ttg  atg ggc gag       13544
Ser Ser  Glu Leu Gly Arg Ile  Thr Arg Pro Arg Leu  Met Gly Glu
    1495                1500                1505

gat gag  tac ttg aac gac tcc  ttg ctt aga ccc gag  agg gaa aag       13589
Asp Glu  Tyr Leu Asn Asp Ser  Leu Leu Arg Pro Glu  Arg Glu Lys
    1510                1515                1520

aac ttc  ccc aac aat ggt ata  gag agc ctg gtg gac  aag atg agt       13634
Asn Phe  Pro Asn Asn Gly Ile  Glu Ser Leu Val Asp  Lys Met Ser
    1525                1530                1535

aga tgg  aag act tat gca cag  gat cac aaa gat gag  cct agg atc       13679
Arg Trp  Lys Thr Tyr Ala Gln  Asp His Lys Asp Glu  Pro Arg Ile
    1540                1545                1550

ttg ggg  gct gca agc ggg act  acc cgt aga cgc cag  cgc cat gac       13724
Leu Gly  Ala Ala Ser Gly Thr  Thr Arg Arg Arg Gln  Arg His Asp
    1555                1560                1565

aga cag  agg ggt ctt gtg tgg  gac gat gag gac tcg  gcc gat gac       13769
Arg Gln  Arg Gly Leu Val Trp  Asp Asp Glu Asp Ser  Ala Asp Asp
    1570                1575                1580

agc agc  gtg ttg gac ttg ggt  ggg aga gga ggg ggc  aac cca ttc       13814
Ser Ser  Val Leu Asp Leu Gly  Gly Arg Gly Gly Gly  Asn Pro Phe
    1585                1590                1595

gct cat  ctg cgc ccg cac ttt  ggg cgc atg ttg taaaagtgaa            13857
Ala His  Leu Arg Pro His Phe  Gly Arg Met Leu
    1600                1605

agtaaaataa aaaaggcaac tcaccaaggc catggcgacg agcgtgcgtt cgttcttttc   13917

tgttatctgt gtctagt atg  atg agg cga gcc gtg  cta ggc gga gcg gtg     13967
                  Met  Met Arg Arg Ala Val  Leu Gly Gly Ala Val
                  1610                1615                1620

gtg tat ccg gag ggt  cct cct cct tcg tac  gag agc gtg atg cag       14012
Val Tyr Pro Glu Gly  Pro Pro Pro Ser Tyr  Glu Ser Val Met Gln
                1625                1630                1635

cag cag gcg gcg gcg  gtg atg cag ccc tcg  ctg gag gct ccc ttt       14057
Gln Gln Ala Ala Ala  Val Met Gln Pro Ser  Leu Glu Ala Pro Phe
                1640                1645                1650

gta ccc ccg cgg tac  ctg gcg cct aca gag  ggg aga aac agc att       14102
Val Pro Pro Arg Tyr  Leu Ala Pro Thr Glu  Gly Arg Asn Ser Ile
                1655                1660                1665

cgt tac tcg gag ctg  gca ccc cag tac gat  acc acc agg ttg tat       14147
Arg Tyr Ser Glu Leu  Ala Pro Gln Tyr Asp  Thr Thr Arg Leu Tyr
                1670                1675                1680
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ctg gtg gac aac aag  tcg gcg gac atc gcc  tca ttg aac tat cag        14192
Leu Val Asp Asn Lys  Ser Ala Asp Ile Ala  Ser Leu Asn Tyr Gln
                1685                1690                1695

aac gac cac agc aac  ttc ctg acc acg gtg  gtg cag aac aat gac        14237
Asn Asp His Ser Asn  Phe Leu Thr Thr Val  Val Gln Asn Asn Asp
                1700                1705                1710

ttt acc ccc acg gag  gcc agc acc cag acc  atc aac ttt gac gag        14282
Phe Thr Pro Thr Glu  Ala Ser Thr Gln Thr  Ile Asn Phe Asp Glu
                1715                1720                1725

cgg tcg cgg tgg ggc  ggt cag ctg aag acc  atc atg cac acc aac        14327
Arg Ser Arg Trp Gly  Gly Gln Leu Lys Thr  Ile Met His Thr Asn
                1730                1735                1740

atg ccc aac gtg aac  gag tac atg ttc agc  aac aag ttc aag gcg        14372
Met Pro Asn Val Asn  Glu Tyr Met Phe Ser  Asn Lys Phe Lys Ala
                1745                1750                1755

cgg gtg atg gtg tca  cgc aag aaa cct gaa  ggc tat aca ggg gat        14417
Arg Val Met Val Ser  Arg Lys Lys Pro Glu  Gly Tyr Thr Gly Asp
                1760                1765                1770

aaa aat gat aca agt  cag gat att ctg gag  tat gag tgg ttt gag        14462
Lys Asn Asp Thr Ser  Gln Asp Ile Leu Glu  Tyr Glu Trp Phe Glu
                1775                1780                1785

ttc act tta cca gaa  ggc aac ttc tca gcc  acc atg acc atc gac        14507
Phe Thr Leu Pro Glu  Gly Asn Phe Ser Ala  Thr Met Thr Ile Asp
                1790                1795                1800

ctg atg aac aat gcc  atc att gac aac tac  ctg gca gtg ggc aga        14552
Leu Met Asn Asn Ala  Ile Ile Asp Asn Tyr  Leu Ala Val Gly Arg
                1805                1810                1815

cag aat gga gtg ttg  gaa agc gac atc ggt  gtc aag ttt gat acc        14597
Gln Asn Gly Val Leu  Glu Ser Asp Ile Gly  Val Lys Phe Asp Thr
                1820                1825                1830

agg aac ttc agg ctg  ggc tgg gac ccc ata  act aaa ctt gtt atg        14642
Arg Asn Phe Arg Leu  Gly Trp Asp Pro Ile  Thr Lys Leu Val Met
                1835                1840                1845

cca gga gtc tac act  tat gaa gcc ttc cat  cct gat att gtg cta        14687
Pro Gly Val Tyr Thr  Tyr Glu Ala Phe His  Pro Asp Ile Val Leu
                1850                1855                1860

cta cct ggc tgt ggg  gtg gac ttt act gag  agc cgc ctt agc aac        14732
Leu Pro Gly Cys Gly  Val Asp Phe Thr Glu  Ser Arg Leu Ser Asn
                1865                1870                1875

ttg ctt ggt att agg  aag aga cac cca ttc  cag gaa ggt ttt aaa        14777
Leu Leu Gly Ile Arg  Lys Arg His Pro Phe  Gln Glu Gly Phe Lys
                1880                1885                1890

att atg tat gag gat  ctt gag ggg ggt aat  atc ccc gcc ctt ttg        14822
Ile Met Tyr Glu Asp  Leu Glu Gly Gly Asn  Ile Pro Ala Leu Leu
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                1895                1900                1905

gat gta gat gcc tat  gaa aaa agc aaa aag  gaa aac aca gac acc       14867
Asp Val Asp Ala Tyr  Glu Lys Ser Lys Lys  Glu Asn Thr Asp Thr
                1910                1915                1920

acc acc act acc act  gtt act act act gaa  gta gca act gtt gca       14912
Thr Thr Thr Thr Thr  Val Thr Thr Thr Glu  Val Ala Thr Val Ala
                1925                1930                1935

aga cac gtt gct gaa  gta act act gaa gca  gca acg gtt gtt gca       14957
Arg His Val Ala Glu  Val Thr Thr Glu Ala  Ala Thr Val Val Ala
                1940                1945                1950

gtg gat cct att gtt  gaa gag aac aat aat  act gtt aga gga gat       15002
Val Asp Pro Ile Val  Glu Glu Asn Asn Asn  Thr Val Arg Gly Asp
                1955                1960                1965

aat atc cat act gca  aat gag atg aaa gca  gca gct gat gat aca       15047
Asn Ile His Thr Ala  Asn Glu Met Lys Ala  Ala Ala Asp Asp Thr
                1970                1975                1980

aca gtt gta gtt gtg  cct ggc gct gta gtg  act gaa acc aaa acc       15092
Thr Val Val Val Val  Pro Gly Ala Val Val  Thr Glu Thr Lys Thr
                1985                1990                1995

aag aca ctc acc att  caa cct cta gaa aag  gat acc aag gag cgc       15137
Lys Thr Leu Thr Ile  Gln Pro Leu Glu Lys  Asp Thr Lys Glu Arg
                2000                2005                2010

agt tac aat gtc atc  tct ggc acc aat gat  act gcc tat cgt agt       15182
Ser Tyr Asn Val Ile  Ser Gly Thr Asn Asp  Thr Ala Tyr Arg Ser
                2015                2020                2025

tgg tac cta gca tac  aac tat ggc gac cct  gaa aaa gga gtc cgc       15227
Trp Tyr Leu Ala Tyr  Asn Tyr Gly Asp Pro  Glu Lys Gly Val Arg
                2030                2035                2040

tcc tgg acg ctg ctc  acc act tca gat gtc  acc tgc gga gcg gag       15272
Ser Trp Thr Leu Leu  Thr Thr Ser Asp Val  Thr Cys Gly Ala Glu
                2045                2050                2055

caa gta tat tgg tcg  ctc cct gac atg atg  cag gac ccc gtc acc       15317
Gln Val Tyr Trp Ser  Leu Pro Asp Met Met  Gln Asp Pro Val Thr
                2060                2065                2070

ttc cga tcc acg aga  caa gtc agc aac tac  ccc gtg gtg ggt gca       15362
Phe Arg Ser Thr Arg  Gln Val Ser Asn Tyr  Pro Val Val Gly Ala
                2075                2080                2085

gag ctc atg ccc gtc  ttc tca aag agt ttc  tac aac gag caa gcc       15407
Glu Leu Met Pro Val  Phe Ser Lys Ser Phe  Tyr Asn Glu Gln Ala
                2090                2095                2100

gtg tac tcc cag cag  ctc cgc cag acc acc  tcg ctt acg cac atc       15452
Val Tyr Ser Gln Gln  Leu Arg Gln Thr Thr  Ser Leu Thr His Ile
                2105                2110                2115

ttc gat cgc ttc cct  gag aat cag atc ctc  atc cgc ccg ccg gcg       15497
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Phe Asp Arg Phe Pro  Glu Asn Gln Ile Leu  Ile Arg Pro Pro Ala
                2120                2125                2130

ccc acc att acc acc  gtt agt gaa aac gtt  cct gct ctc aca gat        15542
Pro Thr Ile Thr Thr  Val Ser Glu Asn Val  Pro Ala Leu Thr Asp
                2135                2140                2145

cac ggg acc ctg ccg  ttg cgc agc agt atc  cgg gga gtc cag cgc        15587
His Gly Thr Leu Pro  Leu Arg Ser Ser Ile  Arg Gly Val Gln Arg
                2150                2155                2160

gtg acc gtt act gac  gcc aga cgc cgc acc  tgc ccc tac gtc tac        15632
Val Thr Val Thr Asp  Ala Arg Arg Arg Thr  Cys Pro Tyr Val Tyr
                2165                2170                2175

aag gcc ctg ggc ata  gtc gcg ccg cgc gtc  ctt tca agc cgc act        15677
Lys Ala Leu Gly Ile  Val Ala Pro Arg Val  Leu Ser Ser Arg Thr
                2180                2185                2190

ttc taaaaaaaaa a atg tcc att ctc  atc tca ccc agt aat  aac acc       15724
Phe              Met Ser Ile Leu  Ile Ser Pro Ser Asn  Asn Thr
                               2195                2200

ggt tgg ggg  ctg cgc aca ccc acc  agg atg tac gga ggc  gct cgc       15769
Gly Trp Gly  Leu Arg Thr Pro Thr  Arg Met Tyr Gly Gly  Ala Arg
        2205                2210                2215

aaa cgg tct  acc cag cac cct gtg  cgt gtg cgc ggg cat  ttc cgc       15814
Lys Arg Ser  Thr Gln His Pro Val  Arg Val Arg Gly His  Phe Arg
        2220                2225                2230

gct ccc tgg  ggc gcc ctc aag ggc  cgt act cgc act cgg  acc acc       15859
Ala Pro Trp  Gly Ala Leu Lys Gly  Arg Thr Arg Thr Arg  Thr Thr
        2235                2240                2245

gtc gat gat  gtg atc gac cag gtg  gtt gca gat gct cgt  aat tat       15904
Val Asp Asp  Val Ile Asp Gln Val  Val Ala Asp Ala Arg  Asn Tyr
        2250                2255                2260

act cct gct  gca cct gca tct act  gtg gat gca gtt att  gac agc       15949
Thr Pro Ala  Ala Pro Ala Ser Thr  Val Asp Ala Val Ile  Asp Ser
        2265                2270                2275

gtg gtg gct  gac gct cgc gag tat  gct cgc cgg aag agc  agg cga       15994
Val Val Ala  Asp Ala Arg Glu Tyr  Ala Arg Arg Lys Ser  Arg Arg
        2280                2285                2290

aga cgc atc  gcc agg cgc cac cgg  gct acc ccc gct atg  cga gct       16039
Arg Arg Ile  Ala Arg Arg His Arg  Ala Thr Pro Ala Met  Arg Ala
        2295                2300                2305

gca aga gct  ctg ctg cgg aga gcc  aaa cgc gtg ggg cga  aga gcc       16084
Ala Arg Ala  Leu Leu Arg Arg Ala  Lys Arg Val Gly Arg  Arg Ala
        2310                2315                2320

atg ctt aga  gcg gcc agg cgc gcg  gct tca ggg gcc agc  gca ggc       16129
Met Leu Arg  Ala Ala Arg Arg Ala  Ala Ser Gly Ala Ser  Ala Gly
        2325                2330                2335
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aga tcc cgc  agg cgc gcg gcc acg  gcg gca gca gcg gcc  att gcc       16174
Arg Ser Arg  Arg Arg Ala Ala Thr  Ala Ala Ala Ala Ala  Ile Ala
        2340                 2345                 2350

aac atg gcc  caa ccg cga aga ggc  aat gtg tac tgg gtg  cgc gat       16219
Asn Met Ala  Gln Pro Arg Arg Gly  Asn Val Tyr Trp Val  Arg Asp
        2355                 2360                 2365

gcc act acc  ggc cag cgc gtg ccc  gtg cgc acc cgt ccc  cct cgc       16264
Ala Thr Thr  Gly Gln Arg Val Pro  Val Arg Thr Arg Pro  Pro Arg
        2370                 2375                 2380

act tagaagatac tgagcagtct ccgatgttgt gtcccagcgg cgagg atg tcc       16318
Thr                                                   Met Ser
                                                          2385

aag cgc aaa tac aag  gaa gag atg ctc cag  gtc atc gcg cct gaa       16363
Lys Arg Lys Tyr Lys  Glu Glu Met Leu Gln  Val Ile Ala Pro Glu
                2390                 2395                 2400

atc tac ggt cca ccg  gtg aag gat gaa aaa  aag ccc cgc aaa atc       16408
Ile Tyr Gly Pro Pro  Val Lys Asp Glu Lys  Lys Pro Arg Lys Ile
                2405                 2410                 2415

aag cgg gtc aaa aag  gac aaa aag gaa gaa  gat ggc gat gat ggg       16453
Lys Arg Val Lys Lys  Asp Lys Lys Glu Glu  Asp Gly Asp Asp Gly
                2420                 2425                 2430

ctg gta gag ttt gtg  cgc gag ttc gct cca  agg cgg cgc gta cag       16498
Leu Val Glu Phe Val  Arg Glu Phe Ala Pro  Arg Arg Arg Val Gln
                2435                 2440                 2445

tgg cgc ggg cgc aaa  gtg cgg ccg gtg ctg  aga ccc gga acc acg       16543
Trp Arg Gly Arg Lys  Val Arg Pro Val Leu  Arg Pro Gly Thr Thr
                2450                 2455                 2460

gtg gtc ttc acg ccc  ggc gag cgc tcc agc  act act ttt aaa cgc       16588
Val Val Phe Thr Pro  Gly Glu Arg Ser Ser  Thr Thr Phe Lys Arg
                2465                 2470                 2475

tcc tat gat gag gtg  tac ggg gat gat gat  att ctg gag cag gcg       16633
Ser Tyr Asp Glu Val  Tyr Gly Asp Asp Asp  Ile Leu Glu Gln Ala
                2480                 2485                 2490

gcc gac cgc ctg ggc  gag ttt gct tat ggc  aaa cgc agc cgc tcc       16678
Ala Asp Arg Leu Gly  Glu Phe Ala Tyr Gly  Lys Arg Ser Arg Ser
                2495                 2500                 2505

agt ccc aag gat gag  gcg gtg tcc ata ccc  ttg gat cat gga aat       16723
Ser Pro Lys Asp Glu  Ala Val Ser Ile Pro  Leu Asp His Gly Asn
                2510                 2515                 2520

ccc acc cca agt cta  aaa cca gtc acc ctg  cag caa gtg cta ccc       16768
Pro Thr Pro Ser Leu  Lys Pro Val Thr Leu  Gln Gln Val Leu Pro
                2525                 2530                 2535

gtg cct gca cgg aga  ggt gtc aag cga gaa  ggc gag gat ctg tat       16813
Val Pro Ala Arg Arg  Gly Val Lys Arg Glu  Gly Glu Asp Leu Tyr
                2540                 2545                 2550
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ccc acc atg caa ctg  atg gtg ccc aag cgc  cag aag ctg gag gac        16858
Pro Thr Met Gln Leu  Met Val Pro Lys Arg  Gln Lys Leu Glu Asp
                2555                2560                2565

gtg ctg gag aaa atg  aaa gtg gat ccc gat  atc cag cct gaa gtt        16903
Val Leu Glu Lys Met  Lys Val Asp Pro Asp  Ile Gln Pro Glu Val
                2570                2575                2580

aaa gtc aga ccc atc  aag cag gtg gcg ccc  ggt ctg gga gtg caa        16948
Lys Val Arg Pro Ile  Lys Gln Val Ala Pro  Gly Leu Gly Val Gln
                2585                2590                2595

acc gtg gac atc aag  att ccc acc gag tcc  atg gaa gtc cag act        16993
Thr Val Asp Ile Lys  Ile Pro Thr Glu Ser  Met Glu Val Gln Thr
                2600                2605                2610

gaa cct gca aag ccc  gca gcc acc tct att  gag gtg cag acg gat        17038
Glu Pro Ala Lys Pro  Ala Ala Thr Ser Ile  Glu Val Gln Thr Asp
                2615                2620                2625

cct tgg ata ccc gcg  ccc gtt gca acc acc  gcc agt acc gcc cga        17083
Pro Trp Ile Pro Ala  Pro Val Ala Thr Thr  Ala Ser Thr Ala Arg
                2630                2635                2640

aga ccc cgg cga aag  tat ggt cct gcg agt  ctg ctg atg ccc aac        17128
Arg Pro Arg Arg Lys  Tyr Gly Pro Ala Ser  Leu Leu Met Pro Asn
                2645                2650                2655

tat gct ctg cac cca  tcc att att cca act  ccg ggt tac cga ggc        17173
Tyr Ala Leu His Pro  Ser Ile Ile Pro Thr  Pro Gly Tyr Arg Gly
                2660                2665                2670

act cgc tac tac cgc  agc cgg agc acc act  tcc cgc cgt cgc aaa        17218
Thr Arg Tyr Tyr Arg  Ser Arg Ser Thr Thr  Ser Arg Arg Arg Lys
                2675                2680                2685

aca cct gca agc cgc  agt cgc cgt cgc cgc  cgc cgc acc gcc agc        17263
Thr Pro Ala Ser Arg  Ser Arg Arg Arg Arg  Arg Arg Thr Ala Ser
                2690                2695                2700

aaa ctg act ccc gcc  gct ttg gtg cgg agg  gtg tat cgc gat ggc        17308
Lys Leu Thr Pro Ala  Ala Leu Val Arg Arg  Val Tyr Arg Asp Gly
                2705                2710                2715

cgc gca gag ccc ctg  atg ctg ccg cgc gca  cgc tac cat cca agc        17353
Arg Ala Glu Pro Leu  Met Leu Pro Arg Ala  Arg Tyr His Pro Ser
                2720                2725                2730

atc acc act taatgactgt tgccgctgcc tccttgcaga t atg gcc  ctc act      17405
Ile Thr Thr                                     Met Ala  Leu Thr
                                                    2735

tgc cgc ctt  cgc gtc ccc att act  ggc tac cga gga aga  aac tcg       17450
Cys Arg Leu  Arg Val Pro Ile Thr  Gly Tyr Arg Gly Arg  Asn Ser
        2740                2745                2750

cgc cgt aga  agg atg ttg ggt agc  ggg atg cgt cgc cac  agg cgg       17495
Arg Arg Arg  Arg Met Leu Gly Ser  Gly Met Arg Arg His  Arg Arg
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        2755                2760                2765

cgg cgc gct  atc agc aag agg ctg  ggg ggt ggc ttt ctg  acc gct       17540
Arg Arg Ala  Ile Ser Lys Arg Leu  Gly Gly Gly Phe Leu  Thr Ala
        2770                2775                2780

ttg att ccc  att atc gcc gcg gcg  atc ggg gcg gta cca  ggc ata       17585
Leu Ile Pro  Ile Ile Ala Ala Ala  Ile Gly Ala Val Pro  Gly Ile
        2785                2790                2795

gct tcc gtg  gcg gtt cag gcc tcg  cag cgc cac tgacattgga            17628
Ala Ser Val  Ala Val Gln Ala Ser  Gln Arg His
        2800                2805

aaaacactta taaataaaat agaatggact ctgacgctcc tggtcctgtg actatgtttt  17688

tgtagag atg gaa  gac atc aat ttt tca  tcc ctg gct ccg cga  cac       17734
        Met Glu  Asp Ile Asn Phe Ser  Ser Leu Ala Pro Arg  His
            2810                2815                2820

ggc acg agg ccg  tac atg ggc acc tgg  agc gac atc ggc acc  agc       17779
Gly Thr Arg Pro  Tyr Met Gly Thr Trp  Ser Asp Ile Gly Thr  Ser
            2825                2830                2835

caa ctg aac ggg  ggc gcc ttc aat tgg  agc agt atc tgg agc  ggg       17824
Gln Leu Asn Gly  Gly Ala Phe Asn Trp  Ser Ser Ile Trp Ser  Gly
            2840                2845                2850

ctt aaa aat ttt  ggc tct gcc ata aaa  acc tat ggg aac aaa  gct       17869
Leu Lys Asn Phe  Gly Ser Ala Ile Lys  Thr Tyr Gly Asn Lys  Ala
            2855                2860                2865

tgg aac agc agc  aca ggg cag gcg ctg  agg aat aag ctt aaa  gag       17914
Trp Asn Ser Ser  Thr Gly Gln Ala Leu  Arg Asn Lys Leu Lys  Glu
            2870                2875                2880

cag aac ttc cag  cag aag gtg gtc gat  ggg atc gcc tct ggc  atc       17959
Gln Asn Phe Gln  Gln Lys Val Val Asp  Gly Ile Ala Ser Gly  Ile
            2885                2890                2895

aat ggg gta gtg  gat ctg gcc aac cag  gcc gtg cag aaa cag  ata       18004
Asn Gly Val Val  Asp Leu Ala Asn Gln  Ala Val Gln Lys Gln  Ile
            2900                2905                2910

aac agc cgc ctg  gac ccg ccg ccc gca  gcc cct ggc gaa atg  gaa       18049
Asn Ser Arg Leu  Asp Pro Pro Pro Ala  Ala Pro Gly Glu Met  Glu
            2915                2920                2925

gtg gag gaa gag  ctc cct ccc ctg gaa  aag cgg gga gac aag  cgc       18094
Val Glu Glu Glu  Leu Pro Pro Leu Glu  Lys Arg Gly Asp Lys  Arg
            2930                2935                2940

ccg cgt ccc gat  atg gag gag acg ctg  gtg acg cgg gga gac  gaa       18139
Pro Arg Pro Asp  Met Glu Glu Thr Leu  Val Thr Arg Gly Asp  Glu
            2945                2950                2955

ccg cct cca tat  gag gag gcg ata aag  ctt gga atg ccc act  acc       18184
Pro Pro Pro Tyr  Glu Glu Ala Ile Lys  Leu Gly Met Pro Thr  Thr
            2960                2965                2970
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agg cct ata gct  ccc atg gcc acc ggg  gta atg aaa cct tct  cag       18229
Arg Pro Ile Ala  Pro Met Ala Thr Gly  Val Met Lys Pro Ser  Gln
            2975                 2980                 2985

tcg cat cga ccc  gcc acc ctg gac ttg  cct cct gcc cct gct  gct       18274
Ser His Arg Pro  Ala Thr Leu Asp Leu  Pro Pro Ala Pro Ala  Ala
            2990                 2995                 3000

gca gcg ccc gct  cca aag cct gtc gct  acc ccg aag cct acc  tcc       18319
Ala Ala Pro Ala  Pro Lys Pro Val Ala  Thr Pro Lys Pro Thr  Ser
            3005                 3010                 3015

gta cag ccc gtc  gcc gta gcc aga ccg  cgt cct ggg ggc act  ccg       18364
Val Gln Pro Val  Ala Val Ala Arg Pro  Arg Pro Gly Gly Thr  Pro
            3020                 3025                 3030

cgc ccg aat gca  aac tgg cag agt act  ctg aac agc atc gtg  ggt       18409
Arg Pro Asn Ala  Asn Trp Gln Ser Thr  Leu Asn Ser Ile Val  Gly
            3035                 3040                 3045

ttg ggc gtg cag  agt gta aag cgc cgt  cgc tgc tat taattaaata        18455
Leu Gly Val Gln  Ser Val Lys Arg Arg  Arg Cys Tyr
            3050                 3055

tggagtagcg cttaacttgc ttgtctgtgt gtatgtgtca tcaccacgcc gccgcagcag   18515

cagaggagaa aggaagaggt cgcgcgccga ggctgagttg ctttcaag atg gcc  acc   18572
                                                      Met Ala  Thr
                                                          3060

cca tcg atg ctg  ccc cag tgg gca tac  atg cac atc gcc gga  cag       18617
Pro Ser Met Leu  Pro Gln Trp Ala Tyr  Met His Ile Ala Gly  Gln
            3065                 3070                 3075

gat gct tcg gag  tac ctg agt ccg ggt  ctg gtg cag ttc gcc  cgt       18662
Asp Ala Ser Glu  Tyr Leu Ser Pro Gly  Leu Val Gln Phe Ala  Arg
            3080                 3085                 3090

gcc aca gat acc  tac ttc aat ctg ggg  aac aag ttt agg aac  ccc       18707
Ala Thr Asp Thr  Tyr Phe Asn Leu Gly  Asn Lys Phe Arg Asn  Pro
            3095                 3100                 3105

acc gtg gcc ccc  acc cac gat gtg acc  acc gac cga agc cag  cgg       18752
Thr Val Ala Pro  Thr His Asp Val Thr  Thr Asp Arg Ser Gln  Arg
            3110                 3115                 3120

ctg atg ctg cgc  ttt gtg ccc gtt gat  cgt gag gac aat act  tac       18797
Leu Met Leu Arg  Phe Val Pro Val Asp  Arg Glu Asp Asn Thr  Tyr
            3125                 3130                 3135

tcg tac aaa gtt  cgc tac aca ctg gct  gtg ggc gac aac aga  gtg       18842
Ser Tyr Lys Val  Arg Tyr Thr Leu Ala  Val Gly Asp Asn Arg  Val
            3140                 3145                 3150

cta gat atg gcc  agc acc ttc ttt gac  atc aga ggg gtg ctt  gat       18887
Leu Asp Met Ala  Ser Thr Phe Phe Asp  Ile Arg Gly Val Leu  Asp
            3155                 3160                 3165
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aga ggt ccc agc  ttc aag ccc tac tct  ggc aca gct tac aac  tcc       18932
Arg Gly Pro Ser  Phe Lys Pro Tyr Ser  Gly Thr Ala Tyr Asn  Ser
            3170                 3175                 3180

ctg gct cct aag  gga gct ccc aac cct  agc cag tgg cta gaa  tct       18977
Leu Ala Pro Lys  Gly Ala Pro Asn Pro  Ser Gln Trp Leu Glu  Ser
            3185                 3190                 3195

act aca gct gat  gaa act acc act act  act aca cat acg ttt  ggt       19022
Thr Thr Ala Asp  Glu Thr Thr Thr Thr  Thr Thr His Thr Phe  Gly
            3200                 3205                 3210

atg gct tct atg  aag ggg tat gac att  acc aaa gac ggt tta  caa       19067
Met Ala Ser Met  Lys Gly Tyr Asp Ile  Thr Lys Asp Gly Leu  Gln
            3215                 3220                 3225

att gga aaa gaa  gta act gcc act ggc  gat gaa aaa cca att  tat       19112
Ile Gly Lys Glu  Val Thr Ala Thr Gly  Asp Glu Lys Pro Ile  Tyr
            3230                 3235                 3240

gca gat aaa aaa  ttt caa cca gaa ccc  caa gta ggg gaa gaa  tct       19157
Ala Asp Lys Lys  Phe Gln Pro Glu Pro  Gln Val Gly Glu Glu  Ser
            3245                 3250                 3255

tgg act gac act  gat gga aca aat gaa  aaa ttt gga ggc aga  act       19202
Trp Thr Asp Thr  Asp Gly Thr Asn Glu  Lys Phe Gly Gly Arg  Thr
            3260                 3265                 3270

ctt aaa agt gct  acc aat atg aaa cca  tgt tat gga tcg ttc  gct       19247
Leu Lys Ser Ala  Thr Asn Met Lys Pro  Cys Tyr Gly Ser Phe  Ala
            3275                 3280                 3285

aga ccc aca aac  aag gaa gga ggt cag  gcc aaa acc aga aaa  gtc       19292
Arg Pro Thr Asn  Lys Glu Gly Gly Gln  Ala Lys Thr Arg Lys  Val
            3290                 3295                 3300

cct gcg gct gaa  gag ggg gga gct gaa  act gaa gag cca gat  att       19337
Pro Ala Ala Glu  Glu Gly Gly Ala Glu  Thr Glu Glu Pro Asp  Ile
            3305                 3310                 3315

gat atg gtg ttt  tat gat gat aga caa  gct gcc gat cct gct  ttg       19382
Asp Met Val Phe  Tyr Asp Asp Arg Gln  Ala Ala Asp Pro Ala  Leu
            3320                 3325                 3330

gcg cct gaa gtt  gtt ctt tac act gaa  aat gta aat ttg gaa  act       19427
Ala Pro Glu Val  Val Leu Tyr Thr Glu  Asn Val Asn Leu Glu  Thr
            3335                 3340                 3345

cct gac acc cat  att gta tac aag ccg  ggt act tca gat gtc  agt       19472
Pro Asp Thr His  Ile Val Tyr Lys Pro  Gly Thr Ser Asp Val  Ser
            3350                 3355                 3360

tca cat gaa aat  ttg gga cag caa gct  atg cct aac aga ccc  aat       19517
Ser His Glu Asn  Leu Gly Gln Gln Ala  Met Pro Asn Arg Pro  Asn
            3365                 3370                 3375

tac att gga ttt  aga gat aac ttt gtt  ggg ctt atg tac tac  aat       19562
Tyr Ile Gly Phe  Arg Asp Asn Phe Val  Gly Leu Met Tyr Tyr  Asn
            3380                 3385                 3390
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agt act ggc aac  atg ggt gtg ttg gca  ggg cag gca tca cag  cta       19607
Ser Thr Gly Asn  Met Gly Val Leu Ala  Gly Gln Ala Ser Gln  Leu
            3395                 3400                 3405

aat gca gta gtt  gac ttg caa gat aga  aac act gag cta tcg  tac       19652
Asn Ala Val Val  Asp Leu Gln Asp Arg  Asn Thr Glu Leu Ser  Tyr
            3410                 3415                 3420

cag ctt ttg ctt  gat tcc ctg ggt gac  aga act cga tat ttc  agc       19697
Gln Leu Leu Leu  Asp Ser Leu Gly Asp  Arg Thr Arg Tyr Phe  Ser
            3425                 3430                 3435

atg tgg aat cag  gct gtg gat agt tat  gac ccc gat gtg cgc  att       19742
Met Trp Asn Gln  Ala Val Asp Ser Tyr  Asp Pro Asp Val Arg  Ile
            3440                 3445                 3450

att gaa aat cat  ggc ata gag gat gaa  ttg cca aat tat tgt  ttt       19787
Ile Glu Asn His  Gly Ile Glu Asp Glu  Leu Pro Asn Tyr Cys  Phe
            3455                 3460                 3465

cct ttg gat gga  att ggg cct ggc aag  tcc tat caa gga att  aaa       19832
Pro Leu Asp Gly  Ile Gly Pro Gly Lys  Ser Tyr Gln Gly Ile  Lys
            3470                 3475                 3480

gag aaa act ggc  gaa gac aaa aaa tgg  gaa aaa gac ggt act  cag       19877
Glu Lys Thr Gly  Glu Asp Lys Lys Trp  Glu Lys Asp Gly Thr  Gln
            3485                 3490                 3495

gcc aat tcc aat  gaa ata gcc ata ggt  aat aac ctg gct atg  gaa       19922
Ala Asn Ser Asn  Glu Ile Ala Ile Gly  Asn Asn Leu Ala Met  Glu
            3500                 3505                 3510

att aat atc cag  gct aac ctc tgg aga  agt ttt ctg tac tcc  aac       19967
Ile Asn Ile Gln  Ala Asn Leu Trp Arg  Ser Phe Leu Tyr Ser  Asn
            3515                 3520                 3525

gtg gct ctg tac  ctt cca gat gct tac  aag tac acg cca gcc  aac       20012
Val Ala Leu Tyr  Leu Pro Asp Ala Tyr  Lys Tyr Thr Pro Ala  Asn
            3530                 3535                 3540

att act ttg cct  gcc aat acc aac acc  tat gaa tac atg aac  ggg       20057
Ile Thr Leu Pro  Ala Asn Thr Asn Thr  Tyr Glu Tyr Met Asn  Gly
            3545                 3550                 3555

cga gtg gtg gca  cca tct ttg gtt gat  tca tac atc aac att  ggt       20102
Arg Val Val Ala  Pro Ser Leu Val Asp  Ser Tyr Ile Asn Ile  Gly
            3560                 3565                 3570

gcc agg tgg tct  ctt gac cca atg gac  aat gtg aac ccc ttc  aat       20147
Ala Arg Trp Ser  Leu Asp Pro Met Asp  Asn Val Asn Pro Phe  Asn
            3575                 3580                 3585

cac cac cga aac  gct ggg ctg cgt tac  aga tcc atg ctt ctg  ggc       20192
His His Arg Asn  Ala Gly Leu Arg Tyr  Arg Ser Met Leu Leu  Gly
            3590                 3595                 3600

aat ggt cgc tat  gtg cct ttc cac atc  caa gtg cct caa aaa  ttc       20237
Asn Gly Arg Tyr  Val Pro Phe His Ile  Gln Val Pro Gln Lys  Phe
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            3605                3610                3615

ttt gct atc aaa  aac ctg ctt ctc ctc  ccc gga tca tac acc  tat       20282
Phe Ala Ile Lys  Asn Leu Leu Leu Leu  Pro Gly Ser Tyr Thr  Tyr
            3620                3625                3630

gag tgg aac ttc  aga aag gat gtg aat  atg gtt ctg cag agt  tcc       20327
Glu Trp Asn Phe  Arg Lys Asp Val Asn  Met Val Leu Gln Ser  Ser
            3635                3640                3645

ctt ggt aat gat  ctc aga act gat gga  gcc agc atc agt ttt  acc       20372
Leu Gly Asn Asp  Leu Arg Thr Asp Gly  Ala Ser Ile Ser Phe  Thr
            3650                3655                3660

agc atc aac ctc  tac gcc acc ttc ttc  ccc atg gct cac aac  act       20417
Ser Ile Asn Leu  Tyr Ala Thr Phe Phe  Pro Met Ala His Asn  Thr
            3665                3670                3675

gct tcc acc ctt  gaa gcc atg ctg cgc  aat gac acc aat gac  cag       20462
Ala Ser Thr Leu  Glu Ala Met Leu Arg  Asn Asp Thr Asn Asp  Gln
            3680                3685                3690

tca ttc aat gac  tac ctt tct gca gct  aac atg ctc tac cca  att       20507
Ser Phe Asn Asp  Tyr Leu Ser Ala Ala  Asn Met Leu Tyr Pro  Ile
            3695                3700                3705

cca gca aat gct  acc aac atc ccc atc  tca att ccc tct cgc  aac       20552
Pro Ala Asn Ala  Thr Asn Ile Pro Ile  Ser Ile Pro Ser Arg  Asn
            3710                3715                3720

tgg gct gcc ttc  agg ggc tgg tca ttc  acc aga ctc aaa aca  aag       20597
Trp Ala Ala Phe  Arg Gly Trp Ser Phe  Thr Arg Leu Lys Thr  Lys
            3725                3730                3735

gag act ccc tct  ttg gga tca gga ttc  gat ccc tac ttt gtt  tac       20642
Glu Thr Pro Ser  Leu Gly Ser Gly Phe  Asp Pro Tyr Phe Val  Tyr
            3740                3745                3750

tct ggt tct att  ccc tac ctg gat ggc  acc ttc tac ctc aac  cac       20687
Ser Gly Ser Ile  Pro Tyr Leu Asp Gly  Thr Phe Tyr Leu Asn  His
            3755                3760                3765

act ttc aag aag  gtg tcc atc atg ttt  gac tcc tca gtc agc  tgg       20732
Thr Phe Lys Lys  Val Ser Ile Met Phe  Asp Ser Ser Val Ser  Trp
            3770                3775                3780

cca ggc aat gac  aga ttg cta act cca  aat gag ttc gaa atc  aag       20777
Pro Gly Asn Asp  Arg Leu Leu Thr Pro  Asn Glu Phe Glu Ile  Lys
            3785                3790                3795

cgc act gtg gat  gga gaa ggg tac aat  gtg gct caa tgc aac  atg       20822
Arg Thr Val Asp  Gly Glu Gly Tyr Asn  Val Ala Gln Cys Asn  Met
            3800                3805                3810

acc aag gat tgg  ttc ctg gtt cag atg  ctt gcc aac tat aac  att       20867
Thr Lys Asp Trp  Phe Leu Val Gln Met  Leu Ala Asn Tyr Asn  Ile
            3815                3820                3825

ggc tac cag ggc  ttt tac atc cca gag  ggg tac aag gat cgc  atg       20912
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Gly Tyr Gln Gly  Phe Tyr Ile Pro Glu  Gly Tyr Lys Asp Arg  Met
            3830                3835                3840

tat tcc ttc ttc  aga aac ttc cag ccc  atg agc aga cag gtg  gtt       20957
Tyr Ser Phe Phe  Arg Asn Phe Gln Pro  Met Ser Arg Gln Val  Val
            3845                3850                3855

gat gaa gtt aat  tac aag gag tac caa  gcc gtc aca ctt gct  tac       21002
Asp Glu Val Asn  Tyr Lys Glu Tyr Gln  Ala Val Thr Leu Ala  Tyr
            3860                3865                3870

caa cac aac aac  tct ggc ttt gtg ggt  tac ctt gcg ccc act  atg       21047
Gln His Asn Asn  Ser Gly Phe Val Gly  Tyr Leu Ala Pro Thr  Met
            3875                3880                3885

agg cag gga gaa  cct tac ccc gct aac  tac cca tac ccc cta  atc       21092
Arg Gln Gly Glu  Pro Tyr Pro Ala Asn  Tyr Pro Tyr Pro Leu  Ile
            3890                3895                3900

gga acc act gct  gtc aag agt gtt acc  cag aaa aag ttc ctg  tgc       21137
Gly Thr Thr Ala  Val Lys Ser Val Thr  Gln Lys Lys Phe Leu  Cys
            3905                3910                3915

gac agg acc atg  tgg cgc atc ccc ttc  tcc agc aac ttc atg  tcc       21182
Asp Arg Thr Met  Trp Arg Ile Pro Phe  Ser Ser Asn Phe Met  Ser
            3920                3925                3930

atg ggt gcc ctt  acc gac ctg gga cag  aac atg ctt tat gcc  aac       21227
Met Gly Ala Leu  Thr Asp Leu Gly Gln  Asn Met Leu Tyr Ala  Asn
            3935                3940                3945

tca gcc cat gcg  ctg gac atg act ttt  gag gtg gat ccc atg  gat       21272
Ser Ala His Ala  Leu Asp Met Thr Phe  Glu Val Asp Pro Met  Asp
            3950                3955                3960

gag ccc acc ctg  ctt tat gtt ctt ttc  gaa gtc ttc gac gtg  gtc       21317
Glu Pro Thr Leu  Leu Tyr Val Leu Phe  Glu Val Phe Asp Val  Val
            3965                3970                3975

aga gtg cac cag  cca cac cgc ggc gtc  atc gag gct gtc tac  ctg       21362
Arg Val His Gln  Pro His Arg Gly Val  Ile Glu Ala Val Tyr  Leu
            3980                3985                3990

cgt acc ccg ttc  tca gct ggt aac gcc  acc aca taaagaagct             21405
Arg Thr Pro Phe  Ser Ala Gly Asn Ala  Thr Thr
            3995                4000

tcttgcttct tgcaagcagc tgtc atg gcc tgt  ggg tcc ggc aac gga  tcc     21456
                          Met Ala Cys  Gly Ser Gly Asn Gly  Ser
                                  4005                4010

agc gag caa gag  ctc agg gcc att gct  aga gac ctg ggc tgt  gga       21501
Ser Glu Gln Glu  Leu Arg Ala Ile Ala  Arg Asp Leu Gly Cys  Gly
            4015                4020                4025

ccc tat ttc ctg  gga acc ttt gat aag  cgc ttc ccg ggg ttc  atg       21546
Pro Tyr Phe Leu  Gly Thr Phe Asp Lys  Arg Phe Pro Gly Phe  Met
            4030                4035                4040
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gct ccc gac aag  ctc gcc tgt gcc att  gtt aat acg gcc ggt  cgc       21591
Ala Pro Asp Lys  Leu Ala Cys Ala Ile  Val Asn Thr Ala Gly  Arg
            4045                 4050                 4055

gag acg ggg gga  gag cac tgg ctg gct  ttt ggt tgg aat ccg  cgc       21636
Glu Thr Gly Gly  Glu His Trp Leu Ala  Phe Gly Trp Asn Pro  Arg
            4060                 4065                 4070

tcc aac acc tgc  tac ctt ttt gat cct  ttt ggc ttc tcg gat  gag       21681
Ser Asn Thr Cys  Tyr Leu Phe Asp Pro  Phe Gly Phe Ser Asp  Glu
            4075                 4080                 4085

cgc ctc aag caa  atc tac cag ttt gag  tat gag ggt ctc ctg  cgc       21726
Arg Leu Lys Gln  Ile Tyr Gln Phe Glu  Tyr Glu Gly Leu Leu  Arg
            4090                 4095                 4100

cgc agt gcc ctg  gct acc aag gat cgc  tgt gtc acc ctg gaa  aag       21771
Arg Ser Ala Leu  Ala Thr Lys Asp Arg  Cys Val Thr Leu Glu  Lys
            4105                 4110                 4115

tcc acc cag acc  gtg cag ggc ccg cgc  tcc gca gcc tgt gga  ctt       21816
Ser Thr Gln Thr  Val Gln Gly Pro Arg  Ser Ala Ala Cys Gly  Leu
            4120                 4125                 4130

ttt tgc tgc atg  ttc ctc cac gct ttt  gtg cat tgg ccc gac  cgc       21861
Phe Cys Cys Met  Phe Leu His Ala Phe  Val His Trp Pro Asp  Arg
            4135                 4140                 4145

ccc atg gac gga  aac ccc acc atg aag  ttg ttg act ggg gtg  ccc       21906
Pro Met Asp Gly  Asn Pro Thr Met Lys  Leu Leu Thr Gly Val  Pro
            4150                 4155                 4160

aac agc atg ctc  caa tca ccc caa gtc  cag ccc acc ctg cgc  cac       21951
Asn Ser Met Leu  Gln Ser Pro Gln Val  Gln Pro Thr Leu Arg  His
            4165                 4170                 4175

aac cag gag gcg  ctc tac cgc ttc ctc  aat acc cac tca tct  tac       21996
Asn Gln Glu Ala  Leu Tyr Arg Phe Leu  Asn Thr His Ser Ser  Tyr
            4180                 4185                 4190

ttt cgt tct cac  cgc gcg cgc atc gaa  aag gct acc gcg ttt  gac       22041
Phe Arg Ser His  Arg Ala Arg Ile Glu  Lys Ala Thr Ala Phe  Asp
            4195                 4200                 4205

cgt atg gat atg  caa taataagtca tgtaaaaacc gtgttcaaat aaacagcact    22096
Arg Met Asp Met  Gln
            4210

ttatttttta catgcactgt ggctctgggt tgctcattca ttcatcattc actcagaagt    22156

cgaaggggtt ctggcgggaa tcagcgtgac ccgctggcag ggatacgttg cggaactgga    22216

acctgttctg ccacttgaac tcggggatca ccagcttggg aactggaatc tcggggaagg    22276

tgtcttgcca cagctttctg gtcagttgca gagcgccgag caggtcagga gcagagatct    22336

tgaaatcaca gttggggccg gcattctggg tgcggtagtt gcggtacact gggttgcagc    22396

actggaacac catcagggcg gggtgtctca cgctcgccag cacggtcggg tcactgatgg    22456
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tagacacatc caagtcttca gcattggcca ttccaaaggg ggtcatctta caggtctgcc    22516

tgcccatcac gggagcgcag ccgggcttgt ggttgcaatc gcagtgaatg gggatcagca    22576

tcatcctggc ctggtcgggg gttatccctg gataaaccgc cttcataaag gcttcgtact    22636

gcttgaaagc ttcctgggcc ttgcttccct cggtgtagaa catcccacag gacttgctgg    22696

aaaactgatt agtagcacag ttggcatcat tcacacagca gcgggcatcg ttgttggcca    22756

gctggaccac attcctgccc cagcggttct gggtgatctt ggctcggtct gggttctcct    22816

tcatcgcgcg ctgcccgttc tcgctcgcca catccatctc gatgatgtga tccttctgga    22876

tcatgatagt gccatgcagg catttcacct tgccttcata atcggtgcag ccatgagccc    22936

acagagcgca cccggtgcac tcccaattgt tgtgggcgat ctcagaataa gaatgcacca    22996

atccctgcag gaatcttccc atcatcgcag tcagggtctt caagctggta aaggtcagcg    23056

ggatgccgcg gtgctcctcg ttcacatact ggtggcagat acgcctgtac tgctcgtgct    23116

gttcgggcat cagcttgaaa gaggttctca ggtcattatc cagcctgtac ctctccatca    23176

gtacggccat tacttccatg cccttctccc aggcagagac caggggcagg ctcatgggat    23236

tcctaacagc aagagcagca gatgcagctc ctttagccag agggtcattc ttgtcaatct    23296

tctcaacact tctcttgcca tccttctcag tgatgcgcac gggtgggtag ctgaaaccca    23356

cgaccaccag ctctgcctgt tctctttctt cttcgctgtc ctggctgatg tcttgcagag    23416

ggacatgttt ggtcttcctg ggcttcttct tgggagggat cgggggaggg ctgttgctcc    23476

gctccggaga cagggaggac cgcgaagttt cgctcaccag taccacctgg ctctcggtag    23536

aagaaccgga ccccacgcgg cggtaggtgt tcctcttcgg gggcagaggt ggaggcgact    23596

gcgatggact gcgatccggc ctgggaggcg gatggctggc agagcctctt ccgcgttcgg    23656

gggtgtgttc ccggtggcgg tcgcttgact gatttcctcc gcggctggcc attgtgttct    23716

cctaggcaga gaaacaacag ac atg gag act cag  cca tcg ctg cca aca        23765
                         Met Glu Thr Gln  Pro Ser Leu Pro Thr
                                     4215                 4220

ccg ctg caa gcg cca  tca cac ctc gcc ccc  agc agc gac gag gag        23810
Pro Leu Gln Ala Pro  Ser His Leu Ala Pro  Ser Ser Asp Glu Glu
               4225                 4230                 4235

gag agc tta acc acc  cca cca ccc agt ccc  gcc acc acc acc tct        23855
Glu Ser Leu Thr Thr  Pro Pro Pro Ser Pro  Ala Thr Thr Thr Ser
               4240                 4245                 4250

acc cta gag gat gag  gag gag gtc gac gca  ccc cag gag atg cag        23900
Thr Leu Glu Asp Glu  Glu Glu Val Asp Ala  Pro Gln Glu Met Gln
               4255                 4260                 4265
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gat atg gag gat gag  aaa gcg gaa gag att  gag gca gat gtc gag        23945
Asp Met Glu Asp Glu  Lys Ala Glu Glu Ile  Glu Ala Asp Val Glu
                4270                4275                4280

cag gac ccg ggc tat  gtg aca ccg gcg gag  cac gag gag gag ctg        23990
Gln Asp Pro Gly Tyr  Val Thr Pro Ala Glu  His Glu Glu Glu Leu
                4285                4290                4295

aga cgc ttt cta gac  aga gag gat gac aac  cgc cca gag cag aaa        24035
Arg Arg Phe Leu Asp  Arg Glu Asp Asp Asn  Arg Pro Glu Gln Lys
                4300                4305                4310

gca gat ggc gat cac  cag gag gct ggg ctc  ggg gat cat gtc gcc        24080
Ala Asp Gly Asp His  Gln Glu Ala Gly Leu  Gly Asp His Val Ala
                4315                4320                4325

gaa tac ctc acc ggg  ctt ggc ggg gag gac  gtg ctc ctc aaa cat        24125
Glu Tyr Leu Thr Gly  Leu Gly Gly Glu Asp  Val Leu Leu Lys His
                4330                4335                4340

cta gca agg cag tcg  atc ata gtt aaa gac  gca ctg ctc gac cgc        24170
Leu Ala Arg Gln Ser  Ile Ile Val Lys Asp  Ala Leu Leu Asp Arg
                4345                4350                4355

acc gaa gtg ccc atc  agt gtg gaa gag ctc  agc cgc gcc tac gag        24215
Thr Glu Val Pro Ile  Ser Val Glu Glu Leu  Ser Arg Ala Tyr Glu
                4360                4365                4370

ctc aac ctg ttc tcg  cct cgg ctg ccc ccc  aaa cgt cag cca aac        24260
Leu Asn Leu Phe Ser  Pro Arg Leu Pro Pro  Lys Arg Gln Pro Asn
                4375                4380                4385

ggc acc tgt gag ccc  aac cct cgc ctc aac  ttc tat ccg gcc ttt        24305
Gly Thr Cys Glu Pro  Asn Pro Arg Leu Asn  Phe Tyr Pro Ala Phe
                4390                4395                4400

gct gtc cca gaa gtg  ctt gct acc tac cac  atc ttt ttc aag aac        24350
Ala Val Pro Glu Val  Leu Ala Thr Tyr His  Ile Phe Phe Lys Asn
                4405                4410                4415

caa aag att cca gtc  tcc tgc cgc gcc aac  cgc acc cgc gcc gat        24395
Gln Lys Ile Pro Val  Ser Cys Arg Ala Asn  Arg Thr Arg Ala Asp
                4420                4425                4430

gcc ctg ctc aac ttg  ggt ccg gga gct cgc  tta cct gat ata gct        24440
Ala Leu Leu Asn Leu  Gly Pro Gly Ala Arg  Leu Pro Asp Ile Ala
                4435                4440                4445

tcc ttg gaa gag gtt  cca aag atc ttc gag  ggt ctg ggc agt gat        24485
Ser Leu Glu Glu Val  Pro Lys Ile Phe Glu  Gly Leu Gly Ser Asp
                4450                4455                4460

gag act cgg gcc gca  aat gct ctg caa cag  gga gag aat ggc atg        24530
Glu Thr Arg Ala Ala  Asn Ala Leu Gln Gln  Gly Glu Asn Gly Met
                4465                4470                4475

gat gaa cat cac agc  gct ctg gtg gag ttg  gag gga gac aat gcc        24575
Asp Glu His His Ser  Ala Leu Val Glu Leu  Glu Gly Asp Asn Ala
                4480                4485                4490
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cgg ctt gca gtg ctc  aag cgc agt atc gag  gtc acc cat ttt gcc        24620
Arg Leu Ala Val Leu  Lys Arg Ser Ile Glu  Val Thr His Phe Ala
                4495                4500                4505

tac ccc gct gtc aac  ctg ccc ccc aaa gtc  atg agc gct gtc atg        24665
Tyr Pro Ala Val Asn  Leu Pro Pro Lys Val  Met Ser Ala Val Met
                4510                4515                4520

gat cag ctg ctc atc  aag cgc gca agc ccc  ctt ccc gaa gac cag        24710
Asp Gln Leu Leu Ile  Lys Arg Ala Ser Pro  Leu Pro Glu Asp Gln
                4525                4530                4535

aac atg cag gat cca  gac gcc tcg gac gag  ggc aag ccg gtg gtt        24755
Asn Met Gln Asp Pro  Asp Ala Ser Asp Glu  Gly Lys Pro Val Val
                4540                4545                4550

agt gac gag cag ctg  tct cgc tgg ctg ggc  acc aac tcc ccg cga        24800
Ser Asp Glu Gln Leu  Ser Arg Trp Leu Gly  Thr Asn Ser Pro Arg
                4555                4560                4565

gac ttg gaa gag agg  cgc aag ctt atg atg  gct gta gtg cta gtc        24845
Asp Leu Glu Glu Arg  Arg Lys Leu Met Met  Ala Val Val Leu Val
                4570                4575                4580

act gtg gag ctg gag  tgt ctc cgc cgc ttt  ttc acc gac cct gag        24890
Thr Val Glu Leu Glu  Cys Leu Arg Arg Phe  Phe Thr Asp Pro Glu
                4585                4590                4595

acc ctg cgc aag ctc  gag gag aac ctg cac  tat act ttc aga cat        24935
Thr Leu Arg Lys Leu  Glu Glu Asn Leu His  Tyr Thr Phe Arg His
                4600                4605                4610

ggt ttc gtg cgc cag  gca tgc aag atc tcc  aac gtg gag ctc acc        24980
Gly Phe Val Arg Gln  Ala Cys Lys Ile Ser  Asn Val Glu Leu Thr
                4615                4620                4625

aac ctg gtc tcc tac  atg ggc att ttg cat  gag aac cgc ctg ggg        25025
Asn Leu Val Ser Tyr  Met Gly Ile Leu His  Glu Asn Arg Leu Gly
                4630                4635                4640

cag agc gta ctg cat  acc acc ctg aaa ggg  gag gcc cgc cgc gac        25070
Gln Ser Val Leu His  Thr Thr Leu Lys Gly  Glu Ala Arg Arg Asp
                4645                4650                4655

tac atc cgc gac tgt  gtc tac ctc tac ctc  tgc cat acc tgg cag        25115
Tyr Ile Arg Asp Cys  Val Tyr Leu Tyr Leu  Cys His Thr Trp Gln
                4660                4665                4670

act ggc atg ggt gta  tgg cag cag tgt ttg  gaa gag cag aac ctg        25160
Thr Gly Met Gly Val  Trp Gln Gln Cys Leu  Glu Glu Gln Asn Leu
                4675                4680                4685

aaa gag ctg gac aag  ctc ttg cag aga tcc  ctc aaa gcc ctg tgg        25205
Lys Glu Leu Asp Lys  Leu Leu Gln Arg Ser  Leu Lys Ala Leu Trp
                4690                4695                4700

aca ggt ttt gac gag  cgc acc gtc gcc tca  gac ctg gca gac atc        25250
Thr Gly Phe Asp Glu  Arg Thr Val Ala Ser  Asp Leu Ala Asp Ile
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                4705                4710                4715

atc ttc ccc gag cgt  ctc agg gtt act ctg  cgc aac ggc ctg cct        25295
Ile Phe Pro Glu Arg  Leu Arg Val Thr Leu  Arg Asn Gly Leu Pro
                4720                4725                4730

gac ttc atg agc cag  agc atg ctt aac aac  ttt cgc tct ttc atc        25340
Asp Phe Met Ser Gln  Ser Met Leu Asn Asn  Phe Arg Ser Phe Ile
                4735                4740                4745

ctg gaa cgc tcc ggt  atc ctg ccc gcc acc  tgc tgc gcg ctg ccc        25385
Leu Glu Arg Ser Gly  Ile Leu Pro Ala Thr  Cys Cys Ala Leu Pro
                4750                4755                4760

tcc gac ttt gtg cct  ctc acc tac cgc gag  tgc ccc ccg ccg cta        25430
Ser Asp Phe Val Pro  Leu Thr Tyr Arg Glu  Cys Pro Pro Pro Leu
                4765                4770                4775

tgg agc cac tgc tac  ctg ttc cgc ctg gcc  aac tac ctc tcc tac        25475
Trp Ser His Cys Tyr  Leu Phe Arg Leu Ala  Asn Tyr Leu Ser Tyr
                4780                4785                4790

cac tcg gat gtg atc  gag gat gtg agc gga  gac ggc ctg ctg gag        25520
His Ser Asp Val Ile  Glu Asp Val Ser Gly  Asp Gly Leu Leu Glu
                4795                4800                4805

tgc cac tgc cgc tgc  aat ctc tgc aca ccc  cac cgt tcc ctc gcc        25565
Cys His Cys Arg Cys  Asn Leu Cys Thr Pro  His Arg Ser Leu Ala
                4810                4815                4820

tgc aac ccc cag ttg  ctg agc gag acc cag  atc atc ggc acc ttc        25610
Cys Asn Pro Gln Leu  Leu Ser Glu Thr Gln  Ile Ile Gly Thr Phe
                4825                4830                4835

gag ttg cag ggt ccc  agc agt gaa ggc gag  ggg tct tct ccg ggg        25655
Glu Leu Gln Gly Pro  Ser Ser Glu Gly Glu  Gly Ser Ser Pro Gly
                4840                4845                4850

cag agt ctg aaa ctg  acc ccg ggg cta tgg  acc tcc gcc tac ctg        25700
Gln Ser Leu Lys Leu  Thr Pro Gly Leu Trp  Thr Ser Ala Tyr Leu
                4855                4860                4865

cgc aag ttc gcc cct  gaa gac tac cac ccc  tat gag atc agg ttc        25745
Arg Lys Phe Ala Pro  Glu Asp Tyr His Pro  Tyr Glu Ile Arg Phe
                4870                4875                4880

tat gag gac caa tca  cag ccg ccc aaa acc  gag ctc tca gcc tgc        25790
Tyr Glu Asp Gln Ser  Gln Pro Pro Lys Thr  Glu Leu Ser Ala Cys
                4885                4890                4895

gtc atc act cag ggg  gca att ctc gcc caa  ttg caa gcc atc caa        25835
Val Ile Thr Gln Gly  Ala Ile Leu Ala Gln  Leu Gln Ala Ile Gln
                4900                4905                4910

aaa tcc cgc caa gaa  ttt ctg ctg aaa aag  ggg aac ggg gtc tac        25880
Lys Ser Arg Gln Glu  Phe Leu Leu Lys Lys  Gly Asn Gly Val Tyr
                4915                4920                4925

ctt gac ccc cag acc  ggt gag gag ctc aac  aca agg ttc cct cag        25925
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Leu Asp Pro Gln Thr  Gly Glu Glu Leu Asn  Thr Arg Phe Pro Gln
                4930                4935                4940

gat gtc cca gcg ccg  agg aag caa gaa gtt  gaa ggt gca gct gcc        25970
Asp Val Pro Ala Pro  Arg Lys Gln Glu Val  Glu Gly Ala Ala Ala
                4945                4950                4955

gcc ccc aga gga tat  gga gga aga ctg gga  cag tca ggc aga gga        26015
Ala Pro Arg Gly Tyr  Gly Gly Arg Leu Gly  Gln Ser Gly Arg Gly
                4960                4965                4970

gga gat gga aga ttg  gga cag cca ggc aga  gga ggc gga cag cct        26060
Gly Asp Gly Arg Leu  Gly Gln Pro Gly Arg  Gly Gly Gly Gln Pro
                4975                4980                4985

gga gga aga cag ttt  gga gga gga aga cga  gga ggc aga gga ggt        26105
Gly Gly Arg Gln Phe  Gly Gly Gly Arg Arg  Gly Gly Arg Gly Gly
                4990                4995                5000

gga aga agc aac cgc  cgc caa aca gtt gtc  ctc ggc agc gga gac        26150
Gly Arg Ser Asn Arg  Arg Gln Thr Val Val  Leu Gly Ser Gly Asp
                5005                5010                5015

aag caa ggt ccc aga  cag cag cag cac ggc  tac aat ctc cgc tcc        26195
Lys Gln Gly Pro Arg  Gln Gln Gln His Gly  Tyr Asn Leu Arg Ser
                5020                5025                5030

ggg ggg ggc cca gcg  gcg tcc caa cag tagatgggac gagaccgggc          26242
Gly Gly Gly Pro Ala  Ala Ser Gln Gln
                5035

gattcccgaa cccgaccacc gcttccaaga ccggtaagaa ggagcggcag ggatacaagt    26302

cctggcgggg gcataagaat gccatcatct cctgcttgca tgaatgcggg ggcaacatat    26362

ccttcacccg gcgctacctg ctcttccacc acggggtgaa cttccccgc aatgtcttgc     26422

attactaccg tcacctccac agcccctact acaaccagca agtcccggca gcctcggcag    26482

agaaagacag cagcagcagc agcagcgggg acctccagca gaaaaccagc agcagcagtt    26542

agaaaatcca gtgcagcagg aggaggactg aggatcacag cgaacgagcc agcgcagacc    26602

cgagagctga gaaacaggat ctttccaacc ctctatgcca tcttccagca gagtcggggg    26662

caagagcagg aactgaaagt aaaaaaccga tctctgcgct cgctcacccg aagttgtttg    26722

tatcacaaga gcgaagacca acttcagcgc actctcgagg acgccgaggc tctcttcaac    26782

aagtactgcg cgctgactct taaagagtag cccgcgcccg cgctcgctcg aaaaaggcgg    26842

gaattacgtc acccttggca cctgtccttt gccctcgtc atg  agt aaa gaa att      26896
                                          Met  Ser Lys Glu Ile
                                          5040

ccc  acg cct tac atg tgg  agc tat cag ccc caa  atg gga ctg gca       26941
Pro  Thr Pro Tyr Met Trp  Ser Tyr Gln Pro Gln  Met Gly Leu Ala
5045                5050                5055
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gca  ggc gcc tcc cag gac  tac tcc acc cgc atg  aat tgg ctc agc       26986
Ala  Gly Ala Ser Gln Asp  Tyr Ser Thr Arg Met  Asn Trp Leu Ser
5060                5065                5070

gcc  ggc ccc tcg atg atc  tca cgg gtt aat gat  ata cga gct tac       27031
Ala  Gly Pro Ser Met Ile  Ser Arg Val Asn Asp  Ile Arg Ala Tyr
5075                5080                5085

cga  aac cag tta ctc cta  gaa cag tca gca ctc  acc acc aca ccc       27076
Arg  Asn Gln Leu Leu Leu  Glu Gln Ser Ala Leu  Thr Thr Thr Pro
5090                5095                5100

cgc  caa cac ctt aat ccc  cgg aat tgg ccc gcc  gcc ctg gtg tac       27121
Arg  Gln His Leu Asn Pro  Arg Asn Trp Pro Ala  Ala Leu Val Tyr
5105                5110                5115

cag  gaa act ccc gct ccc  acc acc gta cta ctt  cct cga gac gcc       27166
Gln  Glu Thr Pro Ala Pro  Thr Thr Val Leu Leu  Pro Arg Asp Ala
5120                5125                5130

cag  gcc gaa gtt cag atg  act aac gca ggt gta  cag ctg gcg ggc       27211
Gln  Ala Glu Val Gln Met  Thr Asn Ala Gly Val  Gln Leu Ala Gly
5135                5140                5145

ggt  tcc gcc ctg tgt cgt  cac cgg cct cag cag  agt ata aaa cgc       27256
Gly  Ser Ala Leu Cys Arg  His Arg Pro Gln Gln  Ser Ile Lys Arg
5150                5155                5160

ctg  gtg atc aga ggc cga  ggt atc cag ctt aac  gac gag tcg gtg       27301
Leu  Val Ile Arg Gly Arg  Gly Ile Gln Leu Asn  Asp Glu Ser Val
5165                5170                5175

agc  tct tcg ctt ggt ctg  cga cca gac gga gtc  ttc caa att gcc       27346
Ser  Ser Ser Leu Gly Leu  Arg Pro Asp Gly Val  Phe Gln Ile Ala
5180                5185                5190

ggc  tgt ggg aga tct tcc  ttc act cct cgt cag  gct gtc ctg act       27391
Gly  Cys Gly Arg Ser Ser  Phe Thr Pro Arg Gln  Ala Val Leu Thr
5195                5200                5205

ttg  gag agt tcg tcc tcg  caa ccc cgc tcg ggc  ggc atc ggg act       27436
Leu  Glu Ser Ser Ser Ser  Gln Pro Arg Ser Gly  Gly Ile Gly Thr
5210                5215                5220

ctc  cag ttt gtg gag gag  ttt act ccc tct gtc  tac ttc aac ccc       27481
Leu  Gln Phe Val Glu Glu  Phe Thr Pro Ser Val  Tyr Phe Asn Pro
5225                5230                5235

ttc  tcc ggc tct cct ggc  cag tac ccg gac gag  ttc ata ccg aac       27526
Phe  Ser Gly Ser Pro Gly  Gln Tyr Pro Asp Glu  Phe Ile Pro Asn
5240                5245                5250

ttc  gac gca atc agc gag  tca gtg gat ggc tat  gat tg atg tct ggt    27573
Phe  Asp Ala Ile Ser Glu  Ser Val Asp Gly Tyr  Asp    Met Ser Gly
5255                5260                5265

ggc  gcg gct gag tta gct  cga ctg cga cat cta  gac cac tgc cgc       27618
Gly  Ala Ala Glu Leu Ala  Arg Leu Arg His Leu  Asp His Cys Arg
5270                5275                5280
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cgc  ttt cgc tgt ttc gcc  cgg gaa ctc acc gag  ttc atc tac ttc       27663
Arg  Phe Arg Cys Phe Ala  Arg Glu Leu Thr Glu  Phe Ile Tyr Phe
5285                5290                5295

gaa  ctc ccc gag gag cac  cct cag gga ccg gcc  cac gga gtg cgg       27708
Glu  Leu Pro Glu Glu His  Pro Gln Gly Pro Ala  His Gly Val Arg
5300                5305                5310

att  acc atc gaa ggg gga  ata gac tct cgc ctg  cat cgg atc ttc       27753
Ile  Thr Ile Glu Gly Gly  Ile Asp Ser Arg Leu  His Arg Ile Phe
5315                5320                5325

tgt  cag cgg cca gtg ctg  atc gaa cgc gac cag  gga act aca aca       27798
Cys  Gln Arg Pro Val Leu  Ile Glu Arg Asp Gln  Gly Thr Thr Thr
5330                5335                5340

gtc  tcc atc tac tgc atc  tgt aac cac ccc gga  ttg cat gaa agc       27843
Val  Ser Ile Tyr Cys Ile  Cys Asn His Pro Gly  Leu His Glu Ser
5345                5350                5355

ctt  tgc tgt ctt att tgt  gct gag ttt aat aaa  aac tgagttcaga       27889
Leu  Cys Cys Leu Ile Cys  Ala Glu Phe Asn Lys  Asn
5360                5365                5370

ccctcctacg gactaccgct tcttcaaccc ggactttaca acaccagcca gaccctccgt   27949

tccagccaga agacccaggc ccttcctctg atccaggact ctaattctac ctccccagca   28009

ccatccccta ctaaccttcc cgaaactaac aacctcggag ctcagctgca acaccgcttc   28069

tccagaagcc tcctttctgc caatactact actcccaaaa ccggaggtga gctccgcggt   28129

ctccctactg acaacccctg ggcggtagca ggttttgtag cgttaggagt agttgcgggt   28189

gggctggtgc ttatcctctg ctacctatac acaccttgct gtgcttattt agtaatattg   28249

tgctgctggt ttaagaa atg ggg gtc gta  cta gta gcg ctt gct  tta ctt     28299
                  Met Gly Val Val  Leu Val Ala Leu Ala  Leu Leu
                                   5375                5380

tcg ctt ttg  ggt ctg ggc tct act  acg cta aga aat cag  cct ttg       28344
Ser Leu Leu  Gly Leu Gly Ser Thr  Thr Leu Arg Asn Gln  Pro Leu
        5385                5390                5395

cta tta gat  ccc aat gat gtt gat  cca tgt ctg gac ttt  gat cca       28389
Leu Leu Asp  Pro Asn Asp Val Asp  Pro Cys Leu Asp Phe  Asp Pro
        5400                5405                5410

gag aac tgc  aca ctc act ttt gca  cct gaa aca agt cgc  ttc tgt       28434
Glu Asn Cys  Thr Leu Thr Phe Ala  Pro Glu Thr Ser Arg  Phe Cys
        5415                5420                5425

gga gtt gtt  att agg tgc gga ttt  gaa tgc agg ccc att  gag att       28479
Gly Val Val  Ile Arg Cys Gly Phe  Glu Cys Arg Pro Ile  Glu Ile
        5430                5435                5440

aca cac aat  aac aaa act tgg aac  aat acc tta ttt acc  aca tgg       28524
Thr His Asn  Asn Lys Thr Trp Asn  Asn Thr Leu Phe Thr  Thr Trp
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        5445                5450                5455

tct cca gga  gat cct cag tgg tat  act gtc tct gtc cgg  ggt cct       28569
Ser Pro Gly  Asp Pro Gln Trp Tyr  Thr Val Ser Val Arg  Gly Pro
        5460                5465                5470

gac ggt tcc  gtc cgc atg gct aat  aac act ttc att ttt  gct gaa       28614
Asp Gly Ser  Val Arg Met Ala Asn  Asn Thr Phe Ile Phe  Ala Glu
        5475                5480                5485

atg tgc gat  atg gcc atg ttc atg  agc aga cag tat gac  cta tgg       28659
Met Cys Asp  Met Ala Met Phe Met  Ser Arg Gln Tyr Asp  Leu Trp
        5490                5495                5500

cct ccc agc  aaa gag aac att gtg  gca ttc tcc att gct  tat tgc       28704
Pro Pro Ser  Lys Glu Asn Ile Val  Ala Phe Ser Ile Ala  Tyr Cys
        5505                5510                5515

ttg ggt aca  tgc atc atc act gct  atc atg tgt gtg agc  ata cac       28749
Leu Gly Thr  Cys Ile Ile Thr Ala  Ile Met Cys Val Ser  Ile His
        5520                5525                5530

ttg ctt ata  gcc att cgc cca aaa  aac aat caa gaa aaa  gag aaa       28794
Leu Leu Ile  Ala Ile Arg Pro Lys  Asn Asn Gln Glu Lys  Glu Lys
        5535                5540                5545

atg ccc tgattataaa tttctattta cagaaaatga cctctgtttc agctctcata       28850
Met Pro

tttgctacta ttatggctgt tcaaggacag gctgttcaag gacagacact tattaatgtt    28910

catcctggaa ctaatcatac cttggtggtt cctaataact attcaaatat tgaatggcaa    28970

tggttcacaa acaacgtatg gtatgaacca tgcgaacatt acagcctatt catttgcaat    29030

cataatttaa ctttaatcaa tgtcagcaca atacacaaag gatactatta tagatatgac    29090

aaccacagca ttgatcctac aatatatcta gtacgtgtaa atccaattaa caaacctata    29150

cccaaagctt tctctagaac tacaatacaa aactttaaaa cagcaatttt acttaatttt    29210

aaaaccaaaa atattacagg caatatactt cccactactc ccactgaaaa aaatacacct    29270

aattcaatat ttgaaatcat cattgcactg ttagcagtag gcataacaat catactatgt    29330

atgataattt atgctcactg ttataaaaaa attcaccaca aaaaagaacc actactaagc    29390

ttttaatttc ttttttatac agcc atg  att ttc ttc gca act  ctt att act     29441
                          Met  Ile Phe Phe Ala Thr  Leu Ile Thr
                          5550                5555

att ggc  att gtt caa ggg caa  gat atc aca att gga  tat gta ggc       29486
Ile Gly  Ile Val Gln Gly Gln  Asp Ile Thr Ile Gly  Tyr Val Gly
    5560                5565                5570

aat aat  att acc cta tta ggt  ccc cca aca gga aca  atc cct acc       29531
Asn Asn  Ile Thr Leu Leu Gly  Pro Pro Thr Gly Thr  Ile Pro Thr
    5575                5580                5585
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tgg tac  aaa ata tat gaa aga  ggg tgg tgg att aga  ccc tgc gac       29576
Trp Tyr  Lys Ile Tyr Glu Arg  Gly Trp Trp Ile Arg  Pro Cys Asp
    5590                 5595                 5600

caa gga  ggt agt aaa tac att  tgt ggt aga gac ata  acc atc acc       29621
Gln Gly  Gly Ser Lys Tyr Ile  Cys Gly Arg Asp Ile  Thr Ile Thr
    5605                 5610                 5615

aat ctt  aat aaa aac gat aat  ggc tac tat ttt tgc  aat aac tat       29666
Asn Leu  Asn Lys Asn Asp Asn  Gly Tyr Tyr Phe Cys  Asn Asn Tyr
    5620                 5625                 5630

gga ggt  ggt aaa aag tct tac  aca ctt gaa gta aga  gac ccc acc       29711
Gly Gly  Gly Lys Lys Ser Tyr  Thr Leu Glu Val Arg  Asp Pro Thr
    5635                 5640                 5645

act tta  gca cca cat acc act  ttc tcc agc agc acg  tct aga aac       29756
Thr Leu  Ala Pro His Thr Thr  Phe Ser Ser Ser Thr  Ser Arg Asn
    5650                 5655                 5660

aca cat  gag gca gct tat gcc  aga gca atg ctt caa  aaa att aat       29801
Thr His  Glu Ala Ala Tyr Ala  Arg Ala Met Leu Gln  Lys Ile Asn
    5665                 5670                 5675

gaa aca  ata aat tct aca atc  tct cat aat cca gac  gaa att ccc       29846
Glu Thr  Ile Asn Ser Thr Ile  Ser His Asn Pro Asp  Glu Ile Pro
    5680                 5685                 5690

aaa tca  atg att ggc att att  gta gcc gtg gca gtt  gga atg gca       29891
Lys Ser  Met Ile Gly Ile Ile  Val Ala Val Ala Val  Gly Met Ala
    5695                 5700                 5705

atc ata  ata att tgt atg atc  gtc tat gct tgc tgc  tat aga aag       29936
Ile Ile  Ile Ile Cys Met Ile  Val Tyr Ala Cys Cys  Tyr Arg Lys
    5710                 5715                 5720

ttt caa  gat gaa aaa gga gac  cca cta cta agc ttt  gat att           29978
Phe Gln  Asp Glu Lys Gly Asp  Pro Leu Leu Ser Phe  Asp Ile
    5725                 5730                 5735

taatttcttt atagaaac atg aaa gga  gta ggt atc cta gtt  ctt tca act   30029
                    Met Lys Gly  Val Gly Ile Leu Val  Leu Ser Thr
                            5740                 5745

tta atc  tac tca gtg atc cct  atc agc atc aat gtg  cag act act       30074
Leu Ile  Tyr Ser Val Ile Pro  Ile Ser Ile Asn Val  Gln Thr Thr
    5750                 5755                 5760

tta aat  gaa act gga aac cac  tca act acc tca cat  aca cct ccc       30119
Leu Asn  Glu Thr Gly Asn His  Ser Thr Thr Ser His  Thr Pro Pro
    5765                 5770                 5775

ccg ctt  tct acc cac cct caa  tcc aaa gat gcc ata  caa cta caa       30164
Pro Leu  Ser Thr His Pro Gln  Ser Lys Asp Ala Ile  Gln Leu Gln
    5780                 5785                 5790

ctc acc  atc ctt att gtg att  ggg tta act atc ctt  gct gtt atc       30209
Leu Thr  Ile Leu Ile Val Ile  Gly Leu Thr Ile Leu  Ala Val Ile
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    5795                5800                5805

ctt tac  ttt atc ttt tgc cgc  caa ata ccc aat gta  gtt aaa cct      30254
Leu Tyr  Phe Ile Phe Cys Arg  Gln Ile Pro Asn Val  Val Lys Pro
    5810                5815                5820

acc aga  cgt ccc atc tat cga  tca ata atc agc aaa  ccc cac atg      30299
Thr Arg  Arg Pro Ile Tyr Arg  Ser Ile Ile Ser Lys  Pro His Met
    5825                5830                5835

gct cta  aat gaa att taatctttct cttcacagta tggtgatcaa ct atg atc    30352
Ala Leu  Asn Glu Ile                                    Met Ile
    5840                                                    5845

cct aga aat ttc ttc  ttc acc ata ctt atc  tgc gct ttc aat gtc      30397
Pro Arg Asn Phe Phe  Phe Thr Ile Leu Ile  Cys Ala Phe Asn Val
                5850                5855                5860

tgt gct aca ttc gcc  aca gtc gcc aat gtg  aca cca gat tgt ata      30442
Cys Ala Thr Phe Ala  Thr Val Ala Asn Val  Thr Pro Asp Cys Ile
                5865                5870                5875

ggg gca ttt gct tcc  tac gta cta ttt gcc  ttc att acc tgc atc      30487
Gly Ala Phe Ala Ser  Tyr Val Leu Phe Ala  Phe Ile Thr Cys Ile
                5880                5885                5890

tgc gtt tgt agc ata  gtc tgc ctg gtt atc  aac ttc ttt caa cta      30532
Cys Val Cys Ser Ile  Val Cys Leu Val Ile  Asn Phe Phe Gln Leu
                5895                5900                5905

gta gac tgg gtt ttt  gta cgc att gcc tac  cta cga cat cac cct      30577
Val Asp Trp Val Phe  Val Arg Ile Ala Tyr  Leu Arg His His Pro
                5910                5915                5920

gaa tac cgc aac caa  aat gtt gca gca att  ctt agg ctc att          30619
Glu Tyr Arg Asn Gln  Asn Val Ala Ala Ile  Leu Arg Leu Ile
                5925                5930

taaaaccatg caaactctgc tactgcttct gctagttata caccaatgtg cctcaaaccc  30679

cacaagcccc acaaaattag atctaagaaa atgtaaattt caagaaccat ggaaattcct  30739

tgattgctat catgaaacat ctgatttccc cacatactgg attacaatca ttggggttgt  30799

taatctagtc tcttgcacac tattctcttt ccttgtttac cacttatttg attttggatg  30859

gaacgccctt aatgcactca cttacccaca agaaccagag gaacatatac cactacagaa  30919

catacaacca ttagcactag aatatgaaaa tgagccacag cctccactac tccctgccat  30979

tagctacttc aacctaaccg gtggag atg  act gac cca cac gcc  gct gct      31029
                            Met  Thr Asp Pro His Ala  Ala Ala
                            5935                5940

gag gaa cta  ctt gat atg gac ggc  cgt gcc tcc gaa cag  cgc ctc      31074
Glu Glu Leu  Leu Asp Met Asp Gly  Arg Ala Ser Glu Gln  Arg Leu
        5945                5950                5955

gct caa cta  cgc att cgc cag cag  cag gaa cgt gcc gcc  aag gag      31119
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Ala Gln Leu  Arg Ile Arg Gln Gln  Gln Glu Arg Ala Ala  Lys Glu
        5960                5965                5970

ctc agg gat  gcc att gag att cac  cag tgc aaa aaa ggc  ata ttc       31164
Leu Arg Asp  Ala Ile Glu Ile His  Gln Cys Lys Lys Gly  Ile Phe
        5975                5980                5985

tgc ttg gta  aaa caa gcc aag atc  tcc tac gag atc acc  gct aac       31209
Cys Leu Val  Lys Gln Ala Lys Ile  Ser Tyr Glu Ile Thr  Ala Asn
        5990                5995                6000

gac cac cgc  ctc tca tat gag ctt  ggc ccg cag cgt cag  aaa ttc       31254
Asp His Arg  Leu Ser Tyr Glu Leu  Gly Pro Gln Arg Gln  Lys Phe
        6005                6010                6015

act tgc atg  gtg gga atc aac ccc  ata gtc atc acc cag  caa gct       31299
Thr Cys Met  Val Gly Ile Asn Pro  Ile Val Ile Thr Gln  Gln Ala
        6020                6025                6030

gga gat acc  aag ggt tgc atc cat  tgt tcc tgt gaa tcc  acc gag       31344
Gly Asp Thr  Lys Gly Cys Ile His  Cys Ser Cys Glu Ser  Thr Glu
        6035                6040                6045

tgc atc tac  acc ctg ctg aag acc  ctc tgc ggc ctt cga  gac ctc       31389
Cys Ile Tyr  Thr Leu Leu Lys Thr  Leu Cys Gly Leu Arg  Asp Leu
        6050                6055                6060

cta ccc atg  aac taatcaacaa cccctaccct cttcccatta aaatccaatt         31441
Leu Pro Met  Asn
        6065

aataaaattc acttacttaa aatcagaaac aaagtttttg tccaagttgt tttcaaccag    31501

cacctcactt ccctcttccc aactctggta ctctaagcct cggcgggtgg catacttcct    31561

ccacactttg aaagggatgt caaattttag ttcttctttt cccacaatct tcatttcttt    31621

attcccag atg gcc aaa cga  gct cgt cta agc agc  tcc ttc aac ccg       31668
         Met Ala Lys Arg  Ala Arg Leu Ser Ser  Ser Phe Asn Pro
                     6070                6075

gtc  tac ccc tat gaa gat  gaa agc agt tca caa  cac ccc ttt ata       31713
Val  Tyr Pro Tyr Glu Asp  Glu Ser Ser Ser Gln  His Pro Phe Ile
6080                6085                6090

aac  cct ggt ttc att tcc  cct aat ggg ttt aca  caa agt cca gac       31758
Asn  Pro Gly Phe Ile Ser  Pro Asn Gly Phe Thr  Gln Ser Pro Asp
6095                6100                6105

gga  gct ctt aca ctc aag  tgt gtt gcc cct ctt  act acc acc agt       31803
Gly  Ala Leu Thr Leu Lys  Cys Val Ala Pro Leu  Thr Thr Thr Ser
6110                6115                6120

ggc  tcc ctg gat att aaa  gta gga ggg ggg ctt  aag gta gac tcc       31848
Gly  Ser Leu Asp Ile Lys  Val Gly Gly Gly Leu  Lys Val Asp Ser
6125                6130                6135

act  gat ggg tcc tta gaa  gaa aac ata agc act  aca gca cca ctt       31893
Thr  Asp Gly Ser Leu Glu  Glu Asn Ile Ser Thr  Thr Ala Pro Leu
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6140                6145                6150

aac  aaa tct aat cat tcc  ata gga tta gca gtg  gga aat gga tta       31938
Asn  Lys Ser Asn His Ser  Ile Gly Leu Ala Val  Gly Asn Gly Leu
6155                6160                6165

caa  aca aat gaa agc aaa  cta tgt gcc aaa tta  gga gag gaa ctt       31983
Gln  Thr Asn Glu Ser Lys  Leu Cys Ala Lys Leu  Gly Glu Glu Leu
6170                6175                6180

acc  ttt gat tct tcc aat  gcc att aca ata aaa  aat aac act tta       32028
Thr  Phe Asp Ser Ser Asn  Ala Ile Thr Ile Lys  Asn Asn Thr Leu
6185                6190                6195

tgg  aca gga gca aaa cca  agt act aac tgt aaa  att caa gaa gat       32073
Trp  Thr Gly Ala Lys Pro  Ser Thr Asn Cys Lys  Ile Gln Glu Asp
6200                6205                6210

gca  gat gcc cta gac tgc  aag cta act cta gtc  ctt gta aaa aat       32118
Ala  Asp Ala Leu Asp Cys  Lys Leu Thr Leu Val  Leu Val Lys Asn
6215                6220                6225

gga  gga cta gta aat gca  tat gtg tca tta ata  gga gac tca gac       32163
Gly  Gly Leu Val Asn Ala  Tyr Val Ser Leu Ile  Gly Asp Ser Asp
6230                6235                6240

tat  gtt aat aca cta ttc  act aaa aag act gca  tca atc agc gta       32208
Tyr  Val Asn Thr Leu Phe  Thr Lys Lys Thr Ala  Ser Ile Ser Val
6245                6250                6255

gaa  ctt gcc ttt gat agc  tcc ggt caa ata ctt  act agc cta tct       32253
Glu  Leu Ala Phe Asp Ser  Ser Gly Gln Ile Leu  Thr Ser Leu Ser
6260                6265                6270

tct  cta aaa act agc ctc  aac ttt aaa cac aac  caa gac atg gcc       32298
Ser  Leu Lys Thr Ser Leu  Asn Phe Lys His Asn  Gln Asp Met Ala
6275                6280                6285

act  gaa act atc agt gcc  aaa ggc ttc atg cct  agt acc act gct       32343
Thr  Glu Thr Ile Ser Ala  Lys Gly Phe Met Pro  Ser Thr Thr Ala
6290                6295                6300

tat  ccc ttt aac acc cag  gct act tct tct aga  gac aat gaa gat       32388
Tyr  Pro Phe Asn Thr Gln  Ala Thr Ser Ser Arg  Asp Asn Glu Asp
6305                6310                6315

tac  att ttt ggt aaa tgt  tac tac aga gcc tca  tat gga gct cta       32433
Tyr  Ile Phe Gly Lys Cys  Tyr Tyr Arg Ala Ser  Tyr Gly Ala Leu
6320                6325                6330

tac  act ttg gat gtt act  gta ata ctc aac aga  cgt atg acc gct       32478
Tyr  Thr Leu Asp Val Thr  Val Ile Leu Asn Arg  Arg Met Thr Ala
6335                6340                6345

gct  gga atg gct tat gca  atg aac ttt acg tgg  ctt ctt gac gcg       32523
Ala  Gly Met Ala Tyr Ala  Met Asn Phe Thr Trp  Leu Leu Asp Ala
6350                6355                6360

aca  gat gcc cca gaa aat  acc aca acc acc ttg  gtc acc tcc ccc       32568
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Thr  Asp Ala Pro Glu Asn  Thr Thr Thr Thr Leu  Val Thr Ser Pro
6365                6370                6375

ttc  tcc ttt tcc tat att  aga gaa gat gac tgacaacaaa ataaagttca      32618
Phe  Ser Phe Ser Tyr Ile  Arg Glu Asp Asp
6380                6385

acttttttatt gaaaatcagt ttacaggata cgagtagtta ttttgcctcc cccttcccat    32678

ttcatagaat acaccaatct ctccccacgc acagctttaa acatttggat tccatttgag    32738

atagtcatgg atttagattc cacattccac acagtttcag agctacataa tcttggatca    32798

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ccgagaacgg gatcgggcgg ttgtgtctca tcaaaccccg aagcagtcgc tgtctgcgcc    32978

gctccgtgcg actgctgctg atgggatcgg ggtccacagt ctctcgaagc atgattctaa    33038

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aatcacagca gtaggtacaa cacaacacca caatattgtt taacaggcca taattaaagg    33158

cgctccagcc aaaactcatt tcaggaataa tttgccccgc gtggccatcg taccaaatcc    33218

tgatgaaaat tagatggcgc cccctccaga atacactgcc cacatacatg atctccttag    33278

gcatatgcat attcacaatc tctcggtacc atggacagcg ctggttaatc atgcagcccc    33338

gaataacctt ccggaaccaa atggccagca atgcgccccc agcaatacat tgaagagaac    33398

cctgtcgatt acagtgacaa tggagaaccc acttctctcg cccatggatc acttgggaat    33458

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tggcagaaca aggcagaccg cgaacataac ttacactatg catggtcaag gtattgcaat    33638

ctggtaacag cggatgctct tcagtcatag aagctctggt ttcactttcc tcacagcgtg    33698

gtaaaggggc cctcagttga ggttccctgg tgtaaggatg gtgtctggcg cacgatgtcg    33758

agcgtgcacg cgacctcgtt gtaatggagc tgcttcctga cattctcgta ttttgcatgg    33818

cagaacctag ccttggcaca acacacttct cttcgccttc tatcccgtcg cctagcacgt    33878

tcagtatggt aattgaagta cagccattcc cgtagattgg tcaaaagttc ctcggcttca    33938

gttgtcataa aaactccatc atatcttact gctctgataa aatcattcac tgtagaatgg    33998

gcaatgccca gccaggcaat gcaattagct tgtgtttcaa ccaaaggagg gggaggaaga    34058

catggaagaa ccataattaa tttttattcc agacgatccc gcagtatttc tacatggaga    34118

tcacgaagat ggcacctctc gcccccactg tgttgatgaa aaatgacagc taggtcaaac    34178
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ataatgcgat tttccaggtg ctcaacggtg gcttcaagca aagcctccaa acgtacatcc 34238

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tcctgtacca ttcccaaata attttcatct ttccatcctt gaattattcg tgttatttca 34358

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cttaagcaca ccctcatagt gaaaaaatat cgtgctcctc tgtcacctgc agcaaattaa 34478

gaatggcaac atcatactgg atgccactgg ctctaagttc ttctctaagt tccagttgta 34538

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tgcaatatgc atactgagaa cctccagtga tatcatccag tgtactggaa agataatcag 34718

gcagagcttc tcgtatacaa ttaataatag aaaagtctgc cagatgaaca tttaaagcct 34778

gtgggatgca gatgcaataa gttatcgcgc tgcgctccaa cattgttagt atggttagtc 34838

tgtaaaaaca aaaaacaaaa ttacatcacg ctgtactggc gaacgggtgg ataaatcact 34898

ctctccaaca ccaggcaggc tacagggtct ccagcgcgac cctcgtaaaa cctgtcagta 34958

tgattaaaaa gcatcaccga aagagattgt tgatggccag catatattat ttgcgatgaa 35018

gcatacaaac cagaagtgtt agtatcagtt aaagaaaaaa atcggccaag atagcatctc 35078

ggaacgatta tgctcaatct caaatgcagc aaagcgacac ctcgcggatg caaagtaaaa 35138

tccacaggag cataaaaaat gtaattattc ccctcttgca caggcagcct agctcccggc 35198

ccctccagga tcacatacaa agcctcagca gccatagctt accgcgcaaa tcaggcacag 35258

cagtcagata acgagaaagc tgtgaactga ctgcccagcc tgtgcgcaat atatagagaa 35318

cccttacact gacgtaattg gacaaagtct aaaaaatccc gccaaaaacc agcacacgcc 35378

cagaactgtg tcacccgcta aaaaataatt ttcacttcct cgttccgtga atgacgtcag 35438

ttccccctttc ccacgagccg tcacttccgg gcatcttgca acgtcacctc cccgcgccgg 35498

cccgcccctt ttgaccgttg aacccgctgg ccaatcccct tccgccctcc attttcaaaa 35558

gctcatttgc atgttggcac cgttccattt ataaggtata ttattgatga tg 35610

<210> 2
<211> 495
<212> PRT
<213> Simian adenovirus 28

<400> 2

Met Asp Pro Thr Asn Pro Leu Gln Gln Gly Ile Arg Leu Gly Phe His
1 5 10 15

```
Ser Ser Ser Phe Val Glu Asn Met Glu Gly Pro Gln Ala Glu Asp Asn
            20                  25                  30

Leu Arg Leu Leu Ala Ser Ala Ala Ser Gly Arg Ser Gly Asp Pro Glu
        35                  40                  45

Thr Pro Thr Gly His Ala Ser Gly Phe Gly Gly Gly Ala Ala Gly Gly
    50                  55                  60

Gln Pro Glu Ser Arg Pro Gly Pro Ser Gly Gly Gly Gly Gly Gly Val
65                  70                  75                  80

Ala Asp Leu Phe Pro Glu Leu Arg Arg Val Leu Thr Arg Ser Thr Ser
                85                  90                  95

Ser Gly Gln Asp Arg Gly Ile Lys Arg Glu Arg Asn Ala Ser Gly His
            100                 105                 110

Asn Ser Arg Thr Glu Leu Ala Leu Ser Leu Met Ser Arg Ser Arg Pro
        115                 120                 125

Glu Thr Ile Trp Trp His Glu Val Gln Ser Glu Gly Arg Asp Glu Val
    130                 135                 140

Ser Ile Leu Gln Glu Lys Tyr Ser Leu Glu Gln Ile Lys Thr Cys Trp
145                 150                 155                 160

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

Ile Ser Leu Arg Pro Asp Lys Gln Tyr Arg Ile Thr Lys Lys Ile Asn
            180                 185                 190

Ile Arg Asn Ala Cys Tyr Ile Ser Gly Asn Gly Ala Glu Val Ile Ile
        195                 200                 205

Asp Thr Pro Asp Lys Thr Ala Phe Arg Cys Cys Met Met Gly Met Trp
    210                 215                 220

Pro Gly Val Ala Gly Met Glu Ala Val Thr Leu Met Asn Ile Arg Phe
225                 230                 235                 240

Arg Gly Asp Gly Tyr Asn Gly Ile Val Phe Met Ala Asn Thr Lys Leu
                245                 250                 255
```

```
Ile Leu His Gly Cys Ser Phe Phe Gly Phe Asn Asn Thr Cys Val Glu
            260                 265                 270

Ala Trp Gly Gln Val Ser Val Arg Gly Cys Ser Phe Tyr Ala Cys Trp
        275                 280                 285

Ile Ala Leu Ser Gly Arg Thr Lys Ser Gln Leu Ser Val Lys Lys Cys
    290                 295                 300

Met Phe Glu Arg Cys Asn Leu Gly Ile Leu Asn Glu Gly Glu Ala Arg
305                 310                 315                 320

Val Arg His Cys Ala Ala Thr Glu Thr Gly Cys Phe Ile Leu Ile Lys
                325                 330                 335

Gly Asn Ala Ser Val Lys His Asn Met Ile Cys Gly Pro Ser Asp Glu
            340                 345                 350

Arg Pro Tyr Gln Met Leu Thr Cys Ala Gly Gly His Cys Asn Met Leu
        355                 360                 365

Ala Thr Val His Ile Val Ser His Ala Arg Lys Lys Trp Pro Val Phe
    370                 375                 380

Glu His Asn Val Met Thr Lys Cys Thr Met His Ile Gly Gly Arg Arg
385                 390                 395                 400

Gly Met Phe Met Pro Tyr Gln Cys Asn Met Asn His Val Lys Val Met
                405                 410                 415

Leu Glu Pro Asp Ala Phe Ser Arg Met Ser Leu Thr Gly Ile Phe Asp
            420                 425                 430

Met Asn Val Gln Leu Trp Lys Ile Leu Arg Tyr Asp Glu Thr Lys Ser
        435                 440                 445

Arg Val Arg Ala Cys Glu Cys Gly Gly Lys His Ala Arg Phe Gln Pro
    450                 455                 460

Val Cys Val Asp Val Thr Glu Asp Leu Arg Pro Asp His Leu Val Leu
465                 470                 475                 480

Ala Cys Thr Gly Ala Glu Phe Gly Ser Ser Gly Glu Glu Thr Asp
```

485 490 495

<210> 3
<211> 138
<212> PRT
<213> Simian adenovirus 28

<400> 3

Met Ser Gly Ser Ala Ser Phe Glu Gly Gly Val Phe Ser Pro Tyr Leu
1 5 10 15

Thr Gly Arg Leu Pro Pro Trp Ala Gly Val Arg Gln Asn Val Met Gly
20 25 30

Ser Thr Val Asp Gly Arg Pro Val Gln Pro Ala Asn Ser Ser Thr Leu
35 40 45

Thr Tyr Ala Thr Leu Ser Ser Ser Ser Leu Asp Ala Ala Ala Ala Ala
50 55 60

Ala Ala Ser Ala Ala Ala Asn Thr Val Leu Gly Met Gly Tyr Tyr Gly
65 70 75 80

Ser Ile Val Ala Asn Ser Ser Ser Ser Asn Asn Pro Ser Thr Leu Ala
85 90 95

Glu Asp Lys Leu Leu Val Leu Leu Ala Gln Leu Glu Ala Leu Thr Gln
100 105 110

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

Glu Ser Ala Val Ala Thr Ala Lys Ser Lys
130 135

<210> 4
<211> 389
<212> PRT
<213> Simian adenovirus 28

<400> 4

Met His Pro Val Leu Arg Gln Met Arg Pro Gln Gln Gln Val Pro Ser
1 5 10 15

Gln Gln Gln Gln Gln Pro Gln Lys Ala Leu Pro Ala Pro Ala Pro Ala
20 25 30

```
Thr Thr Ala Val Ala Ala Val Cys Gly Ala Gly Gln Pro Ala Tyr Asp
        35                  40                  45

Leu Asp Leu Glu Glu Gly Glu Gly Leu Ala Arg Leu Gly Ala Pro Ser
    50                  55                  60

Pro Glu Arg His Pro Arg Val Gln Leu Lys Lys Asp Ser Arg Glu Ala
65                  70                  75                  80

Tyr Val Pro Gln His Asn Leu Phe Arg Asp Arg Ser Gly Glu Glu Pro
                85                  90                  95

Glu Glu Met Arg Ala Ser Arg Phe Asn Ala Gly Arg Glu Leu Arg His
            100                 105                 110

Gly Leu Asp Arg Arg Arg Val Leu Arg Asp Glu Asp Phe Glu Val Asp
        115                 120                 125

Glu Val Thr Gly Ile Ser Pro Ala Arg Ala His Val Ala Ala Ala Asn
    130                 135                 140

Leu Val Ser Ala Tyr Glu Gln Thr Val Lys Glu Glu Arg Asn Phe Gln
145                 150                 155                 160

Lys Ser Phe Asn Asn His Val Arg Thr Leu Ile Ala Arg Glu Glu Val
                165                 170                 175

Thr Leu Gly Leu Met His Leu Trp Asp Leu Met Glu Ala Ile Thr Gln
            180                 185                 190

Asn Pro Thr Ser Lys Pro Leu Thr Ala Gln Leu Phe Leu Val Val Gln
        195                 200                 205

His Ser Arg Asp Asn Glu Ala Phe Arg Glu Ala Leu Leu Asn Ile Thr
    210                 215                 220

Glu Pro Glu Gly Arg Trp Leu Tyr Asp Leu Ile Asn Ile Leu Gln Ser
225                 230                 235                 240

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

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

260 265 270

Tyr Lys Thr Pro Tyr Val Pro Ile Asp Lys Glu Val Lys Ile Asp Gly
275 280 285

Phe Tyr Met Arg Met Thr Leu Lys Val Leu Thr Leu Ser Asp Asp Leu
290 295 300

Gly Val Tyr Arg Asn Asp Arg Met His Arg Ala Val Ser Ala Ser Arg
305 310 315 320

Arg Arg Glu Leu Ser Asp Arg Glu Leu Met His Ser Leu Gln Arg Ala
325 330 335

Leu Thr Gly Ala Gly Thr Asp Gly Glu Asn Tyr Phe Asp Met Gly Ala
340 345 350

Asp Leu Gln Trp Gln Pro Ser Arg Arg Thr Leu Asp Ala Ala Gly Cys
355 360 365

Glu Leu Pro Tyr Val Glu Glu Val Asp Glu Gly Glu Glu Glu Glu Gly
370 375 380

Glu Tyr Leu Glu Asp
385

<210> 5
<211> 587
<212> PRT
<213> Simian adenovirus 28

<400> 5

Met Glu Gln Gln Ala Pro Asp Pro Ala Met Arg Ala Ala Leu Gln Ser
1 5 10 15

Gln Pro Ser Gly Ile Asn Ser Ser Asp Asp Trp Thr Gln Ala Met Gln
20 25 30

Arg Ile Met Ala Leu Thr Thr Arg Asn Pro Glu Ala Phe Arg Gln Gln
35 40 45

Pro Gln Ala Asn Arg Leu Ser Ala Ile Leu Glu Ala Val Val Pro Ser
50 55 60

Arg Ser Asn Pro Thr His Glu Lys Val Leu Ala Ile Val Asn Ala Leu

```
65                  70                  75                  80

Val Glu Asn Lys Ala Ile Arg Pro Asp Glu Ala Gly Leu Val Tyr Asn
                85                  90                  95

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

Asn Leu Asp Arg Met Val Thr Asp Val Arg Glu Ala Val Ser Gln Arg
        115                 120                 125

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

Ala Phe Leu Ser Thr Gln Pro Ala Asn Val Pro Arg Gly Gln Gln Asp
145                 150                 155                 160

Tyr Thr Asn Phe Leu Ser Ala Leu Arg Leu Met Val Thr Glu Val Pro
                165                 170                 175

Gln Ser Glu Val Tyr Gln Ser Gly Pro Asp Tyr Phe Phe Gln Thr Ser
            180                 185                 190

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

Lys Gly Leu Trp Gly Val His Ala Pro Val Gly Asp Arg Ala Thr Val
    210                 215                 220

Ser Ser Leu Leu Thr Pro Asn Ser Arg Leu Leu Leu Leu Leu Val Ala
225                 230                 235                 240

Pro Phe Thr Asp Ser Gly Ser Ile Asp Arg Asn Ser Tyr Leu Gly Tyr
                245                 250                 255

Leu Leu Asn Leu Tyr Arg Glu Ala Ile Gly Gln Ser Gln Val Asp Glu
            260                 265                 270

Gln Thr Tyr Gln Glu Ile Thr Gln Val Ser Arg Ala Leu Gly Gln Glu
        275                 280                 285

Asp Thr Gly Ser Leu Glu Ala Thr Leu Asn Phe Leu Leu Thr Asn Arg
    290                 295                 300
```

```
Ser Gln Lys Ile Pro Pro Gln Tyr Ala Leu Thr Ala Glu Glu Glu Arg
305                 310                 315                 320

Ile Leu Arg Tyr Val Gln Gln Ser Val Gly Leu Phe Leu Met Gln Glu
                325                 330                 335

Gly Ala Thr Pro Ser Ala Ala Leu Asp Met Thr Ala Arg Asn Met Glu
            340                 345                 350

Pro Ser Met Tyr Ala Ser Asn Arg Pro Phe Ile Asn Lys Leu Leu Asp
        355                 360                 365

Tyr Leu His Arg Ala Ala Ala Met Asn Ser Asp Tyr Phe Thr Asn Ala
    370                 375                 380

Ile Leu Asn Pro His Trp Leu Pro Pro Pro Gly Phe Tyr Thr Gly Glu
385                 390                 395                 400

Tyr Asp Met Pro Asp Pro Asn Asp Gly Phe Leu Trp Asp Asp Val Asp
                405                 410                 415

Ser Ser Ile Phe Ser Pro Pro Pro Gly Tyr Asn Thr Trp Lys Lys Glu
            420                 425                 430

Gly Gly Asp Arg Arg His Ser Ser Val Ser Leu Ser Gly Ser Arg Gly
        435                 440                 445

Ala Ala Ala Ala Val Pro Glu Ala Ala Ser Pro Phe Pro Ser Leu Pro
    450                 455                 460

Phe Ser Leu Asn Ser Val Arg Ser Ser Glu Leu Gly Arg Ile Thr Arg
465                 470                 475                 480

Pro Arg Leu Met Gly Glu Asp Glu Tyr Leu Asn Asp Ser Leu Leu Arg
                485                 490                 495

Pro Glu Arg Glu Lys Asn Phe Pro Asn Asn Gly Ile Glu Ser Leu Val
            500                 505                 510

Asp Lys Met Ser Arg Trp Lys Thr Tyr Ala Gln Asp His Lys Asp Glu
        515                 520                 525

Pro Arg Ile Leu Gly Ala Ala Ser Gly Thr Thr Arg Arg Arg Gln Arg
    530                 535                 540
```

```
His Asp Arg Gln Arg Gly Leu Val Trp Asp Asp Glu Asp Ser Ala Asp
545                 550                 555                 560


Asp Ser Ser Val Leu Asp Leu Gly Gly Arg Gly Gly Gly Asn Pro Phe
                565                 570                 575


Ala His Leu Arg Pro His Phe Gly Arg Met Leu
            580                 585


<210>  6
<211>  582
<212>  PRT
<213>  Simian adenovirus 28

<400>  6

Met Met Arg Arg Ala Val Leu Gly Gly Ala Val Val Tyr Pro Glu Gly
1               5                   10                  15


Pro Pro Pro Ser Tyr Glu Ser Val Met Gln Gln Gln Ala Ala Ala Val
            20                  25                  30


Met Gln Pro Ser Leu Glu Ala Pro Phe Val Pro Pro Arg Tyr Leu Ala
        35                  40                  45


Pro Thr Glu Gly Arg Asn Ser Ile Arg Tyr Ser Glu Leu Ala Pro Gln
    50                  55                  60


Tyr Asp Thr Thr Arg Leu Tyr Leu Val Asp Asn Lys Ser Ala Asp Ile
65                  70                  75                  80


Ala Ser Leu Asn Tyr Gln Asn Asp His Ser Asn Phe Leu Thr Thr Val
                85                  90                  95


Val Gln Asn Asn Asp Phe Thr Pro Thr Glu Ala Ser Thr Gln Thr Ile
            100                 105                 110


Asn Phe Asp Glu Arg Ser Arg Trp Gly Gly Gln Leu Lys Thr Ile Met
        115                 120                 125


His Thr Asn Met Pro Asn Val Asn Glu Tyr Met Phe Ser Asn Lys Phe
    130                 135                 140


Lys Ala Arg Val Met Val Ser Arg Lys Lys Pro Glu Gly Tyr Thr Gly
145                 150                 155                 160
```

```
Asp Lys Asn Asp Thr Ser Gln Asp Ile Leu Glu Tyr Glu Trp Phe Glu
                165                 170                 175

Phe Thr Leu Pro Glu Gly Asn Phe Ser Ala Thr Met Thr Ile Asp Leu
            180                 185                 190

Met Asn Asn Ala Ile Ile Asp Asn Tyr Leu Ala Val Gly Arg Gln Asn
        195                 200                 205

Gly Val Leu Glu Ser Asp Ile Gly Val Lys Phe Asp Thr Arg Asn Phe
    210                 215                 220

Arg Leu Gly Trp Asp Pro Ile Thr Lys Leu Val Met Pro Gly Val Tyr
225                 230                 235                 240

Thr Tyr Glu Ala Phe His Pro Asp Ile Val Leu Leu Pro Gly Cys Gly
                245                 250                 255

Val Asp Phe Thr Glu Ser Arg Leu Ser Asn Leu Leu Gly Ile Arg Lys
            260                 265                 270

Arg His Pro Phe Gln Glu Gly Phe Lys Ile Met Tyr Glu Asp Leu Glu
        275                 280                 285

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

Lys Lys Glu Asn Thr Asp Thr Thr Thr Thr Thr Thr Val Thr Thr Thr
305                 310                 315                 320

Glu Val Ala Thr Val Ala Arg His Val Ala Glu Val Thr Thr Glu Ala
                325                 330                 335

Ala Thr Val Val Ala Val Asp Pro Ile Val Glu Glu Asn Asn Asn Thr
            340                 345                 350

Val Arg Gly Asp Asn Ile His Thr Ala Asn Glu Met Lys Ala Ala Ala
        355                 360                 365

Asp Asp Thr Thr Val Val Val Val Pro Gly Ala Val Val Thr Glu Thr
    370                 375                 380

Lys Thr Lys Thr Leu Thr Ile Gln Pro Leu Glu Lys Asp Thr Lys Glu
385                 390                 395                 400
```

```
Arg Ser Tyr Asn Val Ile Ser Gly Thr Asn Asp Thr Ala Tyr Arg Ser
                405                 410                 415

Trp Tyr Leu Ala Tyr Asn Tyr Gly Asp Pro Glu Lys Gly Val Arg Ser
            420                 425                 430

Trp Thr Leu Leu Thr Thr Ser Asp Val Thr Cys Gly Ala Glu Gln Val
        435                 440                 445

Tyr Trp Ser Leu Pro Asp Met Met Gln Asp Pro Val Thr Phe Arg Ser
    450                 455                 460

Thr Arg Gln Val Ser Asn Tyr Pro Val Val Gly Ala Glu Leu Met Pro
465                 470                 475                 480

Val Phe Ser Lys Ser Phe Tyr Asn Glu Gln Ala Val Tyr Ser Gln Gln
                485                 490                 495

Leu Arg Gln Thr Thr Ser Leu Thr His Ile Phe Asp Arg Phe Pro Glu
            500                 505                 510

Asn Gln Ile Leu Ile Arg Pro Pro Ala Pro Thr Ile Thr Thr Val Ser
        515                 520                 525

Glu Asn Val Pro Ala Leu Thr Asp His Gly Thr Leu Pro Leu Arg Ser
    530                 535                 540

Ser Ile Arg Gly Val Gln Arg Val Thr Val Thr Asp Ala Arg Arg Arg
545                 550                 555                 560

Thr Cys Pro Tyr Val Tyr Lys Ala Leu Gly Ile Val Ala Pro Arg Val
                565                 570                 575

Leu Ser Ser Arg Thr Phe
            580
```

<210> 7
<211> 192
<212> PRT
<213> Simian adenovirus 28

<400> 7

```
Met Ser Ile Leu Ile Ser Pro Ser Asn Asn Thr Gly Trp Gly Leu Arg
1               5                   10                  15
```

```
Thr Pro Thr Arg Met Tyr Gly Gly Ala Arg Lys Arg Ser Thr Gln His
            20                  25                  30

Pro Val Arg Val Arg Gly His Phe Arg Ala Pro Trp Gly Ala Leu Lys
        35                  40                  45

Gly Arg Thr Arg Thr Arg Thr Thr Val Asp Asp Val Ile Asp Gln Val
    50                  55                  60

Val Ala Asp Ala Arg Asn Tyr Thr Pro Ala Ala Pro Ala Ser Thr Val
65                  70                  75                  80

Asp Ala Val Ile Asp Ser Val Val Ala Asp Ala Arg Glu Tyr Ala Arg
                85                  90                  95

Arg Lys Ser Arg Arg Arg Arg Ile Ala Arg Arg His Arg Ala Thr Pro
            100                 105                 110

Ala Met Arg Ala Ala Arg Ala Leu Leu Arg Arg Ala Lys Arg Val Gly
        115                 120                 125

Arg Arg Ala Met Leu Arg Ala Ala Arg Arg Ala Ala Ser Gly Ala Ser
    130                 135                 140

Ala Gly Arg Ser Arg Arg Arg Ala Ala Thr Ala Ala Ala Ala Ala Ile
145                 150                 155                 160

Ala Asn Met Ala Gln Pro Arg Arg Gly Asn Val Tyr Trp Val Arg Asp
                165                 170                 175

Ala Thr Thr Gly Gln Arg Val Pro Val Arg Thr Arg Pro Pro Arg Thr
            180                 185                 190
```

<210> 8
<211> 350
<212> PRT
<213> Simian adenovirus 28

<400> 8

```
Met Ser Lys Arg Lys Tyr Lys Glu Glu Met Leu Gln Val Ile Ala Pro
1               5                   10                  15

Glu Ile Tyr Gly Pro Pro Val Lys Asp Glu Lys Lys Pro Arg Lys Ile
            20                  25                  30
```

```
Lys Arg Val Lys Lys Asp Lys Lys Glu Glu Asp Gly Asp Asp Gly Leu
        35                  40                  45

Val Glu Phe Val Arg Glu Phe Ala Pro Arg Arg Arg Val Gln Trp Arg
    50                  55                  60

Gly Arg Lys Val Arg Pro Val Leu Arg Pro Gly Thr Thr Val Val Phe
65                  70                  75                  80

Thr Pro Gly Glu Arg Ser Ser Thr Thr Phe Lys Arg Ser Tyr Asp Glu
                85                  90                  95

Val Tyr Gly Asp Asp Asp Ile Leu Glu Gln Ala Ala Asp Arg Leu Gly
            100                 105                 110

Glu Phe Ala Tyr Gly Lys Arg Ser Arg Ser Ser Pro Lys Asp Glu Ala
        115                 120                 125

Val Ser Ile Pro Leu Asp His Gly Asn Pro Thr Pro Ser Leu Lys Pro
    130                 135                 140

Val Thr Leu Gln Gln Val Leu Pro Val Pro Ala Arg Arg Gly Val Lys
145                 150                 155                 160

Arg Glu Gly Glu Asp Leu Tyr Pro Thr Met Gln Leu Met Val Pro Lys
                165                 170                 175

Arg Gln Lys Leu Glu Asp Val Leu Glu Lys Met Lys Val Asp Pro Asp
            180                 185                 190

Ile Gln Pro Glu Val Lys Val Arg Pro Ile Lys Gln Val Ala Pro Gly
        195                 200                 205

Leu Gly Val Gln Thr Val Asp Ile Lys Ile Pro Thr Glu Ser Met Glu
    210                 215                 220

Val Gln Thr Glu Pro Ala Lys Pro Ala Ala Thr Ser Ile Glu Val Gln
225                 230                 235                 240

Thr Asp Pro Trp Ile Pro Ala Pro Val Ala Thr Thr Ala Ser Thr Ala
                245                 250                 255

Arg Arg Pro Arg Arg Lys Tyr Gly Pro Ala Ser Leu Leu Met Pro Asn
```

```
            260                 265                 270

Tyr Ala Leu His Pro Ser Ile Ile Pro Thr Pro Gly Tyr Arg Gly Thr
        275                 280                 285

Arg Tyr Tyr Arg Ser Arg Ser Thr Thr Ser Arg Arg Arg Lys Thr Pro
    290                 295                 300

Ala Ser Arg Ser Arg Arg Arg Arg Arg Arg Thr Ala Ser Lys Leu Thr
305                 310                 315                 320

Pro Ala Ala Leu Val Arg Arg Val Tyr Arg Asp Gly Arg Ala Glu Pro
                325                 330                 335

Leu Met Leu Pro Arg Ala Arg Tyr His Pro Ser Ile Thr Thr
            340                 345                 350
```

<210> 9
<211> 75
<212> PRT
<213> Simian adenovirus 28

<400> 9

```
Met Ala Leu Thr Cys Arg Leu Arg Val Pro Ile Thr Gly Tyr Arg Gly
1               5                   10                  15

Arg Asn Ser Arg Arg Arg Arg Met Leu Gly Ser Gly Met Arg Arg His
            20                  25                  30

Arg Arg Arg Arg Ala Ile Ser Lys Arg Leu Gly Gly Gly Phe Leu Thr
        35                  40                  45

Ala Leu Ile Pro Ile Ile Ala Ala Ala Ile Gly Ala Val Pro Gly Ile
    50                  55                  60

Ala Ser Val Ala Val Gln Ala Ser Gln Arg His
65                  70                  75
```

<210> 10
<211> 250
<212> PRT
<213> Simian adenovirus 28

<400> 10

```
Met Glu Asp Ile Asn Phe Ser Ser Leu Ala Pro Arg His Gly Thr Arg
1               5                   10                  15
```

```
Pro Tyr Met Gly Thr Trp Ser Asp Ile Gly Thr Ser Gln Leu Asn Gly
            20                  25                  30

Gly Ala Phe Asn Trp Ser Ser Ile Trp Ser Gly Leu Lys Asn Phe Gly
        35                  40                  45

Ser Ala Ile Lys Thr Tyr Gly Asn Lys Ala Trp Asn Ser Ser Thr Gly
    50                  55                  60

Gln Ala Leu Arg Asn Lys Leu Lys Glu Gln Asn Phe Gln Gln Lys Val
65                  70                  75                  80

Val Asp Gly Ile Ala Ser Gly Ile Asn Gly Val Val Asp Leu Ala Asn
                85                  90                  95

Gln Ala Val Gln Lys Gln Ile Asn Ser Arg Leu Asp Pro Pro Pro Ala
            100                 105                 110

Ala Pro Gly Glu Met Glu Val Glu Glu Glu Leu Pro Pro Leu Glu Lys
        115                 120                 125

Arg Gly Asp Lys Arg Pro Arg Pro Asp Met Glu Glu Thr Leu Val Thr
    130                 135                 140

Arg Gly Asp Glu Pro Pro Pro Tyr Glu Glu Ala Ile Lys Leu Gly Met
145                 150                 155                 160

Pro Thr Thr Arg Pro Ile Ala Pro Met Ala Thr Gly Val Met Lys Pro
                165                 170                 175

Ser Gln Ser His Arg Pro Ala Thr Leu Asp Leu Pro Pro Ala Pro Ala
            180                 185                 190

Ala Ala Ala Pro Ala Pro Lys Pro Val Ala Thr Pro Lys Pro Thr Ser
        195                 200                 205

Val Gln Pro Val Ala Val Ala Arg Pro Arg Pro Gly Gly Thr Pro Arg
    210                 215                 220

Pro Asn Ala Asn Trp Gln Ser Thr Leu Asn Ser Ile Val Gly Leu Gly
225                 230                 235                 240

Val Gln Ser Val Lys Arg Arg Arg Cys Tyr
```

245 250

<210> 11
<211> 944
<212> PRT
<213> Simian adenovirus 28

<400> 11

Met Ala Thr Pro Ser Met Leu Pro Gln Trp Ala Tyr Met His Ile Ala
1 5 10 15

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

Arg Ala Thr Asp Thr Tyr Phe Asn Leu Gly Asn Lys Phe Arg Asn Pro
35 40 45

Thr Val Ala Pro Thr His Asp Val Thr Thr Asp Arg Ser Gln Arg Leu
50 55 60

Met Leu Arg Phe Val Pro Val Asp Arg Glu Asp Asn Thr Tyr Ser Tyr
65 70 75 80

Lys Val Arg Tyr Thr Leu Ala Val Gly Asp Asn Arg Val Leu Asp Met
85 90 95

Ala Ser Thr Phe Phe Asp Ile Arg Gly Val Leu Asp Arg Gly Pro Ser
100 105 110

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

Ala Pro Asn Pro Ser Gln Trp Leu Glu Ser Thr Thr Ala Asp Glu Thr
130 135 140

Thr Thr Thr Thr Thr His Thr Phe Gly Met Ala Ser Met Lys Gly Tyr
145 150 155 160

Asp Ile Thr Lys Asp Gly Leu Gln Ile Gly Lys Glu Val Thr Ala Thr
165 170 175

Gly Asp Glu Lys Pro Ile Tyr Ala Asp Lys Lys Phe Gln Pro Glu Pro
180 185 190

Gln Val Gly Glu Glu Ser Trp Thr Asp Thr Asp Gly Thr Asn Glu Lys

```
        195                 200                 205

Phe Gly Gly Arg Thr Leu Lys Ser Ala Thr Asn Met Lys Pro Cys Tyr
    210                 215                 220

Gly Ser Phe Ala Arg Pro Thr Asn Lys Glu Gly Gly Gln Ala Lys Thr
225                 230                 235                 240

Arg Lys Val Pro Ala Ala Glu Glu Gly Gly Ala Glu Thr Glu Glu Pro
                245                 250                 255

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

Leu Ala Pro Glu Val Val Leu Tyr Thr Glu Asn Val Asn Leu Glu Thr
        275                 280                 285

Pro Asp Thr His Ile Val Tyr Lys Pro Gly Thr Ser Asp Val Ser Ser
    290                 295                 300

His Glu Asn Leu Gly Gln Gln Ala Met Pro Asn Arg Pro Asn Tyr Ile
305                 310                 315                 320

Gly Phe Arg Asp Asn Phe Val Gly Leu Met Tyr Tyr Asn Ser Thr Gly
                325                 330                 335

Asn Met Gly Val Leu Ala Gly Gln Ala Ser Gln Leu Asn Ala Val Val
            340                 345                 350

Asp Leu Gln Asp Arg Asn Thr Glu Leu Ser Tyr Gln Leu Leu Leu Asp
        355                 360                 365

Ser Leu Gly Asp Arg Thr Arg Tyr Phe Ser Met Trp Asn Gln Ala Val
    370                 375                 380

Asp Ser Tyr Asp Pro Asp Val Arg Ile Ile Glu Asn His Gly Ile Glu
385                 390                 395                 400

Asp Glu Leu Pro Asn Tyr Cys Phe Pro Leu Asp Gly Ile Gly Pro Gly
                405                 410                 415

Lys Ser Tyr Gln Gly Ile Lys Glu Lys Thr Gly Glu Asp Lys Lys Trp
            420                 425                 430
```

```
Glu Lys Asp Gly Thr Gln Ala Asn Ser Asn Glu Ile Ala Ile Gly Asn
        435                 440                 445

Asn Leu Ala Met Glu Ile Asn Ile Gln Ala Asn Leu Trp Arg Ser Phe
    450                 455                 460

Leu Tyr Ser Asn Val Ala Leu Tyr Leu Pro Asp Ala Tyr Lys Tyr Thr
465                 470                 475                 480

Pro Ala Asn Ile Thr Leu Pro Ala Asn Thr Asn Thr Tyr Glu Tyr Met
                485                 490                 495

Asn Gly Arg Val Val Ala Pro Ser Leu Val Asp Ser Tyr Ile Asn Ile
            500                 505                 510

Gly Ala Arg Trp Ser Leu Asp Pro Met Asp Asn Val Asn Pro Phe Asn
        515                 520                 525

His His Arg Asn Ala Gly Leu Arg Tyr Arg Ser Met Leu Leu Gly Asn
    530                 535                 540

Gly Arg Tyr Val Pro Phe His Ile Gln Val Pro Gln Lys Phe Phe Ala
545                 550                 555                 560

Ile Lys Asn Leu Leu Leu Leu Pro Gly Ser Tyr Thr Tyr Glu Trp Asn
                565                 570                 575

Phe Arg Lys Asp Val Asn Met Val Leu Gln Ser Ser Leu Gly Asn Asp
            580                 585                 590

Leu Arg Thr Asp Gly Ala Ser Ile Ser Phe Thr Ser Ile Asn Leu Tyr
        595                 600                 605

Ala Thr Phe Phe Pro Met Ala His Asn Thr Ala Ser Thr Leu Glu Ala
    610                 615                 620

Met Leu Arg Asn Asp Thr Asn Asp Gln Ser Phe Asn Asp Tyr Leu Ser
625                 630                 635                 640

Ala Ala Asn Met Leu Tyr Pro Ile Pro Ala Asn Ala Thr Asn Ile Pro
                645                 650                 655

Ile Ser Ile Pro Ser Arg Asn Trp Ala Ala Phe Arg Gly Trp Ser Phe
            660                 665                 670
```

```
Thr Arg Leu Lys Thr Lys Glu Thr Pro Ser Leu Gly Ser Gly Phe Asp
        675                 680                 685

Pro Tyr Phe Val Tyr Ser Gly Ser Ile Pro Tyr Leu Asp Gly Thr Phe
    690                 695                 700

Tyr Leu Asn His Thr Phe Lys Lys Val Ser Ile Met Phe Asp Ser Ser
705                 710                 715                 720

Val Ser Trp Pro Gly Asn Asp Arg Leu Leu Thr Pro Asn Glu Phe Glu
                725                 730                 735

Ile Lys Arg Thr Val Asp Gly Glu Gly Tyr Asn Val Ala Gln Cys Asn
            740                 745                 750

Met Thr Lys Asp Trp Phe Leu Val Gln Met Leu Ala Asn Tyr Asn Ile
        755                 760                 765

Gly Tyr Gln Gly Phe Tyr Ile Pro Glu Gly Tyr Lys Asp Arg Met Tyr
    770                 775                 780

Ser Phe Phe Arg Asn Phe Gln Pro Met Ser Arg Gln Val Val Asp Glu
785                 790                 795                 800

Val Asn Tyr Lys Glu Tyr Gln Ala Val Thr Leu Ala Tyr Gln His Asn
                805                 810                 815

Asn Ser Gly Phe Val Gly Tyr Leu Ala Pro Thr Met Arg Gln Gly Glu
            820                 825                 830

Pro Tyr Pro Ala Asn Tyr Pro Tyr Pro Leu Ile Gly Thr Thr Ala Val
        835                 840                 845

Lys Ser Val Thr Gln Lys Lys Phe Leu Cys Asp Arg Thr Met Trp Arg
    850                 855                 860

Ile Pro Phe Ser Ser Asn Phe Met Ser Met Gly Ala Leu Thr Asp Leu
865                 870                 875                 880

Gly Gln Asn Met Leu Tyr Ala Asn Ser Ala His Ala Leu Asp Met Thr
                885                 890                 895

Phe Glu Val Asp Pro Met Asp Glu Pro Thr Leu Leu Tyr Val Leu Phe
            900                 905                 910
```

```
Glu Val Phe Asp Val Val Arg Val His Gln Pro His Arg Gly Val Ile
        915                 920                 925

Glu Ala Val Tyr Leu Arg Thr Pro Phe Ser Ala Gly Asn Ala Thr Thr
    930                 935                 940
```

<210> 12
<211> 209
<212> PRT
<213> Simian adenovirus 28

<400> 12

```
Met Ala Cys Gly Ser Gly Asn Gly Ser Ser Glu Gln Glu Leu Arg Ala
1               5                   10                  15

Ile Ala Arg Asp Leu Gly Cys Gly Pro Tyr Phe Leu Gly Thr Phe Asp
            20                  25                  30

Lys Arg Phe Pro Gly Phe Met Ala Pro Asp Lys Leu Ala Cys Ala Ile
        35                  40                  45

Val Asn Thr Ala Gly Arg Glu Thr Gly Gly Glu His Trp Leu Ala Phe
    50                  55                  60

Gly Trp Asn Pro Arg Ser Asn Thr Cys Tyr Leu Phe Asp Pro Phe Gly
65                  70                  75                  80

Phe Ser Asp Glu Arg Leu Lys Gln Ile Tyr Gln Phe Glu Tyr Glu Gly
                85                  90                  95

Leu Leu Arg Arg Ser Ala Leu Ala Thr Lys Asp Arg Cys Val Thr Leu
            100                 105                 110

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

Leu Phe Cys Cys Met Phe Leu His Ala Phe Val His Trp Pro Asp Arg
    130                 135                 140

Pro Met Asp Gly Asn Pro Thr Met Lys Leu Leu Thr Gly Val Pro Asn
145                 150                 155                 160

Ser Met Leu Gln Ser Pro Gln Val Gln Pro Thr Leu Arg His Asn Gln
                165                 170                 175
```

```
Glu Ala Leu Tyr Arg Phe Leu Asn Thr His Ser Ser Tyr Phe Arg Ser
            180                 185                 190

His Arg Ala Arg Ile Glu Lys Ala Thr Ala Phe Asp Arg Met Asp Met
        195                 200                 205

Gln
```

<210> 13
<211> 828
<212> PRT
<213> Simian adenovirus 28

<400> 13

```
Met Glu Thr Gln Pro Ser Leu Pro Thr Pro Leu Gln Ala Pro Ser His
1               5                   10                  15

Leu Ala Pro Ser Ser Asp Glu Glu Glu Ser Leu Thr Thr Pro Pro Pro
            20                  25                  30

Ser Pro Ala Thr Thr Thr Ser Thr Leu Glu Asp Glu Glu Glu Val Asp
        35                  40                  45

Ala Pro Gln Glu Met Gln Asp Met Glu Asp Glu Lys Ala Glu Glu Ile
    50                  55                  60

Glu Ala Asp Val Glu Gln Asp Pro Gly Tyr Val Thr Pro Ala Glu His
65                  70                  75                  80

Glu Glu Glu Leu Arg Arg Phe Leu Asp Arg Glu Asp Asp Asn Arg Pro
                85                  90                  95

Glu Gln Lys Ala Asp Gly Asp His Gln Glu Ala Gly Leu Gly Asp His
            100                 105                 110

Val Ala Glu Tyr Leu Thr Gly Leu Gly Gly Glu Asp Val Leu Leu Lys
        115                 120                 125

His Leu Ala Arg Gln Ser Ile Ile Val Lys Asp Ala Leu Leu Asp Arg
    130                 135                 140

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

```
Asn Leu Phe Ser Pro Arg Leu Pro Pro Lys Arg Gln Pro Asn Gly Thr
                165                 170                 175

Cys Glu Pro Asn Pro Arg Leu Asn Phe Tyr Pro Ala Phe Ala Val Pro
            180                 185                 190

Glu Val Leu Ala Thr Tyr His Ile Phe Phe Lys Asn Gln Lys Ile Pro
        195                 200                 205

Val Ser Cys Arg Ala Asn Arg Thr Arg Ala Asp Ala Leu Leu Asn Leu
    210                 215                 220

Gly Pro Gly Ala Arg Leu Pro Asp Ile Ala Ser Leu Glu Glu Val Pro
225                 230                 235                 240

Lys Ile Phe Glu Gly Leu Gly Ser Asp Glu Thr Arg Ala Ala Asn Ala
                245                 250                 255

Leu Gln Gln Gly Glu Asn Gly Met Asp Glu His His Ser Ala Leu Val
            260                 265                 270

Glu Leu Glu Gly Asp Asn Ala Arg Leu Ala Val Leu Lys Arg Ser Ile
        275                 280                 285

Glu Val Thr His Phe Ala Tyr Pro Ala Val Asn Leu Pro Pro Lys Val
    290                 295                 300

Met Ser Ala Val Met Asp Gln Leu Leu Ile Lys Arg Ala Ser Pro Leu
305                 310                 315                 320

Pro Glu Asp Gln Asn Met Gln Asp Pro Asp Ala Ser Asp Glu Gly Lys
                325                 330                 335

Pro Val Val Ser Asp Glu Gln Leu Ser Arg Trp Leu Gly Thr Asn Ser
            340                 345                 350

Pro Arg Asp Leu Glu Glu Arg Arg Lys Leu Met Met Ala Val Val Leu
        355                 360                 365

Val Thr Val Glu Leu Glu Cys Leu Arg Arg Phe Phe Thr Asp Pro Glu
    370                 375                 380

Thr Leu Arg Lys Leu Glu Glu Asn Leu His Tyr Thr Phe Arg His Gly
```

```
385                 390                 395                 400

Phe Val Arg Gln Ala Cys Lys Ile Ser Asn Val Glu Leu Thr Asn Leu
                405                 410                 415

Val Ser Tyr Met Gly Ile Leu His Glu Asn Arg Leu Gly Gln Ser Val
            420                 425                 430

Leu His Thr Thr Leu Lys Gly Glu Ala Arg Arg Asp Tyr Ile Arg Asp
        435                 440                 445

Cys Val Tyr Leu Tyr Leu Cys His Thr Trp Gln Thr Gly Met Gly Val
    450                 455                 460

Trp Gln Gln Cys Leu Glu Glu Gln Asn Leu Lys Glu Leu Asp Lys Leu
465                 470                 475                 480

Leu Gln Arg Ser Leu Lys Ala Leu Trp Thr Gly Phe Asp Glu Arg Thr
                485                 490                 495

Val Ala Ser Asp Leu Ala Asp Ile Ile Phe Pro Glu Arg Leu Arg Val
            500                 505                 510

Thr Leu Arg Asn Gly Leu Pro Asp Phe Met Ser Gln Ser Met Leu Asn
        515                 520                 525

Asn Phe Arg Ser Phe Ile Leu Glu Arg Ser Gly Ile Leu Pro Ala Thr
    530                 535                 540

Cys Cys Ala Leu Pro Ser Asp Phe Val Pro Leu Thr Tyr Arg Glu Cys
545                 550                 555                 560

Pro Pro Pro Leu Trp Ser His Cys Tyr Leu Phe Arg Leu Ala Asn Tyr
                565                 570                 575

Leu Ser Tyr His Ser Asp Val Ile Glu Asp Val Ser Gly Asp Gly Leu
            580                 585                 590

Leu Glu Cys His Cys Arg Cys Asn Leu Cys Thr Pro His Arg Ser Leu
        595                 600                 605

Ala Cys Asn Pro Gln Leu Leu Ser Glu Thr Gln Ile Ile Gly Thr Phe
    610                 615                 620
```

```
Glu Leu Gln Gly Pro Ser Ser Glu Gly Glu Gly Ser Ser Pro Gly Gln
625                 630                 635                 640

Ser Leu Lys Leu Thr Pro Gly Leu Trp Thr Ser Ala Tyr Leu Arg Lys
                645                 650                 655

Phe Ala Pro Glu Asp Tyr His Pro Tyr Glu Ile Arg Phe Tyr Glu Asp
            660                 665                 670

Gln Ser Gln Pro Pro Lys Thr Glu Leu Ser Ala Cys Val Ile Thr Gln
        675                 680                 685

Gly Ala Ile Leu Ala Gln Leu Gln Ala Ile Gln Lys Ser Arg Gln Glu
    690                 695                 700

Phe Leu Leu Lys Lys Gly Asn Gly Val Tyr Leu Asp Pro Gln Thr Gly
705                 710                 715                 720

Glu Glu Leu Asn Thr Arg Phe Pro Gln Asp Val Pro Ala Pro Arg Lys
                725                 730                 735

Gln Glu Val Glu Gly Ala Ala Ala Ala Pro Arg Gly Tyr Gly Gly Arg
            740                 745                 750

Leu Gly Gln Ser Gly Arg Gly Gly Asp Gly Arg Leu Gly Gln Pro Gly
        755                 760                 765

Arg Gly Gly Gly Gln Pro Gly Gly Arg Gln Phe Gly Gly Gly Arg Arg
    770                 775                 780

Gly Gly Arg Gly Gly Gly Arg Ser Asn Arg Arg Gln Thr Val Val Leu
785                 790                 795                 800

Gly Ser Gly Asp Lys Gln Gly Pro Arg Gln Gln Gln His Gly Tyr Asn
                805                 810                 815

Leu Arg Ser Gly Gly Gly Pro Ala Ala Ser Gln Gln
            820                 825
```

<210> 14
<211> 227
<212> PRT
<213> Simian adenovirus 28

<400> 14

```
Met Ser Lys Glu Ile Pro Thr Pro Tyr Met Trp Ser Tyr Gln Pro Gln
1               5                  10                  15

Met Gly Leu Ala Ala Gly Ala Ser Gln Asp Tyr Ser Thr Arg Met Asn
            20                  25                  30

Trp Leu Ser Ala Gly Pro Ser Met Ile Ser Arg Val Asn Asp Ile Arg
        35                  40                  45

Ala Tyr Arg Asn Gln Leu Leu Leu Glu Gln Ser Ala Leu Thr Thr Thr
    50                  55                  60

Pro Arg Gln His Leu Asn Pro Arg Asn Trp Pro Ala Ala Leu Val Tyr
65                  70                  75                  80

Gln Glu Thr Pro Ala Pro Thr Thr Val Leu Leu Pro Arg Asp Ala Gln
                85                  90                  95

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

Ala Leu Cys Arg His Arg Pro Gln Gln Ser Ile Lys Arg Leu Val Ile
        115                 120                 125

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

Gly Leu Arg Pro Asp Gly Val Phe Gln Ile Ala Gly Cys Gly Arg Ser
145                 150                 155                 160

Ser Phe Thr Pro Arg Gln Ala Val Leu Thr Leu Glu Ser Ser Ser Ser
                165                 170                 175

Gln Pro Arg Ser Gly Gly Ile Gly Thr Leu Gln Phe Val Glu Glu Phe
            180                 185                 190

Thr Pro Ser Val Tyr Phe Asn Pro Phe Ser Gly Ser Pro Gly Gln Tyr
        195                 200                 205

Pro Asp Glu Phe Ile Pro Asn Phe Asp Ala Ile Ser Glu Ser Val Asp
    210                 215                 220

Gly Tyr Asp
225
```

<210> 15
<211> 105
<212> PRT
<213> Simian adenovirus 28

<400> 15

```
Met Ser Gly Gly Ala Ala Glu Leu Ala Arg Leu Arg His Leu Asp His
1               5                   10                  15


Cys Arg Arg Phe Arg Cys Phe Ala Arg Glu Leu Thr Glu Phe Ile Tyr
            20                  25                  30


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


Ile Thr Ile Glu Gly Gly Ile Asp Ser Arg Leu His Arg Ile Phe Cys
    50                  55                  60


Gln Arg Pro Val Leu Ile Glu Arg Asp Gln Gly Thr Thr Thr Val Ser
65                  70                  75                  80


Ile Tyr Cys Ile Cys Asn His Pro Gly Leu His Glu Ser Leu Cys Cys
                85                  90                  95


Leu Ile Cys Ala Glu Phe Asn Lys Asn
            100                 105
```

<210> 16
<211> 178
<212> PRT
<213> Simian adenovirus 28

<400> 16

```
Met Gly Val Val Leu Val Ala Leu Ala Leu Leu Ser Leu Leu Gly Leu
1               5                   10                  15


Gly Ser Thr Thr Leu Arg Asn Gln Pro Leu Leu Leu Asp Pro Asn Asp
            20                  25                  30


Val Asp Pro Cys Leu Asp Phe Asp Pro Glu Asn Cys Thr Leu Thr Phe
        35                  40                  45


Ala Pro Glu Thr Ser Arg Phe Cys Gly Val Val Ile Arg Cys Gly Phe
    50                  55                  60
```

```
Glu Cys Arg Pro Ile Glu Ile Thr His Asn Asn Lys Thr Trp Asn Asn
65                  70                  75                  80

Thr Leu Phe Thr Thr Trp Ser Pro Gly Asp Pro Gln Trp Tyr Thr Val
                85                  90                  95

Ser Val Arg Gly Pro Asp Gly Ser Val Arg Met Ala Asn Asn Thr Phe
            100                 105                 110

Ile Phe Ala Glu Met Cys Asp Met Ala Met Phe Met Ser Arg Gln Tyr
        115                 120                 125

Asp Leu Trp Pro Pro Ser Lys Glu Asn Ile Val Ala Phe Ser Ile Ala
    130                 135                 140

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

His Leu Leu Ile Ala Ile Arg Pro Lys Asn Asn Gln Glu Lys Glu Lys
                165                 170                 175

Met Pro
```

<210> 17
<211> 188
<212> PRT
<213> Simian adenovirus 28

<400> 17

```
Met Ile Phe Phe Ala Thr Leu Ile Thr Ile Gly Ile Val Gln Gly Gln
1               5                   10                  15

Asp Ile Thr Ile Gly Tyr Val Gly Asn Asn Ile Thr Leu Leu Gly Pro
            20                  25                  30

Pro Thr Gly Thr Ile Pro Thr Trp Tyr Lys Ile Tyr Glu Arg Gly Trp
        35                  40                  45

Trp Ile Arg Pro Cys Asp Gln Gly Gly Ser Lys Tyr Ile Cys Gly Arg
    50                  55                  60

Asp Ile Thr Ile Thr Asn Leu Asn Lys Asn Asp Asn Gly Tyr Tyr Phe
65                  70                  75                  80
```

```
Cys Asn Asn Tyr Gly Gly Gly Lys Lys Ser Tyr Thr Leu Glu Val Arg
                85                  90                  95

Asp Pro Thr Thr Leu Ala Pro His Thr Thr Phe Ser Ser Ser Thr Ser
            100                 105                 110

Arg Asn Thr His Glu Ala Ala Tyr Ala Arg Ala Met Leu Gln Lys Ile
        115                 120                 125

Asn Glu Thr Ile Asn Ser Thr Ile Ser His Asn Pro Asp Glu Ile Pro
    130                 135                 140

Lys Ser Met Ile Gly Ile Ile Val Ala Val Ala Val Gly Met Ala Ile
145                 150                 155                 160

Ile Ile Ile Cys Met Ile Val Tyr Ala Cys Cys Tyr Arg Lys Phe Gln
                165                 170                 175

Asp Glu Lys Gly Asp Pro Leu Leu Ser Phe Asp Ile
            180                 185
```

<210> 18
<211> 106
<212> PRT
<213> Simian adenovirus 28

<400> 18

```
Met Lys Gly Val Gly Ile Leu Val Leu Ser Thr Leu Ile Tyr Ser Val
1               5                   10                  15

Ile Pro Ile Ser Ile Asn Val Gln Thr Thr Leu Asn Glu Thr Gly Asn
            20                  25                  30

His Ser Thr Thr Ser His Thr Pro Pro Pro Leu Ser Thr His Pro Gln
        35                  40                  45

Ser Lys Asp Ala Ile Gln Leu Gln Leu Thr Ile Leu Ile Val Ile Gly
    50                  55                  60

Leu Thr Ile Leu Ala Val Ile Leu Tyr Phe Ile Phe Cys Arg Gln Ile
65                  70                  75                  80

Pro Asn Val Val Lys Pro Thr Arg Arg Pro Ile Tyr Arg Ser Ile Ile
                85                  90                  95
```

```
Ser Lys Pro His Met Ala Leu Asn Glu Ile
            100                 105


<210>  19
<211>  91
<212>  PRT
<213>  Simian adenovirus 28

<400>  19

Met Ile Pro Arg Asn Phe Phe Phe Thr Ile Leu Ile Cys Ala Phe Asn
1               5                   10                  15


Val Cys Ala Thr Phe Ala Thr Val Ala Asn Val Thr Pro Asp Cys Ile
            20                  25                  30


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


Val Cys Ser Ile Val Cys Leu Val Ile Asn Phe Phe Gln Leu Val Asp
    50                  55                  60


Trp Val Phe Val Arg Ile Ala Tyr Leu Arg His His Pro Glu Tyr Arg
65                  70                  75                  80


Asn Gln Asn Val Ala Ala Ile Leu Arg Leu Ile
                85                  90


<210>  20
<211>  132
<212>  PRT
<213>  Simian adenovirus 28

<400>  20

Met Thr Asp Pro His Ala Ala Ala Glu Glu Leu Leu Asp Met Asp Gly
1               5                   10                  15


Arg Ala Ser Glu Gln Arg Leu Ala Gln Leu Arg Ile Arg Gln Gln Gln
            20                  25                  30


Glu Arg Ala Ala Lys Glu Leu Arg Asp Ala Ile Glu Ile His Gln Cys
        35                  40                  45


Lys Lys Gly Ile Phe Cys Leu Val Lys Gln Ala Lys Ile Ser Tyr Glu
    50                  55                  60


Ile Thr Ala Asn Asp His Arg Leu Ser Tyr Glu Leu Gly Pro Gln Arg
```

65 70 75 80

Gln Lys Phe Thr Cys Met Val Gly Ile Asn Pro Ile Val Ile Thr Gln
85 90 95

Gln Ala Gly Asp Thr Lys Gly Cys Ile His Cys Ser Cys Glu Ser Thr
100 105 110

Glu Cys Ile Tyr Thr Leu Leu Lys Thr Leu Cys Gly Leu Arg Asp Leu
115 120 125

Leu Pro Met Asn
130

<210> 21
<211> 323
<212> PRT
<213> Simian adenovirus 28

<400> 21

Met Ala Lys Arg Ala Arg Leu Ser Ser Ser Phe Asn Pro Val Tyr Pro
1 5 10 15

Tyr Glu Asp Glu Ser Ser Ser Gln His Pro Phe Ile Asn Pro Gly Phe
20 25 30

Ile Ser Pro Asn Gly Phe Thr Gln Ser Pro Asp Gly Ala Leu Thr Leu
35 40 45

Lys Cys Val Ala Pro Leu Thr Thr Thr Ser Gly Ser Leu Asp Ile Lys
50 55 60

Val Gly Gly Gly Leu Lys Val Asp Ser Thr Asp Gly Ser Leu Glu Glu
65 70 75 80

Asn Ile Ser Thr Thr Ala Pro Leu Asn Lys Ser Asn His Ser Ile Gly
85 90 95

Leu Ala Val Gly Asn Gly Leu Gln Thr Asn Glu Ser Lys Leu Cys Ala
100 105 110

Lys Leu Gly Glu Glu Leu Thr Phe Asp Ser Ser Asn Ala Ile Thr Ile
115 120 125

Lys Asn Asn Thr Leu Trp Thr Gly Ala Lys Pro Ser Thr Asn Cys Lys

```
    130                 135                 140

Ile Gln Glu Asp Ala Asp Ala Leu Asp Cys Lys Leu Thr Leu Val Leu
145                 150                 155                 160

Val Lys Asn Gly Gly Leu Val Asn Ala Tyr Val Ser Leu Ile Gly Asp
                165                 170                 175

Ser Asp Tyr Val Asn Thr Leu Phe Thr Lys Lys Thr Ala Ser Ile Ser
            180                 185                 190

Val Glu Leu Ala Phe Asp Ser Ser Gly Gln Ile Leu Thr Ser Leu Ser
        195                 200                 205

Ser Leu Lys Thr Ser Leu Asn Phe Lys His Asn Gln Asp Met Ala Thr
    210                 215                 220

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

Phe Asn Thr Gln Ala Thr Ser Ser Arg Asp Asn Glu Asp Tyr Ile Phe
                245                 250                 255

Gly Lys Cys Tyr Tyr Arg Ala Ser Tyr Gly Ala Leu Tyr Thr Leu Asp
            260                 265                 270

Val Thr Val Ile Leu Asn Arg Arg Met Thr Ala Ala Gly Met Ala Tyr
        275                 280                 285

Ala Met Asn Phe Thr Trp Leu Leu Asp Ala Thr Asp Ala Pro Glu Asn
    290                 295                 300

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

Glu Asp Asp
```

<210> 22
<211> 550
<212> DNA
<213> Simian adenovirus 28

<220>
<221> CDS

<222> (2)..(544)
<223> label=Elb\19K

<400> 22
c atg gag gtt tgg gct atc ttg gaa gat ctc agg cag act agg caa ctg 49
Met Glu Val Trp Ala Ile Leu Glu Asp Leu Arg Gln Thr Arg Gln Leu
1 5 10 15

cta gaa aac gcc tcg gac gga gtc tct agt ctt tgg aga ttc tgg ttc 97
Leu Glu Asn Ala Ser Asp Gly Val Ser Ser Leu Trp Arg Phe Trp Phe
20 25 30

ggt ggt gat cta gct agg cta gtc ttt agg gta aaa cgg gag tat agt 145
Gly Gly Asp Leu Ala Arg Leu Val Phe Arg Val Lys Arg Glu Tyr Ser
35 40 45

gaa gaa ttt gaa aag tta ttg gaa gac agt cca gga ctt ttt gaa gcc 193
Glu Glu Phe Glu Lys Leu Leu Glu Asp Ser Pro Gly Leu Phe Glu Ala
50 55 60

ctt aac ttg ggc cac cag gct cat ttt aag gag aag gtt tta tca gtt 241
Leu Asn Leu Gly His Gln Ala His Phe Lys Glu Lys Val Leu Ser Val
65 70 75 80

tta gat ttt tct acc cct ggt aga act gct gct gct gta gct ttc ctt 289
Leu Asp Phe Ser Thr Pro Gly Arg Thr Ala Ala Ala Val Ala Phe Leu
85 90 95

act ttt ata ttg gat aaa tgg atc cca caa acc cac ttc agc aag gga 337
Thr Phe Ile Leu Asp Lys Trp Ile Pro Gln Thr His Phe Ser Lys Gly
100 105 110

tac gtc ttg gat ttc ata gca gca gct ttg tgg aga aca tgg aag gcc 385
Tyr Val Leu Asp Phe Ile Ala Ala Ala Leu Trp Arg Thr Trp Lys Ala
115 120 125

cgc agg ctg agg ata atc tta gat tac tgg cca gtg cag cct ctg ggc 433
Arg Arg Leu Arg Ile Ile Leu Asp Tyr Trp Pro Val Gln Pro Leu Gly
130 135 140

gta gcg gcg atc ctg aga cac cca ccg gcc atg cca gcg gtt ttg gag 481
Val Ala Ala Ile Leu Arg His Pro Pro Ala Met Pro Ala Val Leu Glu
145 150 155 160

gag gag cag cag gag gac aac ccg aga gcc ggc ctg gac cct ccg gtg 529
Glu Glu Gln Gln Glu Asp Asn Pro Arg Ala Gly Leu Asp Pro Pro Val
165 170 175

gag gag gcg gag gag tagctg 550
Glu Glu Ala Glu Glu
180

<210> 23
<211> 181
<212> PRT
<213> Simian adenovirus 28

<400> 23

```
Met Glu Val Trp Ala Ile Leu Glu Asp Leu Arg Gln Thr Arg Gln Leu
1               5                   10                  15

Leu Glu Asn Ala Ser Asp Gly Val Ser Ser Leu Trp Arg Phe Trp Phe
            20                  25                  30

Gly Gly Asp Leu Ala Arg Leu Val Phe Arg Val Lys Arg Glu Tyr Ser
        35                  40                  45

Glu Glu Phe Glu Lys Leu Leu Glu Asp Ser Pro Gly Leu Phe Glu Ala
    50                  55                  60

Leu Asn Leu Gly His Gln Ala His Phe Lys Glu Lys Val Leu Ser Val
65                  70                  75                  80

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

Thr Phe Ile Leu Asp Lys Trp Ile Pro Gln Thr His Phe Ser Lys Gly
            100                 105                 110

Tyr Val Leu Asp Phe Ile Ala Ala Ala Leu Trp Arg Thr Trp Lys Ala
        115                 120                 125

Arg Arg Leu Arg Ile Ile Leu Asp Tyr Trp Pro Val Gln Pro Leu Gly
    130                 135                 140

Val Ala Ala Ile Leu Arg His Pro Pro Ala Met Pro Ala Val Leu Glu
145                 150                 155                 160

Glu Glu Gln Gln Glu Asp Asn Pro Arg Ala Gly Leu Asp Pro Pro Val
                165                 170                 175

Glu Glu Ala Glu Glu
            180


<210>  24
<211>  5100
<212>  DNA
<213>  Simian adenovirus 28


<220>
<221>  CDS
<222>  (7)..(621)
<223>  label=22K
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<220>
<221> CDS
<222> (1916)..(2359)
<223> label=E3\CR1-alpha

<220>
<221> CDS
<222> (2736)..(3473)
<223> label=E3\CR1-beta

<220>
<221> CDS
<222> (4674)..(5090)
<223> label=E3\RID-beta

<400> 24

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ctcagg atg tcc cag cgc cga gga agc aag aag ttg aag gtg cag ctg          48
       Met Ser Gln Arg Arg Gly Ser Lys Lys Leu Lys Val Gln Leu
       1               5                   10

ccg ccc cca gag gat atg gag gaa gac tgg gac agt cag gca gag gag          96
Pro Pro Pro Glu Asp Met Glu Glu Asp Trp Asp Ser Gln Ala Glu Glu
15                  20                  25                  30

gag atg gaa gat tgg gac agc cag gca gag gag gcg gac agc ctg gag         144
Glu Met Glu Asp Trp Asp Ser Gln Ala Glu Glu Ala Asp Ser Leu Glu
                35                  40                  45

gaa gac agt ttg gag gag gaa gac gag gag gca gag gag gtg gaa gaa         192
Glu Asp Ser Leu Glu Glu Glu Asp Glu Glu Ala Glu Glu Val Glu Glu
            50                  55                  60

gca acc gcc gcc aaa cag ttg tcc tcg gca gcg gag aca agc aag gtc         240
Ala Thr Ala Ala Lys Gln Leu Ser Ser Ala Ala Glu Thr Ser Lys Val
        65                  70                  75

cca gac agc agc agc acg gct aca atc tcc gct ccg ggg ggg gcc cag         288
Pro Asp Ser Ser Ser Thr Ala Thr Ile Ser Ala Pro Gly Gly Ala Gln
    80                  85                  90

cgg cgt ccc aac agt aga tgg gac gag acc ggg cga ttc ccg aac ccg         336
Arg Arg Pro Asn Ser Arg Trp Asp Glu Thr Gly Arg Phe Pro Asn Pro
95                  100                 105                 110

acc acc gct tcc aag acc ggt aag aag gag cgg cag gga tac aag tcc         384
Thr Thr Ala Ser Lys Thr Gly Lys Lys Glu Arg Gln Gly Tyr Lys Ser
                115                 120                 125

tgg cgg ggg cat aag aat gcc atc atc tcc tgc ttg cat gaa tgc ggg         432
Trp Arg Gly His Lys Asn Ala Ile Ile Ser Cys Leu His Glu Cys Gly
            130                 135                 140

ggc aac ata tcc ttc acc cgg cgc tac ctg ctc ttc cac cac ggg gtg         480
Gly Asn Ile Ser Phe Thr Arg Arg Tyr Leu Leu Phe His His Gly Val
        145                 150                 155

aac ttc ccc cgc aat gtc ttg cat tac tac cgt cac ctc cac agc ccc         528
Asn Phe Pro Arg Asn Val Leu His Tyr Tyr Arg His Leu His Ser Pro
```

```
    160                 165                 170

tac tac aac cag caa gtc ccg gca gcc tcg gca gag aaa gac agc agc        576
Tyr Tyr Asn Gln Gln Val Pro Ala Ala Ser Ala Glu Lys Asp Ser Ser
175                 180                 185                 190

agc agc agc agc ggg gac ctc cag cag aaa acc agc agc agc agt            621
Ser Ser Ser Ser Gly Asp Leu Gln Gln Lys Thr Ser Ser Ser Ser
                195                 200                 205

tagaaaatcc agtgcagcag gaggaggact gaggatcaca gcgaacgagc cagcgcagac      681

ccgagagctg agaaacagga tctttccaac cctctatgcc atcttccagc agagtcgggg      741

gcaagagcag gaactgaaag taaaaaaccg atctctgcgc tcgctcaccc gaagttgttt      801

gtatcacaag agcgaagacc aacttcagcg cactctcgag gacgccgagg ctctcttcaa      861

caagtactgc gcgctgactc ttaaagagta gcccgcgccc gcgctcgctc gaaaaaggcg      921

ggaattacgt cacccttggc acctgtcctt tgccctcgtc atgagtaaag aaattcccac      981

gccttacatg tggagctatc agccccaaat gggactggca gcaggcgcct cccaggacta     1041

ctccacccgc atgaattggc tcagcgccgg cccctcgatg atctcacggg ttaatgatat     1101

acgagcttac cgaaaccagt tactcctaga acagtcagca ctcaccacca caccccgcca     1161

acaccttaat ccccggaatt ggcccgccgc cctggtgtac caggaaactc ccgctcccac     1221

caccgtacta cttcctcgag acgcccaggc cgaagttcag atgactaacg caggtgtaca     1281

gctggcgggc ggttccgccc tgtgtcgtca ccggcctcag cagagtataa aacgcctggt     1341

gatcagaggc cgaggtatcc agcttaacga cgagtcggtg agctcttcgc ttggtctgcg     1401

accagacgga gtcttccaaa ttgccggctg tgggagatct tccttcactc ctcgtcaggc     1461

tgtcctgact ttggagagtt cgtcctcgca accccgctcg ggcggcatcg ggactctcca     1521

gtttgtggag gagtttactc cctctgtcta cttcaacccc ttctccggct ctcctggcca     1581

gtacccggac gagttcatac cgaacttcga cgcaatcagc gagtcagtgg atggctatga     1641

ttgatgtctg gtggcgcggc tgagttagct cgactgcgac atctagacca ctgccgccgc     1701

tttcgctgtt tcgcccggga actcaccgag ttcatctact tcgaactccc cgaggagcac     1761

cctcagggac cggcccacgg agtgcggatt accatcgaag ggggaataga ctctcgcctg     1821

catcggatct tctgtcagcg gccagtgctg atcgaacgcg accagggaac tacaacagtc     1881

tccatctact gcatctgtaa ccaccccgga ttgc atg aaa gcc ttt gct gtc tta     1936
                                      Met Lys Ala Phe Ala Val Leu
                                                          210

ttt gtg ctg agt tta ata aaa act gag ttc aga ccc tcc tac gga cta       1984
Phe Val Leu Ser Leu Ile Lys Thr Glu Phe Arg Pro Ser Tyr Gly Leu
        215                 220                 225
```

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ccg ctt ctt caa ccc gga ctt tac aac acc agc cag acc ctc cgt tcc       2032
Pro Leu Leu Gln Pro Gly Leu Tyr Asn Thr Ser Gln Thr Leu Arg Ser
    230                 235                 240

agc cag aag acc cag gcc ctt cct ctg atc cag gac tct aat tct acc       2080
Ser Gln Lys Thr Gln Ala Leu Pro Leu Ile Gln Asp Ser Asn Ser Thr
245                 250                 255                 260

tcc cca gca cca tcc cct act aac ctt ccc gaa act aac aac ctc gga       2128
Ser Pro Ala Pro Ser Pro Thr Asn Leu Pro Glu Thr Asn Asn Leu Gly
                265                 270                 275

gct cag ctg caa cac cgc ttc tcc aga agc ctc ctt tct gcc aat act       2176
Ala Gln Leu Gln His Arg Phe Ser Arg Ser Leu Leu Ser Ala Asn Thr
            280                 285                 290

act act ccc aaa acc gga ggt gag ctc cgc ggt ctc cct act gac aac       2224
Thr Thr Pro Lys Thr Gly Gly Glu Leu Arg Gly Leu Pro Thr Asp Asn
        295                 300                 305

ccc tgg gcg gta gca ggt ttt gta gcg tta gga gta gtt gcg ggt ggg       2272
Pro Trp Ala Val Ala Gly Phe Val Ala Leu Gly Val Val Ala Gly Gly
    310                 315                 320

ctg gtg ctt atc ctc tgc tac cta tac aca cct tgc tgt gct tat tta       2320
Leu Val Leu Ile Leu Cys Tyr Leu Tyr Thr Pro Cys Cys Ala Tyr Leu
325                 330                 335                 340

gta ata ttg tgc tgc tgg ttt aag aaa tgg ggg tcg tac tagtagcgct       2369
Val Ile Leu Cys Cys Trp Phe Lys Lys Trp Gly Ser Tyr
                345                 350

tgctttactt tcgcttttgg gtctgggctc tactacgcta agaaatcagc ctttgctatt    2429

agatcccaat gatgttgatc catgtctgga ctttgatcca gagaactgca cactcacttt    2489

tgcacctgaa acaagtcgct tctgtggagt tgttattagg tgcggatttg aatgcaggcc    2549

cattgagatt acacacaata acaaaacttg gaacaatacc ttatttacca catggtctcc    2609

aggagatcct cagtggtata ctgtctctgt ccggggtcct gacggttccg tccgcatggc    2669

taataacact ttcatttttg ctgaaatgtg cgatatggcc atgttcatga gcagacagta    2729

tgacct atg gcc tcc cag caa aga gaa cat tgt ggc att ctc cat tgc       2777
       Met Ala Ser Gln Gln Arg Glu His Cys Gly Ile Leu His Cys
           355                 360                 365

tta ttg ctt ggg tac atg cat cat cac tgc tat cat gtg tgt gag cat       2825
Leu Leu Leu Gly Tyr Met His His His Cys Tyr His Val Cys Glu His
        370                 375                 380

aca ctt gct tat agc cat tcg ccc aaa aaa caa tca aga aaa aga gaa       2873
Thr Leu Ala Tyr Ser His Ser Pro Lys Lys Gln Ser Arg Lys Arg Glu
    385                 390                 395

aat gcc ctg att ata aat ttc tat tta cag aaa atg acc tct gtt tca       2921
Asn Ala Leu Ile Ile Asn Phe Tyr Leu Gln Lys Met Thr Ser Val Ser
```

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400                 405                 410                 415

gct ctc ata ttt gct act att atg gct gtt caa gga cag gct gtt caa      2969
Ala Leu Ile Phe Ala Thr Ile Met Ala Val Gln Gly Gln Ala Val Gln
                420                 425                 430

gga cag aca ctt att aat gtt cat cct gga act aat cat acc ttg gtg      3017
Gly Gln Thr Leu Ile Asn Val His Pro Gly Thr Asn His Thr Leu Val
            435                 440                 445

gtt cct aat aac tat tca aat att gaa tgg caa tgg ttc aca aac aac      3065
Val Pro Asn Asn Tyr Ser Asn Ile Glu Trp Gln Trp Phe Thr Asn Asn
        450                 455                 460

gta tgg tat gaa cca tgc gaa cat tac agc cta ttc att tgc aat cat      3113
Val Trp Tyr Glu Pro Cys Glu His Tyr Ser Leu Phe Ile Cys Asn His
    465                 470                 475

aat tta act tta atc aat gtc agc aca ata cac aaa gga tac tat tat      3161
Asn Leu Thr Leu Ile Asn Val Ser Thr Ile His Lys Gly Tyr Tyr Tyr
480                 485                 490                 495

aga tat gac aac cac agc att gat cct aca ata tat cta gta cgt gta      3209
Arg Tyr Asp Asn His Ser Ile Asp Pro Thr Ile Tyr Leu Val Arg Val
                500                 505                 510

aat cca att aac aaa cct ata ccc aaa gct ttc tct aga act aca ata      3257
Asn Pro Ile Asn Lys Pro Ile Pro Lys Ala Phe Ser Arg Thr Thr Ile
            515                 520                 525

caa aac ttt aaa aca gca att tta ctt aat ttt aaa acc aaa aat att      3305
Gln Asn Phe Lys Thr Ala Ile Leu Leu Asn Phe Lys Thr Lys Asn Ile
        530                 535                 540

aca ggc aat ata ctt ccc act act ccc act gaa aaa aat aca cct aat      3353
Thr Gly Asn Ile Leu Pro Thr Thr Pro Thr Glu Lys Asn Thr Pro Asn
    545                 550                 555

tca ata ttt gaa atc atc att gca ctg tta gca gta ggc ata aca atc      3401
Ser Ile Phe Glu Ile Ile Ile Ala Leu Leu Ala Val Gly Ile Thr Ile
560                 565                 570                 575

ata cta tgt atg ata att tat gct cac tgt tat aaa aaa att cac cac      3449
Ile Leu Cys Met Ile Ile Tyr Ala His Cys Tyr Lys Lys Ile His His
                580                 585                 590

aaa aaa gaa cca cta cta agc ttt taatttcttt tttatacagc catgattttc      3503
Lys Lys Glu Pro Leu Leu Ser Phe
            595

ttcgcaactc ttattactat tggcattgtt caagggcaag atatcacaat tggatatgta     3563

ggcaataata ttaccctatt aggtccccca acaggaacaa tccctacctg gtacaaaata     3623

tatgaaagag ggtggtggat tagaccctgc gaccaaggag gtagtaaata catttgtggt     3683

agagacataa ccatcaccaa tcttaataaa aacgataatg gctactattt ttgcaataac     3743

tatggaggtg gtaaaaagtc ttacacactt gaagtaagag accccaccac tttagcacca     3803
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cataccactt tctccagcag cacgtctaga aacacacatg aggcagctta tgccagagca     3863

atgcttcaaa aaattaatga aacaataaat tctacaatct ctcataatcc agacgaaatt     3923

cccaaatcaa tgattggcat tattgtagcc gtggcagttg gaatggcaat cataataatt     3983

tgtatgatcg tctatgcttg ctgctataga aagtttcaag atgaaaaagg agacccacta     4043

ctaagctttg atatttaatt tctttataga aacatgaaag gagtaggtat cctagttctt     4103

tcaactttaa tctactcagt gatccctatc agcatcaatg tgcagactac tttaaatgaa     4163

actggaaacc actcaactac ctcacataca cctccccgc tttctaccca ccctcaatcc     4223

aaagatgcca tacaactaca actcaccatc cttattgtga ttgggttaac tatccttgct     4283

gttatccttt actttatctt ttgccgccaa atacccaatg tagttaaacc taccagacgt     4343

cccatctatc gatcaataat cagcaaaccc cacatggctc taaatgaaat ttaatctttc     4403

tcttcacagt atggtgatca actatgatcc ctagaaattt cttcttcacc atacttatct     4463

gcgctttcaa tgtctgtgct acattcgcca cagtcgccaa tgtgacacca gattgtatag     4523

gggcatttgc ttcctacgta ctatttgcct tcattacctg catctgcgtt tgtagcatag     4583

tctgcctggt tatcaacttc tttcaactag tagactgggt ttttgtacgc attgcctacc     4643

tacgacatca ccctgaatac cgcaaccaaa atg ttg cag caa ttc tta ggc tca      4697
                                    Met Leu Gln Gln Phe Leu Gly Ser
                                    600                 605

ttt aaa acc atg caa act ctg cta ctg ctt ctg cta gtt ata cac caa      4745
Phe Lys Thr Met Gln Thr Leu Leu Leu Leu Leu Leu Val Ile His Gln
        610                 615                 620

tgt gcc tca aac ccc aca agc ccc aca aaa tta gat cta aga aaa tgt      4793
Cys Ala Ser Asn Pro Thr Ser Pro Thr Lys Leu Asp Leu Arg Lys Cys
    625                 630                 635

aaa ttt caa gaa cca tgg aaa ttc ctt gat tgc tat cat gaa aca tct      4841
Lys Phe Gln Glu Pro Trp Lys Phe Leu Asp Cys Tyr His Glu Thr Ser
640                 645                 650                 655

gat ttc ccc aca tac tgg att aca atc att ggg gtt gtt aat cta gtc      4889
Asp Phe Pro Thr Tyr Trp Ile Thr Ile Ile Gly Val Val Asn Leu Val
                660                 665                 670

tct tgc aca cta ttc tct ttc ctt gtt tac cac tta ttt gat ttt gga      4937
Ser Cys Thr Leu Phe Ser Phe Leu Val Tyr His Leu Phe Asp Phe Gly
            675                 680                 685

tgg aac gcc ctt aat gca ctc act tac cca caa gaa cca gag gaa cat      4985
Trp Asn Ala Leu Asn Ala Leu Thr Tyr Pro Gln Glu Pro Glu Glu His
        690                 695                 700

ata cca cta cag aac ata caa cca tta gca cta gaa tat gaa aat gag      5033
Ile Pro Leu Gln Asn Ile Gln Pro Leu Ala Leu Glu Tyr Glu Asn Glu
```

```
    705                 710                 715

cca cag cct cca cta ctc cct gcc att agc tac ttc aac cta acc ggt       5081
Pro Gln Pro Pro Leu Leu Pro Ala Ile Ser Tyr Phe Asn Leu Thr Gly
720                 725                 730                 735

gga gat gac tgacccacac                                                5100
Gly Asp Asp
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<210> 25
<211> 205
<212> PRT
<213> Simian adenovirus 28

<400> 25

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

Pro Glu Asp Met Glu Glu Asp Trp Asp Ser Gln Ala Glu Glu Glu Met
            20                  25                  30

Glu Asp Trp Asp Ser Gln Ala Glu Glu Ala Asp Ser Leu Glu Glu Asp
        35                  40                  45

Ser Leu Glu Glu Glu Asp Glu Glu Ala Glu Glu Val Glu Glu Ala Thr
    50                  55                  60

Ala Ala Lys Gln Leu Ser Ser Ala Ala Glu Thr Ser Lys Val Pro Asp
65                  70                  75                  80

Ser Ser Ser Thr Ala Thr Ile Ser Ala Pro Gly Gly Ala Gln Arg Arg
                85                  90                  95

Pro Asn Ser Arg Trp Asp Glu Thr Gly Arg Phe Pro Asn Pro Thr Thr
            100                 105                 110

Ala Ser Lys Thr Gly Lys Lys Glu Arg Gln Gly Tyr Lys Ser Trp Arg
        115                 120                 125

Gly His Lys Asn Ala Ile Ile Ser Cys Leu His Glu Cys Gly Gly Asn
    130                 135                 140

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

Pro Arg Asn Val Leu His Tyr Tyr Arg His Leu His Ser Pro Tyr Tyr
```

```
                165                 170                 175

Asn Gln Gln Val Pro Ala Ala Ser Ala Glu Lys Asp Ser Ser Ser Ser
            180                 185                 190

Ser Ser Gly Asp Leu Gln Gln Lys Thr Ser Ser Ser Ser
        195                 200                 205


<210>  26
<211>  148
<212>  PRT
<213>  Simian adenovirus 28

<400>  26

Met Lys Ala Phe Ala Val Leu Phe Val Leu Ser Leu Ile Lys Thr Glu
1               5                   10                  15

Phe Arg Pro Ser Tyr Gly Leu Pro Leu Leu Gln Pro Gly Leu Tyr Asn
            20                  25                  30

Thr Ser Gln Thr Leu Arg Ser Ser Gln Lys Thr Gln Ala Leu Pro Leu
        35                  40                  45

Ile Gln Asp Ser Asn Ser Thr Ser Pro Ala Pro Ser Pro Thr Asn Leu
    50                  55                  60

Pro Glu Thr Asn Asn Leu Gly Ala Gln Leu Gln His Arg Phe Ser Arg
65                  70                  75                  80

Ser Leu Leu Ser Ala Asn Thr Thr Thr Pro Lys Thr Gly Gly Glu Leu
                85                  90                  95

Arg Gly Leu Pro Thr Asp Asn Pro Trp Ala Val Ala Gly Phe Val Ala
            100                 105                 110

Leu Gly Val Val Ala Gly Gly Leu Val Leu Ile Leu Cys Tyr Leu Tyr
        115                 120                 125

Thr Pro Cys Cys Ala Tyr Leu Val Ile Leu Cys Cys Trp Phe Lys Lys
    130                 135                 140

Trp Gly Ser Tyr
145


<210>  27
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<211> 246
<212> PRT
<213> Simian adenovirus 28

<400> 27

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Met Ala Ser Gln Gln Arg Glu His Cys Gly Ile Leu His Cys Leu Leu
1               5                  10                  15

Leu Gly Tyr Met His His His Cys Tyr His Val Cys Glu His Thr Leu
            20                  25                  30

Ala Tyr Ser His Ser Pro Lys Lys Gln Ser Arg Lys Arg Glu Asn Ala
        35                  40                  45

Leu Ile Ile Asn Phe Tyr Leu Gln Lys Met Thr Ser Val Ser Ala Leu
    50                  55                  60

Ile Phe Ala Thr Ile Met Ala Val Gln Gly Gln Ala Val Gln Gly Gln
65                  70                  75                  80

Thr Leu Ile Asn Val His Pro Gly Thr Asn His Thr Leu Val Val Pro
                85                  90                  95

Asn Asn Tyr Ser Asn Ile Glu Trp Gln Trp Phe Thr Asn Asn Val Trp
            100                 105                 110

Tyr Glu Pro Cys Glu His Tyr Ser Leu Phe Ile Cys Asn His Asn Leu
        115                 120                 125

Thr Leu Ile Asn Val Ser Thr Ile His Lys Gly Tyr Tyr Tyr Arg Tyr
    130                 135                 140

Asp Asn His Ser Ile Asp Pro Thr Ile Tyr Leu Val Arg Val Asn Pro
145                 150                 155                 160

Ile Asn Lys Pro Ile Pro Lys Ala Phe Ser Arg Thr Thr Ile Gln Asn
                165                 170                 175

Phe Lys Thr Ala Ile Leu Leu Asn Phe Lys Thr Lys Asn Ile Thr Gly
            180                 185                 190

Asn Ile Leu Pro Thr Thr Pro Thr Glu Lys Asn Thr Pro Asn Ser Ile
        195                 200                 205

Phe Glu Ile Ile Ile Ala Leu Leu Ala Val Gly Ile Thr Ile Ile Leu
```

```
    210                 215                 220

Cys Met Ile Ile Tyr Ala His Cys Tyr Lys Lys Ile His His Lys Lys
225                 230                 235                 240

Glu Pro Leu Leu Ser Phe
                245


<210>  28
<211>  139
<212>  PRT
<213>  Simian adenovirus 28

<400>  28

Met Leu Gln Gln Phe Leu Gly Ser Phe Lys Thr Met Gln Thr Leu Leu
1               5                   10                  15

Leu Leu Leu Leu Val Ile His Gln Cys Ala Ser Asn Pro Thr Ser Pro
            20                  25                  30

Thr Lys Leu Asp Leu Arg Lys Cys Lys Phe Gln Glu Pro Trp Lys Phe
        35                  40                  45

Leu Asp Cys Tyr His Glu Thr Ser Asp Phe Pro Thr Tyr Trp Ile Thr
    50                  55                  60

Ile Ile Gly Val Val Asn Leu Val Ser Cys Thr Leu Phe Ser Phe Leu
65                  70                  75                  80

Val Tyr His Leu Phe Asp Phe Gly Trp Asn Ala Leu Asn Ala Leu Thr
                85                  90                  95

Tyr Pro Gln Glu Pro Glu Glu His Ile Pro Leu Gln Asn Ile Gln Pro
            100                 105                 110

Leu Ala Leu Glu Tyr Glu Asn Glu Pro Gln Pro Pro Leu Leu Pro Ala
        115                 120                 125

Ile Ser Tyr Phe Asn Leu Thr Gly Gly Asp Asp
    130                 135


<210>  29
<211>  1500
<212>  DNA
<213>  Simian adenovirus 28
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<220>
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<222> (574)..(1147)
<223> label = Ela

<220>
<221> CDS
<222> (1236)..(1441)
<223> label = Ela

<400> 29
catcatcaat aatatacctt ataaatggaa cggtgccaac atgcaaatga gcttttgaaa 60

atggagggcg gaaggggatt ggccagcggg ttcaacggtc aaaaggggcg ggccggcgcg 120

gggaggtgac gtatttcgtg tgggaggagt tttgttgcaa gttatcgcgg caaaagtgac 180

gtaaaacgag gtgtggtttg aacacggaag tagacagttt tcccgcgctg actgacagga 240

tatgaggtag ttttgggcgg atgcaagtga aaattcacca ttttcgcgcg aaaactgaat 300

gaggaagtga atttctgagt aatttcgagt ttatgacagg gtggagtatt taccgagggc 360

cgagtagact ttgaccgatt acgtggaggt ttcgattacc gtgtttttca cctaaatttc 420

cgcgtacggt gtcaaagtcc tgtgttttta cgtaggcgtc agctgatcgc tagggtattt 480

aaacctgacg agttccgtca agaggccact cttgagtgcc agcgagaaga gatttctcct 540

ccgcgccgcg agtcagatct ccactttgaa aaa atg aga cac ctg cga ttc ctg 594
Met Arg His Leu Arg Phe Leu
1 5

cct cag gaa atc tcc att gag acc ggg aat gaa ata cta cag ctt gtg 642
Pro Gln Glu Ile Ser Ile Glu Thr Gly Asn Glu Ile Leu Gln Leu Val
10 15 20

gta aat gcc ctg atg gga gac gat ccg gag ccg cct gcg cat ccg ttc 690
Val Asn Ala Leu Met Gly Asp Asp Pro Glu Pro Pro Ala His Pro Phe
25 30 35

gat cct cct acg ctt cat gaa ctg tat gat tta gag gta gat ggg ccg 738
Asp Pro Pro Thr Leu His Glu Leu Tyr Asp Leu Glu Val Asp Gly Pro
40 45 50 55

gag gat cct aac gag gaa gct gtg aat ggt ttt ttt agc gaa tct atg 786
Glu Asp Pro Asn Glu Glu Ala Val Asn Gly Phe Phe Ser Glu Ser Met
60 65 70

cta ttg gct gct aat gaa gga gtg gac ata gac cca cct tct gag acc 834
Leu Leu Ala Ala Asn Glu Gly Val Asp Ile Asp Pro Pro Ser Glu Thr
75 80 85

ctt gat acc cca ggg gtg att gtg gag agc ggc aga ggt ggg aaa aaa 882
Leu Asp Thr Pro Gly Val Ile Val Glu Ser Gly Arg Gly Gly Lys Lys
90 95 100

ttg cct gaa ctt ggt gct gct gaa atg gac ttg cac tgt tat gaa gag 930

```
Leu Pro Glu Leu Gly Ala Ala Glu Met Asp Leu His Cys Tyr Glu Glu
    105                 110                 115

ggt ttt cct ccg agt gat gaa gag gag gaa aat gtg cag tcg atc cag        978
Gly Phe Pro Pro Ser Asp Glu Glu Glu Glu Asn Val Gln Ser Ile Gln
120                 125                 130                 135

acc gca gcg ggt gag gga atg aaa gct gcc aat gat ggt ttt aag ttg       1026
Thr Ala Ala Gly Glu Gly Met Lys Ala Ala Asn Asp Gly Phe Lys Leu
                140                 145                 150

gac tgc ccg gag ctg cct gga cat ggc tgt aag tct tgt gaa ttt cac       1074
Asp Cys Pro Glu Leu Pro Gly His Gly Cys Lys Ser Cys Glu Phe His
            155                 160                 165

agg aat agt act gga cta aaa gaa ctg ttg tgc tcg ctt tgc tat atg       1122
Arg Asn Ser Thr Gly Leu Lys Glu Leu Leu Cys Ser Leu Cys Tyr Met
        170                 175                 180

aga acg cac tgc cat ttt att tac a gtaagtgtgt ttaacttaaa               1167
Arg Thr His Cys His Phe Ile Tyr
    185                 190

tttaaaggga cagtgtagca gtttaatgtc tgttgaatgt gggatttatg tctttgtgat     1227

ttttatag gt  cct gtg tca gat gct gat gaa tcg cct tct cct gat tca       1276
         Ser Pro Val Ser Asp Ala Asp Glu Ser Pro Ser Pro Asp Ser
                     195                 200                 205

act acc tca cct cct gaa att cag gcg cca gtc cct gca aac gta tgc       1324
Thr Thr Ser Pro Pro Glu Ile Gln Ala Pro Val Pro Ala Asn Val Cys
                210                 215                 220

aag ccc att cct gtg aag gct aag cct ggg aaa cgc cct gct gtg gat       1372
Lys Pro Ile Pro Val Lys Ala Lys Pro Gly Lys Arg Pro Ala Val Asp
            225                 230                 235

aag ctg gag gac ttg ctt gag ggt ggg gat gga cct ttg gac ttg agt       1420
Lys Leu Glu Asp Leu Leu Glu Gly Gly Asp Gly Pro Leu Asp Leu Ser
        240                 245                 250

acc cgg aaa ctg cca agg caa tgagtgccct gcacctgtgt ttatttaatg          1471
Thr Arg Lys Leu Pro Arg Gln
    255                 260

tgacgtcagt atttatgtga gagtgccat                                      1500


<210>  30
<211>  260
<212>  PRT
<213>  Simian adenovirus 28

<400>  30

Met Arg His Leu Arg Phe Leu Pro Gln Glu Ile Ser Ile Glu Thr Gly
1               5                   10                  15
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Asn Glu Ile Leu Gln Leu Val Val Asn Ala Leu Met Gly Asp Asp Pro
            20                  25                  30

Glu Pro Pro Ala His Pro Phe Asp Pro Pro Thr Leu His Glu Leu Tyr
        35                  40                  45

Asp Leu Glu Val Asp Gly Pro Glu Asp Pro Asn Glu Glu Ala Val Asn
    50                  55                  60

Gly Phe Phe Ser Glu Ser Met Leu Leu Ala Ala Asn Glu Gly Val Asp
65                  70                  75                  80

Ile Asp Pro Pro Ser Glu Thr Leu Asp Thr Pro Gly Val Ile Val Glu
                85                  90                  95

Ser Gly Arg Gly Gly Lys Lys Leu Pro Glu Leu Gly Ala Ala Glu Met
            100                 105                 110

Asp Leu His Cys Tyr Glu Glu Gly Phe Pro Pro Ser Asp Glu Glu Glu
        115                 120                 125

Glu Asn Val Gln Ser Ile Gln Thr Ala Ala Gly Glu Gly Met Lys Ala
    130                 135                 140

Ala Asn Asp Gly Phe Lys Leu Asp Cys Pro Glu Leu Pro Gly His Gly
145                 150                 155                 160

Cys Lys Ser Cys Glu Phe His Arg Asn Ser Thr Gly Leu Lys Glu Leu
                165                 170                 175

Leu Cys Ser Leu Cys Tyr Met Arg Thr His Cys His Phe Ile Tyr Ser
            180                 185                 190

Pro Val Ser Asp Ala Asp Glu Ser Pro Ser Pro Asp Ser Thr Thr Ser
        195                 200                 205

Pro Pro Glu Ile Gln Ala Pro Val Pro Ala Asn Val Cys Lys Pro Ile
    210                 215                 220

Pro Val Lys Ala Lys Pro Gly Lys Arg Pro Ala Val Asp Lys Leu Glu
225                 230                 235                 240

Asp Leu Leu Glu Gly Gly Asp Gly Pro Leu Asp Leu Ser Thr Arg Lys
                245                 250                 255
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Leu Pro Arg Gln
            260


<210>  31
<211>  890
<212>  DNA
<213>  Simian adenovirus 28


<220>
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<222>  (7)..(355)
<223>  label=33K

<220>
<221>  CDS
<222>  (525)..(889)
<223>  label=33K

<400>  31
ctcagg atg tcc cag cgc cga gga agc aag aag ttg aag gtg cag ctg          48
       Met Ser Gln Arg Arg Gly Ser Lys Lys Leu Lys Val Gln Leu
       1               5                   10

ccg ccc cca gag gat atg gag gaa gac tgg gac agt cag gca gag gag         96
Pro Pro Pro Glu Asp Met Glu Glu Asp Trp Asp Ser Gln Ala Glu Glu
15                  20                  25                  30

gag atg gaa gat tgg gac agc cag gca gag gag gcg gac agc ctg gag        144
Glu Met Glu Asp Trp Asp Ser Gln Ala Glu Glu Ala Asp Ser Leu Glu
                35                  40                  45

gaa gac agt ttg gag gag gaa gac gag gag gca gag gag gtg gaa gaa        192
Glu Asp Ser Leu Glu Glu Glu Asp Glu Glu Ala Glu Glu Val Glu Glu
            50                  55                  60

gca acc gcc gcc aaa cag ttg tcc tcg gca gcg gag aca agc aag gtc        240
Ala Thr Ala Ala Lys Gln Leu Ser Ser Ala Ala Glu Thr Ser Lys Val
        65                  70                  75

cca gac agc agc agc acg gct aca atc tcc gct ccg ggg ggg gcc cag        288
Pro Asp Ser Ser Ser Thr Ala Thr Ile Ser Ala Pro Gly Gly Ala Gln
    80                  85                  90

cgg cgt ccc aac agt aga tgg gac gag acc ggg cga ttc ccg aac ccg        336
Arg Arg Pro Asn Ser Arg Trp Asp Glu Thr Gly Arg Phe Pro Asn Pro
95                  100                 105                 110

acc acc gct tcc aag acc g gtaagaagga gcggcaggga tacaagtcct             385
Thr Thr Ala Ser Lys Thr
                115

ggcgggggca taagaatgcc atcatctcct gcttgcatga atgcgggggc aacatatcct      445

tcacccggcg ctacctgctc ttccaccacg gggtgaactt cccccgcaat gtcttgcatt      505

actaccgtca cctccacag cc  cct act aca acc agc aag tcc cgg cag cct       556
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                    Ala Pro Thr Thr Thr Ser Lys Ser Arg Gln Pro
                                    120                 125

cgg cag aga aag aca gca gca gca gca gca gcg ggg acc tcc agc aga        604
Arg Gln Arg Lys Thr Ala Ala Ala Ala Ala Ala Gly Thr Ser Ser Arg
        130                 135                 140

aaa cca gca gca gca gtt aga aaa tcc agt gca gca gga gga gga ctg        652
Lys Pro Ala Ala Ala Val Arg Lys Ser Ser Ala Ala Gly Gly Gly Leu
    145                 150                 155

agg atc aca gcg aac gag cca gcg cag acc cga gag ctg aga aac agg        700
Arg Ile Thr Ala Asn Glu Pro Ala Gln Thr Arg Glu Leu Arg Asn Arg
160                 165                 170                 175

atc ttt cca acc ctc tat gcc atc ttc cag cag agt cgg ggg caa gag        748
Ile Phe Pro Thr Leu Tyr Ala Ile Phe Gln Gln Ser Arg Gly Gln Glu
                180                 185                 190

cag gaa ctg aaa gta aaa aac cga tct ctg cgc tcg ctc acc cga agt        796
Gln Glu Leu Lys Val Lys Asn Arg Ser Leu Arg Ser Leu Thr Arg Ser
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tgt ttg tat cac aag agc gaa gac caa ctt cag cgc act ctc gag gac        844
Cys Leu Tyr His Lys Ser Glu Asp Gln Leu Gln Arg Thr Leu Glu Asp
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gcc gag gct ctc ttc aac aag tac tgc gcg ctg act ctt aaa gag t          890
Ala Glu Ala Leu Phe Asn Lys Tyr Cys Ala Leu Thr Leu Lys Glu
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Pro Glu Asp Met Glu Glu Asp Trp Asp Ser Gln Ala Glu Glu Glu Met
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Glu Asp Trp Asp Ser Gln Ala Glu Glu Ala Asp Ser Leu Glu Glu Asp
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Ser Leu Glu Glu Glu Asp Glu Glu Ala Glu Glu Val Glu Glu Ala Thr
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Ala Ala Lys Gln Leu Ser Ser Ala Ala Glu Thr Ser Lys Val Pro Asp
65                  70                  75                  80
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Ser Ser Ser Thr Ala Thr Ile Ser Ala Pro Gly Gly Ala Gln Arg Arg
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Pro Asn Ser Arg Trp Asp Glu Thr Gly Arg Phe Pro Asn Pro Thr Thr
            100                 105                 110

Ala Ser Lys Thr Ala Pro Thr Thr Thr Ser Lys Ser Arg Gln Pro Arg
        115                 120                 125

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

Ile Thr Ala Asn Glu Pro Ala Gln Thr Arg Glu Leu Arg Asn Arg Ile
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Phe Pro Thr Leu Tyr Ala Ile Phe Gln Gln Ser Arg Gly Gln Glu Gln
            180                 185                 190

Glu Leu Lys Val Lys Asn Arg Ser Leu Arg Ser Leu Thr Arg Ser Cys
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Leu Tyr His Lys Ser Glu Asp Gln Leu Gln Arg Thr Leu Glu Asp Ala
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gtaaaacgag gtgtgctttg aacacggaag tggacagttt tcccgcgctg actgacagga 240

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ttagattttt ctacccctgg tagaactgct gcagctgtag ccttccttac ttttatattg     1920

gataa atg gat ccc aca aac cca ctt cag caa ggg ata cgt ttt gga ttt     1970
      Met Asp Pro Thr Asn Pro Leu Gln Gln Gly Ile Arg Phe Gly Phe
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cat agc agc agc ttt gtg gag aac atg gaa ggc tcg cag gct gag gat       2018
His Ser Ser Ser Phe Val Glu Asn Met Glu Gly Ser Gln Ala Glu Asp
                20                  25                  30

aat ctt aga tta ctg gcc agt gca gcc tct ggg cgt agc ggc gat cct       2066
Asn Leu Arg Leu Leu Ala Ser Ala Ala Ser Gly Arg Ser Gly Asp Pro
            35                  40                  45

gag aca ccc acc ggc cat gcc agc ggt tct gga gga gga gca gca gga       2114
Glu Thr Pro Thr Gly His Ala Ser Gly Ser Gly Gly Gly Ala Ala Gly
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gga caa ccc gag agc cgg cct gga ccc tcc ggt gga gga ggc gga gga       2162
Gly Gln Pro Glu Ser Arg Pro Gly Pro Ser Gly Gly Gly Gly Gly Gly
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gta gct gac ctg ttt cct gaa ctg cga cgg gtg ctt act agg tct acg       2210
Val Ala Asp Leu Phe Pro Glu Leu Arg Arg Val Leu Thr Arg Ser Thr
80                  85                  90                  95

tcc agt gga cag gac agg ggc att aag agg gag agg aat gct agt ggt       2258
Ser Ser Gly Gln Asp Arg Gly Ile Lys Arg Glu Arg Asn Ala Ser Gly
                100                 105                 110

cat aat tca aga act gag ttg gct tta agt tta atg agt cgc agg cgt       2306
His Asn Ser Arg Thr Glu Leu Ala Leu Ser Leu Met Ser Arg Arg Arg
            115                 120                 125

cct gaa act gtt tgg tgg cat gag gtt cag agt gag ggc agg gat gaa       2354
Pro Glu Thr Val Trp Trp His Glu Val Gln Ser Glu Gly Arg Asp Glu
        130                 135                 140

gtt tca ata ttg cag gag aaa tat tcc cta gaa caa ctt aag acc tgt       2402
Val Ser Ile Leu Gln Glu Lys Tyr Ser Leu Glu Gln Leu Lys Thr Cys
    145                 150                 155

tgg ttg gaa cct gaa gat gat tgg gag gtg gcc att agg aat tat gct       2450
Trp Leu Glu Pro Glu Asp Asp Trp Glu Val Ala Ile Arg Asn Tyr Ala
160                 165                 170                 175

aag ata tct ctg agg cct gat aag cag tat aga att acc aag aag att       2498
Lys Ile Ser Leu Arg Pro Asp Lys Gln Tyr Arg Ile Thr Lys Lys Ile
                180                 185                 190

aat atc aga aat gca tgc tac ata tca ggg aat ggg gcc gag gtt ata       2546
Asn Ile Arg Asn Ala Cys Tyr Ile Ser Gly Asn Gly Ala Glu Val Ile
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ata gat aca caa gat aaa aca gct ttt aga tgt tgt atg atg ggt atg       2594
Ile Asp Thr Gln Asp Lys Thr Ala Phe Arg Cys Cys Met Met Gly Met
        210                 215                 220

tgg cca ggg gtg gcc ggc atg gag gca gta aca ctt atg aat att agg       2642
Trp Pro Gly Val Ala Gly Met Glu Ala Val Thr Leu Met Asn Ile Arg
    225                 230                 235

ttt agg gga gat ggg tat aat ggg att gtc ttt atg gct aac act aaa       2690
Phe Arg Gly Asp Gly Tyr Asn Gly Ile Val Phe Met Ala Asn Thr Lys
240                 245                 250                 255

tta att ctg cac ggt tgt agc ttt ttt ggg ttt aat aat act tgt gtg       2738
Leu Ile Leu His Gly Cys Ser Phe Phe Gly Phe Asn Asn Thr Cys Val
                260                 265                 270

gaa gca tgg gga cag gtt agt gta aga ggc tgt agt ttt tat gca ggc       2786
Glu Ala Trp Gly Gln Val Ser Val Arg Gly Cys Ser Phe Tyr Ala Gly
            275                 280                 285

tgg att gca cta tca ggc agg acc aag agt cag ttg tct gtg aag aaa       2834
Trp Ile Ala Leu Ser Gly Arg Thr Lys Ser Gln Leu Ser Val Lys Lys
        290                 295                 300
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Cys Met Phe Glu Arg Cys Asn Leu Gly Ile Leu Asn Glu Gly Glu Ala
    305                 310                 315

agg gtc cgc cac tgc gct gct aca gaa act ggc tgc ttt att cta ata       2930
Arg Val Arg His Cys Ala Ala Thr Glu Thr Gly Cys Phe Ile Leu Ile
320                 325                 330                 335

aag gga aat gcc agt gtg aag cat aac atg atc tgt gga ccc tca gat       2978
Lys Gly Asn Ala Ser Val Lys His Asn Met Ile Cys Gly Pro Ser Asp
                340                 345                 350

gag agg cct tat cag atg ctg acc tgt gct gga gga cat tgc aat atg       3026
Glu Arg Pro Tyr Gln Met Leu Thr Cys Ala Gly Gly His Cys Asn Met
            355                 360                 365

ctg gct acc gtg cat att gtt tct cat gca cgc aag aaa tgg cct gtg       3074
Leu Ala Thr Val His Ile Val Ser His Ala Arg Lys Lys Trp Pro Val
        370                 375                 380

ttt gag cat aat gtg atg acc aag tgc acc atg cac ata ggt ggt cgc       3122
Phe Glu His Asn Val Met Thr Lys Cys Thr Met His Ile Gly Gly Arg
    385                 390                 395

agg gga atg ttt atg cct tac cag tgt aac ctg aat cat gtg aag gtg       3170
Arg Gly Met Phe Met Pro Tyr Gln Cys Asn Leu Asn His Val Lys Val
400                 405                 410                 415

atg ttg gaa cca gat gcc ttt tcc aga atg agc tta aca gga atc ttt       3218
Met Leu Glu Pro Asp Ala Phe Ser Arg Met Ser Leu Thr Gly Ile Phe
                420                 425                 430

gat atg aat gtg caa cta tgg aag atc ctg aga tat gat gat acc aaa       3266
Asp Met Asn Val Gln Leu Trp Lys Ile Leu Arg Tyr Asp Asp Thr Lys
            435                 440                 445

tcg agg gtg cgc gca tgc gag tgc ggg ggc aag cat gcc agg ttc cag       3314
Ser Arg Val Arg Ala Cys Glu Cys Gly Gly Lys His Ala Arg Phe Gln
        450                 455                 460

ccg gtg tgt gtg gat gtg acg gaa gac ctg aga ccc gat cat ttg gta       3362
Pro Val Cys Val Asp Val Thr Glu Asp Leu Arg Pro Asp His Leu Val
    465                 470                 475

ctt gcc tgc act gga gcg gag ttc ggt tct agt ggg gaa gaa act gac       3410
Leu Ala Cys Thr Gly Ala Glu Phe Gly Ser Ser Gly Glu Glu Thr Asp
480                 485                 490                 495

taaagtgagt agtggggaat gctgtggagg gggcttccag gcgggtaagg tgggcagatt     3470

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Phe Glu Gly Gly Val Phe Ser Pro Tyr Leu Thr Gly Arg Leu Pro Pro
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ccc gtc cag ccc gcc aat tcc tca acg ctg acc tat gcc act ttg agc       3667
Pro Val Gln Pro Ala Asn Ser Ser Thr Leu Thr Tyr Ala Thr Leu Ser
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tct tca ccc ttg gat gca gcc gca gcc gct gcc gcc tct gct gcc gcc       3715
Ser Ser Pro Leu Asp Ala Ala Ala Ala Ala Ala Ala Ser Ala Ala Ala
550                 555                 560                 565

aac act gtc ctt gga atg ggc tat tat gga agc atc gtt gcc aat tcc       3763
Asn Thr Val Leu Gly Met Gly Tyr Tyr Gly Ser Ile Val Ala Asn Ser
                570                 575                 580

agt tcc tca aat aac cct tcg acc ctg gct gag gac aag cta ctt gtc       3811
Ser Ser Ser Asn Asn Pro Ser Thr Leu Ala Glu Asp Lys Leu Leu Val
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ctc ttg gct cag ctc gag gcc ttg acc cag cgc cta ggc gaa ctg tct       3859
Leu Leu Ala Gln Leu Glu Ala Leu Thr Gln Arg Leu Gly Glu Leu Ser
        600                 605                 610

cag cag gtg gcc cag ttg cgc gag caa act gag tct gct gtt gcc aca       3907
Gln Gln Val Ala Gln Leu Arg Glu Gln Thr Glu Ser Ala Val Ala Thr
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gca aag tct aaa taaagattcc caaatcaata aataaaggag atccttgttg           3959
Ala Lys Ser Lys
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actgaccagt tgactgtctg gtgccccggg cgcacgagct cggtgtactt gaggcgcgag    10139

taggcgcggg tgtcaaagat gtaatcgttg caggtgcgca ccaggtactg gtagccgatg    10199

agaaagtgcg gcggtggctg gcggtagagg ggccatcgct ctgtagccgg ggcaccgggg    10259

gcgaggtctt ccagcatgag gcggtggtat ccgtagatgt acctggacat ccaggtgatc    10319

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gagccggccg gagccgcggc taacgtggta ttggcgatcc cgtctcgacc cagccgacga    10619

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gtctggagaa tcaatcgcca gggttgcgtt gcggtgtgcc ccggttcgag ccttagcgcg    10799

gcccggatcg gccggtttcc gcggcaagcg agggtttggc agccccgtca tttctaagac    10859

cccgccagcc gacttctcca gtttacggga gcgagccctc ttttttgttt ttgtcgccca    10919

g atg cat ccc gtg ctg cga cag atg cgc ccc cag caa cag gcc ccc tct    10968
  Met His Pro Val Leu Arg Gln Met Arg Pro Gln Gln Gln Ala Pro Ser
      635                 640                 645

cag caa cag cag cag cca caa aaa gct ctt cct gct cct gca act act      11016
Gln Gln Gln Gln Gln Pro Gln Lys Ala Leu Pro Ala Pro Ala Thr Thr
650                 655                 660                 665

gca gcc gca gcc gtg tgc ggc gcg gga cag ccc gcc tat gat ctg gac      11064
Ala Ala Ala Ala Val Cys Gly Ala Gly Gln Pro Ala Tyr Asp Leu Asp
                670                 675                 680

ttg gaa gag ggc gag gga ctg gca cgc ctg ggt gca cca tcg ccc gag      11112
Leu Glu Glu Gly Glu Gly Leu Ala Arg Leu Gly Ala Pro Ser Pro Glu
            685                 690                 695

cga cac ccg cgg gtg caa ctg aaa aag gac tct cgc gag gcg tac gtg      11160
Arg His Pro Arg Val Gln Leu Lys Lys Asp Ser Arg Glu Ala Tyr Val
        700                 705                 710

ccc cag cat aac ctg ttc agg gac agg agc ggc gag gag ccc gag gag      11208
Pro Gln His Asn Leu Phe Arg Asp Arg Ser Gly Glu Glu Pro Glu Glu
    715                 720                 725

atg cga gcc tct cgc ttt aac gcg ggt cgc gag ctg cgc cac ggt ctg      11256
Met Arg Ala Ser Arg Phe Asn Ala Gly Arg Glu Leu Arg His Gly Leu
730                 735                 740                 745

gac cga aga cgg ctg ctg cgg gac gag gat ttc gag gtc gat gaa gtg      11304
Asp Arg Arg Arg Leu Leu Arg Asp Glu Asp Phe Glu Val Asp Glu Val
                750                 755                 760
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aca ggg atc agc ccc gct agg gca cat gtg gcc gcg gcc aac ctc gtc      11352
Thr Gly Ile Ser Pro Ala Arg Ala His Val Ala Ala Ala Asn Leu Val
            765                 770                 775

tcg gcc tac gag cag acc gtg aag gag gag cgc aac ttc caa aaa tca      11400
Ser Ala Tyr Glu Gln Thr Val Lys Glu Glu Arg Asn Phe Gln Lys Ser
        780                 785                 790

ttc aac aac cat gtg cgc acc ctg atc gcc cgt gag gaa gtg acc ctg      11448
Phe Asn Asn His Val Arg Thr Leu Ile Ala Arg Glu Glu Val Thr Leu
    795                 800                 805

ggt ctg atg cac ctg tgg gac ctg atg gaa gct atc acc cag aac ccc      11496
Gly Leu Met His Leu Trp Asp Leu Met Glu Ala Ile Thr Gln Asn Pro
810                 815                 820                 825

act agc aaa ccc ctg acc gct cag ctg ttt ctg gta gtg caa cac agc      11544
Thr Ser Lys Pro Leu Thr Ala Gln Leu Phe Leu Val Val Gln His Ser
                830                 835                 840

agg gac aat gag gca ttc agg gag gcg ctg ctg aac atc acc gag ccc      11592
Arg Asp Asn Glu Ala Phe Arg Glu Ala Leu Leu Asn Ile Thr Glu Pro
            845                 850                 855

gag ggg aga tgg ttg tat gat cta atc aat atc ctg caa agt att ata      11640
Glu Gly Arg Trp Leu Tyr Asp Leu Ile Asn Ile Leu Gln Ser Ile Ile
        860                 865                 870

gtg cag gaa cgc agc cta ggt ctg gct gag aaa gtg gca gcc atc aac      11688
Val Gln Glu Arg Ser Leu Gly Leu Ala Glu Lys Val Ala Ala Ile Asn
    875                 880                 885

tac tct gtc ttg agc ctg ggc aag tac tac gct cgc aag atc tac aag      11736
Tyr Ser Val Leu Ser Leu Gly Lys Tyr Tyr Ala Arg Lys Ile Tyr Lys
890                 895                 900                 905

acc ccc tac gtg ccc ata gac aag gag gtg aag ata gat ggg ttt tac      11784
Thr Pro Tyr Val Pro Ile Asp Lys Glu Val Lys Ile Asp Gly Phe Tyr
                910                 915                 920

atg cgc atg act ctc aag gtg ctg act ctc agt gac gat ctg ggg gtg      11832
Met Arg Met Thr Leu Lys Val Leu Thr Leu Ser Asp Asp Leu Gly Val
            925                 930                 935

tac cgc aac gac agg atg cac cgc gcg gtg agc gcc agc agg agg cgc      11880
Tyr Arg Asn Asp Arg Met His Arg Ala Val Ser Ala Ser Arg Arg Arg
        940                 945                 950

gag ctg agc gac aga gaa ctt atg cac agc ttg caa aga gct ctg acg      11928
Glu Leu Ser Asp Arg Glu Leu Met His Ser Leu Gln Arg Ala Leu Thr
    955                 960                 965

ggg gca ggg acc gat ggg gag aac tac ttt gac atg ggg gca gac ttg      11976
Gly Ala Gly Thr Asp Gly Glu Asn Tyr Phe Asp Met Gly Ala Asp Leu
970                 975                 980                 985

caa tgg caa cct agc cgc cgg gcc ctg gac gcg gca ggg tgt gag  ctt      12024
Gln Trp Gln Pro Ser Arg Arg Ala Leu Asp Ala Ala Gly Cys Glu  Leu
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                990                 995                1000

cct tac gta gaa  gag gtg gat gaa ggc  gag gag gag gag ggc  gag       12069
Pro Tyr Val Glu  Glu Val Asp Glu Gly  Glu Glu Glu Glu Gly  Glu
            1005                1010                1015

tac ctg gaa gac  tgatggcgcg acccgtattt ttgctag atg gaa cag cag       12120
Tyr Leu Glu Asp                                Met Glu Gln Gln
            1020

gca  ccg gac ccc gca atg  cgg gcg gcg ctg cag  agc cag ccg tcc       12165
Ala  Pro Asp Pro Ala Met  Arg Ala Ala Leu Gln  Ser Gln Pro Ser
1025                1030                1035

ggc  att aac tcc tcg gac  gat tgg acc cag gcc  atg caa cgc atc       12210
Gly  Ile Asn Ser Ser Asp  Asp Trp Thr Gln Ala  Met Gln Arg Ile
1040                1045                1050

atg  gcg ctg acg acc cgc  aac ccc gaa gcc ttt  aga cag caa ccc       12255
Met  Ala Leu Thr Thr Arg  Asn Pro Glu Ala Phe  Arg Gln Gln Pro
1055                1060                1065

cag  gcc aat cgc ctt tcg  gcc atc ctg gag gcc  gta gtt cct tcc       12300
Gln  Ala Asn Arg Leu Ser  Ala Ile Leu Glu Ala  Val Val Pro Ser
1070                1075                1080

cgc  tcc aac ccc acc cac  gag aag gtc ctg gcc  atc gtg aac gcg       12345
Arg  Ser Asn Pro Thr His  Glu Lys Val Leu Ala  Ile Val Asn Ala
1085                1090                1095

ctg  gtg gag aac aag gcc  atc cgt ccc gat gag  gcc ggg ctg gta       12390
Leu  Val Glu Asn Lys Ala  Ile Arg Pro Asp Glu  Ala Gly Leu Val
1100                1105                1110

tac  aat gcc ctc ttg gag  cgc gtg gcc cgc tac  aac agc agc aac       12435
Tyr  Asn Ala Leu Leu Glu  Arg Val Ala Arg Tyr  Asn Ser Ser Asn
1115                1120                1125

gtg  cag acc aac ctg gac  cgg atg gtg acc gat  gtg cgc gag gcc       12480
Val  Gln Thr Asn Leu Asp  Arg Met Val Thr Asp  Val Arg Glu Ala
1130                1135                1140

gtg  tct cag cgc gag cgg  ttc cgg cgc gat gcc  aac ttg ggg tcg       12525
Val  Ser Gln Arg Glu Arg  Phe Arg Arg Asp Ala  Asn Leu Gly Ser
1145                1150                1155

ctg  gtg gcg ctg aac gcc  ttc ctc agc acc cag  cct gcc aac gtg       12570
Leu  Val Ala Leu Asn Ala  Phe Leu Ser Thr Gln  Pro Ala Asn Val
1160                1165                1170

ccc  cgc ggc cag caa gac  tat aca aac ttt cta  agt gca ctg aga       12615
Pro  Arg Gly Gln Gln Asp  Tyr Thr Asn Phe Leu  Ser Ala Leu Arg
1175                1180                1185

ctc  atg gta acc gaa gtc  cct cag agc gag gtt  tac cag tcc ggt       12660
Leu  Met Val Thr Glu Val  Pro Gln Ser Glu Val  Tyr Gln Ser Gly
1190                1195                1200

cca  gac tac ttc ttc cag  acc agc aga cag ggc  ttg cag aca gtg       12705
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Pro  Asp Tyr Phe Phe Gln  Thr Ser Arg Gln Gly  Leu Gln Thr Val
1205                1210                1215

aac  ctg agc cag gct ttc  aag aac ctc aga ggc  ctg tgg gga gtg       12750
Asn  Leu Ser Gln Ala Phe  Lys Asn Leu Arg Gly  Leu Trp Gly Val
1220                1225                1230

cac  gcc ccc gta gga gat  cgc gcg acc gtg tct  agc ttg ctg acc       12795
His  Ala Pro Val Gly Asp  Arg Ala Thr Val Ser  Ser Leu Leu Thr
1235                1240                1245

ccc  aac tcc cgc cta ctg  ctg ctg ctg gta tcc  ccc ttc act gac       12840
Pro  Asn Ser Arg Leu Leu  Leu Leu Leu Val Ser  Pro Phe Thr Asp
1250                1255                1260

agt  ggt agc atc gac cgc  aac tct tac ttg ggc  tac ctg ctg aac       12885
Ser  Gly Ser Ile Asp Arg  Asn Ser Tyr Leu Gly  Tyr Leu Leu Asn
1265                1270                1275

ttg  tat cgc gag gcc ata  ggg cag agc cag gtg  gac gag cag acc       12930
Leu  Tyr Arg Glu Ala Ile  Gly Gln Ser Gln Val  Asp Glu Gln Thr
1280                1285                1290

tat  caa gaa atc acc caa  gtg agc cgc gcc ctg  ggt cag gaa gac       12975
Tyr  Gln Glu Ile Thr Gln  Val Ser Arg Ala Leu  Gly Gln Glu Asp
1295                1300                1305

acg  ggc agc ttg gaa gcc  act ttg aac ttc ttg  ctg acc aac cga       13020
Thr  Gly Ser Leu Glu Ala  Thr Leu Asn Phe Leu  Leu Thr Asn Arg
1310                1315                1320

tcg  cag aag atc cct cct  cag tat gcg ctt acc  gcg gag gag gaa       13065
Ser  Gln Lys Ile Pro Pro  Gln Tyr Ala Leu Thr  Ala Glu Glu Glu
1325                1330                1335

cgg  att ctg aga tat gtg  cag cag agc gtg gga  ctg ttc ctg atg       13110
Arg  Ile Leu Arg Tyr Val  Gln Gln Ser Val Gly  Leu Phe Leu Met
1340                1345                1350

cag  gag ggg gca acc cct  acc gcc gcg ttg gac  atg aca gcg cga       13155
Gln  Glu Gly Ala Thr Pro  Thr Ala Ala Leu Asp  Met Thr Ala Arg
1355                1360                1365

aac  atg gag ccc agc atg  tat gcc agt aac cgg  cct ttc att aac       13200
Asn  Met Glu Pro Ser Met  Tyr Ala Ser Asn Arg  Pro Phe Ile Asn
1370                1375                1380

aaa  ctg ctg gat tac ctg  cac agg gca gcc gct  atg aac tct gat       13245
Lys  Leu Leu Asp Tyr Leu  His Arg Ala Ala Ala  Met Asn Ser Asp
1385                1390                1395

tat  ttt acc aat gct att  ctc aac ccc cac tgg  ctg cct ccg cct       13290
Tyr  Phe Thr Asn Ala Ile  Leu Asn Pro His Trp  Leu Pro Pro Pro
1400                1405                1410

gga  ttt tac acg ggc gag  tat gat atg ccc gac  ccc aat gac ggg       13335
Gly  Phe Tyr Thr Gly Glu  Tyr Asp Met Pro Asp  Pro Asn Asp Gly
1415                1420                1425
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ttt  ctg tgg gac gat gtg  gac agc agc ata ttc  tcc ccg cct cct       13380
Phe  Leu Trp Asp Asp Val  Asp Ser Ser Ile Phe  Ser Pro Pro Pro
1430                1435                1440

ggt  tat aac act tgg aag  aag gaa ggg ggc gat  aga aga cac tct       13425
Gly  Tyr Asn Thr Trp Lys  Lys Glu Gly Gly Asp  Arg Arg His Ser
1445                1450                1455

tcc  gtg tcg ctg tcc ggg  tcg agg ggt gct gcc  gct gcg gtg ccc       13470
Ser  Val Ser Leu Ser Gly  Ser Arg Gly Ala Ala  Ala Ala Val Pro
1460                1465                1470

gag  gct gca agt cct ttc  cct agc ctg ccc ttt  tct ctg aac agt       13515
Glu  Ala Ala Ser Pro Phe  Pro Ser Leu Pro Phe  Ser Leu Asn Ser
1475                1480                1485

gtg  cgc agc agt gaa ctg  ggg aga ata acc cgc  ccg cgt ttg atg       13560
Val  Arg Ser Ser Glu Leu  Gly Arg Ile Thr Arg  Pro Arg Leu Met
1490                1495                1500

ggc  gag gag gaa tac ttg  aac gac tct ttg ctt  aga ccc gag agg       13605
Gly  Glu Glu Glu Tyr Leu  Asn Asp Ser Leu Leu  Arg Pro Glu Arg
1505                1510                1515

gaa  aag aac ttc ccc aac  aat ggg ata gag agc  ctg gtg gat aag       13650
Glu  Lys Asn Phe Pro Asn  Asn Gly Ile Glu Ser  Leu Val Asp Lys
1520                1525                1530

atg  agc aga tgg aaa acc  tat gca cag gat cac  aaa gac gag cct       13695
Met  Ser Arg Trp Lys Thr  Tyr Ala Gln Asp His  Lys Asp Glu Pro
1535                1540                1545

agg  atc ttg ggg gct gct  agc ggg acg acc cgt  aga cgc cag cgc       13740
Arg  Ile Leu Gly Ala Ala  Ser Gly Thr Thr Arg  Arg Arg Gln Arg
1550                1555                1560

cat  gac aga cag agg ggt  ctt gta tgg gac gat  gag gac tcg gcc       13785
His  Asp Arg Gln Arg Gly  Leu Val Trp Asp Asp  Glu Asp Ser Ala
1565                1570                1575

gat  gac agc agc gtg ttg  gac ttg ggt ggg aga  gga ggg ggc aac       13830
Asp  Asp Ser Ser Val Leu  Asp Leu Gly Gly Arg  Gly Gly Gly Asn
1580                1585                1590

ccg  ttc gct cat ctg cgc  ccg cac ttt ggg cgc  atg ttg taaaagtgaa    13879
Pro  Phe Ala His Leu Arg  Pro His Phe Gly Arg  Met Leu
1595                1600                1605

agtaaaataa aaaggcaact caccaaggcc atggcgacga gcgtgcgttc gttcttttct    13939

gttatctgtg tctagt atg atg agg  cga gcc gtg cta ggc  gga gcg gtg       13988
                 Met Met Arg  Arg Ala Val Leu Gly  Gly Ala Val
                         1610                1615

gtg tat  ccg gag ggt cct cct  cct tcg tac gag agc  gtg atg cag       14033
Val Tyr  Pro Glu Gly Pro Pro  Pro Ser Tyr Glu Ser  Val Met Gln
    1620                1625                1630

cag cag  gcg gcg gcg gtg atg  cag ccc tcg ctg gag  gct ccc ttt       14078
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Gln Gln  Ala Ala Ala Val Met  Gln Pro Ser Leu Glu  Ala Pro Phe
    1635                 1640                 1645

gta ccc  ccg cgg tac ctg gcg  cct aca gag ggg aga  aac agc att       14123
Val Pro  Pro Arg Tyr Leu Ala  Pro Thr Glu Gly Arg  Asn Ser Ile
    1650                 1655                 1660

cgt tac  tcg gag ctg gca ccc  cag tac gat acc acc  agg ttg tat       14168
Arg Tyr  Ser Glu Leu Ala Pro  Gln Tyr Asp Thr Thr  Arg Leu Tyr
    1665                 1670                 1675

ctg gtg  gac aac aag tcg gcg  gac atc gcc tca ttg  aac tat cag       14213
Leu Val  Asp Asn Lys Ser Ala  Asp Ile Ala Ser Leu  Asn Tyr Gln
    1680                 1685                 1690

aac gac  cac agc aac ttc ctg  acc acg gtg gtg cag  aac aat gac       14258
Asn Asp  His Ser Asn Phe Leu  Thr Thr Val Val Gln  Asn Asn Asp
    1695                 1700                 1705

ttt acc  ccc acg gag gcc agc  acc cag acc atc aac  ttt gac gag       14303
Phe Thr  Pro Thr Glu Ala Ser  Thr Gln Thr Ile Asn  Phe Asp Glu
    1710                 1715                 1720

cgg tcg  cgg tgg ggc ggt cag  ctg aag acc atc atg  cac acc aac       14348
Arg Ser  Arg Trp Gly Gly Gln  Leu Lys Thr Ile Met  His Thr Asn
    1725                 1730                 1735

atg ccc  aac gtg aac gag tac  atg ttc agc aac aag  ttc aag gct       14393
Met Pro  Asn Val Asn Glu Tyr  Met Phe Ser Asn Lys  Phe Lys Ala
    1740                 1745                 1750

cgg gtg  atg gtg tct aga aag  gct cct gaa ggt gtt  aca gta gct       14438
Arg Val  Met Val Ser Arg Lys  Ala Pro Glu Gly Val  Thr Val Ala
    1755                 1760                 1765

gat aat  tat gac cac aag cag  gat att ctg gag tat  gag tgg ttc       14483
Asp Asn  Tyr Asp His Lys Gln  Asp Ile Leu Glu Tyr  Glu Trp Phe
    1770                 1775                 1780

gag ttc  act tta cca gaa ggc  aac ttc tca gcc act  atg acc atc       14528
Glu Phe  Thr Leu Pro Glu Gly  Asn Phe Ser Ala Thr  Met Thr Ile
    1785                 1790                 1795

gac ctg  atg aac aat gcc atc  ata gac aac tac ttg  gaa gtt ggc       14573
Asp Leu  Met Asn Asn Ala Ile  Ile Asp Asn Tyr Leu  Glu Val Gly
    1800                 1805                 1810

aga cag  aat gga gtg atg gag  agt gac att ggt gtc  aag ttt gac       14618
Arg Gln  Asn Gly Val Met Glu  Ser Asp Ile Gly Val  Lys Phe Asp
    1815                 1820                 1825

acc agg  aac ttc aga ctg ggc  tgg gac ccc aaa act  aag ttg att       14663
Thr Arg  Asn Phe Arg Leu Gly  Trp Asp Pro Lys Thr  Lys Leu Ile
    1830                 1835                 1840

atg cca  ggg gtc tat act tat  gaa gca ttc cat cct  gac att gtg       14708
Met Pro  Gly Val Tyr Thr Tyr  Glu Ala Phe His Pro  Asp Ile Val
    1845                 1850                 1855
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cta ctg  cct ggc tgc ggg gtg  gac ttt act gag agt  cgc ctt agc       14753
Leu Leu  Pro Gly Cys Gly Val  Asp Phe Thr Glu Ser  Arg Leu Ser
    1860                 1865                 1870

aac ttg  ctt ggc atc agg aag  aga cac cca ttc cag  gag ggt ttc       14798
Asn Leu  Leu Gly Ile Arg Lys  Arg His Pro Phe Gln  Glu Gly Phe
    1875                 1880                 1885

aaa ata  ttg tat gag gat cta  gaa ggg ggt aat atc  ccc gcc ctc       14843
Lys Ile  Leu Tyr Glu Asp Leu  Glu Gly Gly Asn Ile  Pro Ala Leu
    1890                 1895                 1900

ttg gac  gta gaa gca tat gaa  aaa agt aag aaa gaa  caa gaa gct       14888
Leu Asp  Val Glu Ala Tyr Glu  Lys Ser Lys Lys Glu  Gln Glu Ala
    1905                 1910                 1915

aaa aca  gaa gct gct aaa gct  gct gct gtt gct aaa  gcc aac ata       14933
Lys Thr  Glu Ala Ala Lys Ala  Ala Ala Val Ala Lys  Ala Asn Ile
    1920                 1925                 1930

gtt gcc  agc gac ccc gta agg  gta gct aat gct gaa  gaa gtc aga       14978
Val Ala  Ser Asp Pro Val Arg  Val Ala Asn Ala Glu  Glu Val Arg
    1935                 1940                 1945

gga gac  aac tat act gcc tca  gct gtt gcg act gaa  gaa tca cta       15023
Gly Asp  Asn Tyr Thr Ala Ser  Ala Val Ala Thr Glu  Glu Ser Leu
    1950                 1955                 1960

ttg gct  gct gtg gct gaa aac  gaa act aca gaa aca  aaa ctc act       15068
Leu Ala  Ala Val Ala Glu Asn  Glu Thr Thr Glu Thr  Lys Leu Thr
    1965                 1970                 1975

atc caa  cca gta gaa aag gat  agt aag agt aga agc  tat aat gtc       15113
Ile Gln  Pro Val Glu Lys Asp  Ser Lys Ser Arg Ser  Tyr Asn Val
    1980                 1985                 1990

ttg gac  gat aaa atc aac aca  gca tat cgc agt tgg  tac ttg tca       15158
Leu Asp  Asp Lys Ile Asn Thr  Ala Tyr Arg Ser Trp  Tyr Leu Ser
    1995                 2000                 2005

tac aac  tat gga gac cct gaa  aaa gga gtc cgt tcc  tgg aca ctg       15203
Tyr Asn  Tyr Gly Asp Pro Glu  Lys Gly Val Arg Ser  Trp Thr Leu
    2010                 2015                 2020

ctt acc  act tca gat gtc aca  tgc ggg gcg gaa cag  gtc tac tgg       15248
Leu Thr  Thr Ser Asp Val Thr  Cys Gly Ala Glu Gln  Val Tyr Trp
    2025                 2030                 2035

tcg ctc  cca gac atg atg cag  gac ccc gtt acc ttt  cgc tcc acg       15293
Ser Leu  Pro Asp Met Met Gln  Asp Pro Val Thr Phe  Arg Ser Thr
    2040                 2045                 2050

aga caa  gtc agc aac tat cca  gtg gtg ggc gca gag  ctc atg ccc       15338
Arg Gln  Val Ser Asn Tyr Pro  Val Val Gly Ala Glu  Leu Met Pro
    2055                 2060                 2065

gtc ttc  tca aag agt ttc tac  aac gag caa gcc gtg  tac tcc cag       15383
Val Phe  Ser Lys Ser Phe Tyr  Asn Glu Gln Ala Val  Tyr Ser Gln
    2070                 2075                 2080
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cag ctc  cgc cag tcc acc tcg  ctc acg cac gtc ttc  aat cgc ttc       15428
Gln Leu  Arg Gln Ser Thr Ser  Leu Thr His Val Phe  Asn Arg Phe
    2085                 2090                 2095

cct gag  aat cag atc ctc atc  cgc ccg ccg gcg ccc  acc att acc       15473
Pro Glu  Asn Gln Ile Leu Ile  Arg Pro Pro Ala Pro  Thr Ile Thr
    2100                 2105                 2110

acc gtc  agt gaa aac gtt cct  gct ctc aca gat cac  ggg acc ctg       15518
Thr Val  Ser Glu Asn Val Pro  Ala Leu Thr Asp His  Gly Thr Leu
    2115                 2120                 2125

ccg ttg  cgc agc agt atc cgg  gga gtc cag cgc gtg  acc gtt act       15563
Pro Leu  Arg Ser Ser Ile Arg  Gly Val Gln Arg Val  Thr Val Thr
    2130                 2135                 2140

gac gcc  aga cgc cgc acc tgc  ccc tac gtc tac aag  gcc ctg ggc       15608
Asp Ala  Arg Arg Arg Thr Cys  Pro Tyr Val Tyr Lys  Ala Leu Gly
    2145                 2150                 2155

ata gtc  gcg ccg cgc gtc ctt  tca agc cgc act ttc  taaaaa atg tcc    15656
Ile Val  Ala Pro Arg Val Leu  Ser Ser Arg Thr Phe         Met Ser
    2160                 2165                 2170

att ctc atc  tca ccc agt aat aac  acc ggt tgg ggg ctg  cgc aca      15701
Ile Leu Ile  Ser Pro Ser Asn Asn  Thr Gly Trp Gly Leu  Arg Thr
        2175                 2180                 2185

ccc acc agg  atg tac gga ggc gct  cgc aaa cgg tct acc  cag cac      15746
Pro Thr Arg  Met Tyr Gly Gly Ala  Arg Lys Arg Ser Thr  Gln His
        2190                 2195                 2200

cct gtg cgt  gtg cgc ggg cat ttc  cgc gct ccc tgg ggc  gcc ctc      15791
Pro Val Arg  Val Arg Gly His Phe  Arg Ala Pro Trp Gly  Ala Leu
        2205                 2210                 2215

aag ggc cgc  gct cgc act cgg acc  acc gtc gat gat gtg  atc gac      15836
Lys Gly Arg  Ala Arg Thr Arg Thr  Thr Val Asp Asp Val  Ile Asp
        2220                 2225                 2230

cag gtg gtt  gca gat gct cgt aat  tat act cct gct gca  cct aca      15881
Gln Val Val  Ala Asp Ala Arg Asn  Tyr Thr Pro Ala Ala  Pro Thr
        2235                 2240                 2245

tct act gtg  gat gca gtt att gac  agc gtg gtg gct gac  gct cgc      15926
Ser Thr Val  Asp Ala Val Ile Asp  Ser Val Val Ala Asp  Ala Arg
        2250                 2255                 2260

gac tat gct  cgc cgg aag agc agg  cga aga cgc atc gcc  aga cgc      15971
Asp Tyr Ala  Arg Arg Lys Ser Arg  Arg Arg Arg Ile Ala  Arg Arg
        2265                 2270                 2275

cac cgg gct  acc ccc gcc atg cga  gct gca aga gct ctg  ctg cgg      16016
His Arg Ala  Thr Pro Ala Met Arg  Ala Ala Arg Ala Leu  Leu Arg
        2280                 2285                 2290

aga gct aaa  cgc gtg ggg cga aga  gcc atg ctt aga gcg  gcc aga      16061
Arg Ala Lys  Arg Val Gly Arg Arg  Ala Met Leu Arg Ala  Ala Arg
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        2295                2300                2305

cgc gcg gct  tca ggt gcc agc gca  ggc aga tcc cgc agg  cgc gcg       16106
Arg Ala Ala  Ser Gly Ala Ser Ala  Gly Arg Ser Arg Arg  Arg Ala
        2310                2315                2320

gcc acg gcg  gca gca gca gcc atc  gcc aac atg gcc caa  ccg cga       16151
Ala Thr Ala  Ala Ala Ala Ala Ile  Ala Asn Met Ala Gln  Pro Arg
        2325                2330                2335

aga ggc aat  gtg tac tgg gtg cgc  gat gcc act acc ggc  cag cgc       16196
Arg Gly Asn  Val Tyr Trp Val Arg  Asp Ala Thr Thr Gly  Gln Arg
        2340                2345                2350

gtg ccc gtg  cgc acc cgt ccc cct  cgc act tagaagatac tgagcagtct      16246
Val Pro Val  Arg Thr Arg Pro Pro  Arg Thr
        2355                2360

ccgatgttgt gtcccagcgg cgagg atg tcc aag  cgc aaa tac aag gaa  gag    16298
                            Met Ser Lys  Arg Lys Tyr Lys Glu  Glu
                                  2365                2370

atg ctc cag gtc  atc gcg cct gaa atc  tac ggt cca ccg gtg  aag       16343
Met Leu Gln Val  Ile Ala Pro Glu Ile  Tyr Gly Pro Pro Val  Lys
            2375                2380                2385

gat gaa aaa aag  ccc cgc aaa atc aag  cgg gtc aaa aag gac  aaa       16388
Asp Glu Lys Lys  Pro Arg Lys Ile Lys  Arg Val Lys Lys Asp  Lys
            2390                2395                2400

aag gaa gaa gat  ggc gat gat ggg ctg  gtg gag ttt gtg cgc  gag       16433
Lys Glu Glu Asp  Gly Asp Asp Gly Leu  Val Glu Phe Val Arg  Glu
            2405                2410                2415

ttc gct cca agg  cgg cgc gtg cag tgg  cgc ggg cgc agg gtg  cgg       16478
Phe Ala Pro Arg  Arg Arg Val Gln Trp  Arg Gly Arg Arg Val  Arg
            2420                2425                2430

ccg gtg ctg aga  ccc gga acc acg gtg  gtc ttc acg ccc ggc  gaa       16523
Pro Val Leu Arg  Pro Gly Thr Thr Val  Val Phe Thr Pro Gly  Glu
            2435                2440                2445

cgc tcc agc act  act ttt aaa cgc tcc  tat gat gag gtg tac  ggg       16568
Arg Ser Ser Thr  Thr Phe Lys Arg Ser  Tyr Asp Glu Val Tyr  Gly
            2450                2455                2460

gat gat gat att  ctg gag cag gca gcc  gac cgc ctg ggc gag  ttt       16613
Asp Asp Asp Ile  Leu Glu Gln Ala Ala  Asp Arg Leu Gly Glu  Phe
            2465                2470                2475

gct tat ggc aaa  cgc agc cgc tcc agt  cct aag gag gag gcg  gtg       16658
Ala Tyr Gly Lys  Arg Ser Arg Ser Ser  Pro Lys Glu Glu Ala  Val
            2480                2485                2490

tcc atc ccc ttg  gat cat gga aat ccc  acc ccg agt ctt aaa  cca       16703
Ser Ile Pro Leu  Asp His Gly Asn Pro  Thr Pro Ser Leu Lys  Pro
            2495                2500                2505

gtc acc ctg caa  caa gtg ctg cct gtg  cct cca cgg aga ggt  gtc       16748
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Val Thr Leu Gln  Gln Val Leu Pro Val  Pro Pro Arg Arg Gly  Val
            2510                2515                2520

aag cga gag ggc  gag gat ctg tat ccc  acc atg caa ttg atg  gtg       16793
Lys Arg Glu Gly  Glu Asp Leu Tyr Pro  Thr Met Gln Leu Met  Val
            2525                2530                2535

ccc aag cgc cag  aag ctg gag gac gtg  ctg gag aaa atg aaa  gtg       16838
Pro Lys Arg Gln  Lys Leu Glu Asp Val  Leu Glu Lys Met Lys  Val
            2540                2545                2550

gat ccc gat atc  cag cct gaa gtt aaa  gtc aga ccc atc aag  cag       16883
Asp Pro Asp Ile  Gln Pro Glu Val Lys  Val Arg Pro Ile Lys  Gln
            2555                2560                2565

gtg gcg ccc ggt  ctg gga gta caa acc  gtg gac atc aag att  ccc       16928
Val Ala Pro Gly  Leu Gly Val Gln Thr  Val Asp Ile Lys Ile  Pro
            2570                2575                2580

acc gag tcc atg  gaa gtc cag act gaa  cct gca aag ccc gca  gcc       16973
Thr Glu Ser Met  Glu Val Gln Thr Glu  Pro Ala Lys Pro Ala  Ala
            2585                2590                2595

acc tcc att gag  gtg cag aca gat cca  tgg atg ccc gcg ccc  att       17018
Thr Ser Ile Glu  Val Gln Thr Asp Pro  Trp Met Pro Ala Pro  Ile
            2600                2605                2610

gca acc acc gcc  agt acc gct cga aga  ccc cgg cga aag tat  ggt       17063
Ala Thr Thr Ala  Ser Thr Ala Arg Arg  Pro Arg Arg Lys Tyr  Gly
            2615                2620                2625

cct gcg agt ctg  ttg atg ccc aat tat  gct ctg cac cca tcc  att       17108
Pro Ala Ser Leu  Leu Met Pro Asn Tyr  Ala Leu His Pro Ser  Ile
            2630                2635                2640

att cca act cct  ggt tac cga ggc act  cgc tac tac cgc agc  agg       17153
Ile Pro Thr Pro  Gly Tyr Arg Gly Thr  Arg Tyr Tyr Arg Ser  Arg
            2645                2650                2655

agc act act tcc  cgc cgc cgc aaa aca  cct gca agc cgc agt  cgc       17198
Ser Thr Thr Ser  Arg Arg Arg Lys Thr  Pro Ala Ser Arg Ser  Arg
            2660                2665                2670

cgt cgc cgc cgc  cgc acc acc agc aaa  ctg act ccc gcc gct  ctg       17243
Arg Arg Arg Arg  Arg Thr Thr Ser Lys  Leu Thr Pro Ala Ala  Leu
            2675                2680                2685

gtg cgg agg gtg  tat cgc gat ggc cgc  gca gag ccc ctg atg  ctg       17288
Val Arg Arg Val  Tyr Arg Asp Gly Arg  Ala Glu Pro Leu Met  Leu
            2690                2695                2700

ccg cgc gct cgc  tac cat cca agc atc  acc act taatgactgt            17331
Pro Arg Ala Arg  Tyr His Pro Ser Ile  Thr Thr
            2705                2710

tgccgctgcc tccttgcaga t atg gcc ctc  act tgc cgc ctt cgc  gtc ccc    17382
                        Met Ala Leu  Thr Cys Arg Leu Arg  Val Pro
                               2715                2720
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att act ggc  tac cga gga aga aac  tcg cgc cgt aga agg  atg ttg       17427
Ile Thr Gly  Tyr Arg Gly Arg Asn  Ser Arg Arg Arg Arg  Met Leu
        2725                 2730                 2735

ggt agc ggg  atg cgt cgc cac agg  cgg cgg cgc gcc acc  agc agg       17472
Gly Ser Gly  Met Arg Arg His Arg  Arg Arg Arg Ala Thr  Ser Arg
        2740                 2745                 2750

agg ctg ggg  ggt ggc ttt ctg acc  gct ttg att ccc atc  atc gcc       17517
Arg Leu Gly  Gly Gly Phe Leu Thr  Ala Leu Ile Pro Ile  Ile Ala
        2755                 2760                 2765

gcg gcg att  ggg gca gta cca ggc  ata gct tcc gtg gcg  gtt cag       17562
Ala Ala Ile  Gly Ala Val Pro Gly  Ile Ala Ser Val Ala  Val Gln
        2770                 2775                 2780

gcc tcg cag  cgc cac tgacattgga aaaaaactta taaataaaat agaatggact    17617
Ala Ser Gln  Arg His
        2785

ctgacgctcc tggtcctgtg actatgtttt tgtagag atg gaa gac  atc aat ttt    17672
                                          Met Glu Asp  Ile Asn Phe
                                                  2790

tca tcc  ctg gct ccg cga cac  ggc acg agg ccg tac  atg ggc acc       17717
Ser Ser  Leu Ala Pro Arg His  Gly Thr Arg Pro Tyr  Met Gly Thr
    2795                 2800                 2805

tgg agc  gac atc ggc acc agc  caa ctg aac ggg ggc  gcc ttc aat       17762
Trp Ser  Asp Ile Gly Thr Ser  Gln Leu Asn Gly Gly  Ala Phe Asn
    2810                 2815                 2820

tgg agc  agt atc tgg agc ggg  ctt aaa aat ttt ggc  tct gcc ata       17807
Trp Ser  Ser Ile Trp Ser Gly  Leu Lys Asn Phe Gly  Ser Ala Ile
    2825                 2830                 2835

aaa acc  tat ggg aac aaa gct  tgg aac agc agc aca  ggg cag gcg       17852
Lys Thr  Tyr Gly Asn Lys Ala  Trp Asn Ser Ser Thr  Gly Gln Ala
    2840                 2845                 2850

ctg agg  aat aag ctt aaa gag  cag aac ttc cag cag  aag gtg gtc       17897
Leu Arg  Asn Lys Leu Lys Glu  Gln Asn Phe Gln Gln  Lys Val Val
    2855                 2860                 2865

gat ggt  atc gcc tct ggc atc  aat ggg gtg gtg gat  ctg gcc aac       17942
Asp Gly  Ile Ala Ser Gly Ile  Asn Gly Val Val Asp  Leu Ala Asn
    2870                 2875                 2880

cag gcc  gtg cag aaa cag ata  aac agc cgc ctg gac  ccg ccg cct       17987
Gln Ala  Val Gln Lys Gln Ile  Asn Ser Arg Leu Asp  Pro Pro Pro
    2885                 2890                 2895

gca gcc  cct ggc gaa atg gaa  gtg gag gaa gag ctc  cct ccc ctg       18032
Ala Ala  Pro Gly Glu Met Glu  Val Glu Glu Glu Leu  Pro Pro Leu
    2900                 2905                 2910

gaa aag  cgg gga gac aag cgc  ccg cgt ccc gat atg  gag gag acg       18077
Glu Lys  Arg Gly Asp Lys Arg  Pro Arg Pro Asp Met  Glu Glu Thr
    2915                 2920                 2925
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ctg gtg  acg cgc gga gac gag  ccg cct cca tat gag  gag gca ata       18122
Leu Val  Thr Arg Gly Asp Glu  Pro Pro Pro Tyr Glu  Glu Ala Ile
    2930                2935                2940

aag ctt  gga atg ccc act acc  aag cct ata gct ccc  atg gcc acc       18167
Lys Leu  Gly Met Pro Thr Thr  Lys Pro Ile Ala Pro  Met Ala Thr
    2945                2950                2955

ggg gta  atg aaa cct tct cag  tcg cat cga ccc gcc  acc ttg gac       18212
Gly Val  Met Lys Pro Ser Gln  Ser His Arg Pro Ala  Thr Leu Asp
    2960                2965                2970

ttg cct  cct gcc cct gct gct  gca gcg ccc gct cca  aag cct gtc       18257
Leu Pro  Pro Ala Pro Ala Ala  Ala Ala Pro Ala Pro  Lys Pro Val
    2975                2980                2985

gct acc  ccg aag ccc acc acc  gta cag ccc gtc gcc  gta gcc aga       18302
Ala Thr  Pro Lys Pro Thr Thr  Val Gln Pro Val Ala  Val Ala Arg
    2990                2995                3000

ccg cgt  ccc ggg ggc act ccg  cgc ccg aat gca aac  tgg cag agt       18347
Pro Arg  Pro Gly Gly Thr Pro  Arg Pro Asn Ala Asn  Trp Gln Ser
    3005                3010                3015

act ctg  aac agc atc gtg ggt  ctg ggc gtg cag agt  gta aag cgc       18392
Thr Leu  Asn Ser Ile Val Gly  Leu Gly Val Gln Ser  Val Lys Arg
    3020                3025                3030

cgt cgc  tgc tat taattaaata tggagtagcg cttaacttgc ttgtctgtgt       18444
Arg Arg  Cys Tyr
    3035

gtatgtgtca tcaccacgcc gccgcagcag cagcagcagc agaggagaaa ggaagaggtc   18504

gcgcgccgag gctgagttgc tttcaag atg gcc acc  cca tcg atg ttg ccc      18555
                              Met Ala Thr  Pro Ser Met Leu Pro
                                      3040                3045

cag tgg gca tac atg  cac atc gcc gga cag  gat gct tcg gag tac       18600
Gln Trp Ala Tyr Met  His Ile Ala Gly Gln  Asp Ala Ser Glu Tyr
                3050                3055                3060

ctg agt ccg ggt ctg  gtg cag ttc gcc cgt  gcc aca gac acc tac       18645
Leu Ser Pro Gly Leu  Val Gln Phe Ala Arg  Ala Thr Asp Thr Tyr
                3065                3070                3075

ttc aat ctg ggg aac  aag ttt agg aac ccc  acc gtg gcc ccc acc       18690
Phe Asn Leu Gly Asn  Lys Phe Arg Asn Pro  Thr Val Ala Pro Thr
                3080                3085                3090

cac gat gtg acc acc  gac cga agc cag cgg  ctg atg ctg cgc ttt       18735
His Asp Val Thr Thr  Asp Arg Ser Gln Arg  Leu Met Leu Arg Phe
                3095                3100                3105

gtg ccc gtt gat cgg  gag gac aat acc tac  tca tac aaa gtt cgc       18780
Val Pro Val Asp Arg  Glu Asp Asn Thr Tyr  Ser Tyr Lys Val Arg
                3110                3115                3120
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tac aca ctg gct gtg  ggc gac aac aga gtg  ctg gat atg gcc agc        18825
Tyr Thr Leu Ala Val  Gly Asp Asn Arg Val  Leu Asp Met Ala Ser
                3125                3130                3135

acc ttc ttt gac atc  cgg ggg gtg ctt gac  aga ggt ccc agt ttc        18870
Thr Phe Phe Asp Ile  Arg Gly Val Leu Asp  Arg Gly Pro Ser Phe
                3140                3145                3150

aag cca tac tct ggc  aca gct tac aac tca  cta gct cct aaa ggc        18915
Lys Pro Tyr Ser Gly  Thr Ala Tyr Asn Ser  Leu Ala Pro Lys Gly
                3155                3160                3165

gct ccc aac act tgt  cag tgg aag tac aaa  aca ctt gct aac aca        18960
Ala Pro Asn Thr Cys  Gln Trp Lys Tyr Lys  Thr Leu Ala Asn Thr
                3170                3175                3180

gaa aca gaa gaa gag  gag gag gag gac gaa  cag gca gat gaa caa        19005
Glu Thr Glu Glu Glu  Glu Glu Glu Asp Glu  Gln Ala Asp Glu Gln
                3185                3190                3195

gaa tac gtt gaa aag  act tct aca ttt gga  aat gcg cct gta aaa        19050
Glu Tyr Val Glu Lys  Thr Ser Thr Phe Gly  Asn Ala Pro Val Lys
                3200                3205                3210

gga ctg gat ata gat  gca gat ggc ttg cag  ata ggt gtg gac ata        19095
Gly Leu Asp Ile Asp  Ala Asp Gly Leu Gln  Ile Gly Val Asp Ile
                3215                3220                3225

caa gat gaa act aaa  cca gtc tac gct aac  aag ctt tat gaa cca        19140
Gln Asp Glu Thr Lys  Pro Val Tyr Ala Asn  Lys Leu Tyr Glu Pro
                3230                3235                3240

gaa ccc caa gtg gga  gat gga caa tgg cat  gat acc act gct att        19185
Glu Pro Gln Val Gly  Asp Gly Gln Trp His  Asp Thr Thr Ala Ile
                3245                3250                3255

act gag cag tat gga  ggc cgt gct ctt aag  cct gac aca aaa atg        19230
Thr Glu Gln Tyr Gly  Gly Arg Ala Leu Lys  Pro Asp Thr Lys Met
                3260                3265                3270

aaa cct tgc tat gga  tcg ttt gct aga cct  aca aat gaa aaa gga        19275
Lys Pro Cys Tyr Gly  Ser Phe Ala Arg Pro  Thr Asn Glu Lys Gly
                3275                3280                3285

gga caa tct aaa act  aga tca gta acg aag  gat gac aaa gta gtg        19320
Gly Gln Ser Lys Thr  Arg Ser Val Thr Lys  Asp Asp Lys Val Val
                3290                3295                3300

gaa gag cca gat att  gat atg gct ttc ttt  gat gga aga gat gcc        19365
Glu Glu Pro Asp Ile  Asp Met Ala Phe Phe  Asp Gly Arg Asp Ala
                3305                3310                3315

aaa aaa cca gat cca  gaa att gtt ctg tat  act gaa aat gtt aac        19410
Lys Lys Pro Asp Pro  Glu Ile Val Leu Tyr  Thr Glu Asn Val Asn
                3320                3325                3330

ttg gaa aca cct gac  act cat atc gtt tac  aaa gcc ggc aca gat        19455
Leu Glu Thr Pro Asp  Thr His Ile Val Tyr  Lys Ala Gly Thr Asp
                3335                3340                3345
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gat tcc agc tca tct  att aat ttg ggc caa  cag tct atg ccc aat        19500
Asp Ser Ser Ser Ser  Ile Asn Leu Gly Gln  Gln Ser Met Pro Asn
                3350                3355                3360

aga ccc aac tat att  ggc ttc aga gac aac  ttc att ggg ctc atg        19545
Arg Pro Asn Tyr Ile  Gly Phe Arg Asp Asn  Phe Ile Gly Leu Met
                3365                3370                3375

tac tat aac agt act  ggc aat atg gga gtg  ttg gcc gga caa gca        19590
Tyr Tyr Asn Ser Thr  Gly Asn Met Gly Val  Leu Ala Gly Gln Ala
                3380                3385                3390

tcc cag cta aat gca  gtg gtt gac ttg cag  gac aga aac aca gag        19635
Ser Gln Leu Asn Ala  Val Val Asp Leu Gln  Asp Arg Asn Thr Glu
                3395                3400                3405

ctg tct tac cag ctt  ttg ctt gat tct ttg  gga gac agg act aga        19680
Leu Ser Tyr Gln Leu  Leu Leu Asp Ser Leu  Gly Asp Arg Thr Arg
                3410                3415                3420

tac ttt agc atg tgg  aat cag gca gtg gac  agc tat gac cct gat        19725
Tyr Phe Ser Met Trp  Asn Gln Ala Val Asp  Ser Tyr Asp Pro Asp
                3425                3430                3435

gtc cgt att att gaa  aac cat ggt gtg gaa  gac gaa ctt ccc aat        19770
Val Arg Ile Ile Glu  Asn His Gly Val Glu  Asp Glu Leu Pro Asn
                3440                3445                3450

tac tgt ttc cca ttg  gat gga gtg ggt cgc  aca gat act tac aaa        19815
Tyr Cys Phe Pro Leu  Asp Gly Val Gly Arg  Thr Asp Thr Tyr Lys
                3455                3460                3465

ggc gtc gta gta gat  caa gct gca gca gca  gga act gca act act        19860
Gly Val Val Val Asp  Gln Ala Ala Ala Ala  Gly Thr Ala Thr Thr
                3470                3475                3480

tgg aaa gat gat acc  act gca aat gaa tac  aat gaa att gct aag        19905
Trp Lys Asp Asp Thr  Thr Ala Asn Glu Tyr  Asn Glu Ile Ala Lys
                3485                3490                3495

ggt aat aat cta gcc  atg gaa att aat ctc  caa gct aac tta tgg        19950
Gly Asn Asn Leu Ala  Met Glu Ile Asn Leu  Gln Ala Asn Leu Trp
                3500                3505                3510

aga agt ttt ctt tac  tcc aat gta gct ttg  tac ctt ccg gat gct        19995
Arg Ser Phe Leu Tyr  Ser Asn Val Ala Leu  Tyr Leu Pro Asp Ala
                3515                3520                3525

tac aaa tac act ccg  gct aat gtc act ctc  cct act aac act aat        20040
Tyr Lys Tyr Thr Pro  Ala Asn Val Thr Leu  Pro Thr Asn Thr Asn
                3530                3535                3540

acc tat gaa tac atg  aat ggg agg gta gtg  tcg cca tct ttg gtg        20085
Thr Tyr Glu Tyr Met  Asn Gly Arg Val Val  Ser Pro Ser Leu Val
                3545                3550                3555

gac gct tat gta aac  att ggc gca aga tgg  tct ttg gat cct atg        20130
Asp Ala Tyr Val Asn  Ile Gly Ala Arg Trp  Ser Leu Asp Pro Met
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                3560                3565                3570

gac aat gtt aac ccc  ttt aat cat cac cgc  aat gct ggc ctg cgc       20175
Asp Asn Val Asn Pro  Phe Asn His His Arg  Asn Ala Gly Leu Arg
                3575                3580                3585

tat cgg tca atg ctt  ctg ggc aac ggt cgc  tat gtg ccc ttc cac       20220
Tyr Arg Ser Met Leu  Leu Gly Asn Gly Arg  Tyr Val Pro Phe His
                3590                3595                3600

atc caa gtg cct cag  aaa ttt ttt gct gtg  aaa aac ctg ctt ctc       20265
Ile Gln Val Pro Gln  Lys Phe Phe Ala Val  Lys Asn Leu Leu Leu
                3605                3610                3615

ctc cca ggc tcc tac  acc tat gag tgg aac  ttt cgc aag gat gta       20310
Leu Pro Gly Ser Tyr  Thr Tyr Glu Trp Asn  Phe Arg Lys Asp Val
                3620                3625                3630

aat atg gtc ttg caa  agt tct ctt ggc aac  gac ctc aga aca gat       20355
Asn Met Val Leu Gln  Ser Ser Leu Gly Asn  Asp Leu Arg Thr Asp
                3635                3640                3645

ggt gct acc atc agt  ttt acc agc att aat  ctc tat gcc acc ttc       20400
Gly Ala Thr Ile Ser  Phe Thr Ser Ile Asn  Leu Tyr Ala Thr Phe
                3650                3655                3660

ttc ccc atg gct cac  aac act gct tcc act  ctt gaa gcc atg ctg       20445
Phe Pro Met Ala His  Asn Thr Ala Ser Thr  Leu Glu Ala Met Leu
                3665                3670                3675

cgc aat gac acc aat  gac cag tca ttc aat  gac tac ctc tct gca       20490
Arg Asn Asp Thr Asn  Asp Gln Ser Phe Asn  Asp Tyr Leu Ser Ala
                3680                3685                3690

gct aac atg ctc tac  cca att cca gca aat  gcc acc aac att ccc       20535
Ala Asn Met Leu Tyr  Pro Ile Pro Ala Asn  Ala Thr Asn Ile Pro
                3695                3700                3705

att tcc att ccc tct  cgc aac tgg gct gcc  ttc agg ggc tgg tcc       20580
Ile Ser Ile Pro Ser  Arg Asn Trp Ala Ala  Phe Arg Gly Trp Ser
                3710                3715                3720

ttc acc aga ctc aaa  act aag gaa act ccc  tct ttg gga tca ggc       20625
Phe Thr Arg Leu Lys  Thr Lys Glu Thr Pro  Ser Leu Gly Ser Gly
                3725                3730                3735

ttt gat ccc tac ttt  gtt tat tct ggc tct  att ccc tac ctg gat       20670
Phe Asp Pro Tyr Phe  Val Tyr Ser Gly Ser  Ile Pro Tyr Leu Asp
                3740                3745                3750

ggt acc ttc tac ctc  aac cac act ttc aag  aag gtg tcc atc atg       20715
Gly Thr Phe Tyr Leu  Asn His Thr Phe Lys  Lys Val Ser Ile Met
                3755                3760                3765

ttt gac tcc tca gtt  agc tgg cct ggc aat  gac aga ttg cta act       20760
Phe Asp Ser Ser Val  Ser Trp Pro Gly Asn  Asp Arg Leu Leu Thr
                3770                3775                3780

cca aat gag ttt gaa  atc aag cgc act gtg  gat gga gaa ggg tac       20805
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Pro Asn Glu Phe Glu  Ile Lys Arg Thr Val  Asp Gly Glu Gly Tyr
                3785                3790                3795

aat gtg gct caa tgc  aac atg acc aag gac  tgg ttc ctg gtt cag        20850
Asn Val Ala Gln Cys  Asn Met Thr Lys Asp  Trp Phe Leu Val Gln
                3800                3805                3810

atg ctt gcc aac tac  aac att ggc tac cag  ggc ttc tac atc cca        20895
Met Leu Ala Asn Tyr  Asn Ile Gly Tyr Gln  Gly Phe Tyr Ile Pro
                3815                3820                3825

gag ggg tac aag gat  cgc atg tac tcc ttc  ttc aga aac ttc cag        20940
Glu Gly Tyr Lys Asp  Arg Met Tyr Ser Phe  Phe Arg Asn Phe Gln
                3830                3835                3840

ccc atg agt agg cag  gtg gtt gat gag atc  aac tac act gac tac        20985
Pro Met Ser Arg Gln  Val Val Asp Glu Ile  Asn Tyr Thr Asp Tyr
                3845                3850                3855

aag gct gtt aag ctt  cca ttc caa cac aac  aac tct gga ttt gtg        21030
Lys Ala Val Lys Leu  Pro Phe Gln His Asn  Asn Ser Gly Phe Val
                3860                3865                3870

ggt tac ctc gct cca  acc att cgt cag ggt  caa gct tat cca gct        21075
Gly Tyr Leu Ala Pro  Thr Ile Arg Gln Gly  Gln Ala Tyr Pro Ala
                3875                3880                3885

aac tac cca tac ccc  cta att gga tcc act  gct gtt aaa agc gtt        21120
Asn Tyr Pro Tyr Pro  Leu Ile Gly Ser Thr  Ala Val Lys Ser Val
                3890                3895                3900

acc cag aaa aag ttc  ttg tgc gac agg acc  atg tgg cgc atc cca        21165
Thr Gln Lys Lys Phe  Leu Cys Asp Arg Thr  Met Trp Arg Ile Pro
                3905                3910                3915

ttc tcc agc aac ttc  atg tcc atg ggt gcc  cta acc gac ctg ggg        21210
Phe Ser Ser Asn Phe  Met Ser Met Gly Ala  Leu Thr Asp Leu Gly
                3920                3925                3930

cag aac atg ctt tat  gcc aac tca gcc cat  gcg ctg gac atg act        21255
Gln Asn Met Leu Tyr  Ala Asn Ser Ala His  Ala Leu Asp Met Thr
                3935                3940                3945

ttt gag gtg gat ccc  atg gat gag ccc aca  ctg ctt tat ctt ctt        21300
Phe Glu Val Asp Pro  Met Asp Glu Pro Thr  Leu Leu Tyr Leu Leu
                3950                3955                3960

ttt gaa gtc ttc gac  gtg gtc aga gtg cac  cag cca cac cgc ggc        21345
Phe Glu Val Phe Asp  Val Val Arg Val His  Gln Pro His Arg Gly
                3965                3970                3975

gtc atc gag gct gtc  tac ctg cgt acc cca  ttc tca gct ggt aac        21390
Val Ile Glu Ala Val  Tyr Leu Arg Thr Pro  Phe Ser Ala Gly Asn
                3980                3985                3990

gcc acc aca taagcctctt gcttcttgca agcagctgcc atg gcc  tgt ggg tct    21444
Ala Thr Thr                                   Met Ala  Cys Gly Ser
                                                   3995
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ggc aac  gga tcc agc gag caa  gag ctc agg gcc att  gct aga gac       21489
Gly Asn  Gly Ser Ser Glu Gln  Glu Leu Arg Ala Ile  Ala Arg Asp
    4000                 4005                 4010

ctg gga  tgc gga ccc tat ttc  ctg gga acc ttt gac  aag cgt ttc       21534
Leu Gly  Cys Gly Pro Tyr Phe  Leu Gly Thr Phe Asp  Lys Arg Phe
    4015                 4020                 4025

ccg ggg  ttc atg gcc ccc gac  aag ctc gcc tgc gcc  att gtt aac       21579
Pro Gly  Phe Met Ala Pro Asp  Lys Leu Ala Cys Ala  Ile Val Asn
    4030                 4035                 4040

acg gct  ggt cgc gag acg ggg  gga gag cac tgg ctg  gct ttt ggt       21624
Thr Ala  Gly Arg Glu Thr Gly  Gly Glu His Trp Leu  Ala Phe Gly
    4045                 4050                 4055

tgg aac  ccg cgc tcc aac acc  tgc tac ctt ttt gat  cct ttt ggc       21669
Trp Asn  Pro Arg Ser Asn Thr  Cys Tyr Leu Phe Asp  Pro Phe Gly
    4060                 4065                 4070

ttc tcg  gat gag cgc ctc aag  caa atc tac cag ttt  gag tat gag       21714
Phe Ser  Asp Glu Arg Leu Lys  Gln Ile Tyr Gln Phe  Glu Tyr Glu
    4075                 4080                 4085

ggt ctc  ctg cgc cgc agt gcc  ctg gct acc aag gat  cgc tgt atc       21759
Gly Leu  Leu Arg Arg Ser Ala  Leu Ala Thr Lys Asp  Arg Cys Ile
    4090                 4095                 4100

acc ctg  gaa aag tcc acc cag  acc gtg cag ggc ccg  cgc tcc gca       21804
Thr Leu  Glu Lys Ser Thr Gln  Thr Val Gln Gly Pro  Arg Ser Ala
    4105                 4110                 4115

gcc tgt  gga ctt ttt tgc tgc  atg ttc ctc cac gct  ttt gtg cac       21849
Ala Cys  Gly Leu Phe Cys Cys  Met Phe Leu His Ala  Phe Val His
    4120                 4125                 4130

tgg ccc  gac cgc ccc atg gac  gga aac ccc acc atg  aag ttg ttg       21894
Trp Pro  Asp Arg Pro Met Asp  Gly Asn Pro Thr Met  Lys Leu Leu
    4135                 4140                 4145

act ggg  gtg ccc aac agc atg  ctc caa tca ccc caa  gtc cag ccc       21939
Thr Gly  Val Pro Asn Ser Met  Leu Gln Ser Pro Gln  Val Gln Pro
    4150                 4155                 4160

acc ctg  cgc cac aac cag gag  gcg ctc tac cgc ttc  ctt aac acc       21984
Thr Leu  Arg His Asn Gln Glu  Ala Leu Tyr Arg Phe  Leu Asn Thr
    4165                 4170                 4175

cac tca  tct tac ttt cgt tct  cac cgc gcg cgc atc  gaa aag gcc       22029
His Ser  Ser Tyr Phe Arg Ser  His Arg Ala Arg Ile  Glu Lys Ala
    4180                 4185                 4190

acc gcg  ttt gac cgt atg gct  atg caa taataagtca tgtaaaaacc         22076
Thr Ala  Phe Asp Arg Met Ala  Met Gln
    4195                 4200

gtgtttcaaa taaacagcac tttatttttt acatgcactg tggctctggg ttgctcattc   22136

attcatcatt cactcagaag tcgaaggggt tctggcggga atcagcgtga cccgctggca   22196
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gggatacgtt gcggaactgg aacctgttct gccacttgaa ctcggggatc accagtttgg    22256

gaactaggat ctcggggaag gtgtcttgcc acagctttct ggtcagttgc agagcgccga    22316

gcaggtcagg agcagagatc ttgaaatcac agttggggcc agcattctga gcgcgggagt    22376

tgcggtacac tgggttacag cactggaaca ccatcagggc ggggtgtctc acgctcgcca    22436

gcacggtcgg gtcactgatg gtagacacat ccaagtcttc agcattggcc attccaaagg    22496

gggtcatctt acaggtctgc ctgcccatca cgggagcgca gccgggcttg tggttgcaat    22556

cgcagtgaat ggggatcagc atcatcctgg cctggtcggg ggttatccct ggataaaccg    22616

ccttcataaa ggcttcgtac tgcttgaaag cttcctgggc cttgcttccc tcggtgtaga    22676

acatcccaca tgacttgctg gaaaactgat tagtagcaca gttggcatca ttcacacagc    22736

agcgggcatc gttgttggcc agctggacca cattcctgcc ccagcggttc tgggtgatct    22796

tggctcggtc tgggttctcc ttcatcgcgc gctgcccgtt ctcgctcgcc acatccatct    22856

cgatgatgtg atccttctgg atcatgatag tgccatgcag gcatttcacc ttgccttcat    22916

aatcggtgca gccatgagcc cacagagcgc acccggtgca ctcccaattg ttgtgggcga    22976

tctcagaata agaatgcacc aacccctgca ggaatcttcc catcatggtt gagagggtct    23036

tgttactggt gaaagtcagc gggacgcctc gatgctcctc gttcacatac tggtggcaaa    23096

ttcgcttgta ctgttcatgc tgctctggca taagcttgaa agaggttctt aggtcattct    23156

ccagcctgta cttctccatc agcacagcca ttacttccat gccctttcc caggcagaaa    23216

ccaggggtag gctcatggaa tttctaacag aaatagcagc tactttagcc agagggtcat    23276

ccttgtcaat cttctcaaca cttcttttgc catccttctc agtgatgcgc acgggtgggt    23336

agctgaagcc cacggccacc agctccgcct cttctctttc ttcttcgctg tcctgactga    23396

tgtcttgtaa agggacatgc ttggtcttcc tgggcttctt tttgggggt attggcggag    23456

ggctgctgct ccgctccgga gacatggagg accgcgaagt ttcgctcacc agtaccacct    23516

ggctctcggt agaagaaccg gaccccacac ggcggtaggt gttcctcttc gggggcagag    23576

gtggaggtga ctgcgatggg ctgcggtccg gcctgggagg cggatgactg gcagagcccc    23636

ttccgcgttc gggggtgtgc tcccggtggc ggtcgcttga ctgatttcct ccgcggctgg    23696

ccattgtgtt ctcctaggca gagaaacaac agac atg gag act  cag cca tcg       23748
                                      Met Glu Thr  Gln Pro Ser
                                             4205

ctg cca  aca ccg ctg caa gca  cca tca cac ctc gcc  tcc agc gat       23793
Leu Pro  Thr Pro Leu Gln Ala  Pro Ser His Leu Ala  Ser Ser Asp
    4210                4215                4220
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gag gag  gag gaa caa agc tta  acc gcc cca cca ccc  agt ccc gcc       23838
Glu Glu  Glu Glu Gln Ser Leu  Thr Ala Pro Pro Pro  Ser Pro Ala
    4225                 4230                 4235

acc acc  acc tct acc ctc gag  gat gag gag gtc gac  gca ccc cag       23883
Thr Thr  Thr Ser Thr Leu Glu  Asp Glu Glu Val Asp  Ala Pro Gln
    4240                 4245                 4250

gag ata  cgg acg cag gat atg  gag gat gag aaa gcg  gaa gag att       23928
Glu Ile  Arg Thr Gln Asp Met  Glu Asp Glu Lys Ala  Glu Glu Ile
    4255                 4260                 4265

gag gca  gat atc gag cag gac  cca ggc tat gtg aca  ccg gcc gag       23973
Glu Ala  Asp Ile Glu Gln Asp  Pro Gly Tyr Val Thr  Pro Ala Glu
    4270                 4275                 4280

cac gag  gaa gag ctg aga cgc  ttt cta gag aaa gat  gat gac aac       24018
His Glu  Glu Glu Leu Arg Arg  Phe Leu Glu Lys Asp  Asp Asp Asn
    4285                 4290                 4295

cgt cca  gaa cag caa gca gat  ggc gat cag cag aat  gtt ggg ctc       24063
Arg Pro  Glu Gln Gln Ala Asp  Gly Asp Gln Gln Asn  Val Gly Leu
    4300                 4305                 4310

ggg gat  cat gtt gtc gac tac  ctc acc ggc ctt ggt  ggg gag gac       24108
Gly Asp  His Val Val Asp Tyr  Leu Thr Gly Leu Gly  Gly Glu Asp
    4315                 4320                 4325

gtg ctc  ctc aaa cac cta gca  agg cag tcg atc ata  atc aaa gat       24153
Val Leu  Leu Lys His Leu Ala  Arg Gln Ser Ile Ile  Ile Lys Asp
    4330                 4335                 4340

gca ctg  ctt gat cgc agc gaa  gtg ccc atc agt gtg  gaa gag ctc       24198
Ala Leu  Leu Asp Arg Ser Glu  Val Pro Ile Ser Val  Glu Glu Leu
    4345                 4350                 4355

agc cgc  gcc tac gag ctc aac  ctg ttc tcg cct cgg  gta ccc ccc       24243
Ser Arg  Ala Tyr Glu Leu Asn  Leu Phe Ser Pro Arg  Val Pro Pro
    4360                 4365                 4370

aag cgt  cag cca aac ggc acc  tgc gag ccc aac cct  cgc ctc aac       24288
Lys Arg  Gln Pro Asn Gly Thr  Cys Glu Pro Asn Pro  Arg Leu Asn
    4375                 4380                 4385

ttc tat  ccc gca ttc acc gtc  ccc gag gtg ctg gct  acc tac cac       24333
Phe Tyr  Pro Ala Phe Thr Val  Pro Glu Val Leu Ala  Thr Tyr His
    4390                 4395                 4400

ata ttt  ttc aaa aac caa aaa  att cca att tcc tgc  cgc gcc aac       24378
Ile Phe  Phe Lys Asn Gln Lys  Ile Pro Ile Ser Cys  Arg Ala Asn
    4405                 4410                 4415

cga act  cgc gcc gat gcc ctg  ctc aac ttg gga cct  ggc gct tgc       24423
Arg Thr  Arg Ala Asp Ala Leu  Leu Asn Leu Gly Pro  Gly Ala Cys
    4420                 4425                 4430

tta cct  gat ata act tcc ttg  gaa gag gtc cca aag  atc ttc gaa       24468
Leu Pro  Asp Ile Thr Ser Leu  Glu Glu Val Pro Lys  Ile Phe Glu
    4435                 4440                 4445
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ggt ctg  ggc agt gat gag act  cgg gcc gca aat gct  ctg caa cag       24513
Gly Leu  Gly Ser Asp Glu Thr  Arg Ala Ala Asn Ala  Leu Gln Gln
    4450                 4455                 4460

gga gag  aat ggc atc gat gaa  cat cac agc gct ctg  gtg gag ttg       24558
Gly Glu  Asn Gly Ile Asp Glu  His His Ser Ala Leu  Val Glu Leu
    4465                 4470                 4475

gag ggc  gat aat gcc cga cta  gca gta ctc aag cgc  agt atc gag       24603
Glu Gly  Asp Asn Ala Arg Leu  Ala Val Leu Lys Arg  Ser Ile Glu
    4480                 4485                 4490

gtg acc  cat ttt gca tac ccc  gct gtc aac ctg cct  ccc aaa gtc       24648
Val Thr  His Phe Ala Tyr Pro  Ala Val Asn Leu Pro  Pro Lys Val
    4495                 4500                 4505

atg agc  gct gtc atg gat cag  ata ctc att aaa cgc  gca agt ccc       24693
Met Ser  Ala Val Met Asp Gln  Ile Leu Ile Lys Arg  Ala Ser Pro
    4510                 4515                 4520

ctt tca  gaa aac atg cag gat  cca gac gcc tcg gat  gag ggc aag       24738
Leu Ser  Glu Asn Met Gln Asp  Pro Asp Ala Ser Asp  Glu Gly Lys
    4525                 4530                 4535

cca gtg  gtc agt gat gaa cag  cta tct cgc tgg ctg  ggc acc aac       24783
Pro Val  Val Ser Asp Glu Gln  Leu Ser Arg Trp Leu  Gly Thr Asn
    4540                 4545                 4550

tcc cca  cga gac ttg gaa gag  cgg cgc aag ctc atg  atg gcc gtg       24828
Ser Pro  Arg Asp Leu Glu Glu  Arg Arg Lys Leu Met  Met Ala Val
    4555                 4560                 4565

gtg cta  gtt act gtg gaa atg  gag tgt ctt cgc cgc  ttc ttc act       24873
Val Leu  Val Thr Val Glu Met  Glu Cys Leu Arg Arg  Phe Phe Thr
    4570                 4575                 4580

gac ccc  gag aca ctg cgc aag  ctc gag gag aac cta  cac tac act       24918
Asp Pro  Glu Thr Leu Arg Lys  Leu Glu Glu Asn Leu  His Tyr Thr
    4585                 4590                 4595

ttt aga  cat gga ttt gtg aga  cag gca tgc aag atc  tcc aac gtg       24963
Phe Arg  His Gly Phe Val Arg  Gln Ala Cys Lys Ile  Ser Asn Val
    4600                 4605                 4610

gag ctt  acc aac ctg gtt tcc  tac atg ggc att ttg  cat gaa aac       25008
Glu Leu  Thr Asn Leu Val Ser  Tyr Met Gly Ile Leu  His Glu Asn
    4615                 4620                 4625

aga ctc  gga cag agc gtg ctg  cac acc acc ctg aag  ggg gaa gcc       25053
Arg Leu  Gly Gln Ser Val Leu  His Thr Thr Leu Lys  Gly Glu Ala
    4630                 4635                 4640

cgt cgc  gac tac atc cgc gac  act gtc tac ctc tac  ctc tgc cat       25098
Arg Arg  Asp Tyr Ile Arg Asp  Thr Val Tyr Leu Tyr  Leu Cys His
    4645                 4650                 4655

acc tgg  cag act ggt atg ggt  gtg tgg cag cag tgt  ttg gaa gaa       25143
Thr Trp  Gln Thr Gly Met Gly  Val Trp Gln Gln Cys  Leu Glu Glu
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    4660                4665                4670

caa aac  ctg aaa gaa cta gac  aag ctc tta cag aga  tcc ctc aaa       25188
Gln Asn  Leu Lys Glu Leu Asp  Lys Leu Leu Gln Arg  Ser Leu Lys
    4675                4680                4685

acc ttg  tgg acg ggt ttt gac  gag cgc aca gtc gcc  tct gat ctg       25233
Thr Leu  Trp Thr Gly Phe Asp  Glu Arg Thr Val Ala  Ser Asp Leu
    4690                4695                4700

gca gat  ctc atc ttc cca gag  cgt ctc agg act act  ctg cgc aac       25278
Ala Asp  Leu Ile Phe Pro Glu  Arg Leu Arg Thr Thr  Leu Arg Asn
    4705                4710                4715

ggg ctg  cct gac ttc atg aac  cag agc atg att aac  aac ttt cgc       25323
Gly Leu  Pro Asp Phe Met Asn  Gln Ser Met Ile Asn  Asn Phe Arg
    4720                4725                4730

tct ttc  atc ctg gaa cgc tcc  ggt atc ctg ccc gcc  acc tgc tgt       25368
Ser Phe  Ile Leu Glu Arg Ser  Gly Ile Leu Pro Ala  Thr Cys Cys
    4735                4740                4745

gcg cta  cca tcc gac ttt gtg  cct ctg acc tac cgc  gag tgc ccc       25413
Ala Leu  Pro Ser Asp Phe Val  Pro Leu Thr Tyr Arg  Glu Cys Pro
    4750                4755                4760

cca ccg  cta tgg agc cac tgc  tac ctg ttc cgc ctg  gcc aac tac       25458
Pro Pro  Leu Trp Ser His Cys  Tyr Leu Phe Arg Leu  Ala Asn Tyr
    4765                4770                4775

cta tca  tac cac tcg gat gtg  atc gag gat gtg agc  gga gat ggc       25503
Leu Ser  Tyr His Ser Asp Val  Ile Glu Asp Val Ser  Gly Asp Gly
    4780                4785                4790

ctg ctt  gag tgc cac tgc cgc  tgt aat ctc tgc tca  cca cat cgc       25548
Leu Leu  Glu Cys His Cys Arg  Cys Asn Leu Cys Ser  Pro His Arg
    4795                4800                4805

tcc ctc  gtc tgt aac ccc cag  ttg ctt agc gaa acc  caa att ata       25593
Ser Leu  Val Cys Asn Pro Gln  Leu Leu Ser Glu Thr  Gln Ile Ile
    4810                4815                4820

ggc acc  ttc gaa ttg cag ggt  ccc agc agc gaa ggc  gag ggg tct       25638
Gly Thr  Phe Glu Leu Gln Gly  Pro Ser Ser Glu Gly  Glu Gly Ser
    4825                4830                4835

tct cct  ggg caa agt ttg aaa  ctg acc ccg gga ctg  tgg acc tcc       25683
Ser Pro  Gly Gln Ser Leu Lys  Leu Thr Pro Gly Leu  Trp Thr Ser
    4840                4845                4850

gcc tac  ctg cgc aag ttc tcc  ccc gag gac tac cac  ccc tat gag       25728
Ala Tyr  Leu Arg Lys Phe Ser  Pro Glu Asp Tyr His  Pro Tyr Glu
    4855                4860                4865

atc agg  ttc tat gaa gac caa  tca cag ccg ccc aaa  gct gag ctc       25773
Ile Arg  Phe Tyr Glu Asp Gln  Ser Gln Pro Pro Lys  Ala Glu Leu
    4870                4875                4880

tca gcg  tgc gtc atc acc cag  ggg gca att ttg gcc  caa ttg caa       25818
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Ser Ala  Cys Val Ile Thr Gln  Gly Ala Ile Leu Ala  Gln Leu Gln
    4885                 4890                 4895

gcc atc  caa aaa tcc cgc caa  gaa ttt ttg ctg aaa  aag ggt aac       25863
Ala Ile  Gln Lys Ser Arg Gln  Glu Phe Leu Leu Lys  Lys Gly Asn
    4900                 4905                 4910

gga gtc  tac ctc gac ccc cag  act ggt gag gag ctc  aac aca agg       25908
Gly Val  Tyr Leu Asp Pro Gln  Thr Gly Glu Glu Leu  Asn Thr Arg
    4915                 4920                 4925

ttc tct  cag gat gtc tca gcg  ccg agg aaa caa gaa  gtt gaa agt       25953
Phe Ser  Gln Asp Val Ser Ala  Pro Arg Lys Gln Glu  Val Glu Ser
    4930                 4935                 4940

gca gct  gcc gcc ccc aga gga  tat gga gga aga ctg  gga cag tca       25998
Ala Ala  Ala Ala Pro Arg Gly  Tyr Gly Gly Arg Leu  Gly Gln Ser
    4945                 4950                 4955

gac aga  gga gat gga aga ttg  gga cag cca ggc aga  gga gga gga       26043
Asp Arg  Gly Asp Gly Arg Leu  Gly Gln Pro Gly Arg  Gly Gly Gly
    4960                 4965                 4970

gga cag  cct gga gga aga cag  ttt gga gga gga aga  cga gga ggc       26088
Gly Gln  Pro Gly Gly Arg Gln  Phe Gly Gly Gly Arg  Arg Gly Gly
    4975                 4980                 4985

aga gga  ggt gga aga agc aac  cgc cgc caa aca gtt  gtc ctc ggc       26133
Arg Gly  Gly Gly Arg Ser Asn  Arg Arg Gln Thr Val  Val Leu Gly
    4990                 4995                 5000

ggc gga  gac aag caa ggc cac  aga caa cac cac agc  tac cat ctc       26178
Gly Gly  Asp Lys Gln Gly His  Arg Gln His His Ser  Tyr His Leu
    5005                 5010                 5015

cgt tcc  ggg tcg ggg ggt cca  gca ccg tcc caa cag  tagatgggat       26224
Arg Ser  Gly Ser Gly Gly Pro  Ala Pro Ser Gln Gln
    5020                 5025                 5030

gagaccgggc gactcccgaa tgcgaccacc gcttctaaga ctggtaagaa ggagcggcag    26284

ggatacaagt cctggcgggg gcataagaac gctatcatat cctgcttgca tgaatgcggg    26344

ggcaacatat ccttcacccg ccgctacctg ctcttccacc acggggtgaa cttcccccgc    26404

aatgtcttgc attactaccg tcacctccac agcccctact acagccagca agcctcggca    26464

gaaaaagaca acagcagcaa gaacctccag cagaaaacca gcagcagtta gaacacccac    26524

agcaggtgca acaggaggag gactgagaat cacagcgaac gagccagcgc agacccgaga    26584

gctgagaaac cggatttttc caaccctcta tgccatcttc caacagagtc gggggcaaga    26644

gcaggaactg aaagtaaaaa accgatcttt gcgctcgctc acccgaagtt gtttgtatca    26704

caagagcgaa gaccaacttc agcgcactct cgaggacgcc gaggctctct tcaacaagta    26764

ctgcgcgctc actcttaaag agtagcccgc gcccgcgcta gctcgaaaaa aggcgggaat    26824
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tacgtcaccc attggcgcct gtcctttgcc ctcgtc atg agt aaa gaa att  ccc     26878
                                        Met Ser Lys Glu Ile  Pro
                                                          5035

acg cct tac atg  tgg agt tat caa ccc  caa atg gga ctg gca  gca       26923
Thr Pro Tyr Met  Trp Ser Tyr Gln Pro  Gln Met Gly Leu Ala  Ala
            5040                 5045                 5050

ggc gcc tcc cag  gac tac tcc acc cgt  atg aat tgg ctc agc  gcc       26968
Gly Ala Ser Gln  Asp Tyr Ser Thr Arg  Met Asn Trp Leu Ser  Ala
            5055                 5060                 5065

ggt ccc tcg atg  atc tca cgg gtt aat  gat ata cga gct tat  cga       27013
Gly Pro Ser Met  Ile Ser Arg Val Asn  Asp Ile Arg Ala Tyr  Arg
            5070                 5075                 5080

aac caa tta ctc  cta gaa cag tca gca  ctt acc gcc aca ccc  aga       27058
Asn Gln Leu Leu  Leu Glu Gln Ser Ala  Leu Thr Ala Thr Pro  Arg
            5085                 5090                 5095

caa cac ctt aat  ccc cgg aat tgg ccc  gcc gcc ctg gtg tac  cag       27103
Gln His Leu Asn  Pro Arg Asn Trp Pro  Ala Ala Leu Val Tyr  Gln
            5100                 5105                 5110

gaa acc ccc gct  ccc acc acc gtc cta  ctt cct cga gac gcc  cag       27148
Glu Thr Pro Ala  Pro Thr Thr Val Leu  Leu Pro Arg Asp Ala  Gln
            5115                 5120                 5125

gcc gaa gtt cag  atg act aac gca ggt  gta cag ctg gct ggc  ggt       27193
Ala Glu Val Gln  Met Thr Asn Ala Gly  Val Gln Leu Ala Gly  Gly
            5130                 5135                 5140

tcc gcc ctg tgt  cgt cac cgg cct caa  cag agt ata aaa cgc  ctg       27238
Ser Ala Leu Cys  Arg His Arg Pro Gln  Gln Ser Ile Lys Arg  Leu
            5145                 5150                 5155

gtg atc aga ggc  cga ggt atc cag ctc  aac gac gag tcg gtg  agc       27283
Val Ile Arg Gly  Arg Gly Ile Gln Leu  Asn Asp Glu Ser Val  Ser
            5160                 5165                 5170

tct tcg ctt ggt  cta cga cca gac gga  gtc ttc caa att gcc  ggc       27328
Ser Ser Leu Gly  Leu Arg Pro Asp Gly  Val Phe Gln Ile Ala  Gly
            5175                 5180                 5185

tgc ggg aga tct  tcc ttc act cct cgt  cag gct gta ctg act  ttg       27373
Cys Gly Arg Ser  Ser Phe Thr Pro Arg  Gln Ala Val Leu Thr  Leu
            5190                 5195                 5200

gag agt tcg tca  tcg cag ccc cgc tcg  ggt ggc atc ggg act  ctc       27418
Glu Ser Ser Ser  Ser Gln Pro Arg Ser  Gly Gly Ile Gly Thr  Leu
            5205                 5210                 5215

caa ttt gtg gag  gag ttt act ccc tct  gtc tac ttc aac ccc  ttc       27463
Gln Phe Val Glu  Glu Phe Thr Pro Ser  Val Tyr Phe Asn Pro  Phe
            5220                 5225                 5230

tcc ggc tct cct  ggg cat tat ccg gac  gag ttc ata cca aac  ttc       27508
Ser Gly Ser Pro  Gly His Tyr Pro Asp  Glu Phe Ile Pro Asn  Phe
            5235                 5240                 5245
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gac gca atc agc  gag tca gtg gat ggc  tat gat tg atg tct aat  ggt    27555
Asp Ala Ile Ser  Glu Ser Val Asp Gly  Tyr Asp    Met Ser Asn  Gly
            5250                 5255                    5260

ggc gcg gct gag  cta gct cga ctg cga  cat cta gac cac tgc  cgc      27600
Gly Ala Ala Glu  Leu Ala Arg Leu Arg  His Leu Asp His Cys  Arg
            5265                 5270                5275

cgc ttt cgc tgc  ttt gcc cga gaa ctc  acc gag ttc atc tac  ttc      27645
Arg Phe Arg Cys  Phe Ala Arg Glu Leu  Thr Glu Phe Ile Tyr  Phe
            5280                 5285                5290

gaa ata ccc gag  gag cac cct caa gga  ccg gcc cac gga gtg  cgt      27690
Glu Ile Pro Glu  Glu His Pro Gln Gly  Pro Ala His Gly Val  Arg
            5295                 5300                5305

att acc atc gaa  ggg ggg ata gac tct  cgc ctg cat cgg atc  ttc      27735
Ile Thr Ile Glu  Gly Gly Ile Asp Ser  Arg Leu His Arg Ile  Phe
            5310                 5315                5320

tgc cag cga ccc  gtg cta atc gag cgc  gac cag gga aac acc  aca      27780
Cys Gln Arg Pro  Val Leu Ile Glu Arg  Asp Gln Gly Asn Thr  Thr
            5325                 5330                5335

gtc tcc atc tac  tgc atc tgt aac cac  ccc gga ttg cat gaa  agc      27825
Val Ser Ile Tyr  Cys Ile Cys Asn His  Pro Gly Leu His Glu  Ser
            5340                 5345                5350

ctt tgc tgt ctt  att tgt gct gag ttt  aat aaa aac tgagttaaga       27871
Leu Cys Cys Leu  Ile Cys Ala Glu Phe  Asn Lys Asn
            5355                 5360

ctctcctacg gactaccaat tcttcaactc ggactttata acaatcagac cctccgttca  27931

agtcagaaga ccccaaccct tcctctgatc caggaatcta attctacctc cccagcacca  27991

cactttacta gccttcccga aactaacaac ctcggagctc aactgcacca cttttccaga  28051

agccttctct ctgccaatac taccactccc agaaccggag gtgagctccg tggtcttcct  28111

aataacaacc cctgggtggt aactgggttt gtaacgctag gtgtagttgc gggtgggctt  28171

gtgcttgtcc tttgctacct atacacacct tgctgtgctt atttagtaat cttgtgttgc  28231

tggtttaaga a atg ggg  gcc cta cta gtc gcg  ctt gct tta ctt tca       28278
             Met Gly  Ala Leu Leu Val Ala  Leu Ala Leu Leu Ser
                 5365                 5370                5375

ctt ttg gat ctg ggc  tct act atg cta gtt  cag cct gta cta ttt       28323
Leu Leu Asp Leu Gly  Ser Thr Met Leu Val  Gln Pro Val Leu Phe
                5380                 5385                5390

gat cca tgc ctc aat  ttt gat cca gac aac  tgc aca ctc act ttt       28368
Asp Pro Cys Leu Asn  Phe Asp Pro Asp Asn  Cys Thr Leu Thr Phe
                5395                 5400                5405

gct cca gag gct ggc  cgc tgt gga gtt ctt  att agg tgc gga cgg       28413
Ala Pro Glu Ala Gly  Arg Cys Gly Val Leu  Ile Arg Cys Gly Arg
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                5410                5415                5420

gaa tgc agt ccc att  gaa ata cac cac aat  aac aaa att tgg aac        28458
Glu Cys Ser Pro Ile  Glu Ile His His Asn  Asn Lys Ile Trp Asn
                5425                5430                5435

aat acc tta ttc acc  aca tgg cag cca gga  gac cct gag tgg tat        28503
Asn Thr Leu Phe Thr  Thr Trp Gln Pro Gly  Asp Pro Glu Trp Tyr
                5440                5445                5450

act gtc tct gtc cgt  ggt cct gac ggt tcc  atc cgc act gct aat        28548
Thr Val Ser Val Arg  Gly Pro Asp Gly Ser  Ile Arg Thr Ala Asn
                5455                5460                5465

aac act ttt att ttt  gct gag atg tgc gat  ctg acc atg ttc atg        28593
Asn Thr Phe Ile Phe  Ala Glu Met Cys Asp  Leu Thr Met Phe Met
                5470                5475                5480

agc aaa cag tat aac  cta tgg cct cca agc  aag gag aac att gtg        28638
Ser Lys Gln Tyr Asn  Leu Trp Pro Pro Ser  Lys Glu Asn Ile Val
                5485                5490                5495

gca ttc tcc att gct  tat ttc ttg tgt acg  tgt ctc att act gct        28683
Ala Phe Ser Ile Ala  Tyr Phe Leu Cys Thr  Cys Leu Ile Thr Ala
                5500                5505                5510

att cta tgt atc tgc  ata cac ttg ctt att  tgc cac cgc cac aga        28728
Ile Leu Cys Ile Cys  Ile His Leu Leu Ile  Cys His Arg His Arg
                5515                5520                5525

aac agc aat gag gaa  aaa gag aaa atg cct  tgagcttttt ctcatttttg      28778
Asn Ser Asn Glu Glu  Lys Glu Lys Met Pro
                5530                5535

ttttttttg tttacagcc atg gct tca gtt ata  gct cta att att gtc        28827
                      Met Ala Ser Val Ile  Ala Leu Ile Ile Val
                                    5540                5545

agc att ctc act gcc  gca cag gga caa aca  att gtc tat att acc        28872
Ser Ile Leu Thr Ala  Ala Gln Gly Gln Thr  Ile Val Tyr Ile Thr
                5550                5555                5560

tta ggt cat aac cac  act ctt ata gga ccc  caa att agt tca cag        28917
Leu Gly His Asn His  Thr Leu Ile Gly Pro  Gln Ile Ser Ser Gln
                5565                5570                5575

gtt ata tgg acc aaa  ctt gga agt gtt gat  tat ttt gac ata atc        28962
Val Ile Trp Thr Lys  Leu Gly Ser Val Asp  Tyr Phe Asp Ile Ile
                5580                5585                5590

tgc aac aga act aaa  cca ata ttt gta acc  tgt aac aaa caa aat        29007
Cys Asn Arg Thr Lys  Pro Ile Phe Val Thr  Cys Asn Lys Gln Asn
                5595                5600                5605

ctc acc tta att aat  gtt agc gaa att tac  agc ggt tac tat tat        29052
Leu Thr Leu Ile Asn  Val Ser Glu Ile Tyr  Ser Gly Tyr Tyr Tyr
                5610                5615                5620

ggt tat gac aga cac  agc agt gaa tat aaa  aat tac cta gtt cgc        29097
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Gly Tyr Asp Arg His  Ser Ser Glu Tyr Lys  Asn Tyr Leu Val Arg
                5625                5630                5635

ata act caa ccc aaa  acc aca aaa atg cca  aat aag gca aaa att       29142
Ile Thr Gln Pro Lys  Thr Thr Lys Met Pro  Asn Lys Ala Lys Ile
                5640                5645                5650

caa atg gtt agc gca  tta gaa cat ctt aca  tat ccc acc aca ccc       29187
Gln Met Val Ser Ala  Leu Glu His Leu Thr  Tyr Pro Thr Thr Pro
                5655                5660                5665

gat gag aga aac att  cca aat tca atg att  gcc att att gcg gcg       29232
Asp Glu Arg Asn Ile  Pro Asn Ser Met Ile  Ala Ile Ile Ala Ala
                5670                5675                5680

gtg gca gtg gga atg  gca cta ata ata att  tgt atg ttc cta tat       29277
Val Ala Val Gly Met  Ala Leu Ile Ile Ile  Cys Met Phe Leu Tyr
                5685                5690                5695

gct tgt tac tgt aga  aag ttt cat cac aaa  cag gat tcc cta cta       29322
Ala Cys Tyr Cys Arg  Lys Phe His His Lys  Gln Asp Ser Leu Leu
                5700                5705                5710

aat ttt tgacatttaa ttttttatac agct atg gtt tcc  act aca gcc ttt      29373
Asn Phe                           Met Val Ser  Thr Thr Ala Phe
                                                5715

ttt  gtt att agt agc ctt  gca gct gtc act tat  ggt cgc tca cac       29418
Phe  Val Ile Ser Ser Leu  Ala Ala Val Thr Tyr  Gly Arg Ser His
5720                5725                5730

ctc  act gta act gtt ggc  tca act tgt aca cta  caa gga ccc caa       29463
Leu  Thr Val Thr Val Gly  Ser Thr Cys Thr Leu  Gln Gly Pro Gln
5735                5740                5745

gaa  ggg cat gtc agt tgg  tgg aga ata tat gat  agt gga tgg ttc       29508
Glu  Gly His Val Ser Trp  Trp Arg Ile Tyr Asp  Ser Gly Trp Phe
5750                5755                5760

att  agg cca tgt gac cag  cct ggt aac aaa ttt  ttc tgc aac ggg       29553
Ile  Arg Pro Cys Asp Gln  Pro Gly Asn Lys Phe  Phe Cys Asn Gly
5765                5770                5775

aga  gac ttg acc att att  aac atc aca gta aat  gac cag ggc ttc       29598
Arg  Asp Leu Thr Ile Ile  Asn Ile Thr Val Asn  Asp Gln Gly Phe
5780                5785                5790

tat  tat gga act aac tat  aaa aat aac tta gat  tac aac att atc       29643
Tyr  Tyr Gly Thr Asn Tyr  Lys Asn Asn Leu Asp  Tyr Asn Ile Ile
5795                5800                5805

gta  gtg cca gcc acc act  cca gct ccc cgc aaa  acc act ttc ttt       29688
Val  Val Pro Ala Thr Thr  Pro Ala Pro Arg Lys  Thr Thr Phe Phe
5810                5815                5820

agc  agc agt gcc agt att  tct aaa aca gct tct  gca agc ttc aaa       29733
Ser  Ser Ser Ala Ser Ile  Ser Lys Thr Ala Ser  Ala Ser Phe Lys
5825                5830                5835
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aaa  ttc gct tta cgt aat  tcc aca acc tct tcc  act tcc aat aat       29778
Lys  Phe Ala Leu Arg Asn  Ser Thr Thr Ser Ser  Thr Ser Asn Asn
5840                5845                5850

aca  atg tct aaa tca gta  atc ggc atc gct gct  gcc gcg ata gtg       29823
Thr  Met Ser Lys Ser Val  Ile Gly Ile Ala Ala  Ala Ala Ile Val
5855                5860                5865

gga  tta atg att ata att  cta tgc ata atc tac  tac gcc tgc tgc       29868
Gly  Leu Met Ile Ile Ile  Leu Cys Ile Ile Tyr  Tyr Ala Cys Cys
5870                5875                5880

tat  aga aaa caa cat gaa  caa aaa acc gat ccc  ttg ctg aat ttt       29913
Tyr  Arg Lys Gln His Glu  Gln Lys Thr Asp Pro  Leu Leu Asn Phe
5885                5890                5895

gat  att taatttttt atagaatc atg aaa aaa cta  agt atc cta gct        29961
Asp  Ile                    Met Lys Lys Leu  Ser Ile Leu Ala
5900                                5905

ttc  att ttg ttt caa aca  ttt acc aat gtg cag  act act tta agt       30006
Phe  Ile Leu Phe Gln Thr  Phe Thr Asn Val Gln  Thr Thr Leu Ser
5910                5915                5920

cat  ggt ata gag aac cac  act acc tct tat gag  ctc aca aac att       30051
His  Gly Ile Glu Asn His  Thr Thr Ser Tyr Glu  Leu Thr Asn Ile
5925                5930                5935

act  acc cat cat cct aaa  tat gct atg caa cta  gaa atc acc atg       30096
Thr  Thr His His Pro Lys  Tyr Ala Met Gln Leu  Glu Ile Thr Met
5940                5945                5950

cta  att gta gtt gga ata  ctt atc cta gct att  att ttc tat ttt       30141
Leu  Ile Val Val Gly Ile  Leu Ile Leu Ala Ile  Ile Phe Tyr Phe
5955                5960                5965

aca  cta tgc cgc caa ata  cct aat att cat aaa  aat tct aaa aga       30186
Thr  Leu Cys Arg Gln Ile  Pro Asn Ile His Lys  Asn Ser Lys Arg
5970                5975                5980

cgt  ccc atc tat tgc cct  gtg att agt cga ccc  cat atg act cta       30231
Arg  Pro Ile Tyr Cys Pro  Val Ile Ser Arg Pro  His Met Thr Leu
5985                5990                5995

aat  gaa atc taagatcatc tatttctctt ttttacagta tggtgaacac             30280
Asn  Glu Ile
6000

caatcatgat tcctagaaat ttcttcttca ccatactcat ctgtgctttt aatgtctgtg    30340

ccaccttcac agcagtagcc actgcaaccc cagactgtat aggagcattt gcctcatata    30400

cacttttcgc ttttgtcgct tgcacctgcg tgtgtagcgt agtctgcctg gttattaatt    30460

ttttccaact tgtagactgg atctttgtac gacttgccta cctgcgtcac catcccgaat    30520

accgcaatca ac atg ttg cgg  cac ttc tca gac tta  ttt aaa acc atg       30568
             Met Leu Arg  His Phe Ser Asp Leu  Phe Lys Thr Met
                     6005                6010
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cag  gct ata cta cca gtc  att ctg ctt ctg ttg  ctc ccc tgc gat       30613
Gln  Ala Ile Leu Pro Val  Ile Leu Leu Leu Leu  Leu Pro Cys Asp
6015                 6020                 6025

gcc  tta acc ccc gtc gct  aat cgt acc cca cct  gaa caa ctt aga       30658
Ala  Leu Thr Pro Val Ala  Asn Arg Thr Pro Pro  Glu Gln Leu Arg
6030                 6035                 6040

aaa  tgc aaa ttc caa caa  cca tgg aca ttc ctt  gat tgc tac cga       30703
Lys  Cys Lys Phe Gln Gln  Pro Trp Thr Phe Leu  Asp Cys Tyr Arg
6045                 6050                 6055

gaa  aaa tct gat ttc cct  aca tac tgg att atg  atc att gga att       30748
Glu  Lys Ser Asp Phe Pro  Thr Tyr Trp Ile Met  Ile Ile Gly Ile
6060                 6065                 6070

gtc  aat cta gtt tct tgc  aca cta ttc tct ttc  ctt gtt tat cat       30793
Val  Asn Leu Val Ser Cys  Thr Leu Phe Ser Phe  Leu Val Tyr His
6075                 6080                 6085

ttt  ttt gat ttt gga tgg  aat gcc ccc aat gca  ctc act tac cca       30838
Phe  Phe Asp Phe Gly Trp  Asn Ala Pro Asn Ala  Leu Thr Tyr Pro
6090                 6095                 6100

caa  gaa cca gag gaa cat  atc cca cta cag aac  atg caa cag cca       30883
Gln  Glu Pro Glu Glu His  Ile Pro Leu Gln Asn  Met Gln Gln Pro
6105                 6110                 6115

ata  gct ata ata gat tat  gac aat gag cca cag  ccc tcg ctg ctt       30928
Ile  Ala Ile Ile Asp Tyr  Asp Asn Glu Pro Gln  Pro Ser Leu Leu
6120                 6125                 6130

cct  gct att agt tac ttc  aac cta acc ggt gga  gat gac tgacccactc    30977
Pro  Ala Ile Ser Tyr Phe  Asn Leu Thr Gly Gly  Asp Asp
6135                 6140                 6145

gccgcctcca ctgctgccga ggaactactt gatatggacg gccgcgcctc agaacagcga    31037

ctcgcccaac tacgcattcg ccagcagcag gaacgtgccg ccaaggagct cagggatgct    31097

attgagattc accagtgcaa aaaaggcata ttctgcttgg taaaacaagc caagatctcc    31157

tacgagatca ccgctaacga ccaccgcctc tcatatgagc ttggcccgca gcgtcagaaa    31217

ttcacttgca tggtgggaat caaccccata gtcatcaccc agcaagccgg agataccaag    31277

ggttgcatcc attgttcctg tgaatccacc gagtgcatct acaccctact gaagaccctc    31337

tgcggccttc gagacctcct acccatgaac taatcacccc cgcccctacc aattacaaaa    31397

agccaattaa taaaaatcac ttacttaaaa tcagaaataa ggtttttgtc tgcgttgttt    31457

tcaagcagca cctcacttcc ctcttcccaa ctctggtact ctaagcctcg gcgggtggca    31517

tacttcctcc acactttgaa agggatgtca aattttagtt cctcttctct gcccacaatc    31577

ttcatttctt tatccccag atg gcc aaa  cga gtt cga cta agc  agc tcc       31626
                  Met Ala Lys  Arg Val Arg Leu Ser  Ser Ser
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                                6150                6155

ttc aat ccg  gtc tac ccc tat gaa  gat gaa agc agc tca  caa cac       31671
Phe Asn Pro  Val Tyr Pro Tyr Glu  Asp Glu Ser Ser Ser  Gln His
        6160                6165                6170

ccc ttt ata  aac cct ggt ttc att  tcc tca aat ggt ttt  aca caa       31716
Pro Phe Ile  Asn Pro Gly Phe Ile  Ser Ser Asn Gly Phe  Thr Gln
        6175                6180                6185

agt cca gac  gga gtt ctt acg ctc  aaa tgt gtt gcc cct  ctt act       31761
Ser Pro Asp  Gly Val Leu Thr Leu  Lys Cys Val Ala Pro  Leu Thr
        6190                6195                6200

acc acc agc  ggc gct cta gac atc  aag gtg gga gga ggg  ctt aaa       31806
Thr Thr Ser  Gly Ala Leu Asp Ile  Lys Val Gly Gly Gly  Leu Lys
        6205                6210                6215

gta gac agc  act gat ggt tcc tta  gaa gaa gac atg ggc  att gca       31851
Val Asp Ser  Thr Asp Gly Ser Leu  Glu Glu Asp Met Gly  Ile Ala
        6220                6225                6230

gct ccc ctt  acc aaa gtt aac cac  tcc gta gga tta gca  tta ggt       31896
Ala Pro Leu  Thr Lys Val Asn His  Ser Val Gly Leu Ala  Leu Gly
        6235                6240                6245

gac ggg cta  gag aca aaa gaa aac  aaa ctt tat gta aaa  ctg gga       31941
Asp Gly Leu  Glu Thr Lys Glu Asn  Lys Leu Tyr Val Lys  Leu Gly
        6250                6255                6260

gaa gga ctt  aaa ttt aac tct ggt  agt ata aac att gac  cat gat       31986
Glu Gly Leu  Lys Phe Asn Ser Gly  Ser Ile Asn Ile Asp  His Asp
        6265                6270                6275

att aac acc  tta tgg acg gga gtt  aat cca agt gct aac  tgt ata       32031
Ile Asn Thr  Leu Trp Thr Gly Val  Asn Pro Ser Ala Asn  Cys Ile
        6280                6285                6290

att acg gaa  gat gga gaa gct aat  gac agc aag ctc acc  cta ata       32076
Ile Thr Glu  Asp Gly Glu Ala Asn  Asp Ser Lys Leu Thr  Leu Ile
        6295                6300                6305

ctt gtt aag  aca ggc gga cta gtt  aat gct tat gtc tca  tta atg       32121
Leu Val Lys  Thr Gly Gly Leu Val  Asn Ala Tyr Val Ser  Leu Met
        6310                6315                6320

ggt gac tca  gaa gcg gtc aat aaa  cta acc aca gat aaa  agt gct       32166
Gly Asp Ser  Glu Ala Val Asn Lys  Leu Thr Thr Asp Lys  Ser Ala
        6325                6330                6335

caa att act  gtt gat ata tac ttt  gat aat gaa gga aaa  gtt ctt       32211
Gln Ile Thr  Val Asp Ile Tyr Phe  Asp Asn Glu Gly Lys  Val Leu
        6340                6345                6350

act gaa cta  tca gca ctt aaa aca  ggt ctt aaa cat aaa  ttt ggt       32256
Thr Glu Leu  Ser Ala Leu Lys Thr  Gly Leu Lys His Lys  Phe Gly
        6355                6360                6365

caa aat atg  gct tct gac gaa gca  caa aac tgc aaa ggc  ttt atg       32301
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Gln Asn Met  Ala Ser Asp Glu Ala  Gln Asn Cys Lys Gly  Phe Met
        6370                 6375                 6380

ccc agc tta  act gca tac cca ttt  aga aat cca act aaa  cct acc       32346
Pro Ser Leu  Thr Ala Tyr Pro Phe  Arg Asn Pro Thr Lys  Pro Thr
        6385                 6390                 6395

aaa gga aga  gaa gac tac atc tat  gga atc act tac tat  caa gcc       32391
Lys Gly Arg  Glu Asp Tyr Ile Tyr  Gly Ile Thr Tyr Tyr  Gln Ala
        6400                 6405                 6410

aca gat ggc  aca ctc tat gag cta  aaa acc act gtt act  cta aac       32436
Thr Asp Gly  Thr Leu Tyr Glu Leu  Lys Thr Thr Val Thr  Leu Asn
        6415                 6420                 6425

tac agt gtt  att agt tct cta tgt  gca tat gca atg cac  att tca       32481
Tyr Ser Val  Ile Ser Ser Leu Cys  Ala Tyr Ala Met His  Ile Ser
        6430                 6435                 6440

tgg tca tgg  gat agt gta aca gag  cca gag aca acc ccc  act act       32526
Trp Ser Trp  Asp Ser Val Thr Glu  Pro Glu Thr Thr Pro  Thr Thr
        6445                 6450                 6455

ctt att acc  tcc ccc ttc tcc ttt  tcc tac att aga gaa  gat gac       32571
Leu Ile Thr  Ser Pro Phe Ser Phe  Ser Tyr Ile Arg Glu  Asp Asp
        6460                 6465                 6470

tgacaaagaa taaagttcaa ctttttatt gaaaatcagt ttacaggata cgagtagtta    32631

ttttgcctcc cccttcccat ttcatagaat acaccaatct ctccccacgc acagctttaa    32691

acatttggat tccatttgag atagtcatgg atttagattc cacattccac acagtttcag    32751

agctagataa tcttggatca gtgatagata taaatccatc ggggcagtcc ttcaaggtga    32811

tttcacagtc cagttgctgt ggctgcggct ccggagtctg gatcagagtc atctggaaga    32871

agaacgatgg gagtcataat ccgagaacgg gatcgggcgg ttgtgtctca tcaaaccccg    32931

aagcagtcgc tgtctgcgcc gctccgtgcg actgctgctg atgggatcgg ggtccacagt    32991

ctctcgaagc atgattctaa tagccctcaa cattaacatt ctggtacgat gcgcacagca    33051

acgcatcctg atctcactta ggtcacagca gtaagtacaa cacaacacca caatgttgtt    33111

taacaggcca taattaaagg cgctccagcc aaaactcatt tcaggaataa tttgcccagc    33171

gtggccatcg taccaaatcc tgatgtaaat caaatggcgc cccctccaga acacactgcc    33231

cacatacatg atctccttag gcatatgcat attcacaatc tctcggtacc atggacagcg    33291

ctggttaatc atgcagcccc aaataatctt ccggaaccaa atggccagca ctgcgccccc    33351

agcaatacat tgaagagaac cctgtcgatt acagtgacaa tggagaaccc acttctctcg    33411

cccatggatc acttgggaat aaaatatatc tattgtggca caacacagac ataaatgcat    33471

acatcttctc atcaccctta actcttcagg ggttaaaaac atatcccagg gaataggaag    33531
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ctcttgcaaa acagtgaagg tggcagaaca aggcagaccg cgaacataac ttacactgtg 33591

catggtcaag gtattgcaat ctggtaacag cggatgctcc tcagtcatag aagctctggt 33651

ttcactttcc tcacagcgtg gtaaaggggc cctcagttga ggttccctgg tgtaaggatg 33711

gtgtctggcg cacgatgtcg agcgtgcccg cgacctcgtt gtaatggagc ttcttcctga 33771

cattctcgta ttttgcaaag cagaacctag tcttggcaca gcacacgtcc cgtcgcctcc 33831

tgtcccgccg cctagcacgt tcagtgtggt aattatagta cagccattcc cgtagattgg 33891

tcaaaagatc ttcagcctca gttgtcataa aaactccatc atatcttact gctctgataa 33951

aatcattcac ggtagaaagt gcaatgccca gccaggcaat gcaattagct tgtgtttcga 34011

ccaaaggagg gggaggaaga catggaagaa ccataattaa tttttatgcc agacgatccc 34071

gcagtatttc tatatggaga tcacggagat ggcacctctc gcccccactg tgttgatgaa 34131

aaatgacagc taggtcaaac ataatgcgat tttccaggtg ctcaacggtg gcttcaagca 34191

aagcctccaa acgtacatcc aaaaacaaaa gaacagcaaa agcaggagca ttttctaatt 34251

cctcaatcat catattacat tcctgtacca ttcccaaata attttcatct ttccatcctt 34311

gaattattcg tgttatttca tctggtaaat ccaatccaca catgagaaat agctcccgga 34371

gggcgccctc caccggcaat cttaagcata ccctcatagt gacaaaatat cgtgctcctc 34431

tgtcacctgc agcaaattga gaatggcaat atcaaacgga atgccactgg ctctaagttc 34491

ttctctaagt tccagttgta aaaactcttg catatcatcg ccaaactgct tagccatagg 34551

tcctccagga ataagagcgg gggacgctac agtgcagaac aagcgcatgc cgccccaatt 34611

gcctccagca aaagtgaggt tgcaatatgc atactgagaa cctccagtga tatcatccag 34671

tgtactggaa agataatcag gcagagcttc tcgtatgcaa ttaataatag aaaagtctgc 34731

cagatgcaca tttaaagcct gtgggatgca gatgcaataa gttatcgcgc tgcgctccaa 34791

cattgttagt atggttagtc tgtaaaaaca aaaaacaaaa aaaaaattac atcacgctag 34851

actggcgaac gggtggaaaa atcactctct ccaacaccag gcaggctaca gggtctccag 34911

cgcgaccctc gtaaaacctg tcagtatgat taaaaagcat caccgaaagg ggttgttgat 34971

ggccagcata tattatttgc gatgaagcat acaatccaga agtgttagta tcagttaaag 35031

aaaaaaatcg gccaagatag catctcggaa cgattatgct caatctcaaa tgcagcaaag 35091

cgacacctcg cggatgcaaa ataaaatcca caggagcata aaaaaagtaa ttattcccct 35151

cttgcacagg cagcctagct cccggcccct ccaaaatcac atataaagct tcagcagcca 35211

tagcttaccg cgcaaatcag gcacagcagt cagatagaga aaaagctgtg aactgactgc 35271

ccagcctgtg cgcaatatat agagaaccct tacactgacg taattggaca aagtctaaaa 35331

aatcccgcca aaaaaccagc acacgcccag aactgtgtca cccgctaaaa aaaataattt 35391

tcacttcctc gttccgtgaa tgacgtcagt tccccttccc cacgagccgt cacttccggt 35451

catcttgcaa cgtcacctcc ccgcgccggc ccgccccttt tgaccgttga accctgtagc 35511

caatcccctt ccgccctcca ttttcaaaag ctcatttgca tgttggcacc gttccattta 35571

taaggtatat tattgatgat g 35592

<210> 40
<211> 495
<212> PRT
<213> Simian adenovirus 27

<400> 40

Met Asp Pro Thr Asn Pro Leu Gln Gln Gly Ile Arg Phe Gly Phe His
1 5 10 15

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

Leu Arg Leu Leu Ala Ser Ala Ala Ser Gly Arg Ser Gly Asp Pro Glu
35 40 45

Thr Pro Thr Gly His Ala Ser Gly Ser Gly Gly Gly Ala Ala Gly Gly
50 55 60

Gln Pro Glu Ser Arg Pro Gly Pro Ser Gly Gly Gly Gly Gly Gly Val
65 70 75 80

Ala Asp Leu Phe Pro Glu Leu Arg Arg Val Leu Thr Arg Ser Thr Ser
85 90 95

Ser Gly Gln Asp Arg Gly Ile Lys Arg Glu Arg Asn Ala Ser Gly His
100 105 110

Asn Ser Arg Thr Glu Leu Ala Leu Ser Leu Met Ser Arg Arg Arg Pro
115 120 125

Glu Thr Val Trp Trp His Glu Val Gln Ser Glu Gly Arg Asp Glu Val
130 135 140

Ser Ile Leu Gln Glu Lys Tyr Ser Leu Glu Gln Leu Lys Thr Cys Trp
145 150 155 160

```
Leu Glu Pro Glu Asp Asp Trp Glu Val Ala Ile Arg Asn Tyr Ala Lys
                165                 170                 175

Ile Ser Leu Arg Pro Asp Lys Gln Tyr Arg Ile Thr Lys Lys Ile Asn
            180                 185                 190

Ile Arg Asn Ala Cys Tyr Ile Ser Gly Asn Gly Ala Glu Val Ile Ile
        195                 200                 205

Asp Thr Gln Asp Lys Thr Ala Phe Arg Cys Cys Met Met Gly Met Trp
    210                 215                 220

Pro Gly Val Ala Gly Met Glu Ala Val Thr Leu Met Asn Ile Arg Phe
225                 230                 235                 240

Arg Gly Asp Gly Tyr Asn Gly Ile Val Phe Met Ala Asn Thr Lys Leu
                245                 250                 255

Ile Leu His Gly Cys Ser Phe Phe Gly Phe Asn Asn Thr Cys Val Glu
            260                 265                 270

Ala Trp Gly Gln Val Ser Val Arg Gly Cys Ser Phe Tyr Ala Gly Trp
        275                 280                 285

Ile Ala Leu Ser Gly Arg Thr Lys Ser Gln Leu Ser Val Lys Lys Cys
    290                 295                 300

Met Phe Glu Arg Cys Asn Leu Gly Ile Leu Asn Glu Gly Glu Ala Arg
305                 310                 315                 320

Val Arg His Cys Ala Ala Thr Glu Thr Gly Cys Phe Ile Leu Ile Lys
                325                 330                 335

Gly Asn Ala Ser Val Lys His Asn Met Ile Cys Gly Pro Ser Asp Glu
            340                 345                 350

Arg Pro Tyr Gln Met Leu Thr Cys Ala Gly Gly His Cys Asn Met Leu
        355                 360                 365

Ala Thr Val His Ile Val Ser His Ala Arg Lys Lys Trp Pro Val Phe
    370                 375                 380

Glu His Asn Val Met Thr Lys Cys Thr Met His Ile Gly Gly Arg Arg
385                 390                 395                 400
```

```
Gly Met Phe Met Pro Tyr Gln Cys Asn Leu Asn His Val Lys Val Met
                405                 410                 415

Leu Glu Pro Asp Ala Phe Ser Arg Met Ser Leu Thr Gly Ile Phe Asp
            420                 425                 430

Met Asn Val Gln Leu Trp Lys Ile Leu Arg Tyr Asp Asp Thr Lys Ser
        435                 440                 445

Arg Val Arg Ala Cys Glu Cys Gly Gly Lys His Ala Arg Phe Gln Pro
    450                 455                 460

Val Cys Val Asp Val Thr Glu Asp Leu Arg Pro Asp His Leu Val Leu
465                 470                 475                 480

Ala Cys Thr Gly Ala Glu Phe Gly Ser Ser Gly Glu Glu Thr Asp
                485                 490                 495
```

<210> 41
<211> 138
<212> PRT
<213> Simian adenovirus 27

<400> 41

```
Met Ser Gly Ser Ala Ser Phe Glu Gly Gly Val Phe Ser Pro Tyr Leu
1               5                   10                  15

Thr Gly Arg Leu Pro Pro Trp Ala Gly Val Arg Gln Asn Val Met Gly
            20                  25                  30

Ser Thr Val Asp Gly Arg Pro Val Gln Pro Ala Asn Ser Ser Thr Leu
        35                  40                  45

Thr Tyr Ala Thr Leu Ser Ser Ser Pro Leu Asp Ala Ala Ala Ala Ala
    50                  55                  60

Ala Ala Ser Ala Ala Ala Asn Thr Val Leu Gly Met Gly Tyr Tyr Gly
65                  70                  75                  80

Ser Ile Val Ala Asn Ser Ser Ser Ser Asn Asn Pro Ser Thr Leu Ala
                85                  90                  95

Glu Asp Lys Leu Leu Val Leu Leu Ala Gln Leu Glu Ala Leu Thr Gln
            100                 105                 110
```

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


Glu Ser Ala Val Ala Thr Ala Lys Ser Lys
    130                 135


<210>  42
<211>  387
<212>  PRT
<213>  Simian adenovirus 27

<400>  42

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


Gln Gln Gln Gln Gln Pro Gln Lys Ala Leu Pro Ala Pro Ala Thr Thr
            20                  25                  30


Ala Ala Ala Ala Val Cys Gly Ala Gly Gln Pro Ala Tyr Asp Leu Asp
        35                  40                  45


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


Arg His Pro Arg Val Gln Leu Lys Lys Asp Ser Arg Glu Ala Tyr Val
65                  70                  75                  80


Pro Gln His Asn Leu Phe Arg Asp Arg Ser Gly Glu Glu Pro Glu Glu
                85                  90                  95


Met Arg Ala Ser Arg Phe Asn Ala Gly Arg Glu Leu Arg His Gly Leu
            100                 105                 110


Asp Arg Arg Arg Leu Leu Arg Asp Glu Asp Phe Glu Val Asp Glu Val
        115                 120                 125


Thr Gly Ile Ser Pro Ala Arg Ala His Val Ala Ala Ala Asn Leu Val
    130                 135                 140


Ser Ala Tyr Glu Gln Thr Val Lys Glu Glu Arg Asn Phe Gln Lys Ser
145                 150                 155                 160


Phe Asn Asn His Val Arg Thr Leu Ile Ala Arg Glu Glu Val Thr Leu
                165                 170                 175
```

```
Gly Leu Met His Leu Trp Asp Leu Met Glu Ala Ile Thr Gln Asn Pro
            180                 185                 190

Thr Ser Lys Pro Leu Thr Ala Gln Leu Phe Leu Val Val Gln His Ser
        195                 200                 205

Arg Asp Asn Glu Ala Phe Arg Glu Ala Leu Leu Asn Ile Thr Glu Pro
    210                 215                 220

Glu Gly Arg Trp Leu Tyr Asp Leu Ile Asn Ile Leu Gln Ser Ile Ile
225                 230                 235                 240

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

Tyr Ser Val Leu Ser Leu Gly Lys Tyr Tyr Ala Arg Lys Ile Tyr Lys
            260                 265                 270

Thr Pro Tyr Val Pro Ile Asp Lys Glu Val Lys Ile Asp Gly Phe Tyr
        275                 280                 285

Met Arg Met Thr Leu Lys Val Leu Thr Leu Ser Asp Asp Leu Gly Val
    290                 295                 300

Tyr Arg Asn Asp Arg Met His Arg Ala Val Ser Ala Ser Arg Arg Arg
305                 310                 315                 320

Glu Leu Ser Asp Arg Glu Leu Met His Ser Leu Gln Arg Ala Leu Thr
                325                 330                 335

Gly Ala Gly Thr Asp Gly Glu Asn Tyr Phe Asp Met Gly Ala Asp Leu
            340                 345                 350

Gln Trp Gln Pro Ser Arg Arg Ala Leu Asp Ala Ala Gly Cys Glu Leu
        355                 360                 365

Pro Tyr Val Glu Glu Val Asp Glu Gly Glu Glu Glu Glu Gly Glu Tyr
    370                 375                 380

Leu Glu Asp
385
```

<210> 43
<211> 587

<212> PRT
<213> Simian adenovirus 27

<400> 43

```
Met Glu Gln Gln Ala Pro Asp Pro Ala Met Arg Ala Ala Leu Gln Ser
1               5                   10                  15

Gln Pro Ser Gly Ile Asn Ser Ser Asp Asp Trp Thr Gln Ala Met Gln
            20                  25                  30

Arg Ile Met Ala Leu Thr Thr Arg Asn Pro Glu Ala Phe Arg Gln Gln
        35                  40                  45

Pro Gln Ala Asn Arg Leu Ser Ala Ile Leu Glu Ala Val Val Pro Ser
    50                  55                  60

Arg Ser Asn Pro Thr His Glu Lys Val Leu Ala Ile Val Asn Ala Leu
65                  70                  75                  80

Val Glu Asn Lys Ala Ile Arg Pro Asp Glu Ala Gly Leu Val Tyr Asn
                85                  90                  95

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

Asn Leu Asp Arg Met Val Thr Asp Val Arg Glu Ala Val Ser Gln Arg
        115                 120                 125

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

Ala Phe Leu Ser Thr Gln Pro Ala Asn Val Pro Arg Gly Gln Gln Asp
145                 150                 155                 160

Tyr Thr Asn Phe Leu Ser Ala Leu Arg Leu Met Val Thr Glu Val Pro
                165                 170                 175

Gln Ser Glu Val Tyr Gln Ser Gly Pro Asp Tyr Phe Phe Gln Thr Ser
            180                 185                 190

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

Arg Gly Leu Trp Gly Val His Ala Pro Val Gly Asp Arg Ala Thr Val
    210                 215                 220
```

```
Ser Ser Leu Leu Thr Pro Asn Ser Arg Leu Leu Leu Leu Leu Val Ser
225                 230                 235                 240

Pro Phe Thr Asp Ser Gly Ser Ile Asp Arg Asn Ser Tyr Leu Gly Tyr
                245                 250                 255

Leu Leu Asn Leu Tyr Arg Glu Ala Ile Gly Gln Ser Gln Val Asp Glu
            260                 265                 270

Gln Thr Tyr Gln Glu Ile Thr Gln Val Ser Arg Ala Leu Gly Gln Glu
        275                 280                 285

Asp Thr Gly Ser Leu Glu Ala Thr Leu Asn Phe Leu Leu Thr Asn Arg
    290                 295                 300

Ser Gln Lys Ile Pro Pro Gln Tyr Ala Leu Thr Ala Glu Glu Glu Arg
305                 310                 315                 320

Ile Leu Arg Tyr Val Gln Gln Ser Val Gly Leu Phe Leu Met Gln Glu
                325                 330                 335

Gly Ala Thr Pro Thr Ala Ala Leu Asp Met Thr Ala Arg Asn Met Glu
            340                 345                 350

Pro Ser Met Tyr Ala Ser Asn Arg Pro Phe Ile Asn Lys Leu Leu Asp
        355                 360                 365

Tyr Leu His Arg Ala Ala Ala Met Asn Ser Asp Tyr Phe Thr Asn Ala
    370                 375                 380

Ile Leu Asn Pro His Trp Leu Pro Pro Pro Gly Phe Tyr Thr Gly Glu
385                 390                 395                 400

Tyr Asp Met Pro Asp Pro Asn Asp Gly Phe Leu Trp Asp Asp Val Asp
                405                 410                 415

Ser Ser Ile Phe Ser Pro Pro Pro Gly Tyr Asn Thr Trp Lys Lys Glu
            420                 425                 430

Gly Gly Asp Arg Arg His Ser Ser Val Ser Leu Ser Gly Ser Arg Gly
        435                 440                 445

Ala Ala Ala Ala Val Pro Glu Ala Ala Ser Pro Phe Pro Ser Leu Pro
```

```
    450                 455                 460

Phe Ser Leu Asn Ser Val Arg Ser Ser Glu Leu Gly Arg Ile Thr Arg
465                 470                 475                 480

Pro Arg Leu Met Gly Glu Glu Glu Tyr Leu Asn Asp Ser Leu Leu Arg
                485                 490                 495

Pro Glu Arg Glu Lys Asn Phe Pro Asn Asn Gly Ile Glu Ser Leu Val
            500                 505                 510

Asp Lys Met Ser Arg Trp Lys Thr Tyr Ala Gln Asp His Lys Asp Glu
        515                 520                 525

Pro Arg Ile Leu Gly Ala Ala Ser Gly Thr Thr Arg Arg Arg Gln Arg
    530                 535                 540

His Asp Arg Gln Arg Gly Leu Val Trp Asp Asp Glu Asp Ser Ala Asp
545                 550                 555                 560

Asp Ser Ser Val Leu Asp Leu Gly Gly Arg Gly Gly Gly Asn Pro Phe
                565                 570                 575

Ala His Leu Arg Pro His Phe Gly Arg Met Leu
            580                 585


<210>  44
<211>  563
<212>  PRT
<213>  Simian adenovirus 27

<400>  44

Met Met Arg Arg Ala Val Leu Gly Gly Ala Val Val Tyr Pro Glu Gly
1               5                   10                  15

Pro Pro Pro Ser Tyr Glu Ser Val Met Gln Gln Gln Ala Ala Ala Val
            20                  25                  30

Met Gln Pro Ser Leu Glu Ala Pro Phe Val Pro Pro Arg Tyr Leu Ala
        35                  40                  45

Pro Thr Glu Gly Arg Asn Ser Ile Arg Tyr Ser Glu Leu Ala Pro Gln
    50                  55                  60

Tyr Asp Thr Thr Arg Leu Tyr Leu Val Asp Asn Lys Ser Ala Asp Ile
```

65 70 75 80

Ala Ser Leu Asn Tyr Gln Asn Asp His Ser Asn Phe Leu Thr Thr Val
85 90 95

Val Gln Asn Asn Asp Phe Thr Pro Thr Glu Ala Ser Thr Gln Thr Ile
100 105 110

Asn Phe Asp Glu Arg Ser Arg Trp Gly Gly Gln Leu Lys Thr Ile Met
115 120 125

His Thr Asn Met Pro Asn Val Asn Glu Tyr Met Phe Ser Asn Lys Phe
130 135 140

Lys Ala Arg Val Met Val Ser Arg Lys Ala Pro Glu Gly Val Thr Val
145 150 155 160

Ala Asp Asn Tyr Asp His Lys Gln Asp Ile Leu Glu Tyr Glu Trp Phe
165 170 175

Glu Phe Thr Leu Pro Glu Gly Asn Phe Ser Ala Thr Met Thr Ile Asp
180 185 190

Leu Met Asn Asn Ala Ile Ile Asp Asn Tyr Leu Glu Val Gly Arg Gln
195 200 205

Asn Gly Val Met Glu Ser Asp Ile Gly Val Lys Phe Asp Thr Arg Asn
210 215 220

Phe Arg Leu Gly Trp Asp Pro Lys Thr Lys Leu Ile Met Pro Gly Val
225 230 235 240

Tyr Thr Tyr Glu Ala Phe His Pro Asp Ile Val Leu Leu Pro Gly Cys
245 250 255

Gly Val Asp Phe Thr Glu Ser Arg Leu Ser Asn Leu Leu Gly Ile Arg
260 265 270

Lys Arg His Pro Phe Gln Glu Gly Phe Lys Ile Leu Tyr Glu Asp Leu
275 280 285

Glu Gly Gly Asn Ile Pro Ala Leu Leu Asp Val Glu Ala Tyr Glu Lys
290 295 300

```
Ser Lys Lys Glu Gln Glu Ala Lys Thr Glu Ala Ala Lys Ala Ala Ala
305                 310                 315                 320

Val Ala Lys Ala Asn Ile Val Ala Ser Asp Pro Val Arg Val Ala Asn
                325                 330                 335

Ala Glu Glu Val Arg Gly Asp Asn Tyr Thr Ala Ser Ala Val Ala Thr
            340                 345                 350

Glu Glu Ser Leu Leu Ala Ala Val Ala Glu Asn Glu Thr Thr Glu Thr
        355                 360                 365

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

Asn Val Leu Asp Asp Lys Ile Asn Thr Ala Tyr Arg Ser Trp Tyr Leu
385                 390                 395                 400

Ser Tyr Asn Tyr Gly Asp Pro Glu Lys Gly Val Arg Ser Trp Thr Leu
                405                 410                 415

Leu Thr Thr Ser Asp Val Thr Cys Gly Ala Glu Gln Val Tyr Trp Ser
            420                 425                 430

Leu Pro Asp Met Met Gln Asp Pro Val Thr Phe Arg Ser Thr Arg Gln
        435                 440                 445

Val Ser Asn Tyr Pro Val Val Gly Ala Glu Leu Met Pro Val Phe Ser
    450                 455                 460

Lys Ser Phe Tyr Asn Glu Gln Ala Val Tyr Ser Gln Gln Leu Arg Gln
465                 470                 475                 480

Ser Thr Ser Leu Thr His Val Phe Asn Arg Phe Pro Glu Asn Gln Ile
                485                 490                 495

Leu Ile Arg Pro Pro Ala Pro Thr Ile Thr Thr Val Ser Glu Asn Val
            500                 505                 510

Pro Ala Leu Thr Asp His Gly Thr Leu Pro Leu Arg Ser Ser Ile Arg
        515                 520                 525

Gly Val Gln Arg Val Thr Val Thr Asp Ala Arg Arg Arg Thr Cys Pro
    530                 535                 540
```

```
Tyr Val Tyr Lys Ala Leu Gly Ile Val Ala Pro Arg Val Leu Ser Ser
545                 550                 555                 560


Arg Thr Phe



<210>  45
<211>  192
<212>  PRT
<213>  Simian adenovirus 27

<400>  45

Met Ser Ile Leu Ile Ser Pro Ser Asn Asn Thr Gly Trp Gly Leu Arg
1               5                   10                  15


Thr Pro Thr Arg Met Tyr Gly Gly Ala Arg Lys Arg Ser Thr Gln His
            20                  25                  30


Pro Val Arg Val Arg Gly His Phe Arg Ala Pro Trp Gly Ala Leu Lys
        35                  40                  45


Gly Arg Ala Arg Thr Arg Thr Thr Val Asp Asp Val Ile Asp Gln Val
    50                  55                  60


Val Ala Asp Ala Arg Asn Tyr Thr Pro Ala Ala Pro Thr Ser Thr Val
65                  70                  75                  80


Asp Ala Val Ile Asp Ser Val Val Ala Asp Ala Arg Asp Tyr Ala Arg
                85                  90                  95


Arg Lys Ser Arg Arg Arg Arg Ile Ala Arg Arg His Arg Ala Thr Pro
            100                 105                 110


Ala Met Arg Ala Ala Arg Ala Leu Leu Arg Arg Ala Lys Arg Val Gly
        115                 120                 125


Arg Arg Ala Met Leu Arg Ala Ala Arg Arg Ala Ala Ser Gly Ala Ser
    130                 135                 140


Ala Gly Arg Ser Arg Arg Arg Ala Ala Thr Ala Ala Ala Ala Ala Ile
145                 150                 155                 160


Ala Asn Met Ala Gln Pro Arg Arg Gly Asn Val Tyr Trp Val Arg Asp
                165                 170                 175
```

```
Ala Thr Thr Gly Gln Arg Val Pro Val Arg Thr Arg Pro Pro Arg Thr
            180                 185                 190


<210>  46
<211>  350
<212>  PRT
<213>  Simian adenovirus 27

<400>  46

Met Ser Lys Arg Lys Tyr Lys Glu Glu Met Leu Gln Val Ile Ala Pro
1               5                   10                  15


Glu Ile Tyr Gly Pro Pro Val Lys Asp Glu Lys Lys Pro Arg Lys Ile
            20                  25                  30


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


Val Glu Phe Val Arg Glu Phe Ala Pro Arg Arg Arg Val Gln Trp Arg
    50                  55                  60


Gly Arg Arg Val Arg Pro Val Leu Arg Pro Gly Thr Thr Val Val Phe
65                  70                  75                  80


Thr Pro Gly Glu Arg Ser Ser Thr Thr Phe Lys Arg Ser Tyr Asp Glu
                85                  90                  95


Val Tyr Gly Asp Asp Asp Ile Leu Glu Gln Ala Ala Asp Arg Leu Gly
            100                 105                 110


Glu Phe Ala Tyr Gly Lys Arg Ser Arg Ser Ser Pro Lys Glu Glu Ala
        115                 120                 125


Val Ser Ile Pro Leu Asp His Gly Asn Pro Thr Pro Ser Leu Lys Pro
    130                 135                 140


Val Thr Leu Gln Gln Val Leu Pro Val Pro Pro Arg Arg Gly Val Lys
145                 150                 155                 160


Arg Glu Gly Glu Asp Leu Tyr Pro Thr Met Gln Leu Met Val Pro Lys
                165                 170                 175


Arg Gln Lys Leu Glu Asp Val Leu Glu Lys Met Lys Val Asp Pro Asp
            180                 185                 190
```

```
Ile Gln Pro Glu Val Lys Val Arg Pro Ile Lys Gln Val Ala Pro Gly
        195                 200                 205

Leu Gly Val Gln Thr Val Asp Ile Lys Ile Pro Thr Glu Ser Met Glu
    210                 215                 220

Val Gln Thr Glu Pro Ala Lys Pro Ala Ala Thr Ser Ile Glu Val Gln
225                 230                 235                 240

Thr Asp Pro Trp Met Pro Ala Pro Ile Ala Thr Thr Ala Ser Thr Ala
                245                 250                 255

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

Tyr Ala Leu His Pro Ser Ile Ile Pro Thr Pro Gly Tyr Arg Gly Thr
        275                 280                 285

Arg Tyr Tyr Arg Ser Arg Ser Thr Thr Ser Arg Arg Arg Lys Thr Pro
    290                 295                 300

Ala Ser Arg Ser Arg Arg Arg Arg Arg Arg Thr Thr Ser Lys Leu Thr
305                 310                 315                 320

Pro Ala Ala Leu Val Arg Arg Val Tyr Arg Asp Gly Arg Ala Glu Pro
                325                 330                 335

Leu Met Leu Pro Arg Ala Arg Tyr His Pro Ser Ile Thr Thr
            340                 345                 350


<210>  47
<211>  75
<212>  PRT
<213>  Simian adenovirus 27

<400>  47

Met Ala Leu Thr Cys Arg Leu Arg Val Pro Ile Thr Gly Tyr Arg Gly
1               5                   10                  15

Arg Asn Ser Arg Arg Arg Arg Met Leu Gly Ser Gly Met Arg Arg His
            20                  25                  30

Arg Arg Arg Arg Ala Thr Ser Arg Arg Leu Gly Gly Gly Phe Leu Thr
        35                  40                  45
```

```
Ala Leu Ile Pro Ile Ile Ala Ala Ala Ile Gly Ala Val Pro Gly Ile
    50                  55                  60

Ala Ser Val Ala Val Gln Ala Ser Gln Arg His
65                  70                  75


<210>  48
<211>  250
<212>  PRT
<213>  Simian adenovirus 27

<400>  48

Met Glu Asp Ile Asn Phe Ser Ser Leu Ala Pro Arg His Gly Thr Arg
1               5                   10                  15

Pro Tyr Met Gly Thr Trp Ser Asp Ile Gly Thr Ser Gln Leu Asn Gly
            20                  25                  30

Gly Ala Phe Asn Trp Ser Ser Ile Trp Ser Gly Leu Lys Asn Phe Gly
        35                  40                  45

Ser Ala Ile Lys Thr Tyr Gly Asn Lys Ala Trp Asn Ser Ser Thr Gly
    50                  55                  60

Gln Ala Leu Arg Asn Lys Leu Lys Glu Gln Asn Phe Gln Gln Lys Val
65                  70                  75                  80

Val Asp Gly Ile Ala Ser Gly Ile Asn Gly Val Val Asp Leu Ala Asn
                85                  90                  95

Gln Ala Val Gln Lys Gln Ile Asn Ser Arg Leu Asp Pro Pro Pro Ala
            100                 105                 110

Ala Pro Gly Glu Met Glu Val Glu Glu Glu Leu Pro Pro Leu Glu Lys
        115                 120                 125

Arg Gly Asp Lys Arg Pro Arg Pro Asp Met Glu Glu Thr Leu Val Thr
    130                 135                 140

Arg Gly Asp Glu Pro Pro Pro Tyr Glu Glu Ala Ile Lys Leu Gly Met
145                 150                 155                 160

Pro Thr Thr Lys Pro Ile Ala Pro Met Ala Thr Gly Val Met Lys Pro
                165                 170                 175
```

```
Ser Gln Ser His Arg Pro Ala Thr Leu Asp Leu Pro Pro Ala Pro Ala
            180                 185                 190

Ala Ala Ala Pro Ala Pro Lys Pro Val Ala Thr Pro Lys Pro Thr Thr
        195                 200                 205

Val Gln Pro Val Ala Val Ala Arg Pro Arg Pro Gly Gly Thr Pro Arg
    210                 215                 220

Pro Asn Ala Asn Trp Gln Ser Thr Leu Asn Ser Ile Val Gly Leu Gly
225                 230                 235                 240

Val Gln Ser Val Lys Arg Arg Arg Cys Tyr
                245                 250
```

<210> 49
<211> 956
<212> PRT
<213> Simian adenovirus 27

<400> 49

```
Met Ala Thr Pro Ser Met Leu Pro Gln Trp Ala Tyr Met His Ile Ala
1               5                   10                  15

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

Arg Ala Thr Asp Thr Tyr Phe Asn Leu Gly Asn Lys Phe Arg Asn Pro
        35                  40                  45

Thr Val Ala Pro Thr His Asp Val Thr Thr Asp Arg Ser Gln Arg Leu
    50                  55                  60

Met Leu Arg Phe Val Pro Val Asp Arg Glu Asp Asn Thr Tyr Ser Tyr
65                  70                  75                  80

Lys Val Arg Tyr Thr Leu Ala Val Gly Asp Asn Arg Val Leu Asp Met
                85                  90                  95

Ala Ser Thr Phe Phe Asp Ile Arg Gly Val Leu Asp Arg Gly Pro Ser
            100                 105                 110

Phe Lys Pro Tyr Ser Gly Thr Ala Tyr Asn Ser Leu Ala Pro Lys Gly
        115                 120                 125
```

```
Ala Pro Asn Thr Cys Gln Trp Lys Tyr Lys Thr Leu Ala Asn Thr Glu
    130                 135                 140

Thr Glu Glu Glu Glu Glu Glu Asp Glu Gln Ala Asp Glu Gln Glu Tyr
145                 150                 155                 160

Val Glu Lys Thr Ser Thr Phe Gly Asn Ala Pro Val Lys Gly Leu Asp
                165                 170                 175

Ile Asp Ala Asp Gly Leu Gln Ile Gly Val Asp Ile Gln Asp Glu Thr
            180                 185                 190

Lys Pro Val Tyr Ala Asn Lys Leu Tyr Glu Pro Glu Pro Gln Val Gly
        195                 200                 205

Asp Gly Gln Trp His Asp Thr Thr Ala Ile Thr Glu Gln Tyr Gly Gly
    210                 215                 220

Arg Ala Leu Lys Pro Asp Thr Lys Met Lys Pro Cys Tyr Gly Ser Phe
225                 230                 235                 240

Ala Arg Pro Thr Asn Glu Lys Gly Gly Gln Ser Lys Thr Arg Ser Val
                245                 250                 255

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

Phe Asp Gly Arg Asp Ala Lys Lys Pro Asp Pro Glu Ile Val Leu Tyr
        275                 280                 285

Thr Glu Asn Val Asn Leu Glu Thr Pro Asp Thr His Ile Val Tyr Lys
    290                 295                 300

Ala Gly Thr Asp Asp Ser Ser Ser Ser Ile Asn Leu Gly Gln Gln Ser
305                 310                 315                 320

Met Pro Asn Arg Pro Asn Tyr Ile Gly Phe Arg Asp Asn Phe Ile Gly
                325                 330                 335

Leu Met Tyr Tyr Asn Ser Thr Gly Asn Met Gly Val Leu Ala Gly Gln
            340                 345                 350

Ala Ser Gln Leu Asn Ala Val Val Asp Leu Gln Asp Arg Asn Thr Glu
        355                 360                 365
```

```
Leu Ser Tyr Gln Leu Leu Leu Asp Ser Leu Gly Asp Arg Thr Arg Tyr
    370                 375                 380

Phe Ser Met Trp Asn Gln Ala Val Asp Ser Tyr Asp Pro Asp Val Arg
385                 390                 395                 400

Ile Ile Glu Asn His Gly Val Glu Asp Glu Leu Pro Asn Tyr Cys Phe
                405                 410                 415

Pro Leu Asp Gly Val Gly Arg Thr Asp Thr Tyr Lys Gly Val Val Val
            420                 425                 430

Asp Gln Ala Ala Ala Ala Gly Thr Ala Thr Thr Trp Lys Asp Asp Thr
        435                 440                 445

Thr Ala Asn Glu Tyr Asn Glu Ile Ala Lys Gly Asn Asn Leu Ala Met
    450                 455                 460

Glu Ile Asn Leu Gln Ala Asn Leu Trp Arg Ser Phe Leu Tyr Ser Asn
465                 470                 475                 480

Val Ala Leu Tyr Leu Pro Asp Ala Tyr Lys Tyr Thr Pro Ala Asn Val
                485                 490                 495

Thr Leu Pro Thr Asn Thr Asn Thr Tyr Glu Tyr Met Asn Gly Arg Val
            500                 505                 510

Val Ser Pro Ser Leu Val Asp Ala Tyr Val Asn Ile Gly Ala Arg Trp
        515                 520                 525

Ser Leu Asp Pro Met Asp Asn Val Asn Pro Phe Asn His His Arg Asn
    530                 535                 540

Ala Gly Leu Arg Tyr Arg Ser Met Leu Leu Gly Asn Gly Arg Tyr Val
545                 550                 555                 560

Pro Phe His Ile Gln Val Pro Gln Lys Phe Phe Ala Val Lys Asn Leu
                565                 570                 575

Leu Leu Leu Pro Gly Ser Tyr Thr Tyr Glu Trp Asn Phe Arg Lys Asp
            580                 585                 590

Val Asn Met Val Leu Gln Ser Ser Leu Gly Asn Asp Leu Arg Thr Asp
```

595 600 605

Gly Ala Thr Ile Ser Phe Thr Ser Ile Asn Leu Tyr Ala Thr Phe Phe
610 615 620

Pro Met Ala His Asn Thr Ala Ser Thr Leu Glu Ala Met Leu Arg Asn
625 630 635 640

Asp Thr Asn Asp Gln Ser Phe Asn Asp Tyr Leu Ser Ala Ala Asn Met
645 650 655

Leu Tyr Pro Ile Pro Ala Asn Ala Thr Asn Ile Pro Ile Ser Ile Pro
660 665 670

Ser Arg Asn Trp Ala Ala Phe Arg Gly Trp Ser Phe Thr Arg Leu Lys
675 680 685

Thr Lys Glu Thr Pro Ser Leu Gly Ser Gly Phe Asp Pro Tyr Phe Val
690 695 700

Tyr Ser Gly Ser Ile Pro Tyr Leu Asp Gly Thr Phe Tyr Leu Asn His
705 710 715 720

Thr Phe Lys Lys Val Ser Ile Met Phe Asp Ser Ser Val Ser Trp Pro
725 730 735

Gly Asn Asp Arg Leu Leu Thr Pro Asn Glu Phe Glu Ile Lys Arg Thr
740 745 750

Val Asp Gly Glu Gly Tyr Asn Val Ala Gln Cys Asn Met Thr Lys Asp
755 760 765

Trp Phe Leu Val Gln Met Leu Ala Asn Tyr Asn Ile Gly Tyr Gln Gly
770 775 780

Phe Tyr Ile Pro Glu Gly Tyr Lys Asp Arg Met Tyr Ser Phe Phe Arg
785 790 795 800

Asn Phe Gln Pro Met Ser Arg Gln Val Val Asp Glu Ile Asn Tyr Thr
805 810 815

Asp Tyr Lys Ala Val Lys Leu Pro Phe Gln His Asn Asn Ser Gly Phe
820 825 830

```
Val Gly Tyr Leu Ala Pro Thr Ile Arg Gln Gly Gln Ala Tyr Pro Ala
        835                 840                 845

Asn Tyr Pro Tyr Pro Leu Ile Gly Ser Thr Ala Val Lys Ser Val Thr
    850                 855                 860

Gln Lys Lys Phe Leu Cys Asp Arg Thr Met Trp Arg Ile Pro Phe Ser
865                 870                 875                 880

Ser Asn Phe Met Ser Met Gly Ala Leu Thr Asp Leu Gly Gln Asn Met
                885                 890                 895

Leu Tyr Ala Asn Ser Ala His Ala Leu Asp Met Thr Phe Glu Val Asp
            900                 905                 910

Pro Met Asp Glu Pro Thr Leu Leu Tyr Leu Leu Phe Glu Val Phe Asp
        915                 920                 925

Val Val Arg Val His Gln Pro His Arg Gly Val Ile Glu Ala Val Tyr
    930                 935                 940

Leu Arg Thr Pro Phe Ser Ala Gly Asn Ala Thr Thr
945                 950                 955


<210>  50
<211>  209
<212>  PRT
<213>  Simian adenovirus 27

<400>  50

Met Ala Cys Gly Ser Gly Asn Gly Ser Ser Glu Gln Glu Leu Arg Ala
1               5                   10                  15

Ile Ala Arg Asp Leu Gly Cys Gly Pro Tyr Phe Leu Gly Thr Phe Asp
            20                  25                  30

Lys Arg Phe Pro Gly Phe Met Ala Pro Asp Lys Leu Ala Cys Ala Ile
        35                  40                  45

Val Asn Thr Ala Gly Arg Glu Thr Gly Gly Glu His Trp Leu Ala Phe
    50                  55                  60

Gly Trp Asn Pro Arg Ser Asn Thr Cys Tyr Leu Phe Asp Pro Phe Gly
65                  70                  75                  80
```

```
Phe Ser Asp Glu Arg Leu Lys Gln Ile Tyr Gln Phe Glu Tyr Glu Gly
                85                  90                  95

Leu Leu Arg Arg Ser Ala Leu Ala Thr Lys Asp Arg Cys Ile Thr Leu
            100                 105                 110

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

Leu Phe Cys Cys Met Phe Leu His Ala Phe Val His Trp Pro Asp Arg
    130                 135                 140

Pro Met Asp Gly Asn Pro Thr Met Lys Leu Leu Thr Gly Val Pro Asn
145                 150                 155                 160

Ser Met Leu Gln Ser Pro Gln Val Gln Pro Thr Leu Arg His Asn Gln
                165                 170                 175

Glu Ala Leu Tyr Arg Phe Leu Asn Thr His Ser Ser Tyr Phe Arg Ser
            180                 185                 190

His Arg Ala Arg Ile Glu Lys Ala Thr Ala Phe Asp Arg Met Ala Met
        195                 200                 205

Gln
```

<210> 51
<211> 828
<212> PRT
<213> Simian adenovirus 27

<400> 51

```
Met Glu Thr Gln Pro Ser Leu Pro Thr Pro Leu Gln Ala Pro Ser His
1               5                   10                  15

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

Pro Ser Pro Ala Thr Thr Thr Ser Thr Leu Glu Asp Glu Glu Val Asp
        35                  40                  45

Ala Pro Gln Glu Ile Arg Thr Gln Asp Met Glu Asp Glu Lys Ala Glu
    50                  55                  60
```

```
Glu Ile Glu Ala Asp Ile Glu Gln Asp Pro Gly Tyr Val Thr Pro Ala
65                  70                  75                  80

Glu His Glu Glu Glu Leu Arg Arg Phe Leu Glu Lys Asp Asp Asp Asn
                85                  90                  95

Arg Pro Glu Gln Gln Ala Asp Gly Asp Gln Gln Asn Val Gly Leu Gly
            100                 105                 110

Asp His Val Val Asp Tyr Leu Thr Gly Leu Gly Gly Glu Asp Val Leu
        115                 120                 125

Leu Lys His Leu Ala Arg Gln Ser Ile Ile Ile Lys Asp Ala Leu Leu
    130                 135                 140

Asp Arg Ser Glu Val Pro Ile Ser Val Glu Glu Leu Ser Arg Ala Tyr
145                 150                 155                 160

Glu Leu Asn Leu Phe Ser Pro Arg Val Pro Pro Lys Arg Gln Pro Asn
                165                 170                 175

Gly Thr Cys Glu Pro Asn Pro Arg Leu Asn Phe Tyr Pro Ala Phe Thr
            180                 185                 190

Val Pro Glu Val Leu Ala Thr Tyr His Ile Phe Phe Lys Asn Gln Lys
        195                 200                 205

Ile Pro Ile Ser Cys Arg Ala Asn Arg Thr Arg Ala Asp Ala Leu Leu
    210                 215                 220

Asn Leu Gly Pro Gly Ala Cys Leu Pro Asp Ile Thr Ser Leu Glu Glu
225                 230                 235                 240

Val Pro Lys Ile Phe Glu Gly Leu Gly Ser Asp Glu Thr Arg Ala Ala
                245                 250                 255

Asn Ala Leu Gln Gln Gly Glu Asn Gly Ile Asp Glu His His Ser Ala
            260                 265                 270

Leu Val Glu Leu Glu Gly Asp Asn Ala Arg Leu Ala Val Leu Lys Arg
        275                 280                 285

Ser Ile Glu Val Thr His Phe Ala Tyr Pro Ala Val Asn Leu Pro Pro
    290                 295                 300
```

```
Lys Val Met Ser Ala Val Met Asp Gln Ile Leu Ile Lys Arg Ala Ser
305                 310                 315                 320

Pro Leu Ser Glu Asn Met Gln Asp Pro Asp Ala Ser Asp Glu Gly Lys
                325                 330                 335

Pro Val Val Ser Asp Glu Gln Leu Ser Arg Trp Leu Gly Thr Asn Ser
            340                 345                 350

Pro Arg Asp Leu Glu Glu Arg Arg Lys Leu Met Met Ala Val Val Leu
        355                 360                 365

Val Thr Val Glu Met Glu Cys Leu Arg Arg Phe Phe Thr Asp Pro Glu
    370                 375                 380

Thr Leu Arg Lys Leu Glu Glu Asn Leu His Tyr Thr Phe Arg His Gly
385                 390                 395                 400

Phe Val Arg Gln Ala Cys Lys Ile Ser Asn Val Glu Leu Thr Asn Leu
                405                 410                 415

Val Ser Tyr Met Gly Ile Leu His Glu Asn Arg Leu Gly Gln Ser Val
            420                 425                 430

Leu His Thr Thr Leu Lys Gly Glu Ala Arg Arg Asp Tyr Ile Arg Asp
        435                 440                 445

Thr Val Tyr Leu Tyr Leu Cys His Thr Trp Gln Thr Gly Met Gly Val
    450                 455                 460

Trp Gln Gln Cys Leu Glu Glu Gln Asn Leu Lys Glu Leu Asp Lys Leu
465                 470                 475                 480

Leu Gln Arg Ser Leu Lys Thr Leu Trp Thr Gly Phe Asp Glu Arg Thr
                485                 490                 495

Val Ala Ser Asp Leu Ala Asp Leu Ile Phe Pro Glu Arg Leu Arg Thr
            500                 505                 510

Thr Leu Arg Asn Gly Leu Pro Asp Phe Met Asn Gln Ser Met Ile Asn
        515                 520                 525

Asn Phe Arg Ser Phe Ile Leu Glu Arg Ser Gly Ile Leu Pro Ala Thr
    530                 535                 540
```

```
Cys Cys Ala Leu Pro Ser Asp Phe Val Pro Leu Thr Tyr Arg Glu Cys
545                 550                 555                 560

Pro Pro Pro Leu Trp Ser His Cys Tyr Leu Phe Arg Leu Ala Asn Tyr
                565                 570                 575

Leu Ser Tyr His Ser Asp Val Ile Glu Asp Val Ser Gly Asp Gly Leu
            580                 585                 590

Leu Glu Cys His Cys Arg Cys Asn Leu Cys Ser Pro His Arg Ser Leu
        595                 600                 605

Val Cys Asn Pro Gln Leu Leu Ser Glu Thr Gln Ile Ile Gly Thr Phe
    610                 615                 620

Glu Leu Gln Gly Pro Ser Ser Glu Gly Glu Gly Ser Ser Pro Gly Gln
625                 630                 635                 640

Ser Leu Lys Leu Thr Pro Gly Leu Trp Thr Ser Ala Tyr Leu Arg Lys
                645                 650                 655

Phe Ser Pro Glu Asp Tyr His Pro Tyr Glu Ile Arg Phe Tyr Glu Asp
            660                 665                 670

Gln Ser Gln Pro Pro Lys Ala Glu Leu Ser Ala Cys Val Ile Thr Gln
        675                 680                 685

Gly Ala Ile Leu Ala Gln Leu Gln Ala Ile Gln Lys Ser Arg Gln Glu
    690                 695                 700

Phe Leu Leu Lys Lys Gly Asn Gly Val Tyr Leu Asp Pro Gln Thr Gly
705                 710                 715                 720

Glu Glu Leu Asn Thr Arg Phe Ser Gln Asp Val Ser Ala Pro Arg Lys
                725                 730                 735

Gln Glu Val Glu Ser Ala Ala Ala Ala Pro Arg Gly Tyr Gly Gly Arg
            740                 745                 750

Leu Gly Gln Ser Asp Arg Gly Asp Gly Arg Leu Gly Gln Pro Gly Arg
        755                 760                 765

Gly Gly Gly Gly Gln Pro Gly Gly Arg Gln Phe Gly Gly Gly Arg Arg
```

```
    770                 775                 780

Gly Gly Arg Gly Gly Gly Arg Ser Asn Arg Arg Gln Thr Val Val Leu
785                 790                 795                 800

Gly Gly Gly Asp Lys Gln Gly His Arg Gln His His Ser Tyr His Leu
                805                 810                 815

Arg Ser Gly Ser Gly Gly Pro Ala Pro Ser Gln Gln
            820                 825
```

<210> 52
<211> 227
<212> PRT
<213> Simian adenovirus 27

<400> 52

```
Met Ser Lys Glu Ile Pro Thr Pro Tyr Met Trp Ser Tyr Gln Pro Gln
1               5                   10                  15

Met Gly Leu Ala Ala Gly Ala Ser Gln Asp Tyr Ser Thr Arg Met Asn
            20                  25                  30

Trp Leu Ser Ala Gly Pro Ser Met Ile Ser Arg Val Asn Asp Ile Arg
        35                  40                  45

Ala Tyr Arg Asn Gln Leu Leu Leu Glu Gln Ser Ala Leu Thr Ala Thr
    50                  55                  60

Pro Arg Gln His Leu Asn Pro Arg Asn Trp Pro Ala Ala Leu Val Tyr
65                  70                  75                  80

Gln Glu Thr Pro Ala Pro Thr Thr Val Leu Leu Pro Arg Asp Ala Gln
                85                  90                  95

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

Ala Leu Cys Arg His Arg Pro Gln Gln Ser Ile Lys Arg Leu Val Ile
        115                 120                 125

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

Gly Leu Arg Pro Asp Gly Val Phe Gln Ile Ala Gly Cys Gly Arg Ser
```

145 150 155 160

Ser Phe Thr Pro Arg Gln Ala Val Leu Thr Leu Glu Ser Ser Ser Ser
165 170 175

Gln Pro Arg Ser Gly Gly Ile Gly Thr Leu Gln Phe Val Glu Glu Phe
180 185 190

Thr Pro Ser Val Tyr Phe Asn Pro Phe Ser Gly Ser Pro Gly His Tyr
195 200 205

Pro Asp Glu Phe Ile Pro Asn Phe Asp Ala Ile Ser Glu Ser Val Asp
210 215 220

Gly Tyr Asp
225

<210> 53
<211> 106
<212> PRT
<213> Simian adenovirus 27

<400> 53

Met Ser Asn Gly Gly Ala Ala Glu Leu Ala Arg Leu Arg His Leu Asp
1 5 10 15

His Cys Arg Arg Phe Arg Cys Phe Ala Arg Glu Leu Thr Glu Phe Ile
20 25 30

Tyr Phe Glu Ile Pro Glu Glu His Pro Gln Gly Pro Ala His Gly Val
35 40 45

Arg Ile Thr Ile Glu Gly Gly Ile Asp Ser Arg Leu His Arg Ile Phe
50 55 60

Cys Gln Arg Pro Val Leu Ile Glu Arg Asp Gln Gly Asn Thr Thr Val
65 70 75 80

Ser Ile Tyr Cys Ile Cys Asn His Pro Gly Leu His Glu Ser Leu Cys
85 90 95

Cys Leu Ile Cys Ala Glu Phe Asn Lys Asn
100 105

<210> 54

<211> 172
<212> PRT
<213> Simian adenovirus 27

<400> 54

Met Gly Ala Leu Leu Val Ala Leu Ala Leu Leu Ser Leu Leu Asp Leu
1 5 10 15

Gly Ser Thr Met Leu Val Gln Pro Val Leu Phe Asp Pro Cys Leu Asn
20 25 30

Phe Asp Pro Asp Asn Cys Thr Leu Thr Phe Ala Pro Glu Ala Gly Arg
35 40 45

Cys Gly Val Leu Ile Arg Cys Gly Arg Glu Cys Ser Pro Ile Glu Ile
50 55 60

His His Asn Asn Lys Ile Trp Asn Asn Thr Leu Phe Thr Thr Trp Gln
65 70 75 80

Pro Gly Asp Pro Glu Trp Tyr Thr Val Ser Val Arg Gly Pro Asp Gly
85 90 95

Ser Ile Arg Thr Ala Asn Asn Thr Phe Ile Phe Ala Glu Met Cys Asp
100 105 110

Leu Thr Met Phe Met Ser Lys Gln Tyr Asn Leu Trp Pro Pro Ser Lys
115 120 125

Glu Asn Ile Val Ala Phe Ser Ile Ala Tyr Phe Leu Cys Thr Cys Leu
130 135 140

Ile Thr Ala Ile Leu Cys Ile Cys Ile His Leu Leu Ile Cys His Arg
145 150 155 160

His Arg Asn Ser Asn Glu Glu Lys Glu Lys Met Pro
165 170

<210> 55
<211> 177
<212> PRT
<213> Simian adenovirus 27

<400> 55

Met Ala Ser Val Ile Ala Leu Ile Ile Val Ser Ile Leu Thr Ala Ala
1 5 10 15

```
Gln Gly Gln Thr Ile Val Tyr Ile Thr Leu Gly His Asn His Thr Leu
            20                  25                  30

Ile Gly Pro Gln Ile Ser Ser Gln Val Ile Trp Thr Lys Leu Gly Ser
        35                  40                  45

Val Asp Tyr Phe Asp Ile Ile Cys Asn Arg Thr Lys Pro Ile Phe Val
    50                  55                  60

Thr Cys Asn Lys Gln Asn Leu Thr Leu Ile Asn Val Ser Glu Ile Tyr
65                  70                  75                  80

Ser Gly Tyr Tyr Tyr Gly Tyr Asp Arg His Ser Ser Glu Tyr Lys Asn
                85                  90                  95

Tyr Leu Val Arg Ile Thr Gln Pro Lys Thr Thr Lys Met Pro Asn Lys
            100                 105                 110

Ala Lys Ile Gln Met Val Ser Ala Leu Glu His Leu Thr Tyr Pro Thr
        115                 120                 125

Thr Pro Asp Glu Arg Asn Ile Pro Asn Ser Met Ile Ala Ile Ile Ala
    130                 135                 140

Ala Val Ala Val Gly Met Ala Leu Ile Ile Ile Cys Met Phe Leu Tyr
145                 150                 155                 160

Ala Cys Tyr Cys Arg Lys Phe His His Lys Gln Asp Ser Leu Leu Asn
                165                 170                 175

Phe
```

<210> 56
<211> 189
<212> PRT
<213> Simian adenovirus 27

<400> 56

```
Met Val Ser Thr Thr Ala Phe Phe Val Ile Ser Ser Leu Ala Ala Val
1               5                   10                  15

Thr Tyr Gly Arg Ser His Leu Thr Val Thr Val Gly Ser Thr Cys Thr
            20                  25                  30
```

```
Leu Gln Gly Pro Gln Glu Gly His Val Ser Trp Trp Arg Ile Tyr Asp
        35                  40                  45

Ser Gly Trp Phe Ile Arg Pro Cys Asp Gln Pro Gly Asn Lys Phe Phe
    50                  55                  60

Cys Asn Gly Arg Asp Leu Thr Ile Ile Asn Ile Thr Val Asn Asp Gln
65                  70                  75                  80

Gly Phe Tyr Tyr Gly Thr Asn Tyr Lys Asn Asn Leu Asp Tyr Asn Ile
                85                  90                  95

Ile Val Val Pro Ala Thr Thr Pro Ala Pro Arg Lys Thr Thr Phe Phe
            100                 105                 110

Ser Ser Ser Ala Ser Ile Ser Lys Thr Ala Ser Ala Ser Phe Lys Lys
        115                 120                 125

Phe Ala Leu Arg Asn Ser Thr Thr Ser Ser Thr Ser Asn Asn Thr Met
    130                 135                 140

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

Ile Ile Ile Leu Cys Ile Ile Tyr Tyr Ala Cys Cys Tyr Arg Lys Gln
                165                 170                 175

His Glu Gln Lys Thr Asp Pro Leu Leu Asn Phe Asp Ile
            180                 185


<210>  57
<211>  101
<212>  PRT
<213>  Simian adenovirus 27

<400>  57

Met Lys Lys Leu Ser Ile Leu Ala Phe Ile Leu Phe Gln Thr Phe Thr
1               5                   10                  15

Asn Val Gln Thr Thr Leu Ser His Gly Ile Glu Asn His Thr Thr Ser
            20                  25                  30

Tyr Glu Leu Thr Asn Ile Thr Thr His His Pro Lys Tyr Ala Met Gln
        35                  40                  45
```

```
Leu Glu Ile Thr Met Leu Ile Val Val Gly Ile Leu Ile Leu Ala Ile
    50                  55                  60

Ile Phe Tyr Phe Thr Leu Cys Arg Gln Ile Pro Asn Ile His Lys Asn
65                  70                  75                  80

Ser Lys Arg Arg Pro Ile Tyr Cys Pro Val Ile Ser Arg Pro His Met
                85                  90                  95

Thr Leu Asn Glu Ile
            100


<210>  58
<211>  145
<212>  PRT
<213>  Simian adenovirus 27

<400>  58

Met Leu Arg His Phe Ser Asp Leu Phe Lys Thr Met Gln Ala Ile Leu
1               5                  10                  15

Pro Val Ile Leu Leu Leu Leu Leu Pro Cys Asp Ala Leu Thr Pro Val
            20                  25                  30

Ala Asn Arg Thr Pro Pro Glu Gln Leu Arg Lys Cys Lys Phe Gln Gln
        35                  40                  45

Pro Trp Thr Phe Leu Asp Cys Tyr Arg Glu Lys Ser Asp Phe Pro Thr
    50                  55                  60

Tyr Trp Ile Met Ile Ile Gly Ile Val Asn Leu Val Ser Cys Thr Leu
65                  70                  75                  80

Phe Ser Phe Leu Val Tyr His Phe Phe Asp Phe Gly Trp Asn Ala Pro
                85                  90                  95

Asn Ala Leu Thr Tyr Pro Gln Glu Pro Glu Glu His Ile Pro Leu Gln
            100                 105                 110

Asn Met Gln Gln Pro Ile Ala Ile Ile Asp Tyr Asp Asn Glu Pro Gln
        115                 120                 125

Pro Ser Leu Leu Pro Ala Ile Ser Tyr Phe Asn Leu Thr Gly Gly Asp
    130                 135                 140
```

Asp
145

<210> 59
<211> 325
<212> PRT
<213> Simian adenovirus 27

<400> 59

Met Ala Lys Arg Val Arg Leu Ser Ser Ser Phe Asn Pro Val Tyr Pro
1 5 10 15

Tyr Glu Asp Glu Ser Ser Ser Gln His Pro Phe Ile Asn Pro Gly Phe
20 25 30

Ile Ser Ser Asn Gly Phe Thr Gln Ser Pro Asp Gly Val Leu Thr Leu
35 40 45

Lys Cys Val Ala Pro Leu Thr Thr Thr Ser Gly Ala Leu Asp Ile Lys
50 55 60

Val Gly Gly Gly Leu Lys Val Asp Ser Thr Asp Gly Ser Leu Glu Glu
65 70 75 80

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

Leu Ala Leu Gly Asp Gly Leu Glu Thr Lys Glu Asn Lys Leu Tyr Val
100 105 110

Lys Leu Gly Glu Gly Leu Lys Phe Asn Ser Gly Ser Ile Asn Ile Asp
115 120 125

His Asp Ile Asn Thr Leu Trp Thr Gly Val Asn Pro Ser Ala Asn Cys
130 135 140

Ile Ile Thr Glu Asp Gly Glu Ala Asn Asp Ser Lys Leu Thr Leu Ile
145 150 155 160

Leu Val Lys Thr Gly Gly Leu Val Asn Ala Tyr Val Ser Leu Met Gly
165 170 175

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

```
Thr Val Asp Ile Tyr Phe Asp Asn Glu Gly Lys Val Leu Thr Glu Leu
        195                 200                 205

Ser Ala Leu Lys Thr Gly Leu Lys His Lys Phe Gly Gln Asn Met Ala
    210                 215                 220

Ser Asp Glu Ala Gln Asn Cys Lys Gly Phe Met Pro Ser Leu Thr Ala
225                 230                 235                 240

Tyr Pro Phe Arg Asn Pro Thr Lys Pro Thr Lys Gly Arg Glu Asp Tyr
                245                 250                 255

Ile Tyr Gly Ile Thr Tyr Tyr Gln Ala Thr Asp Gly Thr Leu Tyr Glu
            260                 265                 270

Leu Lys Thr Thr Val Thr Leu Asn Tyr Ser Val Ile Ser Ser Leu Cys
        275                 280                 285

Ala Tyr Ala Met His Ile Ser Trp Ser Trp Asp Ser Val Thr Glu Pro
    290                 295                 300

Glu Thr Thr Pro Thr Thr Leu Ile Thr Ser Pro Phe Ser Phe Ser Tyr
305                 310                 315                 320

Ile Arg Glu Asp Asp
                325
```

<210> 60
<211> 550
<212> DNA
<213> Simian adenovirus 27

<220>
<221> CDS
<222> (1)..(543)
<223> label=Elb\19K

<400> 60

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atg gag gtt tgg gct atc ttg gaa gat ctc aga cag act agg caa ctg          48
Met Glu Val Trp Ala Ile Leu Glu Asp Leu Arg Gln Thr Arg Gln Leu
1               5                   10                  15

cta gaa aac gcc tcg gac gga gtc tct agt ctt tgg aga ttc tgg ttc          96
Leu Glu Asn Ala Ser Asp Gly Val Ser Ser Leu Trp Arg Phe Trp Phe
            20                  25                  30

ggt ggt gat cta gct agg cta gtc ttc agg gta aaa cgg gag tat agt         144
```

```
Gly Gly Asp Leu Ala Arg Leu Val Phe Arg Val Lys Arg Glu Tyr Ser
        35                  40                  45

gaa gaa ttt gaa aag tta ttg gaa gac agt cca gga ctt ttt gaa gct        192
Glu Glu Phe Glu Lys Leu Leu Glu Asp Ser Pro Gly Leu Phe Glu Ala
    50                  55                  60

ctt aac ttg ggc cac cag gct cat ttt aag gag aag gtt tta tca gtt        240
Leu Asn Leu Gly His Gln Ala His Phe Lys Glu Lys Val Leu Ser Val
65                  70                  75                  80

tta gat ttt tct acc cct ggt aga act gct gca gct gta gcc ttc ctt        288
Leu Asp Phe Ser Thr Pro Gly Arg Thr Ala Ala Ala Val Ala Phe Leu
                85                  90                  95

act ttt ata ttg gat aaa tgg atc cca caa acc cac ttc agc aag gga        336
Thr Phe Ile Leu Asp Lys Trp Ile Pro Gln Thr His Phe Ser Lys Gly
            100                 105                 110

tac gtt ttg gat ttc ata gca gca gct ttg tgg aga aca tgg aag gct        384
Tyr Val Leu Asp Phe Ile Ala Ala Ala Leu Trp Arg Thr Trp Lys Ala
        115                 120                 125

cgc agg ctg agg ata atc tta gat tac tgg cca gtg cag cct ctg ggc        432
Arg Arg Leu Arg Ile Ile Leu Asp Tyr Trp Pro Val Gln Pro Leu Gly
    130                 135                 140

gta gcg gcg atc ctg aga cac cca ccg gcc atg cca gcg gtt ctg gag        480
Val Ala Ala Ile Leu Arg His Pro Pro Ala Met Pro Ala Val Leu Glu
145                 150                 155                 160

gag gag cag cag gag gac aac ccg aga gcc ggc ctg gac cct ccg gtg        528
Glu Glu Gln Gln Glu Asp Asn Pro Arg Ala Gly Leu Asp Pro Pro Val
                165                 170                 175

gag gag gcg gag gag tagctga                                           550
Glu Glu Ala Glu Glu
            180


<210>  61
<211>  181
<212>  PRT
<213>  Simian adenovirus 27

<400>  61

Met Glu Val Trp Ala Ile Leu Glu Asp Leu Arg Gln Thr Arg Gln Leu
1               5                   10                  15


Leu Glu Asn Ala Ser Asp Gly Val Ser Ser Leu Trp Arg Phe Trp Phe
            20                  25                  30


Gly Gly Asp Leu Ala Arg Leu Val Phe Arg Val Lys Arg Glu Tyr Ser
        35                  40                  45
```

```
Glu Glu Phe Glu Lys Leu Leu Glu Asp Ser Pro Gly Leu Phe Glu Ala
    50                  55                  60

Leu Asn Leu Gly His Gln Ala His Phe Lys Glu Lys Val Leu Ser Val
65                  70                  75                  80

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

Thr Phe Ile Leu Asp Lys Trp Ile Pro Gln Thr His Phe Ser Lys Gly
            100                 105                 110

Tyr Val Leu Asp Phe Ile Ala Ala Ala Leu Trp Arg Thr Trp Lys Ala
        115                 120                 125

Arg Arg Leu Arg Ile Ile Leu Asp Tyr Trp Pro Val Gln Pro Leu Gly
    130                 135                 140

Val Ala Ala Ile Leu Arg His Pro Pro Ala Met Pro Ala Val Leu Glu
145                 150                 155                 160

Glu Glu Gln Gln Glu Asp Asn Pro Arg Ala Gly Leu Asp Pro Pro Val
                165                 170                 175

Glu Glu Ala Glu Glu
            180


<210>  62
<211>  5470
<212>  DNA
<213>  Simian adenovirus 27


<220>
<221>  CDS
<222>  (9)..(602)
<223>  label=22K

<220>
<221>  CDS
<222>  (1908)..(2345)
<223>  label=E3\CR1-alpha

<220>
<221>  CDS
<222>  (4376)..(4648)
<223>  label=E3\RID-alpha

<220>
<221>  CDS
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<222> (5053)..(5457)
<223> label=E3\14.7K

<400> 62
ctctcagg atg tct cag cgc cga gga aac aag aag ttg aaa gtg cag ctg 50
Met Ser Gln Arg Arg Gly Asn Lys Lys Leu Lys Val Gln Leu
1 5 10

ccg ccc cca gag gat atg gag gaa gac tgg gac agt cag aca gag gag 98
Pro Pro Pro Glu Asp Met Glu Glu Asp Trp Asp Ser Gln Thr Glu Glu
15 20 25 30

atg gaa gat tgg gac agc cag gca gag gag gag gag gac agc ctg gag 146
Met Glu Asp Trp Asp Ser Gln Ala Glu Glu Glu Glu Asp Ser Leu Glu
35 40 45

gaa gac agt ttg gag gag gaa gac gag gag gca gag gag gtg gaa gaa 194
Glu Asp Ser Leu Glu Glu Glu Asp Glu Glu Ala Glu Glu Val Glu Glu
50 55 60

gca acc gcc gcc aaa cag ttg tcc tcg gcg gcg gag aca agc aag gcc 242
Ala Thr Ala Ala Lys Gln Leu Ser Ser Ala Ala Glu Thr Ser Lys Ala
65 70 75

aca gac aac acc aca gct acc atc tcc gtt ccg ggt cgg ggg gtc cag 290
Thr Asp Asn Thr Thr Ala Thr Ile Ser Val Pro Gly Arg Gly Val Gln
80 85 90

cac cgt ccc aac agt aga tgg gat gag acc ggg cga ctc ccg aat gcg 338
His Arg Pro Asn Ser Arg Trp Asp Glu Thr Gly Arg Leu Pro Asn Ala
95 100 105 110

acc acc gct tct aag act ggt aag aag gag cgg cag gga tac aag tcc 386
Thr Thr Ala Ser Lys Thr Gly Lys Lys Glu Arg Gln Gly Tyr Lys Ser
115 120 125

tgg cgg ggg cat aag aac gct atc ata tcc tgc ttg cat gaa tgc ggg 434
Trp Arg Gly His Lys Asn Ala Ile Ile Ser Cys Leu His Glu Cys Gly
130 135 140

ggc aac ata tcc ttc acc cgc cgc tac ctg ctc ttc cac cac ggg gtg 482
Gly Asn Ile Ser Phe Thr Arg Arg Tyr Leu Leu Phe His His Gly Val
145 150 155

aac ttc ccc cgc aat gtc ttg cat tac tac cgt cac ctc cac agc ccc 530
Asn Phe Pro Arg Asn Val Leu His Tyr Tyr Arg His Leu His Ser Pro
160 165 170

tac tac agc cag caa gcc tcg gca gaa aaa gac aac agc agc aag aac 578
Tyr Tyr Ser Gln Gln Ala Ser Ala Glu Lys Asp Asn Ser Ser Lys Asn
175 180 185 190

ctc cag cag aaa acc agc agc agt tagaacaccc acagcaggtg caacaggagg 632
Leu Gln Gln Lys Thr Ser Ser Ser
195

aggactgaga atcacagcga acgagccagc gcagacccga gagctgagaa accggatttt 692

tccaaccctc tatgccatct tccaacagag tcgggggcaa gagcaggaac tgaaagtaaa 752

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aaaccgatct ttgcgctcgc tcacccgaag ttgtttgtat cacaagagcg aagaccaact      812

tcagcgcact ctcgaggacg ccgaggctct cttcaacaag tactgcgcgc tcactcttaa      872

agagtagccc gcgcccgcgc tagctcgaaa aaaggcggga attacgtcac ccattggcgc      932

ctgtcctttg ccctcgtcat gagtaaagaa attcccacgc cttacatgtg gagttatcaa      992

ccccaaatgg gactggcagc aggcgcctcc caggactact ccacccgtat gaattggctc     1052

agcgccggtc cctcgatgat ctcacgggtt aatgatatac gagcttatcg aaaccaatta     1112

ctcctagaac agtcagcact taccgccaca cccagacaac accttaatcc ccggaattgg     1172

cccgccgccc tggtgtacca ggaaaccccc gctcccacca ccgtcctact tcctcgagac     1232

gcccaggccg aagttcagat gactaacgca ggtgtacagc tggctggcgg ttccgccctg     1292

tgtcgtcacc ggcctcaaca gagtataaaa cgcctggtga tcagaggccg aggtatccag     1352

ctcaacgacg agtcggtgag ctcttcgctt ggtctacgac cagacggagt cttccaaatt     1412

gccggctgcg ggagatcttc cttcactcct cgtcaggctg tactgacttt ggagagttcg     1472

tcatcgcagc cccgctcggg tggcatcggg actctccaat ttgtggagga gtttactccc     1532

tctgtctact tcaacccctt ctccggctct cctgggcatt atccggacga gttcatacca     1592

aacttcgacg caatcagcga gtcagtggat ggctatgatt gatgtctaat ggtggcgcgg     1652

ctgagctagc tcgactgcga catctagacc actgccgccg ctttcgctgc tttgcccgag     1712

aactcaccga gttcatctac ttcgaaatac ccgaggagca ccctcaagga ccggcccacg     1772

gagtgcgtat taccatcgaa ggggggatag actctcgcct gcatcggatc ttctgccagc     1832

gacccgtgct aatcgagcgc gaccagggaa acaccacagt ctccatctac tgcatctgta     1892

accacccccgg attgc atg aaa gcc ttt gct gtc tta ttt gtg ctg agt tta      1943
                Met Lys Ala Phe Ala Val Leu Phe Val Leu Ser Leu
                    200                 205                 210

ata aaa act gag tta aga ctc tcc tac gga cta cca att ctt caa ctc      1991
Ile Lys Thr Glu Leu Arg Leu Ser Tyr Gly Leu Pro Ile Leu Gln Leu
                215                 220                 225

gga ctt tat aac aat cag acc ctc cgt tca agt cag aag acc cca acc      2039
Gly Leu Tyr Asn Asn Gln Thr Leu Arg Ser Ser Gln Lys Thr Pro Thr
            230                 235                 240

ctt cct ctg atc cag gaa tct aat tct acc tcc cca gca cca cac ttt      2087
Leu Pro Leu Ile Gln Glu Ser Asn Ser Thr Ser Pro Ala Pro His Phe
        245                 250                 255

act agc ctt ccc gaa act aac aac ctc gga gct caa ctg cac cac ttt      2135
Thr Ser Leu Pro Glu Thr Asn Asn Leu Gly Ala Gln Leu His His Phe
    260                 265                 270
```

```
tcc aga agc ctt ctc tct gcc aat act acc act ccc aga acc gga ggt       2183
Ser Arg Ser Leu Leu Ser Ala Asn Thr Thr Thr Pro Arg Thr Gly Gly
275                 280                 285                 290

gag ctc cgt ggt ctt cct aat aac aac ccc tgg gtg gta act ggg ttt       2231
Glu Leu Arg Gly Leu Pro Asn Asn Asn Pro Trp Val Val Thr Gly Phe
                295                 300                 305

gta acg cta ggt gta gtt gcg ggt ggg ctt gtg ctt gtc ctt tgc tac       2279
Val Thr Leu Gly Val Val Ala Gly Gly Leu Val Leu Val Leu Cys Tyr
            310                 315                 320

cta tac aca cct tgc tgt gct tat tta gta atc ttg tgt tgc tgg ttt       2327
Leu Tyr Thr Pro Cys Cys Ala Tyr Leu Val Ile Leu Cys Cys Trp Phe
        325                 330                 335

aag aaa tgg ggg ccc tac tagtcgcgct tgctttactt tcacttttgg              2375
Lys Lys Trp Gly Pro Tyr
    340

atctgggctc tactatgcta gttcagcctg tactatttga tccatgcctc aattttgatc     2435

cagacaactg cacactcact tttgctccag aggctggccg ctgtggagtt cttattaggt     2495

gcggacggga atgcagtccc attgaaatac accacaataa caaaatttgg aacaatacct     2555

tattcaccac atggcagcca ggagaccctg agtggtatac tgtctctgtc cgtggtcctg     2615

acggttccat ccgcactgct aataacactt ttatttttgc tgagatgtgc gatctgacca     2675

tgttcatgag caaacagtat aacctatggc ctccaagcaa ggagaacatt gtggcattct     2735

ccattgctta tttcttgtgt acgtgtctca ttactgctat tctatgtatc tgcatacact     2795

tgcttatttg ccaccgccac agaaacagca atgaggaaaa agagaaaatg ccttgagctt     2855

tttctcattt ttgtttttt ttgtttacag ccatggcttc agttatagct ctaattattg     2915

tcagcattct cactgccgca cagggacaaa caattgtcta tattacctta ggtcataacc     2975

acactcttat aggaccccaa attagttcac aggttatatg gaccaaactt ggaagtgttg     3035

attattttga cataatctgc aacagaacta aaccaatatt tgtaacctgt aacaaacaaa     3095

atctcacctt aattaatgtt agcgaaattt acagcggtta ctattatggt tatgacagac     3155

acagcagtga atataaaaat tacctagttc gcataactca acccaaaacc acaaaaatgc     3215

caaataaggc aaaaattcaa atggttagcg cattagaaca tcttacatat cccaccacac     3275

ccgatgagag aaacattcca aattcaatga ttgccattat tgcggcggtg gcagtgggaa     3335

tggcactaat aataatttgt atgttcctat atgcttgtta ctgtagaaag tttcatcaca     3395

aacaggattc cctactaaat ttttgacatt taatttttta tacagctatg gtttccacta     3455

cagccttttt tgttattagt agccttgcag ctgtcactta tggtcgctca cacctcactg     3515

taactgttgg ctcaacttgt acactacaag gaccccaaga agggcatgtc agttggtgga     3575
```

```
gaatatatga tagtggatgg ttcattaggc catgtgacca gcctggtaac aaatttttct     3635

gcaacgggag agacttgacc attattaaca tcacagtaaa tgaccagggc ttctattatg     3695

gaactaacta taaaaataac ttagattaca acattatcgt agtgccagcc accactccag     3755

ctccccgcaa aaccactttc tttagcagca gtgccagtat ttctaaaaca gcttctgcaa     3815

gcttcaaaaa attcgcttta cgtaattcca caacctcttc cacttccaat aatacaatgt     3875

ctaaatcagt aatcggcatc gctgctgccg cgatagtggg attaatgatt ataattctat     3935

gcataatcta ctacgcctgc tgctatagaa aacaacatga acaaaaaacc gatcccttgc     3995

tgaattttga tatttaattt ttttatagaa tcatgaaaaa actaagtatc ctagctttca     4055

ttttgtttca aacatttacc aatgtgcaga ctactttaag tcatggtata gagaaccaca     4115

ctacctctta tgagctcaca aacattacta cccatcatcc taaatatgct atgcaactag     4175

aaatcaccat gctaattgta gttggaatac ttatcctagc tattattttc tattttacac     4235

tatgccgcca aatacctaat attcataaaa attctaaaag acgtcccatc tattgccctg     4295

tgattagtcg accccatatg actctaaatg aaatctaaga tcatctattt ctctttttta     4355

cagtatggtg aacaccaatc atg att cct aga aat ttc ttc ttc acc ata ctc     4408
                     Met Ile Pro Arg Asn Phe Phe Phe Thr Ile Leu
                     345                 350                 355

atc tgt gct ttt aat gtc tgt gcc acc ttc aca gca gta gcc act gca      4456
Ile Cys Ala Phe Asn Val Cys Ala Thr Phe Thr Ala Val Ala Thr Ala
                360                 365                 370

acc cca gac tgt ata gga gca ttt gcc tca tat aca ctt ttc gct ttt      4504
Thr Pro Asp Cys Ile Gly Ala Phe Ala Ser Tyr Thr Leu Phe Ala Phe
            375                 380                 385

gtc gct tgc acc tgc gtg tgt agc gta gtc tgc ctg gtt att aat ttt      4552
Val Ala Cys Thr Cys Val Cys Ser Val Val Cys Leu Val Ile Asn Phe
        390                 395                 400

ttc caa ctt gta gac tgg atc ttt gta cga ctt gcc tac ctg cgt cac      4600
Phe Gln Leu Val Asp Trp Ile Phe Val Arg Leu Ala Tyr Leu Arg His
    405                 410                 415

cat ccc gaa tac cgc aat caa cat gtt gcg gca ctt ctc aga ctt att      4648
His Pro Glu Tyr Arg Asn Gln His Val Ala Ala Leu Leu Arg Leu Ile
420                 425                 430                 435

taaaaccatg caggctatac taccagtcat tctgcttctg ttgctcccct gcgatgcctt     4708

aacccccgtc gctaatcgta ccccacctga acaacttaga aaatgcaaat tccaacaacc     4768

atggacattc cttgattgct accgagaaaa atctgatttc cctacatact ggattatgat     4828

cattggaatt gtcaatctag tttcttgcac actattctct ttccttgttt atcatttttt     4888
```

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tgattttgga tggaatgccc ccaatgcact cacttaccca caagaaccag aggaacatat     4948

cccactacag aacatgcaac agccaatagc tataatagat tatgacaatg agccacagcc     5008

ctcgctgctt cctgctatta gttacttcaa cctaaccggt ggag atg act gac cca      5064
                                              Met Thr Asp Pro

ctc gcc gcc tcc act gct gcc gag gaa cta ctt gat atg gac ggc cgc       5112
Leu Ala Ala Ser Thr Ala Ala Glu Glu Leu Leu Asp Met Asp Gly Arg
440                 445                 450                 455

gcc tca gaa cag cga ctc gcc caa cta cgc att cgc cag cag cag gaa       5160
Ala Ser Glu Gln Arg Leu Ala Gln Leu Arg Ile Arg Gln Gln Gln Glu
                460                 465                 470

cgt gcc gcc aag gag ctc agg gat gct att gag att cac cag tgc aaa       5208
Arg Ala Ala Lys Glu Leu Arg Asp Ala Ile Glu Ile His Gln Cys Lys
            475                 480                 485

aaa ggc ata ttc tgc ttg gta aaa caa gcc aag atc tcc tac gag atc       5256
Lys Gly Ile Phe Cys Leu Val Lys Gln Ala Lys Ile Ser Tyr Glu Ile
        490                 495                 500

acc gct aac gac cac cgc ctc tca tat gag ctt ggc ccg cag cgt cag       5304
Thr Ala Asn Asp His Arg Leu Ser Tyr Glu Leu Gly Pro Gln Arg Gln
    505                 510                 515

aaa ttc act tgc atg gtg gga atc aac ccc ata gtc atc acc cag caa       5352
Lys Phe Thr Cys Met Val Gly Ile Asn Pro Ile Val Ile Thr Gln Gln
520                 525                 530                 535

gcc gga gat acc aag ggt tgc atc cat tgt tcc tgt gaa tcc acc gag       5400
Ala Gly Asp Thr Lys Gly Cys Ile His Cys Ser Cys Glu Ser Thr Glu
                540                 545                 550

tgc atc tac acc cta ctg aag acc ctc tgc ggc ctt cga gac ctc cta       5448
Cys Ile Tyr Thr Leu Leu Lys Thr Leu Cys Gly Leu Arg Asp Leu Leu
            555                 560                 565

ccc atg aac taatcacccc cgc                                           5470
Pro Met Asn
        570
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<210> 63
<211> 198
<212> PRT
<213> Simian adenovirus 27

<400> 63

```
Met Ser Gln Arg Arg Gly Asn Lys Lys Leu Lys Val Gln Leu Pro Pro
1               5                   10                  15

Pro Glu Asp Met Glu Glu Asp Trp Asp Ser Gln Thr Glu Glu Met Glu
            20                  25                  30
```

```
Asp Trp Asp Ser Gln Ala Glu Glu Glu Glu Asp Ser Leu Glu Glu Asp
        35                  40                  45

Ser Leu Glu Glu Glu Asp Glu Glu Ala Glu Glu Val Glu Glu Ala Thr
    50                  55                  60

Ala Ala Lys Gln Leu Ser Ser Ala Ala Glu Thr Ser Lys Ala Thr Asp
65                  70                  75                  80

Asn Thr Thr Ala Thr Ile Ser Val Pro Gly Arg Gly Val Gln His Arg
                85                  90                  95

Pro Asn Ser Arg Trp Asp Glu Thr Gly Arg Leu Pro Asn Ala Thr Thr
            100                 105                 110

Ala Ser Lys Thr Gly Lys Lys Glu Arg Gln Gly Tyr Lys Ser Trp Arg
        115                 120                 125

Gly His Lys Asn Ala Ile Ile Ser Cys Leu His Glu Cys Gly Gly Asn
    130                 135                 140

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

Pro Arg Asn Val Leu His Tyr Tyr Arg His Leu His Ser Pro Tyr Tyr
                165                 170                 175

Ser Gln Gln Ala Ser Ala Glu Lys Asp Asn Ser Ser Lys Asn Leu Gln
            180                 185                 190

Gln Lys Thr Ser Ser Ser
        195
```

<210> 64
<211> 146
<212> PRT
<213> Simian adenovirus 27

<400> 64

```
Met Lys Ala Phe Ala Val Leu Phe Val Leu Ser Leu Ile Lys Thr Glu
1               5                   10                  15

Leu Arg Leu Ser Tyr Gly Leu Pro Ile Leu Gln Leu Gly Leu Tyr Asn
            20                  25                  30
```

```
Asn Gln Thr Leu Arg Ser Ser Gln Lys Thr Pro Thr Leu Pro Leu Ile
        35                  40                  45

Gln Glu Ser Asn Ser Thr Ser Pro Ala Pro His Phe Thr Ser Leu Pro
    50                  55                  60

Glu Thr Asn Asn Leu Gly Ala Gln Leu His His Phe Ser Arg Ser Leu
65                  70                  75                  80

Leu Ser Ala Asn Thr Thr Thr Pro Arg Thr Gly Gly Glu Leu Arg Gly
                85                  90                  95

Leu Pro Asn Asn Asn Pro Trp Val Val Thr Gly Phe Val Thr Leu Gly
            100                 105                 110

Val Val Ala Gly Gly Leu Val Leu Val Leu Cys Tyr Leu Tyr Thr Pro
        115                 120                 125

Cys Cys Ala Tyr Leu Val Ile Leu Cys Cys Trp Phe Lys Lys Trp Gly
    130                 135                 140

Pro Tyr
145
```

<210> 65
<211> 91
<212> PRT
<213> Simian adenovirus 27

<400> 65

```
Met Ile Pro Arg Asn Phe Phe Phe Thr Ile Leu Ile Cys Ala Phe Asn
1               5                   10                  15

Val Cys Ala Thr Phe Thr Ala Val Ala Thr Ala Thr Pro Asp Cys Ile
            20                  25                  30

Gly Ala Phe Ala Ser Tyr Thr Leu Phe Ala Phe Val Ala Cys Thr Cys
        35                  40                  45

Val Cys Ser Val Val Cys Leu Val Ile Asn Phe Phe Gln Leu Val Asp
    50                  55                  60

Trp Ile Phe Val Arg Leu Ala Tyr Leu Arg His His Pro Glu Tyr Arg
65                  70                  75                  80
```

```
Asn Gln His Val Ala Ala Leu Leu Arg Leu Ile
                85                  90


<210>  66
<211>  135
<212>  PRT
<213>  Simian adenovirus 27

<400>  66

Met Thr Asp Pro Leu Ala Ala Ser Thr Ala Ala Glu Glu Leu Leu Asp
1               5                   10                  15


Met Asp Gly Arg Ala Ser Glu Gln Arg Leu Ala Gln Leu Arg Ile Arg
            20                  25                  30


Gln Gln Gln Glu Arg Ala Ala Lys Glu Leu Arg Asp Ala Ile Glu Ile
        35                  40                  45


His Gln Cys Lys Lys Gly Ile Phe Cys Leu Val Lys Gln Ala Lys Ile
    50                  55                  60


Ser Tyr Glu Ile Thr Ala Asn Asp His Arg Leu Ser Tyr Glu Leu Gly
65                  70                  75                  80


Pro Gln Arg Gln Lys Phe Thr Cys Met Val Gly Ile Asn Pro Ile Val
                85                  90                  95


Ile Thr Gln Gln Ala Gly Asp Thr Lys Gly Cys Ile His Cys Ser Cys
            100                 105                 110


Glu Ser Thr Glu Cys Ile Tyr Thr Leu Leu Lys Thr Leu Cys Gly Leu
        115                 120                 125


Arg Asp Leu Leu Pro Met Asn
    130                 135


<210>  67
<211>  920
<212>  DNA
<213>  Simian adenovirus 27


<220>
<221>  CDS
<222>  (35)..(611)
<223>  label=Ela
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<220>
<221> CDS
<222> (705)..(910)
<223> label=Ela

<400> 67
ccgcgccgcg agtcagatct ccactttgaa aaaa atg aga cac ctg cga ttc ctg 55
Met Arg His Leu Arg Phe Leu
1 5

cct cag gaa atc tcc att gag acc ggg gat gaa ata ctg cag ttt gtg 103
Pro Gln Glu Ile Ser Ile Glu Thr Gly Asp Glu Ile Leu Gln Phe Val
10 15 20

gta aat gcc ctg atg gga gac gat ccg gag ccg cct gcg cag cct ttc 151
Val Asn Ala Leu Met Gly Asp Asp Pro Glu Pro Pro Ala Gln Pro Phe
25 30 35

gat cct cct acg ctt cat gaa ctg tat gat tta gag gta gac ggg ccg 199
Asp Pro Pro Thr Leu His Glu Leu Tyr Asp Leu Glu Val Asp Gly Pro
40 45 50 55

gag gac cct aac gag gaa gct gtg aat ggg ttt ttc agc gat tct atg 247
Glu Asp Pro Asn Glu Glu Ala Val Asn Gly Phe Phe Ser Asp Ser Met
60 65 70

cta tta gct gct agt gaa gga gtg gac tta gac cca cct tct gag acc 295
Leu Leu Ala Ala Ser Glu Gly Val Asp Leu Asp Pro Pro Ser Glu Thr
75 80 85

ctt gat acc cca ggg gtg gtg gtg gaa agc ggc gga ggt ggg aaa aaa 343
Leu Asp Thr Pro Gly Val Val Val Glu Ser Gly Gly Gly Gly Lys Lys
90 95 100

ttg cct gaa ctt ggt gct gct gaa atg gat ttg cac tgt tat gaa gag 391
Leu Pro Glu Leu Gly Ala Ala Glu Met Asp Leu His Cys Tyr Glu Glu
105 110 115

ggc ttt cct ccg agt gat gat gaa gat gag gaa aat gtg cag tcg atc 439
Gly Phe Pro Pro Ser Asp Asp Glu Asp Glu Glu Asn Val Gln Ser Ile
120 125 130 135

cag acc gca gcg ggt gag gga ata aga gct gcc aat gat ggt ttt aag 487
Gln Thr Ala Ala Gly Glu Gly Ile Arg Ala Ala Asn Asp Gly Phe Lys
140 145 150

ttg gac tac ccg gag ctg cct gga cat ggc tgt aag tct tgt gaa ttt 535
Leu Asp Tyr Pro Glu Leu Pro Gly His Gly Cys Lys Ser Cys Glu Phe
155 160 165

cac agg aat agt act gga cta aaa gaa ctg ttg tgc tcg ctt tgc tat 583
His Arg Asn Ser Thr Gly Leu Lys Glu Leu Leu Cys Ser Leu Cys Tyr
170 175 180

atg aga acg cac tgc cat ttt att tac a gtaagtgtgt ttaacttaaa 631
Met Arg Thr His Cys His Phe Ile Tyr
185 190

tttaaaggga cagtgtagca gtgttaataa ctgtgaatgt gggatttatg tttttgcttg 691

```
tgatttttta tag gt  cct gtg tct gat gct gat gaa tcg cct tct cct         739
               Ser Pro Val Ser Asp Ala Asp Glu Ser Pro Ser Pro
                       195                 200

gat tca act acc tca cct cct gaa att cag gcg cca gtc cct gca aac         787
Asp Ser Thr Thr Ser Pro Pro Glu Ile Gln Ala Pro Val Pro Ala Asn
205                 210                 215                 220

ata tgc aag ccc att cct gtg aag gct aag cct ggg aaa cgc cct gct         835
Ile Cys Lys Pro Ile Pro Val Lys Ala Lys Pro Gly Lys Arg Pro Ala
                225                 230                 235

gtg gat aag ctg gag gac ttg ctt gag ggt ggg gat gga cct ttg gac         883
Val Asp Lys Leu Glu Asp Leu Leu Glu Gly Gly Asp Gly Pro Leu Asp
            240                 245                 250

ttg agt acc cgg aaa ctg cca agg caa tgagtgccct                         920
Leu Ser Thr Arg Lys Leu Pro Arg Gln
        255                 260
```

<210> 68
<211> 261
<212> PRT
<213> Simian adenovirus 27

<400> 68

```
Met Arg His Leu Arg Phe Leu Pro Gln Glu Ile Ser Ile Glu Thr Gly
1               5                   10                  15

Asp Glu Ile Leu Gln Phe Val Val Asn Ala Leu Met Gly Asp Asp Pro
            20                  25                  30

Glu Pro Pro Ala Gln Pro Phe Asp Pro Pro Thr Leu His Glu Leu Tyr
        35                  40                  45

Asp Leu Glu Val Asp Gly Pro Glu Asp Pro Asn Glu Glu Ala Val Asn
    50                  55                  60

Gly Phe Phe Ser Asp Ser Met Leu Leu Ala Ala Ser Glu Gly Val Asp
65                  70                  75                  80

Leu Asp Pro Pro Ser Glu Thr Leu Asp Thr Pro Gly Val Val Val Glu
                85                  90                  95

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

Asp Leu His Cys Tyr Glu Glu Gly Phe Pro Pro Ser Asp Asp Glu Asp
        115                 120                 125
```

```
Glu Glu Asn Val Gln Ser Ile Gln Thr Ala Ala Gly Glu Gly Ile Arg
    130                 135                 140

Ala Ala Asn Asp Gly Phe Lys Leu Asp Tyr Pro Glu Leu Pro Gly His
145                 150                 155                 160

Gly Cys Lys Ser Cys Glu Phe His Arg Asn Ser Thr Gly Leu Lys Glu
                165                 170                 175

Leu Leu Cys Ser Leu Cys Tyr Met Arg Thr His Cys His Phe Ile Tyr
            180                 185                 190

Ser Pro Val Ser Asp Ala Asp Glu Ser Pro Ser Pro Asp Ser Thr Thr
        195                 200                 205

Ser Pro Pro Glu Ile Gln Ala Pro Val Pro Ala Asn Ile Cys Lys Pro
    210                 215                 220

Ile Pro Val Lys Ala Lys Pro Gly Lys Arg Pro Ala Val Asp Lys Leu
225                 230                 235                 240

Glu Asp Leu Leu Glu Gly Gly Asp Gly Pro Leu Asp Leu Ser Thr Arg
                245                 250                 255

Lys Leu Pro Arg Gln
            260
```

<210> 69
<211> 880
<212> DNA
<213> Simian adenovirus 27

<220>
<221> CDS
<222> (9)..(357)
<223> label=33K

<220>
<221> CDS
<222> (527)..(876)
<223> label=33K

<400> 69

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ctctcagg atg tct cag cgc cga gga aac aag aag ttg aaa gtg cag ctg        50
         Met Ser Gln Arg Arg Gly Asn Lys Lys Leu Lys Val Gln Leu
         1               5                   10
```

```
ccg ccc cca gag gat atg gag gaa gac tgg gac agt cag aca gag gag          98
Pro Pro Pro Glu Asp Met Glu Glu Asp Trp Asp Ser Gln Thr Glu Glu
15                  20                  25                  30

atg gaa gat tgg gac agc cag gca gag gag gag gag gac agc ctg gag         146
Met Glu Asp Trp Asp Ser Gln Ala Glu Glu Glu Glu Asp Ser Leu Glu
                35                  40                  45

gaa gac agt ttg gag gag gaa gac gag gag gca gag gag gtg gaa gaa         194
Glu Asp Ser Leu Glu Glu Glu Asp Glu Glu Ala Glu Glu Val Glu Glu
            50                  55                  60

gca acc gcc gcc aaa cag ttg tcc tcg gcg gcg gag aca agc aag gcc         242
Ala Thr Ala Ala Lys Gln Leu Ser Ser Ala Ala Glu Thr Ser Lys Ala
        65                  70                  75

aca gac aac acc aca gct acc atc tcc gtt ccg ggt cgg ggg gtc cag         290
Thr Asp Asn Thr Thr Ala Thr Ile Ser Val Pro Gly Arg Gly Val Gln
    80                  85                  90

cac cgt ccc aac agt aga tgg gat gag acc ggg cga ctc ccg aat gcg         338
His Arg Pro Asn Ser Arg Trp Asp Glu Thr Gly Arg Leu Pro Asn Ala
95                  100                 105                 110

acc acc gct tct aag act g gtaagaagga gcggcaggga tacaagtcct              387
Thr Thr Ala Ser Lys Thr
                115

ggcgggggca taagaacgct atcatatcct gcttgcatga atgcgggggc aacatatcct       447

tcacccgccg ctacctgctc ttccaccacg gggtgaactt cccccgcaat gtcttgcatt       507

actaccgtca cctccacag cc  cct act aca gcc agc aag cct cgg cag aaa         558
                     Ala Pro Thr Thr Ala Ser Lys Pro Arg Gln Lys
                                 120                 125

aag aca aca gca gca aga acc tcc agc aga aaa cca gca gca gtt aga         606
Lys Thr Thr Ala Ala Arg Thr Ser Ser Arg Lys Pro Ala Ala Val Arg
        130                 135                 140

aca ccc aca gca ggt gca aca gga gga gga ctg aga atc aca gcg aac         654
Thr Pro Thr Ala Gly Ala Thr Gly Gly Gly Leu Arg Ile Thr Ala Asn
    145                 150                 155

gag cca gcg cag acc cga gag ctg aga aac cgg att ttt cca acc ctc         702
Glu Pro Ala Gln Thr Arg Glu Leu Arg Asn Arg Ile Phe Pro Thr Leu
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tat gcc atc ttc caa cag agt cgg ggg caa gag cag gaa ctg aaa gta         750
Tyr Ala Ile Phe Gln Gln Ser Arg Gly Gln Glu Gln Glu Leu Lys Val
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aaa aac cga tct ttg cgc tcg ctc acc cga agt tgt ttg tat cac aag         798
Lys Asn Arg Ser Leu Arg Ser Leu Thr Arg Ser Cys Leu Tyr His Lys
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agc gaa gac caa ctt cag cgc act ctc gag gac gcc gag gct ctc ttc         846
Ser Glu Asp Gln Leu Gln Arg Thr Leu Glu Asp Ala Glu Ala Leu Phe
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Asn Lys Tyr Cys Ala Leu Thr Leu Lys Glu
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Asp Trp Asp Ser Gln Ala Glu Glu Glu Glu Asp Ser Leu Glu Glu Asp
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Ser Leu Glu Glu Glu Asp Glu Glu Ala Glu Glu Val Glu Glu Ala Thr
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Ala Ala Lys Gln Leu Ser Ser Ala Ala Glu Thr Ser Lys Ala Thr Asp
65                  70                  75                  80

Asn Thr Thr Ala Thr Ile Ser Val Pro Gly Arg Gly Val Gln His Arg
                85                  90                  95

Pro Asn Ser Arg Trp Asp Glu Thr Gly Arg Leu Pro Asn Ala Thr Thr
            100                 105                 110

Ala Ser Lys Thr Ala Pro Thr Thr Ala Ser Lys Pro Arg Gln Lys Lys
        115                 120                 125

Thr Thr Ala Ala Arg Thr Ser Ser Arg Lys Pro Ala Ala Val Arg Thr
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Pro Thr Ala Gly Ala Thr Gly Gly Gly Leu Arg Ile Thr Ala Asn Glu
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Pro Ala Gln Thr Arg Glu Leu Arg Asn Arg Ile Phe Pro Thr Leu Tyr
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Ala Ile Phe Gln Gln Ser Arg Gly Gln Glu Gln Glu Leu Lys Val Lys
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Asn Arg Ser Leu Arg Ser Leu Thr Arg Ser Cys Leu Tyr His Lys Ser
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Lys Tyr Cys Ala Leu Thr Leu Lys Glu
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gaagccctta acttgggcca ccaggctcat tttaaggaga aggttttatc agttttagat     1860

ttttctaccc ctggtagaac tgctgctgct gtagctttcc ttacttttat attggataa      1919

atg gat ccc aca aac cca ctt cag caa ggg ata cgt ctt gga ttt cat       1967
Met Asp Pro Thr Asn Pro Leu Gln Gln Gly Ile Arg Leu Gly Phe His
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Ser Ser Ser Phe Val Glu Asn Met Glu Gly Pro Gln Ala Glu Asp Asn
            20                  25                  30

ctt aga tta ctg gcc agt gca gcc tct ggg cgt agc agc aat cct gag       2063
Leu Arg Leu Leu Ala Ser Ala Ala Ser Gly Arg Ser Ser Asn Pro Glu
        35                  40                  45

aca ccc acc ggc cat gcc agc ggt ttt gga gga gga gca gca gga gga       2111
Thr Pro Thr Gly His Ala Ser Gly Phe Gly Gly Gly Ala Ala Gly Gly
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caa ccc gag agc cgg ctt gga ccc tcc ggt gga gga ggc gga gga gta       2159
Gln Pro Glu Ser Arg Leu Gly Pro Ser Gly Gly Gly Gly Gly Gly Val
65                  70                  75                  80

gct gac ctg ttt cct gaa ctg cga cgg gtg ctt act agg tct acg tcc       2207
Ala Asp Leu Phe Pro Glu Leu Arg Arg Val Leu Thr Arg Ser Thr Ser
                85                  90                  95

agt gga cag gac agg ggc att aag agg gag agg aat gct agt ggg cat       2255
Ser Gly Gln Asp Arg Gly Ile Lys Arg Glu Arg Asn Ala Ser Gly His
            100                 105                 110

aat tca aga act gag ttg gct tta agt tta atg agt cgc agc cgc cct       2303
Asn Ser Arg Thr Glu Leu Ala Leu Ser Leu Met Ser Arg Ser Arg Pro
        115                 120                 125

gaa act atc tgg tgg cat gag gtt cag agc gag ggc agg gat gaa gtt       2351
Glu Thr Ile Trp Trp His Glu Val Gln Ser Glu Gly Arg Asp Glu Val
    130                 135                 140

tca ata ttg cag gaa aaa tat tct cta gaa caa att aaa acc tgt tgg       2399
Ser Ile Leu Gln Glu Lys Tyr Ser Leu Glu Gln Ile Lys Thr Cys Trp
145                 150                 155                 160

ttg gaa cct gag gat gat tgg gag gtg gcc att agg aat tat gct aag       2447
Leu Glu Pro Glu Asp Asp Trp Glu Val Ala Ile Arg Asn Tyr Ala Lys
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ata tct ctg agg cct gat aaa cag tat aaa att acc aaa aag att aat       2495
Ile Ser Leu Arg Pro Asp Lys Gln Tyr Lys Ile Thr Lys Lys Ile Asn
            180                 185                 190

atc aga aat gca tgc tac ata gca ggg aat ggg gcc gag gtt ata ata       2543
Ile Arg Asn Ala Cys Tyr Ile Ala Gly Asn Gly Ala Glu Val Ile Ile
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cca ggg gtg gct ggc atg gag gca gtg acc ctt atg aat ata agg ttt       2639
Pro Gly Val Ala Gly Met Glu Ala Val Thr Leu Met Asn Ile Arg Phe
225                 230                 235                 240

agg gga gat ggg tat aat ggg att gtc ttt atg gct aac act aag ctg       2687
Arg Gly Asp Gly Tyr Asn Gly Ile Val Phe Met Ala Asn Thr Lys Leu
                245                 250                 255

att ctg cat ggt tgt agc ttt ttt ggg ttt aat aat act tgt gtg gaa       2735
Ile Leu His Gly Cys Ser Phe Phe Gly Phe Asn Asn Thr Cys Val Glu
            260                 265                 270

tct tgg gga caa gtc agt atc agg ggt tgt agt ttc tat gca tgc tgg       2783
Ser Trp Gly Gln Val Ser Ile Arg Gly Cys Ser Phe Tyr Ala Cys Trp
        275                 280                 285

att gca cta tca ggc aga acc aag agt cag ttg tct gtg aag aaa tgc       2831
Ile Ala Leu Ser Gly Arg Thr Lys Ser Gln Leu Ser Val Lys Lys Cys
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Met Phe Glu Arg Cys Asn Leu Gly Ile Leu Asn Glu Gly Glu Ala Arg
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gtc cgc cac tgt gct gct aca gaa act ggc tgc ttc att cta ata aag       2927
Val Arg His Cys Ala Ala Thr Glu Thr Gly Cys Phe Ile Leu Ile Lys
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gga aat gcc agt gtg aag cat aac atg atc tgt gga ccc tcg gat gag       2975
Gly Asn Ala Ser Val Lys His Asn Met Ile Cys Gly Pro Ser Asp Glu
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agg cct tat cag atg ctg acc tgt gct gga gga cat tgc aat atg ctg       3023
Arg Pro Tyr Gln Met Leu Thr Cys Ala Gly Gly His Cys Asn Met Leu
        355                 360                 365

gct act gtg cat att gtt tct cat gca cgc aag aaa tgg cct gtt ttt       3071
Ala Thr Val His Ile Val Ser His Ala Arg Lys Lys Trp Pro Val Phe
    370                 375                 380

gaa cat aat gtg atg acc aag tgc acc atg cac gca ggt ggt cgc agg       3119
Glu His Asn Val Met Thr Lys Cys Thr Met His Ala Gly Gly Arg Arg
385                 390                 395                 400

gga atg ttt atg cct tac cag tgt aac atg aat cat gtg aag gtg atg       3167
Gly Met Phe Met Pro Tyr Gln Cys Asn Met Asn His Val Lys Val Met
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Leu Glu Pro Asp Ala Phe Ser Arg Met Ser Leu Thr Gly Ile Phe Asp
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gtg tgt gtg gat gtg acg gaa gac ctg aga ccc gat cat ttg gtg ctt       3359
Val Cys Val Asp Val Thr Glu Asp Leu Arg Pro Asp His Leu Val Leu
465                 470                 475                 480

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Ala Cys Thr Gly Ala Glu Phe Gly Ser Ser Gly Glu Glu Thr Asp
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Glu Gly Gly Val Phe Ser Pro Tyr Leu Thr Gly Arg Leu Pro Pro Trp
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Ala Gly Val Arg Gln Asn Val Met Gly Ser Thr Val Asp Gly Arg Pro
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Val Gln Pro Ala Asn Ser Ser Thr Leu Thr Tyr Ala Thr Leu Ser Ser
535                 540                 545                 550

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Ser Ser Leu Asp Ala Ala Ala Ala Ala Ala Ala Ser Ala Ala Ala Asn
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act gtc ctt gga atg ggc tat tat gga agc atc gtt gcc aat tcc agt       3759
Thr Val Leu Gly Met Gly Tyr Tyr Gly Ser Ile Val Ala Asn Ser Ser
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Ser Ser Asn Asn Pro Ser Thr Leu Ala Glu Asp Lys Leu Leu Val Leu
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Leu Ala Gln Leu Glu Ala Leu Thr Gln Arg Leu Gly Glu Leu Ser Gln
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cag gtg gcc cag ttg cgc gag caa act gag tct gct gtt gcc aca gca       3903
Gln Val Ala Gln Leu Arg Glu Gln Thr Glu Ser Ala Val Ala Thr Ala
615                 620                 625                 630

aag tct aaa taaagattcc caaatcaata aataaaggag atccttgttg               3952
Lys Ser Lys


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tgttgacgag ccgctcgtcc cccgaaagtt tcatgaccag catgaagggg attagctgct 7792

tgccaaagga ccccatccag gtgtaggttt ccacatcgta ggtgaggaag agcctttctg 7852

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ccaccaccgt gcccttgttt ttccttttgg gcggaggagg cggctctgtt gcttcttgca 8452

tgttcagaag cggtggcgag ggcgcgcgcc gggcggtagg ggcggctctg gccccggcgg 8512

catggctggc agaggcacgt cggcgccgcg cgcgggtagg ttctggtact gcgctctgag 8572

aagacttgcg tgcgcgacga cgcggcggtt gacgtcctgg atctgacgcc tctgggtgaa 8632

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ctcctcctct tcttctatct cttcttccac taacatctct tcttcctctt caggcggggg 9292

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ttcaatgacc tctccgcggc ggcggcgcat ggtctcggtg acggcgcggc cgttctccct     9412

gggtctcaga gtgaagacgc ctccgcgcat ctccctgaag tggtgattgg ggggctctcc     9472

gtttggcagg gacagggcgc tgatgatgca ttttatcaat tgccccgtag ggactccgcg     9532

caaggacctg atcgtctgaa gatccacggg atctgaaaac ctttcgacga aagcgtctaa     9592

ccagtcgcaa tcgcaaggta ggctgagcac tgtttcttgc gggcgggggt ggctagatgc     9652

tcggtcgggg ttctctcttc cttctccttc ctcatcatct cgggagggtg agacgatgct     9712

gctggtgatg aaattaaaat aggcagttct gagacggcgg atggtggcga ggagcaccag     9772

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gtccgctacg acccctttcgg cgaggatggc ttgctgcacc tgggtgaggg tggcttggaa    10012

gtcgtcaaag tccacgaagc gatggtaggc cccggtgttg atggtgtagg agcagttggc    10072

catgactgac cagttgactg tctggtgccc cggacgcacg atctcggtgt acttgagtcg    10132

cgagtaggcg cgggtgtcaa agatgtaatc gttgcaggtg cgcaccaggt actggtagcc    10192

gatgagaaag tgcggcggtg gctggcggta gaggggccat cgctctgtag ccggggctcc    10252

gggggcgagg tcttccagca tgaggcggtg gtatccgtag atgtacctgg acatccaggt    10312

gatcccggag gcggtggtgg acgcccgcgg gaactcgcgc actcggttcc agatgttgcg    10372

cagcggcatg aagtagttca tggtaggcac ggtctggcca gtgaggcggg cgcagtcatt    10432

gatgctctat agacacggag aaaacgaaag cgatgagcgg ctcgcctccg tggcctggag    10492

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cgtagtctgg agaatcaatc gccagggttg cgttgcggtg tgccccggtt cgagccttag    10792

cgcggcccgg atcggccggt ttccgcggca agcgagggtt tggcagcccc gtcatttcta    10852

agaccccgcc agccgacttc tccagtttac gggagcgagc cctctttttt ttttgttttt    10912

gtcgcccag atg cat ccc gtg ctg cga cag atg cgc ccc cag caa cag gtc    10963
          Met His Pro Val Leu Arg Gln Met Arg Pro Gln Gln Gln Val
              635                 640                 645

cct tct cag caa cag cag cag cca caa aag gct ctt cct gct cct gct     11011
Pro Ser Gln Gln Gln Gln Gln Pro Gln Lys Ala Leu Pro Ala Pro Ala
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        650                 655                 660

cct gca act act gca gtc gca gcc gtg tgc ggc gcg gga cag ccc gcc      11059
Pro Ala Thr Thr Ala Val Ala Ala Val Cys Gly Ala Gly Gln Pro Ala
    665                 670                 675

tat gat ctg gac ttg gaa gag ggc gag gga ctg gcg cgc ctg ggt gca      11107
Tyr Asp Leu Asp Leu Glu Glu Gly Glu Gly Leu Ala Arg Leu Gly Ala
680                 685                 690                 695

cca tcg ccc gag cgg cac ccg cgg gtg caa ctg aaa aag gac tct cgc      11155
Pro Ser Pro Glu Arg His Pro Arg Val Gln Leu Lys Lys Asp Ser Arg
                700                 705                 710

gag gcg tac gtg ccc cag cag aac ctg ttc agg gac agg agc ggc gag      11203
Glu Ala Tyr Val Pro Gln Gln Asn Leu Phe Arg Asp Arg Ser Gly Glu
            715                 720                 725

gag ccc gag gag atg cga gcc tct cgc ttt aac gcg ggt cgc gag ctg      11251
Glu Pro Glu Glu Met Arg Ala Ser Arg Phe Asn Ala Gly Arg Glu Leu
        730                 735                 740

cgc cac ggt ctg gac cga aga cgg gtg ctg cgg gac gag gat ttc gag      11299
Arg His Gly Leu Asp Arg Arg Arg Val Leu Arg Asp Glu Asp Phe Glu
    745                 750                 755

gtc gat gaa gtg aca ggg atc agc ccc gct agg gca cat gtg gcc gcg      11347
Val Asp Glu Val Thr Gly Ile Ser Pro Ala Arg Ala His Val Ala Ala
760                 765                 770                 775

gcc aac ctc gtc tcg gcc tac gag cag acc gtg aag gag gag cgc aac      11395
Ala Asn Leu Val Ser Ala Tyr Glu Gln Thr Val Lys Glu Glu Arg Asn
                780                 785                 790

ttc caa aaa tca ttt aac aac cat gtg cgc acc ctg atc gcc cgt gag      11443
Phe Gln Lys Ser Phe Asn Asn His Val Arg Thr Leu Ile Ala Arg Glu
            795                 800                 805

gaa gtg act ctg ggt ctg atg cac ctg tgg gac ctg atg gaa gct atc      11491
Glu Val Thr Leu Gly Leu Met His Leu Trp Asp Leu Met Glu Ala Ile
        810                 815                 820

acc cag aac ccc act agc aaa ccc ctg acc gct cag ctg ttt ctg gta      11539
Thr Gln Asn Pro Thr Ser Lys Pro Leu Thr Ala Gln Leu Phe Leu Val
    825                 830                 835

gtg caa cat agc agg gac aat gag gca ttc agg gag gcg ctg ctg aac      11587
Val Gln His Ser Arg Asp Asn Glu Ala Phe Arg Glu Ala Leu Leu Asn
840                 845                 850                 855

atc acc gag ccc gag ggg aga tgg ttg tat gat ctg atc aat atc ctg      11635
Ile Thr Glu Pro Glu Gly Arg Trp Leu Tyr Asp Leu Ile Asn Ile Leu
                860                 865                 870

cag agt att ata gtg cag gaa cgt agc ttg ggt ctg gct gag aaa gtg      11683
Gln Ser Ile Ile Val Gln Glu Arg Ser Leu Gly Leu Ala Glu Lys Val
            875                 880                 885

gca gcc atc aac tac tcg gtc ttg agc ctg ggc aag tac tac gct cgc      11731
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Ala Ala Ile Asn Tyr Ser Val Leu Ser Leu Gly Lys Tyr Tyr Ala Arg
        890                 895                 900

aag atc tac aag acc ccc tac gtg ccc ata gac aag gag gtg aag ata      11779
Lys Ile Tyr Lys Thr Pro Tyr Val Pro Ile Asp Lys Glu Val Lys Ile
    905                 910                 915

gat ggg ttt tac atg cgc atg act ctc aag gtg ctg act ctc agt gac      11827
Asp Gly Phe Tyr Met Arg Met Thr Leu Lys Val Leu Thr Leu Ser Asp
920                 925                 930                 935

gat ctg ggg gtg tac cgc aac gac agg atg cac cgc gcg gtg agc gcc      11875
Asp Leu Gly Val Tyr Arg Asn Asp Arg Met His Arg Ala Val Ser Ala
                940                 945                 950

agc agg agg cgc gag ctg agc gac aga gaa ctt atg cac agc ttg caa      11923
Ser Arg Arg Arg Glu Leu Ser Asp Arg Glu Leu Met His Ser Leu Gln
            955                 960                 965

aga gct ctg acg ggg gca ggg acc gat ggg gag aac tac ttt gac atg      11971
Arg Ala Leu Thr Gly Ala Gly Thr Asp Gly Glu Asn Tyr Phe Asp Met
        970                 975                 980

ggg gca gac ttg cag tgg caa cct agc cgc agg acc ctg gac gcg gca      12019
Gly Ala Asp Leu Gln Trp Gln Pro Ser Arg Arg Thr Leu Asp Ala Ala
    985                 990                 995

ggg  tgt gag ctt cct tac  gtg gaa gag gtg gat  gaa ggc gag gag       12064
Gly  Cys Glu Leu Pro Tyr  Val Glu Glu Val Asp  Glu Gly Glu Glu
1000                1005                1010

gag  gag ggc gag tac ctg  gaa gac tgatggcgcg acccgtattt ttgctag      12115
Glu  Glu Gly Glu Tyr Leu  Glu Asp
1015                1020

atg gaa cag  cag gca ccg gac ccc  gca atg cgg gcg gcg  ctg cag       12160
Met Glu Gln  Gln Ala Pro Asp Pro  Ala Met Arg Ala Ala  Leu Gln
        1025                1030                1035

agc cag ccg  tcc ggc att aac tcc  tcg gac gat tgg acc  cag gcc       12205
Ser Gln Pro  Ser Gly Ile Asn Ser  Ser Asp Asp Trp Thr  Gln Ala
        1040                1045                1050

atg caa cgc  atc atg gcg ctg acg  acc cgc aac ccc gaa  gcc ttt       12250
Met Gln Arg  Ile Met Ala Leu Thr  Thr Arg Asn Pro Glu  Ala Phe
        1055                1060                1065

aga cag caa  ccc cag gcc aac cgc  ctt tcg gcc atc ctg  gag gcc       12295
Arg Gln Gln  Pro Gln Ala Asn Arg  Leu Ser Ala Ile Leu  Glu Ala
        1070                1075                1080

gta gtt cct  tcc cgc tcc aac ccc  acc cac gag aag gtc  ctg gcc       12340
Val Val Pro  Ser Arg Ser Asn Pro  Thr His Glu Lys Val  Leu Ala
        1085                1090                1095

atc gtg aac  gcg ctg gtg gag aac  aag gcc atc cgt ccc  gat gag       12385
Ile Val Asn  Ala Leu Val Glu Asn  Lys Ala Ile Arg Pro  Asp Glu
        1100                1105                1110
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gcc ggg ctg  gta tac aat gcc ctc  ttg gag cgc gtg gcc  cgc tac       12430
Ala Gly Leu  Val Tyr Asn Ala Leu  Leu Glu Arg Val Ala  Arg Tyr
        1115                 1120                 1125

aac agc agc  aac gtg cag acc aac  ctg gac cgg atg gtg  acc gat       12475
Asn Ser Ser  Asn Val Gln Thr Asn  Leu Asp Arg Met Val  Thr Asp
        1130                 1135                 1140

gtg cgc gag  gcc gtg tct cag cgc  gag cgg ttc cag cgc  gat gcc       12520
Val Arg Glu  Ala Val Ser Gln Arg  Glu Arg Phe Gln Arg  Asp Ala
        1145                 1150                 1155

aac ttg ggg  tcg ctg gtg gcg ctg  aac gcc ttt ctc agc  acc cag       12565
Asn Leu Gly  Ser Leu Val Ala Leu  Asn Ala Phe Leu Ser  Thr Gln
        1160                 1165                 1170

cct gcc aac  gtg ccc cgc ggc cag  caa gac tat aca aac  ttt cta       12610
Pro Ala Asn  Val Pro Arg Gly Gln  Gln Asp Tyr Thr Asn  Phe Leu
        1175                 1180                 1185

agt gca ctg  aga ctc atg gta acc  gaa gtc cct cag agc  gag gtg       12655
Ser Ala Leu  Arg Leu Met Val Thr  Glu Val Pro Gln Ser  Glu Val
        1190                 1195                 1200

tac cag tcc  gga cca gac tat ttc  ttc cag acc agc aga  cag ggc       12700
Tyr Gln Ser  Gly Pro Asp Tyr Phe  Phe Gln Thr Ser Arg  Gln Gly
        1205                 1210                 1215

ttg cag aca  gtg aat ctg agc cag  gct ttc aag aac cta  aag ggg       12745
Leu Gln Thr  Val Asn Leu Ser Gln  Ala Phe Lys Asn Leu  Lys Gly
        1220                 1225                 1230

ctg tgg gga  gtg cac gcc ccg gta  gga gat cgt gcg acc  gtg tct       12790
Leu Trp Gly  Val His Ala Pro Val  Gly Asp Arg Ala Thr  Val Ser
        1235                 1240                 1245

agc ttg ctg  acc ccc aac tcc cgc  cta ctg ctg ctg ctg  gtt gcc       12835
Ser Leu Leu  Thr Pro Asn Ser Arg  Leu Leu Leu Leu Leu  Val Ala
        1250                 1255                 1260

ccc ttc act  gat agc ggt agc atc  gac cgc aac tcc tac  ttg ggc       12880
Pro Phe Thr  Asp Ser Gly Ser Ile  Asp Arg Asn Ser Tyr  Leu Gly
        1265                 1270                 1275

tat ctg ctg  aac ttg tat cgc gag  gcc ata gga cag agc  cag gtg       12925
Tyr Leu Leu  Asn Leu Tyr Arg Glu  Ala Ile Gly Gln Ser  Gln Val
        1280                 1285                 1290

gac gag cag  acc tac caa gaa atc  acc caa gtg agc cgc  gcc ctg       12970
Asp Glu Gln  Thr Tyr Gln Glu Ile  Thr Gln Val Ser Arg  Ala Leu
        1295                 1300                 1305

ggt cag gaa  gat acg ggc agt ttg  gaa gcc acc ttg aac  ttc ttg       13015
Gly Gln Glu  Asp Thr Gly Ser Leu  Glu Ala Thr Leu Asn  Phe Leu
        1310                 1315                 1320

ctg acc aac  cgg tcg cag aag atc  cct cct cag tat gcg  ctt acc       13060
Leu Thr Asn  Arg Ser Gln Lys Ile  Pro Pro Gln Tyr Ala  Leu Thr
        1325                 1330                 1335
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gcg gag gag  gag cgg atc ctg aga  tat gtc cag cag agc  gtg gga       13105
Ala Glu Glu  Glu Arg Ile Leu Arg  Tyr Val Gln Gln Ser  Val Gly
        1340                 1345                 1350

ctg ttc ctg  atg caa gag gga gcg  acc cct agt gcc gcg  ctg gac       13150
Leu Phe Leu  Met Gln Glu Gly Ala  Thr Pro Ser Ala Ala  Leu Asp
        1355                 1360                 1365

atg aca gcg  cga aac atg gag ccc  agc atg tat gcc agt  aac cgg       13195
Met Thr Ala  Arg Asn Met Glu Pro  Ser Met Tyr Ala Ser  Asn Arg
        1370                 1375                 1380

cct ttc atc  aac aaa ctg ctg gac  tac ctg cac aga gca  gcc gct       13240
Pro Phe Ile  Asn Lys Leu Leu Asp  Tyr Leu His Arg Ala  Ala Ala
        1385                 1390                 1395

atg aac tct  gat tat ttc acc aat  gct atc ctc aac ccc  cac tgg       13285
Met Asn Ser  Asp Tyr Phe Thr Asn  Ala Ile Leu Asn Pro  His Trp
        1400                 1405                 1410

ctg ccc ccg  cct gga ttt tac acg  ggc gag tac gac atg  ccc gac       13330
Leu Pro Pro  Pro Gly Phe Tyr Thr  Gly Glu Tyr Asp Met  Pro Asp
        1415                 1420                 1425

ccc aat gac  ggg ttc ctg tgg gac  gat gtg gac agc agc  ata ttc       13375
Pro Asn Asp  Gly Phe Leu Trp Asp  Asp Val Asp Ser Ser  Ile Phe
        1430                 1435                 1440

tcc ccg cct  cct ggt tat aac act  tgg aag aag gaa ggg  ggc gat       13420
Ser Pro Pro  Pro Gly Tyr Asn Thr  Trp Lys Lys Glu Gly  Gly Asp
        1445                 1450                 1455

aga aga cac  tct tcc gtg tcg ctg  tcc gga tcg agg ggt  gct gcc       13465
Arg Arg His  Ser Ser Val Ser Leu  Ser Gly Ser Arg Gly  Ala Ala
        1460                 1465                 1470

gct gcg gtg  ccc gag gct gca agt  cct ttc cct agc ctg  ccc ttt       13510
Ala Ala Val  Pro Glu Ala Ala Ser  Pro Phe Pro Ser Leu  Pro Phe
        1475                 1480                 1485

tct ctg aac  agc gtg cgc agc agt  gaa ctg ggt aga ata  acc cgc       13555
Ser Leu Asn  Ser Val Arg Ser Ser  Glu Leu Gly Arg Ile  Thr Arg
        1490                 1495                 1500

ccg cgc ttg  atg ggc gag gat gag  tac ttg aac gac tcc  ttg ctt       13600
Pro Arg Leu  Met Gly Glu Asp Glu  Tyr Leu Asn Asp Ser  Leu Leu
        1505                 1510                 1515

aga ccc gag  agg gaa aag aac ttc  ccc aac aat ggg ata  gag agc       13645
Arg Pro Glu  Arg Glu Lys Asn Phe  Pro Asn Asn Gly Ile  Glu Ser
        1520                 1525                 1530

ctg gtg gat  aag atg agt aga tgg  aag acc tat gca cag  gat cac       13690
Leu Val Asp  Lys Met Ser Arg Trp  Lys Thr Tyr Ala Gln  Asp His
        1535                 1540                 1545

aaa gac gag  cct agg atc ttg ggg  gct gcg agc ggg acg  acc cgt       13735
Lys Asp Glu  Pro Arg Ile Leu Gly  Ala Ala Ser Gly Thr  Thr Arg
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        1550                1555                1560

agg cgc cag  cgc cat gac aga cag  agg ggt ctt gtg tgg  gac gat       13780
Arg Arg Gln  Arg His Asp Arg Gln  Arg Gly Leu Val Trp  Asp Asp
        1565                1570                1575

gag gac tcg  gcc gat gac agc agc  gtg ttg gac ttg ggt  ggg aga       13825
Glu Asp Ser  Ala Asp Asp Ser Ser  Val Leu Asp Leu Gly  Gly Arg
        1580                1585                1590

gga ggg ggc  aac ccg ttc gct cat  ctg cgc ccg cac ttt  ggg cgc       13870
Gly Gly Gly  Asn Pro Phe Ala His  Leu Arg Pro His Phe  Gly Arg
        1595                1600                1605

atg ttg taaaagtgaa agtaaaataa aaaggcaact caccaaggcc atggcgacga       13926
Met Leu


gcgtgcgttc gttcttttct gttatctgtg tctagt atg  atg agg cga gcc gtg     13980
                                        Met  Met Arg Arg Ala Val
                                        1610                1615

cta ggc gga gcg gtg  gtg tat ccg gag ggt  cct cct cct tcg tac       14025
Leu Gly Gly Ala Val  Val Tyr Pro Glu Gly  Pro Pro Pro Ser Tyr
                1620                1625                1630

gag agc gtg atg cag  cag cag gcg gcg gcg  gtg atg cag ccc tcg       14070
Glu Ser Val Met Gln  Gln Gln Ala Ala Ala  Val Met Gln Pro Ser
                1635                1640                1645

ctg gag gct ccc ttt  gta ccc ccg cgg tac  ctg gcg cct aca gag       14115
Leu Glu Ala Pro Phe  Val Pro Pro Arg Tyr  Leu Ala Pro Thr Glu
                1650                1655                1660

ggg aga aac agc att  cgt tac tcg gag ctg  gcg ccc cag tac gat       14160
Gly Arg Asn Ser Ile  Arg Tyr Ser Glu Leu  Ala Pro Gln Tyr Asp
                1665                1670                1675

acc acc agg ttg tat  ctg gtg gac aac aag  tcg gcg gac atc gcc       14205
Thr Thr Arg Leu Tyr  Leu Val Asp Asn Lys  Ser Ala Asp Ile Ala
                1680                1685                1690

tca ttg aac tat cag  aac gac cac agc aac  ttc ctg acc acg gtg       14250
Ser Leu Asn Tyr Gln  Asn Asp His Ser Asn  Phe Leu Thr Thr Val
                1695                1700                1705

gtg cag aac aat gac  ttt acc ccc acg gag  gcc agc acc cag acc       14295
Val Gln Asn Asn Asp  Phe Thr Pro Thr Glu  Ala Ser Thr Gln Thr
                1710                1715                1720

atc aac ttt gac gag  cgg tcg cgg tgg ggc  ggt cag ctg aag acc       14340
Ile Asn Phe Asp Glu  Arg Ser Arg Trp Gly  Gly Gln Leu Lys Thr
                1725                1730                1735

atc atg cac acc aac  atg ccc aac gtg aac  gag tac atg ttc agc       14385
Ile Met His Thr Asn  Met Pro Asn Val Asn  Glu Tyr Met Phe Ser
                1740                1745                1750

aac aag ttc aag gct  cgg gtg atg gtg tct  aga gag gcc tca aag       14430
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Asn Lys Phe Lys Ala  Arg Val Met Val Ser  Arg Glu Ala Ser Lys
                1755                1760                1765

att gat tca gag aaa  aat gac agg agc aag  gac act ctc aag tat        14475
Ile Asp Ser Glu Lys  Asn Asp Arg Ser Lys  Asp Thr Leu Lys Tyr
                1770                1775                1780

gag tgg ttt gag ttc  act cta cca gaa ggc  aac ttc tca gcc acc        14520
Glu Trp Phe Glu Phe  Thr Leu Pro Glu Gly  Asn Phe Ser Ala Thr
                1785                1790                1795

atg acc atc gac ctg  atg aac aat gcc atc  att gac aac tac ttg        14565
Met Thr Ile Asp Leu  Met Asn Asn Ala Ile  Ile Asp Asn Tyr Leu
                1800                1805                1810

gcc gtg ggt aga cag  aat gga gtg ctg caa  agt gac atc ggt gtc        14610
Ala Val Gly Arg Gln  Asn Gly Val Leu Gln  Ser Asp Ile Gly Val
                1815                1820                1825

aag ttt gat acc agg  aac ttc agg ctg ggc  tgg gac cct gta act        14655
Lys Phe Asp Thr Arg  Asn Phe Arg Leu Gly  Trp Asp Pro Val Thr
                1830                1835                1840

aaa ctt gtt atg cca  ggg gtc tac act tat  gaa gcc ttt cat cct        14700
Lys Leu Val Met Pro  Gly Val Tyr Thr Tyr  Glu Ala Phe His Pro
                1845                1850                1855

gat att gtt tta cta  cct gac tgt ggg gtg  gac ttt act gag agc        14745
Asp Ile Val Leu Leu  Pro Asp Cys Gly Val  Asp Phe Thr Glu Ser
                1860                1865                1870

cgc ctt agc aac ttg  ctt ggc atc agg aag  aga cac cca ttc cag        14790
Arg Leu Ser Asn Leu  Leu Gly Ile Arg Lys  Arg His Pro Phe Gln
                1875                1880                1885

gaa ggc ttc aag ata  atg tat gag gat ctt  gaa ggg ggt aat atc        14835
Glu Gly Phe Lys Ile  Met Tyr Glu Asp Leu  Glu Gly Gly Asn Ile
                1890                1895                1900

cct gcc ctt cta gat  gta gcc gaa tat gaa  aaa agc aaa aag gaa        14880
Pro Ala Leu Leu Asp  Val Ala Glu Tyr Glu  Lys Ser Lys Lys Glu
                1905                1910                1915

att gca agc agc act  act act act act gca  gta aca act gtt gca        14925
Ile Ala Ser Ser Thr  Thr Thr Thr Thr Ala  Val Thr Thr Val Ala
                1920                1925                1930

aga aat gtt gct gat  act tca gtt gaa gcg  gta gca gtt gcc gta        14970
Arg Asn Val Ala Asp  Thr Ser Val Glu Ala  Val Ala Val Ala Val
                1935                1940                1945

gta gat act att aag  gca gaa aat gac agt  gcg gtc aga ggc gat        15015
Val Asp Thr Ile Lys  Ala Glu Asn Asp Ser  Ala Val Arg Gly Asp
                1950                1955                1960

aac ttt caa tcg aaa  aat gac atg aaa gca  tct gag gaa gta acg        15060
Asn Phe Gln Ser Lys  Asn Asp Met Lys Ala  Ser Glu Glu Val Thr
                1965                1970                1975
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gtg gtg cct gta agt  ccg ccc aca gta act  gaa act gaa acc aaa        15105
Val Val Pro Val Ser  Pro Pro Thr Val Thr  Glu Thr Glu Thr Lys
                1980                1985                1990

gaa cca acc att aaa  cct cta gaa aag gat  acc aag gat cgc agt        15150
Glu Pro Thr Ile Lys  Pro Leu Glu Lys Asp  Thr Lys Asp Arg Ser
                1995                2000                2005

tac aat gtc atc tct  ggc acc aat gat act  gcc tat cgc agt tgg        15195
Tyr Asn Val Ile Ser  Gly Thr Asn Asp Thr  Ala Tyr Arg Ser Trp
                2010                2015                2020

tac cta gca tac aac  tat ggc gac cct gaa  aaa gga gtc cgc tcc        15240
Tyr Leu Ala Tyr Asn  Tyr Gly Asp Pro Glu  Lys Gly Val Arg Ser
                2025                2030                2035

tgg aca ctg ctc acc  act tca gat gtc acc  tgc gga gcg gag caa        15285
Trp Thr Leu Leu Thr  Thr Ser Asp Val Thr  Cys Gly Ala Glu Gln
                2040                2045                2050

gta tat tgg tct ctc  cct gac atg atg cag  gac ccc gtc acc ttc        15330
Val Tyr Trp Ser Leu  Pro Asp Met Met Gln  Asp Pro Val Thr Phe
                2055                2060                2065

cgc tct acg aga caa  gtc agc aac tac ccc  gtg gtg ggt gca gag        15375
Arg Ser Thr Arg Gln  Val Ser Asn Tyr Pro  Val Val Gly Ala Glu
                2070                2075                2080

ctc atg ccc gtc ttc  tca aag agt ttc tac  aac gag caa gcc gtg        15420
Leu Met Pro Val Phe  Ser Lys Ser Phe Tyr  Asn Glu Gln Ala Val
                2085                2090                2095

tac tcc cag cag ctc  cgc cag acc acc tcg  ctc acg cac gtc ttc        15465
Tyr Ser Gln Gln Leu  Arg Gln Thr Thr Ser  Leu Thr His Val Phe
                2100                2105                2110

aat cgc ttc cct gag  aat cag atc ctc atc  cgc ccg ccg gcg ccc        15510
Asn Arg Phe Pro Glu  Asn Gln Ile Leu Ile  Arg Pro Pro Ala Pro
                2115                2120                2125

acc att acc acc gtc  agt gaa aac gtt cct  gct ctc aca gat cac        15555
Thr Ile Thr Thr Val  Ser Glu Asn Val Pro  Ala Leu Thr Asp His
                2130                2135                2140

ggg acc ctg ccg ttg  cgc agc agt atc cgg  gga gtc cag cgc gtg        15600
Gly Thr Leu Pro Leu  Arg Ser Ser Ile Arg  Gly Val Gln Arg Val
                2145                2150                2155

acc gtt act gac gcc  aga cgc cgc acc tgc  ccc tac gtc tac aag        15645
Thr Val Thr Asp Ala  Arg Arg Arg Thr Cys  Pro Tyr Val Tyr Lys
                2160                2165                2170

gcc ctg ggc ata gtc  gcg ccg cgc gtc ctt  tca agc cgc act ttc        15690
Ala Leu Gly Ile Val  Ala Pro Arg Val Leu  Ser Ser Arg Thr Phe
                2175                2180                2185

taaaaa atg tcc att ctc atc  tca ccc agt aat aac  acc ggt tgg ggg     15738
       Met Ser Ile Leu Ile  Ser Pro Ser Asn Asn  Thr Gly Trp Gly
                         2190                2195
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ctg  cgc aca ccc acc agg  atg tac gga ggc gct  cgc aaa cgg tct       15783
Leu  Arg Thr Pro Thr Arg  Met Tyr Gly Gly Ala  Arg Lys Arg Ser
2200                2205                2210

acc  cag cac cct gtg cgt  gtg cgc ggg cat ttc  cgc gct ccc tgg       15828
Thr  Gln His Pro Val Arg  Val Arg Gly His Phe  Arg Ala Pro Trp
2215                2220                2225

ggc  gcc ctc aag ggc cgt  gct cgc act agg acc  acc gtc gat gat       15873
Gly  Ala Leu Lys Gly Arg  Ala Arg Thr Arg Thr  Thr Val Asp Asp
2230                2235                2240

gtg  atc gac cag gtg gtt  gca gat gct cgt aat  tat act cct gct       15918
Val  Ile Asp Gln Val Val  Ala Asp Ala Arg Asn  Tyr Thr Pro Ala
2245                2250                2255

gca  cct gca tct act gtg  gat gca gtt att gac  agc gtt gtg gct       15963
Ala  Pro Ala Ser Thr Val  Asp Ala Val Ile Asp  Ser Val Val Ala
2260                2265                2270

gac  gct cgc gac tat gct  cgc agg aag agc agg  cga aga cgc atc       16008
Asp  Ala Arg Asp Tyr Ala  Arg Arg Lys Ser Arg  Arg Arg Arg Ile
2275                2280                2285

gcc  agg cgc cac cga gct  acc ccc gcc atg cga  gct gca aga gct       16053
Ala  Arg Arg His Arg Ala  Thr Pro Ala Met Arg  Ala Ala Arg Ala
2290                2295                2300

ctg  ctg cgg aga gcc aaa  cgc gtg ggg cga aga  gcc atg ctt aga       16098
Leu  Leu Arg Arg Ala Lys  Arg Val Gly Arg Arg  Ala Met Leu Arg
2305                2310                2315

gcg  gcc aga cgc gcg gct  tca ggt gcc agc gca  ggc agg tcc cgc       16143
Ala  Ala Arg Arg Ala Ala  Ser Gly Ala Ser Ala  Gly Arg Ser Arg
2320                2325                2330

agg  cgc gcg gcc acg gcg  gca gca gcg gcc atc  gcc aac atg gcc       16188
Arg  Arg Ala Ala Thr Ala  Ala Ala Ala Ala Ile  Ala Asn Met Ala
2335                2340                2345

caa  ccg cga aga ggc aat  gtg tac tgg gtg cgc  gat gcc act acc       16233
Gln  Pro Arg Arg Gly Asn  Val Tyr Trp Val Arg  Asp Ala Thr Thr
2350                2355                2360

ggc  cag cgc gtg ccc gtg  cgc acc cgt ccc cct  cgc act tagaagatac    16282
Gly  Gln Arg Val Pro Val  Arg Thr Arg Pro Pro  Arg Thr
2365                2370                2375

tgagcagtct ccgatgttgt gtcccagcgg cgagg atg tcc aag  cgc aaa tac      16335
                                       Met Ser Lys  Arg Lys Tyr
                                                2380

aag gaa  gag atg ctc cag gtc  atc gcg cct gaa atc  tac ggt cca       16380
Lys Glu  Glu Met Leu Gln Val  Ile Ala Pro Glu Ile  Tyr Gly Pro
    2385                2390                2395

ccg gtg  aag gat gaa aaa aag  ccc cgc aaa atc aag  cgg gtc aaa       16425
Pro Val  Lys Asp Glu Lys Lys  Pro Arg Lys Ile Lys  Arg Val Lys
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    2400                2405                2410

aag gac  aaa aag gaa gaa gat  ggc gat gat ggg ctg  gtg gag ttt       16470
Lys Asp  Lys Lys Glu Glu Asp  Gly Asp Asp Gly Leu  Val Glu Phe
    2415                2420                2425

gtg cgc  gag ttc gct cca agg  cgg cgc gta cag tgg  cgc ggg cgc       16515
Val Arg  Glu Phe Ala Pro Arg  Arg Arg Val Gln Trp  Arg Gly Arg
    2430                2435                2440

agg gtg  cgg ccg gtg ctg agg  ccc gga acc acg gtg  gtc ttc acg       16560
Arg Val  Arg Pro Val Leu Arg  Pro Gly Thr Thr Val  Val Phe Thr
    2445                2450                2455

ccc ggc  gaa cgc tcc agc act  act ttt aaa cgc tcc  tat gat gag       16605
Pro Gly  Glu Arg Ser Ser Thr  Thr Phe Lys Arg Ser  Tyr Asp Glu
    2460                2465                2470

gtg tac  ggg gat gat gat att  ctg gag cag gca gcc  gac cgc ctg       16650
Val Tyr  Gly Asp Asp Asp Ile  Leu Glu Gln Ala Ala  Asp Arg Leu
    2475                2480                2485

ggc gag  ttt gct tat ggc aaa  cgc agc cgc tcc agt  ccc aag gat       16695
Gly Glu  Phe Ala Tyr Gly Lys  Arg Ser Arg Ser Ser  Pro Lys Asp
    2490                2495                2500

gag gcg  gtg tcc atc ccc ttg  gat cat gga aat ccc  acc cca agt       16740
Glu Ala  Val Ser Ile Pro Leu  Asp His Gly Asn Pro  Thr Pro Ser
    2505                2510                2515

cta aaa  cca gtc acc ctg cag  caa gtg cta ccc gtg  cct cca cgg       16785
Leu Lys  Pro Val Thr Leu Gln  Gln Val Leu Pro Val  Pro Pro Arg
    2520                2525                2530

aga ggt  gtc aag cga gag ggc  gag gat ctg tat ccc  acc atg caa       16830
Arg Gly  Val Lys Arg Glu Gly  Glu Asp Leu Tyr Pro  Thr Met Gln
    2535                2540                2545

ctg atg  gtg ccc aag cgc cag  aag ctg gag gac gtg  ctg gag aaa       16875
Leu Met  Val Pro Lys Arg Gln  Lys Leu Glu Asp Val  Leu Glu Lys
    2550                2555                2560

atg aaa  gtg gat ccc gat atc  cag cct gaa gtt aaa  gtc aga ccc       16920
Met Lys  Val Asp Pro Asp Ile  Gln Pro Glu Val Lys  Val Arg Pro
    2565                2570                2575

atc aag  cag gtg gcg ccc ggt  ctg gga gta caa acc  gtg gac atc       16965
Ile Lys  Gln Val Ala Pro Gly  Leu Gly Val Gln Thr  Val Asp Ile
    2580                2585                2590

aag att  ccc acc gag tcc atg  gaa gtc cag act gaa  cct gca aag       17010
Lys Ile  Pro Thr Glu Ser Met  Glu Val Gln Thr Glu  Pro Ala Lys
    2595                2600                2605

cct aca  gcc acc tcc att gag  gtg cag aca gat cca  tgg atg ccc       17055
Pro Thr  Ala Thr Ser Ile Glu  Val Gln Thr Asp Pro  Trp Met Pro
    2610                2615                2620

gcg ccc  att gca acc acc gcc  agt acc gct cga aga  cca cgg cga       17100
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Ala Pro  Ile Ala Thr Thr Ala  Ser Thr Ala Arg Arg  Pro Arg Arg
    2625                2630                2635

aag tat  ggt cct gcg agt ctg  ctg atg ccc aac tat  gct ctg cac       17145
Lys Tyr  Gly Pro Ala Ser Leu  Leu Met Pro Asn Tyr  Ala Leu His
    2640                2645                2650

cca tcc  att att cca act cct  ggt tac cga ggc act  cgc tac tac       17190
Pro Ser  Ile Ile Pro Thr Pro  Gly Tyr Arg Gly Thr  Arg Tyr Tyr
    2655                2660                2665

cgc agc  cgg agc acc act tcc  cgc cgc cgc aaa aca  cct gca agc       17235
Arg Ser  Arg Ser Thr Thr Ser  Arg Arg Arg Lys Thr  Pro Ala Ser
    2670                2675                2680

cgc agc  cgc cgt cgc cgc cgc  cgc acc gcc agc aaa  ctg act ccc       17280
Arg Ser  Arg Arg Arg Arg Arg  Arg Thr Ala Ser Lys  Leu Thr Pro
    2685                2690                2695

gcc gct  ttg gtg cgg agg gtg  tat cgc gat ggc cgc  gca gag ccc       17325
Ala Ala  Leu Val Arg Arg Val  Tyr Arg Asp Gly Arg  Ala Glu Pro
    2700                2705                2710

ctg atg  ctg ccg cgc gca cgc  tac cat cca agc atc  acc act           17367
Leu Met  Leu Pro Arg Ala Arg  Tyr His Pro Ser Ile  Thr Thr
    2715                2720                2725

taatgactgt tgccactgcc tccttgcaga t atg gcc ctc  act tgc cgc ctt      17419
                                    Met Ala Leu  Thr Cys Arg Leu
                                            2730

cgc  gtc ccc att act ggc  tac cga gga aga aac  tcg cgc cgt aga       17464
Arg  Val Pro Ile Thr Gly  Tyr Arg Gly Arg Asn  Ser Arg Arg Arg
2735                2740                2745

agg  atg ttg ggg cgc ggg  atg cgt cgc cac agg  cgg cgg cgc gct       17509
Arg  Met Leu Gly Arg Gly  Met Arg Arg His Arg  Arg Arg Arg Ala
2750                2755                2760

atc  agc aag agg ctg ggg  ggt ggc ttt ctg acc  gct ttg att ccc       17554
Ile  Ser Lys Arg Leu Gly  Gly Gly Phe Leu Thr  Ala Leu Ile Pro
2765                2770                2775

att  atc gcc gcg gcg att  ggg gca gta cca ggc  ata gct tcc gtg       17599
Ile  Ile Ala Ala Ala Ile  Gly Ala Val Pro Gly  Ile Ala Ser Val
2780                2785                2790

gcg  gtt cag gcc tcg cag  cgc cac tgacattgga aaaacttata             17643
Ala  Val Gln Ala Ser Gln  Arg His
2795                2800

aataaaatag aatggactct gacgctcctg gtcctgtgac tatgtttttg tagag atg    17701
                                                              Met


gaa gac  atc aat ttt tca tcc  ctg gct ccg cga cac  ggc acg agg       17746
Glu Asp  Ile Asn Phe Ser Ser  Leu Ala Pro Arg His  Gly Thr Arg
    2805                2810                2815
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ccg tac  atg ggc acc tgg agc  gac atc ggc acc agc  caa ctg aac       17791
Pro Tyr  Met Gly Thr Trp Ser  Asp Ile Gly Thr Ser  Gln Leu Asn
    2820                 2825                 2830

ggg ggc  gcc ttc aat tgg agc  agt atc tgg agc ggg  ctt aaa aat       17836
Gly Gly  Ala Phe Asn Trp Ser  Ser Ile Trp Ser Gly  Leu Lys Asn
    2835                 2840                 2845

ttt ggc  tct acc ata aaa acc  tat ggg aac aaa gct  tgg aac agc       17881
Phe Gly  Ser Thr Ile Lys Thr  Tyr Gly Asn Lys Ala  Trp Asn Ser
    2850                 2855                 2860

agc aca  ggg cag gcg ctg agg  aat aag ctt aaa gag  cag aac ttc       17926
Ser Thr  Gly Gln Ala Leu Arg  Asn Lys Leu Lys Glu  Gln Asn Phe
    2865                 2870                 2875

caa cag  aag gtg gtc gat ggg  atc gcc tct ggc atc  aat ggg gtg       17971
Gln Gln  Lys Val Val Asp Gly  Ile Ala Ser Gly Ile  Asn Gly Val
    2880                 2885                 2890

gtg gat  ctg gcc aac cag gcc  gtg cag aaa cag ata  aac agc cgc       18016
Val Asp  Leu Ala Asn Gln Ala  Val Gln Lys Gln Ile  Asn Ser Arg
    2895                 2900                 2905

ctg gac  gcg ccg cct gca gcc  cct ggc gaa atg gaa  gtg gag gaa       18061
Leu Asp  Ala Pro Pro Ala Ala  Pro Gly Glu Met Glu  Val Glu Glu
    2910                 2915                 2920

gag ctc  cct ccc ctg gaa aag  cgg gga gac aag cgc  ccg cgt ccc       18106
Glu Leu  Pro Pro Leu Glu Lys  Arg Gly Asp Lys Arg  Pro Arg Pro
    2925                 2930                 2935

gat atg  gag gag acg ctg gtg  acg cgc gga gac gag  ccg cct cca       18151
Asp Met  Glu Glu Thr Leu Val  Thr Arg Gly Asp Glu  Pro Pro Pro
    2940                 2945                 2950

tac gag  gag gca ata aag ctt  gga atg ccc act acc  agg cct ata       18196
Tyr Glu  Glu Ala Ile Lys Leu  Gly Met Pro Thr Thr  Arg Pro Ile
    2955                 2960                 2965

gct ccc  atg gcc acc ggg gta  atg aaa cct tct cag  tcg cat cga       18241
Ala Pro  Met Ala Thr Gly Val  Met Lys Pro Ser Gln  Ser His Arg
    2970                 2975                 2980

ccc gcc  acc ttg gac ttg cct  cct tcc cct gct gct  gtc gcg tcc       18286
Pro Ala  Thr Leu Asp Leu Pro  Pro Ser Pro Ala Ala  Val Ala Ser
    2985                 2990                 2995

gct cca  aag cct gtc gct acc  ccg aag ccc acc acc  gta cag ccc       18331
Ala Pro  Lys Pro Val Ala Thr  Pro Lys Pro Thr Thr  Val Gln Pro
    3000                 3005                 3010

gtc gcc  gta gcc aga ccg cgt  ccc ggg ggc act ccg  cgc ccg aat       18376
Val Ala  Val Ala Arg Pro Arg  Pro Gly Gly Thr Pro  Arg Pro Asn
    3015                 3020                 3025

gca aac  tgg cag agt act ctg  aac agc atc gtg ggt  ctg ggc gtg       18421
Ala Asn  Trp Gln Ser Thr Leu  Asn Ser Ile Val Gly  Leu Gly Val
    3030                 3035                 3040
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cag agt  gta aag cgc cgt cgc  tgc tat taattaaata tggagtagcg          18468
Gln Ser  Val Lys Arg Arg Arg  Cys Tyr
    3045                3050

cttaacttgc ttgtctgtgt gtatgtgtca tcaccacgcc gccgcagcag cagcagagga    18528

gaaaggaaga ggtcgcgcga cgaggctgag ttgctttcaa g atg gcc acc  cca       18581
                                              Met Ala Thr  Pro
                                                      3055

tcg atg ttg ccc  cag tgg gca tac atg  cac atc gcc gga cag  gat       18626
Ser Met Leu Pro  Gln Trp Ala Tyr Met  His Ile Ala Gly Gln  Asp
            3060                3065                3070

gct tcg gaa tac  ctg agt ccg ggt ctg  gtg cag ttc gcc cgt  gcc       18671
Ala Ser Glu Tyr  Leu Ser Pro Gly Leu  Val Gln Phe Ala Arg  Ala
            3075                3080                3085

aca gac acc tac  ttc aat ctg ggg aac  aag ttt agg aac ccc  acc       18716
Thr Asp Thr Tyr  Phe Asn Leu Gly Asn  Lys Phe Arg Asn Pro  Thr
            3090                3095                3100

gtg gcc ccc acc  cac gat gtg acc acc  gac cga agc cag cgg  ctg       18761
Val Ala Pro Thr  His Asp Val Thr Thr  Asp Arg Ser Gln Arg  Leu
            3105                3110                3115

atg ctg cgc ttt  gtg ccc gtt gat cgg  gag gac aat acc tac  tct       18806
Met Leu Arg Phe  Val Pro Val Asp Arg  Glu Asp Asn Thr Tyr  Ser
            3120                3125                3130

tac aaa gtt cgc  tac aca ctg gct gtg  ggc gac aac aga gtg  ctg       18851
Tyr Lys Val Arg  Tyr Thr Leu Ala Val  Gly Asp Asn Arg Val  Leu
            3135                3140                3145

gat atg gcc agc  acc ttc ttt gac atc  agg ggc gtg ctt gac  aga       18896
Asp Met Ala Ser  Thr Phe Phe Asp Ile  Arg Gly Val Leu Asp  Arg
            3150                3155                3160

ggt ccc agt ttc  aag cca tac tct ggc  aca gct tac aac tcc  ctg       18941
Gly Pro Ser Phe  Lys Pro Tyr Ser Gly  Thr Ala Tyr Asn Ser  Leu
            3165                3170                3175

gct cct aaa ggc  gcc ccc aat aca tct  cag tgg gtt gat gaa  gga       18986
Ala Pro Lys Gly  Ala Pro Asn Thr Ser  Gln Trp Val Asp Glu  Gly
            3180                3185                3190

aag aaa att aca  gac aac ggt gtg gaa  gca gct gat gac aat  gca       19031
Lys Lys Ile Thr  Asp Asn Gly Val Glu  Ala Ala Asp Asp Asn  Ala
            3195                3200                3205

aaa gct act tac  act ttt ggc aat gct  cca gtg aaa gcg gag  gat       19076
Lys Ala Thr Tyr  Thr Phe Gly Asn Ala  Pro Val Lys Ala Glu  Asp
            3210                3215                3220

gac att aca aaa  gat ggt tta cca gta  gca gta gaa gtt act  ggc       19121
Asp Ile Thr Lys  Asp Gly Leu Pro Val  Ala Val Glu Val Thr  Gly
            3225                3230                3235
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gaa gat gat gaa  act aaa cca att tat  gca gat aag ttg tat  cag       19166
Glu Asp Asp Glu  Thr Lys Pro Ile Tyr  Ala Asp Lys Leu Tyr  Gln
            3240                3245                3250

cca gaa cca cag  gta gga gag gaa aca  tgg act gat aca gat  gcg       19211
Pro Glu Pro Gln  Val Gly Glu Glu Thr  Trp Thr Asp Thr Asp  Ala
            3255                3260                3265

acc act gag aag  tat ggc ggt aga gca  ctt aag cct gac act  aaa       19256
Thr Thr Glu Lys  Tyr Gly Gly Arg Ala  Leu Lys Pro Asp Thr  Lys
            3270                3275                3280

atg aaa cca tgt  tac gga tct ttt gct  aaa cca acc aat act  aaa       19301
Met Lys Pro Cys  Tyr Gly Ser Phe Ala  Lys Pro Thr Asn Thr  Lys
            3285                3290                3295

ggt ggt cag gca  aaa gta aaa aag aca  gaa gaa gaa aca gtt  gac       19346
Gly Gly Gln Ala  Lys Val Lys Lys Thr  Glu Glu Glu Thr Val  Asp
            3300                3305                3310

cct aca aaa gtt  caa tat gac att gat  atg aac ttc ttt gaa  gaa       19391
Pro Thr Lys Val  Gln Tyr Asp Ile Asp  Met Asn Phe Phe Glu  Glu
            3315                3320                3325

aga tct cag aaa  aat ggc agt ccc aaa  att gtg atg tat gca  gaa       19436
Arg Ser Gln Lys  Asn Gly Ser Pro Lys  Ile Val Met Tyr Ala  Glu
            3330                3335                3340

aat gta gat ttg  gaa act cca gat act  cat gtg gtg tac aaa  cct       19481
Asn Val Asp Leu  Glu Thr Pro Asp Thr  His Val Val Tyr Lys  Pro
            3345                3350                3355

ggt act tca gaa  gac agt tca cat gct  aat ctg ggt caa cag  tct       19526
Gly Thr Ser Glu  Asp Ser Ser His Ala  Asn Leu Gly Gln Gln  Ser
            3360                3365                3370

atg ccc aat aga  ccc aac tac att ggc  ttt agg gat aat ttt  atc       19571
Met Pro Asn Arg  Pro Asn Tyr Ile Gly  Phe Arg Asp Asn Phe  Ile
            3375                3380                3385

ggc ctt atg tac  tac aac agc act ggg  aac atg gga gtg ctg  gct       19616
Gly Leu Met Tyr  Tyr Asn Ser Thr Gly  Asn Met Gly Val Leu  Ala
            3390                3395                3400

ggt caa gca tct  cag ttg aat gcg gtg  gtt gac ttg caa gac  aga       19661
Gly Gln Ala Ser  Gln Leu Asn Ala Val  Val Asp Leu Gln Asp  Arg
            3405                3410                3415

aac aca gaa ctg  tct tac caa tta ttg  ctt gac tct ctg ggc  gac       19706
Asn Thr Glu Leu  Ser Tyr Gln Leu Leu  Leu Asp Ser Leu Gly  Asp
            3420                3425                3430

agg acc aga tac  ttt agc atg tgg aat  cag gcg gta gat agc  tat       19751
Arg Thr Arg Tyr  Phe Ser Met Trp Asn  Gln Ala Val Asp Ser  Tyr
            3435                3440                3445

gat cct gat gtg  cgc att att gaa aat  cat gga gtg gaa gac  gag       19796
Asp Pro Asp Val  Arg Ile Ile Glu Asn  His Gly Val Glu Asp  Glu
            3450                3455                3460
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ctt ccc aac tac  tgc ttt cca tta gat  gga gtg ggc cca aga  aca       19841
Leu Pro Asn Tyr  Cys Phe Pro Leu Asp  Gly Val Gly Pro Arg  Thr
            3465                 3470                 3475

gtt agc tac aaa  caa atg gaa cca aac  ggg aca gac gca gca  gat       19886
Val Ser Tyr Lys  Gln Met Glu Pro Asn  Gly Thr Asp Ala Ala  Asp
            3480                 3485                 3490

gct aat ggt tgg  aaa aat gtt act cca  act gga atc agt gaa  att       19931
Ala Asn Gly Trp  Lys Asn Val Thr Pro  Thr Gly Ile Ser Glu  Ile
            3495                 3500                 3505

gct aaa ggc aat  cct ttc gcc atg gaa  att aat ctc caa gcc  aat       19976
Ala Lys Gly Asn  Pro Phe Ala Met Glu  Ile Asn Leu Gln Ala  Asn
            3510                 3515                 3520

cta tgg aga agt  ttc ctt tat tca aat  gtg gcc ctg tat cta  cca       20021
Leu Trp Arg Ser  Phe Leu Tyr Ser Asn  Val Ala Leu Tyr Leu  Pro
            3525                 3530                 3535

gat tcc tac aaa  tac acc ccg gcc aat  gtt act ctt ccc acc  aac       20066
Asp Ser Tyr Lys  Tyr Thr Pro Ala Asn  Val Thr Leu Pro Thr  Asn
            3540                 3545                 3550

acc aac act tat  gac tac ctg aac gga  cgg gtg gtt ccc cca  tct       20111
Thr Asn Thr Tyr  Asp Tyr Leu Asn Gly  Arg Val Val Pro Pro  Ser
            3555                 3560                 3565

ctg gtg gat act  tat gta aac att gga  gcc aga tgg tct ctt  gat       20156
Leu Val Asp Thr  Tyr Val Asn Ile Gly  Ala Arg Trp Ser Leu  Asp
            3570                 3575                 3580

gcc atg gac aat  gtt aat cca ttt aac  cac cac cgc aat gct  gga       20201
Ala Met Asp Asn  Val Asn Pro Phe Asn  His His Arg Asn Ala  Gly
            3585                 3590                 3595

ctg cgc tac cgg  tcc atg ctt ttg ggc  aat ggt cgc tat gtt  cca       20246
Leu Arg Tyr Arg  Ser Met Leu Leu Gly  Asn Gly Arg Tyr Val  Pro
            3600                 3605                 3610

ttc cac ata caa  gtg cct cag aaa ttc  ttt gct atc aag aac  ctg       20291
Phe His Ile Gln  Val Pro Gln Lys Phe  Phe Ala Ile Lys Asn  Leu
            3615                 3620                 3625

ttg ctt ctc cct  ggc tcc tac acc tat  gag tgg aac ttc aga  aag       20336
Leu Leu Leu Pro  Gly Ser Tyr Thr Tyr  Glu Trp Asn Phe Arg  Lys
            3630                 3635                 3640

gat gtg aac atg  gtc ctg cag agt tcc  ctt ggt aat gat ctc  aga       20381
Asp Val Asn Met  Val Leu Gln Ser Ser  Leu Gly Asn Asp Leu  Arg
            3645                 3650                 3655

act gat gga gcc  agc atc agt ttt acc  agc atc aac ctc tat  gcc       20426
Thr Asp Gly Ala  Ser Ile Ser Phe Thr  Ser Ile Asn Leu Tyr  Ala
            3660                 3665                 3670

acc ttc ttc ccc  atg gct cac aac act  gct tcc acc ctt gaa  gcc       20471
Thr Phe Phe Pro  Met Ala His Asn Thr  Ala Ser Thr Leu Glu  Ala
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            3675                3680                3685

atg ctg cgc aat  gac aca aat gac cag  tca ttc aat gac tat  ctc       20516
Met Leu Arg Asn  Asp Thr Asn Asp Gln  Ser Phe Asn Asp Tyr  Leu
            3690                3695                3700

tct gca gct aac  atg ctc tac cct att  cca gcc aat gcc acc  aac       20561
Ser Ala Ala Asn  Met Leu Tyr Pro Ile  Pro Ala Asn Ala Thr  Asn
            3705                3710                3715

att ccc att tcc  att cca tct cgc aac  tgg gct gcc ttc agg  ggc       20606
Ile Pro Ile Ser  Ile Pro Ser Arg Asn  Trp Ala Ala Phe Arg  Gly
            3720                3725                3730

tgg tcc ttc acc  aga ctc aaa acc aag  gaa act ccc tct ctg  gga       20651
Trp Ser Phe Thr  Arg Leu Lys Thr Lys  Glu Thr Pro Ser Leu  Gly
            3735                3740                3745

tca ggc ttt gat  ccc tac ttt gtt tac  tct ggc tcc att ccc  tac       20696
Ser Gly Phe Asp  Pro Tyr Phe Val Tyr  Ser Gly Ser Ile Pro  Tyr
            3750                3755                3760

ctg gat ggt acc  ttc tac ctg aac cac  act ttc aag aag gtg  tcc       20741
Leu Asp Gly Thr  Phe Tyr Leu Asn His  Thr Phe Lys Lys Val  Ser
            3765                3770                3775

atc atg ttt gac  tcc tca gtc agc tgg  cca ggc aat gac aga  ttg       20786
Ile Met Phe Asp  Ser Ser Val Ser Trp  Pro Gly Asn Asp Arg  Leu
            3780                3785                3790

cta act cca aat  gag ttt gaa atc aag  cgc act gtg gat ggg  gaa       20831
Leu Thr Pro Asn  Glu Phe Glu Ile Lys  Arg Thr Val Asp Gly  Glu
            3795                3800                3805

ggg tac aat gtg  gct caa tgc aac atg  acc aag gat tgg ttc  ctg       20876
Gly Tyr Asn Val  Ala Gln Cys Asn Met  Thr Lys Asp Trp Phe  Leu
            3810                3815                3820

gtt cag atg ctt  gcc aac tat aac att  ggc tac cag ggc ttc  tac       20921
Val Gln Met Leu  Ala Asn Tyr Asn Ile  Gly Tyr Gln Gly Phe  Tyr
            3825                3830                3835

atc cca gag ggg  tac aag gat cgc atg  tac tcc ttc ttc aga  aac       20966
Ile Pro Glu Gly  Tyr Lys Asp Arg Met  Tyr Ser Phe Phe Arg  Asn
            3840                3845                3850

ttc cag ccc atg  agc aga cag gtg gtc  gat gaa att aac tac  aag       21011
Phe Gln Pro Met  Ser Arg Gln Val Val  Asp Glu Ile Asn Tyr  Lys
            3855                3860                3865

gac tac aaa gcc  gtt gct gtt ccc tac  cag cac aac aac tct  ggc       21056
Asp Tyr Lys Ala  Val Ala Val Pro Tyr  Gln His Asn Asn Ser  Gly
            3870                3875                3880

ttt gtg ggt tac  atg gct cct acc atg  cga cag ggg caa gct  tat       21101
Phe Val Gly Tyr  Met Ala Pro Thr Met  Arg Gln Gly Gln Ala  Tyr
            3885                3890                3895

cca gct aac tat  ccc tac cca cta atc  gga acc act gct gtt  aag       21146
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Pro Ala Asn Tyr  Pro Tyr Pro Leu Ile  Gly Thr Thr Ala Val  Lys
            3900                3905                3910

agt gtt acc cag  aaa aag ttc ctg tgc  gac agg acc atg tgg  cgc       21191
Ser Val Thr Gln  Lys Lys Phe Leu Cys  Asp Arg Thr Met Trp  Arg
            3915                3920                3925

atc ccc ttc tcc  agc aac ttc atg tcc  atg ggt gcc cta acc  gac       21236
Ile Pro Phe Ser  Ser Asn Phe Met Ser  Met Gly Ala Leu Thr  Asp
            3930                3935                3940

ctg ggg cag aac  atg ctt tat gcc aac  tca gcc cat gcg ctg  gac       21281
Leu Gly Gln Asn  Met Leu Tyr Ala Asn  Ser Ala His Ala Leu  Asp
            3945                3950                3955

atg act ttt gag  gtg gat ccc atg gat  gag ccc aca ctg ctt  tat       21326
Met Thr Phe Glu  Val Asp Pro Met Asp  Glu Pro Thr Leu Leu  Tyr
            3960                3965                3970

ctt ctt ttt gaa  gtc ttc gac gtg gtc  aga gtg cac cag cca  cac       21371
Leu Leu Phe Glu  Val Phe Asp Val Val  Arg Val His Gln Pro  His
            3975                3980                3985

cgc ggc gtc atc  gag gct gtc tac ctg  cgt act cca ttc tca  gct       21416
Arg Gly Val Ile  Glu Ala Val Tyr Leu  Arg Thr Pro Phe Ser  Ala
            3990                3995                4000

ggt aac gcc acc  aca taagaagcct cttgcttctt gcaagcagcc atg gcc tgt    21470
Gly Asn Ala Thr  Thr                                Met Ala Cys
            4005

ggg  tcc ggc aac gga tcc  agc gag caa gag ctc  agg gcc att gct       21515
Gly  Ser Gly Asn Gly Ser  Ser Glu Gln Glu Leu  Arg Ala Ile Ala
4010                4015                4020

aga  gac ctg ggc tgc gga  ccc tat ttc ctg gga  acc ttt gac aag       21560
Arg  Asp Leu Gly Cys Gly  Pro Tyr Phe Leu Gly  Thr Phe Asp Lys
4025                4030                4035

cgt  ttc ccg ggg ttc atg  gcc ccc gac aag ctc  gcc tgc gcc att       21605
Arg  Phe Pro Gly Phe Met  Ala Pro Asp Lys Leu  Ala Cys Ala Ile
4040                4045                4050

gtt  aac acg gcc ggt cgc  gag acg ggg gga gag  cac tgg ctg gct       21650
Val  Asn Thr Ala Gly Arg  Glu Thr Gly Gly Glu  His Trp Leu Ala
4055                4060                4065

ttt  ggt tgg aac ccg cgc  tcc aac acc tgc tac  ctt ttt gat cct       21695
Phe  Gly Trp Asn Pro Arg  Ser Asn Thr Cys Tyr  Leu Phe Asp Pro
4070                4075                4080

ttt  ggc ttc tcg gat gag  cgc ctc aag caa atc  tac cag ttt gag       21740
Phe  Gly Phe Ser Asp Glu  Arg Leu Lys Gln Ile  Tyr Gln Phe Glu
4085                4090                4095

tat  gag ggt ctc ctg cgc  cgc agt gcc ctg gct  acc aag gat cgc       21785
Tyr  Glu Gly Leu Leu Arg  Arg Ser Ala Leu Ala  Thr Lys Asp Arg
4100                4105                4110
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tgt  atc acc ctg gaa aag  tcc acc cag acc gtg  cag ggc ccg cgc       21830
Cys  Ile Thr Leu Glu Lys  Ser Thr Gln Thr Val  Gln Gly Pro Arg
4115                 4120                 4125

tcc  gca gcc tgt gga ctt  ttt tgc tgc atg ttc  ctc cac gct ttt       21875
Ser  Ala Ala Cys Gly Leu  Phe Cys Cys Met Phe  Leu His Ala Phe
4130                 4135                 4140

gtg  cac tgg ccc gac cgc  ccc atg gac gga aac  ccc acc atg aag       21920
Val  His Trp Pro Asp Arg  Pro Met Asp Gly Asn  Pro Thr Met Lys
4145                 4150                 4155

ttg  ttg act ggg gtg ccc  aac agc atg ctc caa  tca ccc caa gtc       21965
Leu  Leu Thr Gly Val Pro  Asn Ser Met Leu Gln  Ser Pro Gln Val
4160                 4165                 4170

cag  ccc acc ctg cgc cac  aac cag gag gcg ctc  tac cgc ttc ctc       22010
Gln  Pro Thr Leu Arg His  Asn Gln Glu Ala Leu  Tyr Arg Phe Leu
4175                 4180                 4185

aat  acc cac tca tct tac  ttt cgt tct cac cgc  gcg cgc atc gaa       22055
Asn  Thr His Ser Ser Tyr  Phe Arg Ser His Arg  Ala Arg Ile Glu
4190                 4195                 4200

aag  gct acc gcg ttt gac  cgt atg gat atg caa  taataagtca           22098
Lys  Ala Thr Ala Phe Asp  Arg Met Asp Met Gln
4205                 4210                 4215

tgtaaaccgt gttcaaataa acagcacttt atttttaca tgcactgtgg ctctgggttg    22158

ctcattcatt catcattcac tcagaagtcg aaggggttct ggcgggaatc agcatgaccc    22218

gctggcaggg atacgttgcg gaactggaac ctgttctgcc acttgaactc ggggatcacc    22278

agtttgggaa ctaggatctc ggggaaggtg tcttgccaca gctttctggt cagttgcaga    22338

gcgccgagca ggtcaggagc agagatcttg aaatcacagt tggggccagc attctgggca    22398

cgggagttgc ggtacactgg gttgcagcac tggaacacca tcagggcggg gtgtctcacg    22458

ctcgccagca cggtcgggtc actgatggta gacacatcca agtcttcagc attggccatt    22518

ccaaaggggg tcatcttaca tgtctgcctg cccatcacgg gagcgcagcc gggcttgtgg    22578

ttgcaatcgc agcgaatggg gatcagcatc atcctggcct ggtcgggggt tatccctgga    22638

tacaccgcct tcataaaggc ttcgtactgc ttgaaagctt cctgggcctt gcttccctcg    22698

gtgtagaaca tcccacagga cttgctggaa aattgattag tagcacagtt ggcatcattc    22758

acacagcagc gggcatcgtt gttggccagc tggaccacat tcctgcccca gcggttctgg    22818

gtgatcttgg ctcgatctgg gttctccttc atcgcgcgct gcccgttctc gctcgccaca    22878

tccatctcga tgatgtgatc cttctggatc atgatagtac catgcaggca tttcaccttg    22938

ccttcataat cggtgcagcc atgagcccac agagcgcacc cggtgcactc ccaattgttg    22998

tgggcgatct cagaataaga atgcaccaat ccctgcatga atcttcccat cattgtagtc    23058
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agggtcttta tgctggtaaa tgtcagcggg atgccacggt gctcctcgtt cacatactgg    23118

tggcagatac gcctgtactg ctcctgctgc tcgggcatca gcttgaaaga ggttctcagg    23178

tcattatcca gcctgtacct ctccatcagt acggccatta cttccatgcc cttctcccag    23238

gcagagacca ggggcaggct catgggattc ctaacagcaa gagcagctcc tttagccaga    23298

gggtcattct tgtcaatctt ctcaacactt ctcttgccat ccttctcagt gatgcgcacg    23358

ggtgggtagc tgaaacccac ggccaccagc tctgcctgtt ctctttcttc ttcgctgtcc    23418

tggctgatgt cttgcagagg gacatgtttg gtcttcctgg gcttcttctt gggagggatc    23478

gggggagggc tgttgctccg ctccggagac agggaggacc gcgaagtttc gctcaccagt    23538

accacctggc tctcggtaga agaacctgac cccacacggc ggtaggtgtt cctcttcggg    23598

ggcagaggtg gaggcgactg cgatggactg cggtccggcc tgggaggcgg atggctggca    23658

gagcctcttc cgcgttcggg ggtgtgctcc cggtggcggt cgcttgactg atttcctccg    23718

cggctggcca ttgtgttctc ctaggcagag aaacaacaga c atg gag act cag        23771
                                              Met Glu Thr Gln

cca  tcg ctg cca aca ccg  ctg caa gcg cca tca  cac ctc gcc ccc       23816
Pro  Ser Leu Pro Thr Pro  Leu Gln Ala Pro Ser  His Leu Ala Pro
4220                4225                4230

agc  agc gac gag gag gaa  cag agc tta acc acc  cca cca ccc agt       23861
Ser  Ser Asp Glu Glu Glu  Gln Ser Leu Thr Thr  Pro Pro Pro Ser
4235                4240                4245

ccc  gcc acc acc acc tct  acc cta gag gat gag  gag gag gtc gac       23906
Pro  Ala Thr Thr Thr Ser  Thr Leu Glu Asp Glu  Glu Glu Val Asp
4250                4255                4260

gca  ccc cag gag atg cag  gat atg gag gat gag  aaa gcg gaa gag       23951
Ala  Pro Gln Glu Met Gln  Asp Met Glu Asp Glu  Lys Ala Glu Glu
4265                4270                4275

att  gag gca gat gtc gag  cag gac ccg ggc tat  gtg aca ccg gcg       23996
Ile  Glu Ala Asp Val Glu  Gln Asp Pro Gly Tyr  Val Thr Pro Ala
4280                4285                4290

gag  cac gag gag gag ctg  aga cgc ttt cta gac  aga gag gat aac       24041
Glu  His Glu Glu Glu Leu  Arg Arg Phe Leu Asp  Arg Glu Asp Asn
4295                4300                4305

aac  cgc cca gag cag caa  gca gat ggc gac cac  cag gag gct ggg       24086
Asn  Arg Pro Glu Gln Gln  Ala Asp Gly Asp His  Gln Glu Ala Gly
4310                4315                4320

ctc  ggg gat cat gtc gcc  gac tac ctc acc ggg  ctt ggc ggg gag       24131
Leu  Gly Asp His Val Ala  Asp Tyr Leu Thr Gly  Leu Gly Gly Glu
4325                4330                4335
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gac  gtg ctc ctc aaa cat  cta gca agg cag tcg  atc ata gtt aaa       24176
Asp  Val Leu Leu Lys His  Leu Ala Arg Gln Ser  Ile Ile Val Lys
4340                 4345                 4350

gac  gca ctg ctc ggc cgc  acc gaa gtg ccc atc  agt gtg gaa gag       24221
Asp  Ala Leu Leu Gly Arg  Thr Glu Val Pro Ile  Ser Val Glu Glu
4355                 4360                 4365

ctc  agc cgc gcc tac gag  ctc aac ctg ttc tca  cct cgg gtg ccc       24266
Leu  Ser Arg Ala Tyr Glu  Leu Asn Leu Phe Ser  Pro Arg Val Pro
4370                 4375                 4380

cct  aag cgt cag cca aac  ggc acc tgc gaa ccc  aac cct cgc ctc       24311
Pro  Lys Arg Gln Pro Asn  Gly Thr Cys Glu Pro  Asn Pro Arg Leu
4385                 4390                 4395

aac  ttc tat ccg gcc ttt  gct gtc cca gaa gtg  ctg gct acc tac       24356
Asn  Phe Tyr Pro Ala Phe  Ala Val Pro Glu Val  Leu Ala Thr Tyr
4400                 4405                 4410

cac  att ttt ttc aag aac  caa aag att cca gtt  tcc tgc cgt gcc       24401
His  Ile Phe Phe Lys Asn  Gln Lys Ile Pro Val  Ser Cys Arg Ala
4415                 4420                 4425

aac  cgc acc cgc gcc gat  gcc ctg ctc aac ttg  ggt ccg ggc gct       24446
Asn  Arg Thr Arg Ala Asp  Ala Leu Leu Asn Leu  Gly Pro Gly Ala
4430                 4435                 4440

cgc  tta cct gat ata gct  tcc ttg gaa gag gtt  cca aag atc ttc       24491
Arg  Leu Pro Asp Ile Ala  Ser Leu Glu Glu Val  Pro Lys Ile Phe
4445                 4450                 4455

gag  ggt ctg ggc agt gat  gag act cgg gct gca  aat gct ctg caa       24536
Glu  Gly Leu Gly Ser Asp  Glu Thr Arg Ala Ala  Asn Ala Leu Gln
4460                 4465                 4470

cag  gga gag aat ggc atg  gat gaa cat cac agc  gcg ctg gta gag       24581
Gln  Gly Glu Asn Gly Met  Asp Glu His His Ser  Ala Leu Val Glu
4475                 4480                 4485

ttg  gag ggc gac aat gcc  cgg ctg gca gtg ctc  aag cgc agt atc       24626
Leu  Glu Gly Asp Asn Ala  Arg Leu Ala Val Leu  Lys Arg Ser Ile
4490                 4495                 4500

gag  gtc acc cat ttt gcc  tac ccc gct gtc aac  ctg ccc ccc aaa       24671
Glu  Val Thr His Phe Ala  Tyr Pro Ala Val Asn  Leu Pro Pro Lys
4505                 4510                 4515

gtc  atg agc gct gtc atg  gat cag ctg ctc atc  aag cga gca agc       24716
Val  Met Ser Ala Val Met  Asp Gln Leu Leu Ile  Lys Arg Ala Ser
4520                 4525                 4530

ccc  ctt tcc gaa gac cag  aac atg cag gat cca  gac gcc tct gac       24761
Pro  Leu Ser Glu Asp Gln  Asn Met Gln Asp Pro  Asp Ala Ser Asp
4535                 4540                 4545

gag  ggc aag ccg gtg gtc  agt gac gag cag ctg  tct cgc tgg ctg       24806
Glu  Gly Lys Pro Val Val  Ser Asp Glu Gln Leu  Ser Arg Trp Leu
4550                 4555                 4560
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ggc  acc aac tcc ccg cga  gac ttg gaa gag agg  cgc aag ctt atg       24851
Gly  Thr Asn Ser Pro Arg  Asp Leu Glu Glu Arg  Arg Lys Leu Met
4565                4570                4575

atg  gct gta gtg cta gtc  act gtg gag ctg gag  tgt ctc cgc cgc       24896
Met  Ala Val Val Leu Val  Thr Val Glu Leu Glu  Cys Leu Arg Arg
4580                4585                4590

ttt  ttc acc gac cct gag  acc ctg cgc aag ctc  gag gag aac ttg       24941
Phe  Phe Thr Asp Pro Glu  Thr Leu Arg Lys Leu  Glu Glu Asn Leu
4595                4600                4605

cac  tat act ttc aga cat  ggc ttc gtg cgc cag  gca tgc aag atc       24986
His  Tyr Thr Phe Arg His  Gly Phe Val Arg Gln  Ala Cys Lys Ile
4610                4615                4620

tcc  aac gtg gag ctc acc  aac ctg gtc tcc tac  atg ggc att ttg       25031
Ser  Asn Val Glu Leu Thr  Asn Leu Val Ser Tyr  Met Gly Ile Leu
4625                4630                4635

cat  gag aac cgc ctg ggg  caa agt gtg ctg cac  acc acc ctg aag       25076
His  Glu Asn Arg Leu Gly  Gln Ser Val Leu His  Thr Thr Leu Lys
4640                4645                4650

ggg  gag gcc cgc cgc gac  tac atc cgc gac tgt  gtc tac ctc tac       25121
Gly  Glu Ala Arg Arg Asp  Tyr Ile Arg Asp Cys  Val Tyr Leu Tyr
4655                4660                4665

ctc  tgc cac acc tgg cag  act ggc atg ggt gta  tgg cag cag tgt       25166
Leu  Cys His Thr Trp Gln  Thr Gly Met Gly Val  Trp Gln Gln Cys
4670                4675                4680

ttg  gaa gag cag aac ctg  aaa gag ctg gac aag  ctc ttg cag aga       25211
Leu  Glu Glu Gln Asn Leu  Lys Glu Leu Asp Lys  Leu Leu Gln Arg
4685                4690                4695

tcc  ctc aaa gcc ctg tgg  aca ggt ttt gac gag  cgc acc gtc gcc       25256
Ser  Leu Lys Ala Leu Trp  Thr Gly Phe Asp Glu  Arg Thr Val Ala
4700                4705                4710

tca  gac ctg gca gac atc  atc ttt ccc gag cgt  ctc agg gtt act       25301
Ser  Asp Leu Ala Asp Ile  Ile Phe Pro Glu Arg  Leu Arg Val Thr
4715                4720                4725

ctg  cgc aac ggc ctg cct  gac ttc atg agc cag  agc atg ctt aac       25346
Leu  Arg Asn Gly Leu Pro  Asp Phe Met Ser Gln  Ser Met Leu Asn
4730                4735                4740

aac  ttt cgc tct ttc atc  ctg gaa cgc tcc ggt  atc ctg ccc gcc       25391
Asn  Phe Arg Ser Phe Ile  Leu Glu Arg Ser Gly  Ile Leu Pro Ala
4745                4750                4755

acc  tgc tgc gcg ctg ccc  tcc gac ttt gtg cct  ctc acc tac cgc       25436
Thr  Cys Cys Ala Leu Pro  Ser Asp Phe Val Pro  Leu Thr Tyr Arg
4760                4765                4770

gag  tgc ccc ccg ccg cta  tgg agc cac tgc tac  ctg ttc cgc ctg       25481
Glu  Cys Pro Pro Pro Leu  Trp Ser His Cys Tyr  Leu Phe Arg Leu
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4775                4780                4785

gcc  aac tac ctc tcc tac  cac tcg gat gtg atc  gag gat gtg agc       25526
Ala  Asn Tyr Leu Ser Tyr  His Ser Asp Val Ile  Glu Asp Val Ser
4790                4795                4800

gga  gac ggc ctg ctg gag  tgc cac tgc cgc tgc  aat ctc tgc aca       25571
Gly  Asp Gly Leu Leu Glu  Cys His Cys Arg Cys  Asn Leu Cys Thr
4805                4810                4815

ccc  cac cgt tcc ctc gcc  tgc aac ccc cag ttg  ctg agc gag acc       25616
Pro  His Arg Ser Leu Ala  Cys Asn Pro Gln Leu  Leu Ser Glu Thr
4820                4825                4830

cag  atc atc ggc acc ttc  gag ttg cag ggt ccc  agc agc gaa ggc       25661
Gln  Ile Ile Gly Thr Phe  Glu Leu Gln Gly Pro  Ser Ser Glu Gly
4835                4840                4845

gag  ggg tct tct ccg ggg  cag agt ctg aaa ctg  acc ccg ggg cta       25706
Glu  Gly Ser Ser Pro Gly  Gln Ser Leu Lys Leu  Thr Pro Gly Leu
4850                4855                4860

tgg  acc tcc gcc tac ctg  cgc aag ttc gcc ccc  gaa gac tac cac       25751
Trp  Thr Ser Ala Tyr Leu  Arg Lys Phe Ala Pro  Glu Asp Tyr His
4865                4870                4875

ccc  tat gag att agg ttc  tat gag gac caa tca  cag ccg ccc aaa       25796
Pro  Tyr Glu Ile Arg Phe  Tyr Glu Asp Gln Ser  Gln Pro Pro Lys
4880                4885                4890

gcc  gag ctc tca gcc tgc  gtc atc act cag ggg  gca att ctc gcc       25841
Ala  Glu Leu Ser Ala Cys  Val Ile Thr Gln Gly  Ala Ile Leu Ala
4895                4900                4905

caa  ttg caa gcc atc caa  aaa tcc cgc caa gaa  ttt ctg ctg aaa       25886
Gln  Leu Gln Ala Ile Gln  Lys Ser Arg Gln Glu  Phe Leu Leu Lys
4910                4915                4920

agg  ggg aac ggg gtc tac  ctc gac ccc cag acc  ggt gag gag ctc       25931
Arg  Gly Asn Gly Val Tyr  Leu Asp Pro Gln Thr  Gly Glu Glu Leu
4925                4930                4935

aac  aca agg ttc cct cag  gat gtc cca gcg ccg  agg aag caa gaa       25976
Asn  Thr Arg Phe Pro Gln  Asp Val Pro Ala Pro  Arg Lys Gln Glu
4940                4945                4950

gtt  gaa agt gca gct gcc  gcc ccc aga gga cat  gga gga aga ctg       26021
Val  Glu Ser Ala Ala Ala  Ala Pro Arg Gly His  Gly Gly Arg Leu
4955                4960                4965

gga  cag tca ggc aga gga  gga gga gat gga aga  ttg gga cag cca       26066
Gly  Gln Ser Gly Arg Gly  Gly Gly Asp Gly Arg  Leu Gly Gln Pro
4970                4975                4980

ggc  aga gga ggt gga cag  cct gga gga aga cag  ttt gga gga gga       26111
Gly  Arg Gly Gly Gly Gln  Pro Gly Gly Arg Gln  Phe Gly Gly Gly
4985                4990                4995

aga  cga gga ggc aga gga  ggt gga aga agc agc  cgc cgc caa aca       26156
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Arg  Arg Gly Gly Arg Gly  Gly Gly Arg Ser Ser  Arg Arg Gln Thr
5000                 5005                 5010

gtt  gtc ctc ggc agc gga  gac aag caa ggt ccc  aga cag cag cag       26201
Val  Val Leu Gly Ser Gly  Asp Lys Gln Gly Pro  Arg Gln Gln Gln
5015                 5020                 5025

cag  cac ggc tac aat ctc  cgc tcc ggg tcg ggg  ggc cca gcg gcg       26246
Gln  His Gly Tyr Asn Leu  Arg Ser Gly Ser Gly  Gly Pro Ala Ala
5030                 5035                 5040

tcc  caa cag tagatgggac gagaccgggc gattcccgaa cccgaccacc            26295
Ser  Gln Gln
5045

gcttccaaga ccggtaagaa ggagcggcag ggatacaagt cctggcgggg gcataagaat   26355

gccatcatct cctgcttgca tgaatgcggg ggcaacatat ccttcacccg gcgctacctg   26415

ctcttccacc acggggtgaa cttccccccgc aatgtcttgc attactaccg tcacctccac  26475

agcccctact acagccagca agtcccggca gcctcggcag agaaagacag cagcagcagc   26535

ggggacctcc agcagaaaac cagcagcagc agttagaaaa tccagtgcag caggaggagg   26595

actgaggatc acagcgaacg agccagcgca gacccgagag ctgagaaaca ggatctttcc   26655

aaccctctat gccatcttcc agcagagtcg ggggcaagag caggaactga aagtaaaaaa   26715

ccgatctctg cgctcgctca cccgaagttg tttgtatcac aagagcgaag accaacttca   26775

gcgcactctc gaggacgccg aggctctctt caacaagtac tgcgcgctga ctcttaaaga   26835

gtagcccgcg cccgcgctcg ctcgaaaaag gcgggaatta cgtcaccctt ggcacctgtc   26895

ctttgccctc gtc atg agt aaa  gaa att ccc acg cct  tac atg tgg agc     26944
               Met Ser Lys  Glu Ile Pro Thr Pro  Tyr Met Trp Ser
                       5050                 5055

tat  cag ccc caa atg gga  ctg gca gcc ggc gcc  tcc cag gac tac      26989
Tyr  Gln Pro Gln Met Gly  Leu Ala Ala Gly Ala  Ser Gln Asp Tyr
5060                 5065                 5070

tcc  acc cgc atg aat tgg  ctc agc gcc ggc ccc  tcg atg atc tca      27034
Ser  Thr Arg Met Asn Trp  Leu Ser Ala Gly Pro  Ser Met Ile Ser
5075                 5080                 5085

cgg  gtt aat gat ata cga  gct tac cga aac cag  tta ctc cta gaa      27079
Arg  Val Asn Asp Ile Arg  Ala Tyr Arg Asn Gln  Leu Leu Leu Glu
5090                 5095                 5100

cag  tca gct ctc acc acc  aca ccc cgc caa cac  ctt aat ccc cgg      27124
Gln  Ser Ala Leu Thr Thr  Thr Pro Arg Gln His  Leu Asn Pro Arg
5105                 5110                 5115

aat  tgg ccc gcc gcc ctg  gtg tac cag gaa act  ccc gct ccc acc      27169
Asn  Trp Pro Ala Ala Leu  Val Tyr Gln Glu Thr  Pro Ala Pro Thr
5120                 5125                 5130
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acc  gta cta ctt cct cga  gac gcc cag gcc gaa  gtt cag atg act       27214
Thr  Val Leu Leu Pro Arg  Asp Ala Gln Ala Glu  Val Gln Met Thr
5135                 5140                 5145

aac  gca ggt gta cag ctg  gcg ggc ggt tcc gcc  ctg tgt cgt cac       27259
Asn  Ala Gly Val Gln Leu  Ala Gly Gly Ser Ala  Leu Cys Arg His
5150                 5155                 5160

cgg  cct cag cag agt ata  aaa cgc ctg gtg atc  aga ggc cga ggt       27304
Arg  Pro Gln Gln Ser Ile  Lys Arg Leu Val Ile  Arg Gly Arg Gly
5165                 5170                 5175

atc  cag ctc aac gac gag  tcg gtg agc tct tcg  ctt ggt ctg cga       27349
Ile  Gln Leu Asn Asp Glu  Ser Val Ser Ser Ser  Leu Gly Leu Arg
5180                 5185                 5190

cca  gac gga gtc ttc cag  atc gcc ggc tgt ggg  aga tct tcc ttc       27394
Pro  Asp Gly Val Phe Gln  Ile Ala Gly Cys Gly  Arg Ser Ser Phe
5195                 5200                 5205

act  cct cgt cag gct gtc  ctg act ttg gag agt  tcg tcc tcg cag       27439
Thr  Pro Arg Gln Ala Val  Leu Thr Leu Glu Ser  Ser Ser Ser Gln
5210                 5215                 5220

ccc  cgc tcg ggc ggc atc  ggg act ctc cag ttt  gtg gag gag ttt       27484
Pro  Arg Ser Gly Gly Ile  Gly Thr Leu Gln Phe  Val Glu Glu Phe
5225                 5230                 5235

act  ccc tct gtc tac ttc  aac ccc ttc tcc ggc  tct cct ggc cag       27529
Thr  Pro Ser Val Tyr Phe  Asn Pro Phe Ser Gly  Ser Pro Gly Gln
5240                 5245                 5250

tac  ccg gac gag ttc ata  ccg aac ttc gac gca  atc agc gag tca       27574
Tyr  Pro Asp Glu Phe Ile  Pro Asn Phe Asp Ala  Ile Ser Glu Ser
5255                 5260                 5265

gtg  gat ggc tat gat tgatgtctgg tggcgcggct gagttagctc gactgcgaca     27629
Val  Asp Gly Tyr Asp
5270

tctagaccac tgccgccgct ttcgctgttt cgcccgggaa ctcaccgagt tcatctactt    27689

cgaactcccc gaggagcacc ctcagggacc ggcccacgga gtgcggatta ccatcgaagg    27749

ggggatagac tctcacctgc atcggatctt ctgccagcga cccgtgctga tcgagcgcga    27809

ccagggaact acaacagtct ccatctactg catctgtaac caccccggat tgc atg       27865
                                                           Met
                                                           5275

aaa gcc ttt gct gtc  tta ttt gtg ctg agt  tta ata aaa act gag       27910
Lys Ala Phe Ala Val  Leu Phe Val Leu Ser  Leu Ile Lys Thr Glu
                5280                 5285                 5290

tta aga ctc acc ttc  gga cta ccg ctt ctt  caa ccc gga ctt tac       27955
Leu Arg Leu Thr Phe  Gly Leu Pro Leu Leu  Gln Pro Gly Leu Tyr
                5295                 5300                 5305

aac acc agc cag acc  ctc cgt tcc agc cag  aag aac cag acc ctt       28000
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Asn Thr Ser Gln Thr  Leu Arg Ser Ser Gln  Lys Asn Gln Thr Leu
                5310                 5315                 5320

cct ctg atc cag gac  tct aat tct acc tcc  cca gcg cct ttc cct        28045
Pro Leu Ile Gln Asp  Ser Asn Ser Thr Ser  Pro Ala Pro Phe Pro
                5325                 5330                 5335

act aac ctt ccc gtt  act aac aac ctc gga  gct cag ctg cat cac        28090
Thr Asn Leu Pro Val  Thr Asn Asn Leu Gly  Ala Gln Leu His His
                5340                 5345                 5350

cgc ttc tcc aga agc  ctc ctt tct gcc aat  att act act ccc aga        28135
Arg Phe Ser Arg Ser  Leu Leu Ser Ala Asn  Ile Thr Thr Pro Arg
                5355                 5360                 5365

acc gga ggt gag ctc  cgt ggt ctc cct act  gac aac ccc tgg gtg        28180
Thr Gly Gly Glu Leu  Arg Gly Leu Pro Thr  Asp Asn Pro Trp Val
                5370                 5375                 5380

gta gcg ggt ttt gta  gcg cta gga gta gtt  gcg ggt ggg ttg gtg        28225
Val Ala Gly Phe Val  Ala Leu Gly Val Val  Ala Gly Gly Leu Val
                5385                 5390                 5395

ctt ata ctc tgc tac  cta tac aca cct tgc  tgt gct tat tta gta        28270
Leu Ile Leu Cys Tyr  Leu Tyr Thr Pro Cys  Cys Ala Tyr Leu Val
                5400                 5405                 5410

gtg ttg tgt tgc tgg  ttt aag aaa tgg ggg  tcg tac tagtatcgct        28316
Val Leu Cys Cys Trp  Phe Lys Lys Trp Gly  Ser Tyr
                5415                 5420

tgctttactt tcgcttttgg gtctgggctc tgctacgcta agaaatcagc ctttgctatt    28376

agatcccgat gatgttgatc catgtctgga ctttgatcca gagaactgca cactcacttt    28436

tgcacctgaa acaagtcgct tctgtggagt tgttattagg tgcggatttg aatgcaggtc    28496

cattgagatt acacacaata acaaaacttg gaacaatacc ttattcacaa tatggcaacc    28556

aggagatcct cagtggtata ctgtctctgt ccggggtcct gacggttcca tccgcatggc    28616

taataacact ttcatttttg ctgaaatgtg cgatatggcc atgttcatga gcagacagta    28676

tgacct atg gcc tcc  cag caa aga gaa cat  tgt ggc ttt ctc cat  tgc    28724
       Met Ala Ser  Gln Gln Arg Glu His  Cys Gly Phe Leu His  Cys
                5425                 5430                 5435

tta ttg ctt gtg  tac ttg cat cat cac  tgc tat cat gtg tgt  gag      28769
Leu Leu Leu Val  Tyr Leu His His His  Cys Tyr His Val Cys  Glu
            5440                 5445                 5450

cat aca ctt gct  tat agc cat tcg ccc  aaa aaa caa tca aga  aaa      28814
His Thr Leu Ala  Tyr Ser His Ser Pro  Lys Lys Gln Ser Arg  Lys
            5455                 5460                 5465

aga gaa aat gcc  ctg att ata aat ttc  tat tta cag aaa atg  acc      28859
Arg Glu Asn Ala  Leu Ile Ile Asn Phe  Tyr Leu Gln Lys Met  Thr
            5470                 5475                 5480
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tct gtt tca gct  ctc ata ttt gct act  att atg gct gtt caa  gga       28904
Ser Val Ser Ala  Leu Ile Phe Ala Thr  Ile Met Ala Val Gln  Gly
            5485                 5490                 5495

cag gct gct caa  gga cag aca ctt att  aat gtt cat cct gga  act       28949
Gln Ala Ala Gln  Gly Gln Thr Leu Ile  Asn Val His Pro Gly  Thr
            5500                 5505                 5510

aat cat acc ttg  gtg gtt cct aat aac  tat tca aat att gaa  tgg       28994
Asn His Thr Leu  Val Val Pro Asn Asn  Tyr Ser Asn Ile Glu  Trp
            5515                 5520                 5525

caa tgg ttc aca  aac aac gta tgg tat  gaa cca tgc gaa cat  tac       29039
Gln Trp Phe Thr  Asn Asn Val Trp Tyr  Glu Pro Cys Glu His  Tyr
            5530                 5535                 5540

agc cta ttc att  tgc aat cat aat tta  act tta atc aat gtc  agc       29084
Ser Leu Phe Ile  Cys Asn His Asn Leu  Thr Leu Ile Asn Val  Ser
            5545                 5550                 5555

aca ata cac aaa  gga tac tat tat aga  tat gac aac cac agc  att       29129
Thr Ile His Lys  Gly Tyr Tyr Tyr Arg  Tyr Asp Asn His Ser  Ile
            5560                 5565                 5570

gat cct aca ata  tat cta gta cgt gta  aat cca att aac aaa  cct       29174
Asp Pro Thr Ile  Tyr Leu Val Arg Val  Asn Pro Ile Asn Lys  Pro
            5575                 5580                 5585

ata ccc aaa gct  ttc tct aga act aca  ata caa aac ttt aaa  aca       29219
Ile Pro Lys Ala  Phe Ser Arg Thr Thr  Ile Gln Asn Phe Lys  Thr
            5590                 5595                 5600

gca att tta ctt  aat ttt aaa acc aaa  aat att aca ggc aat  ata       29264
Ala Ile Leu Leu  Asn Phe Lys Thr Lys  Asn Ile Thr Gly Asn  Ile
            5605                 5610                 5615

ctt ccc act act  ccc act gaa aaa aat  aca cct aat tca ata  ttt       29309
Leu Pro Thr Thr  Pro Thr Glu Lys Asn  Thr Pro Asn Ser Ile  Phe
            5620                 5625                 5630

gaa atc atc att  gca ctg tta gca gta  ggc ata aca atc ata  cta       29354
Glu Ile Ile Ile  Ala Leu Leu Ala Val  Gly Ile Thr Ile Ile  Leu
            5635                 5640                 5645

tgt atg ata att  tat gct cac tgt tat  aaa aaa att cac cac  aaa       29399
Cys Met Ile Ile  Tyr Ala His Cys Tyr  Lys Lys Ile His His  Lys
            5650                 5655                 5660

aaa gaa cca cta  cta agc ttt taatttcttt tttatacagc c atg att  ttc    29450
Lys Glu Pro Leu  Leu Ser Phe                          Met Ile  Phe
            5665                                              5670

ttc gca act ctt  att act att ggc att  gtt caa ggg caa gat  atc       29495
Phe Ala Thr Leu  Ile Thr Ile Gly Ile  Val Gln Gly Gln Asp  Ile
            5675                 5680                 5685

aca att gga tat  gta ggc aat aat att  acc cta tta ggt ccc  cca       29540
Thr Ile Gly Tyr  Val Gly Asn Asn Ile  Thr Leu Leu Gly Pro  Pro
            5690                 5695                 5700
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aca gga aca atc  cct acc tgg tac aaa  ata tat gaa aga ggg  tgg       29585
Thr Gly Thr Ile  Pro Thr Trp Tyr Lys  Ile Tyr Glu Arg Gly  Trp
            5705                5710                5715

tgg att aga ccc  tgc gac caa gga ggt  agt aaa tac att tgt  ggt       29630
Trp Ile Arg Pro  Cys Asp Gln Gly Gly  Ser Lys Tyr Ile Cys  Gly
            5720                5725                5730

aga gac ata acc  atc acc aat ctt aat  aaa aac gat aat ggc  tac       29675
Arg Asp Ile Thr  Ile Thr Asn Leu Asn  Lys Asn Asp Asn Gly  Tyr
            5735                5740                5745

tat ttt tgc aat  aac tat gga ggt ggt  aaa aag tct tac aca  ctt       29720
Tyr Phe Cys Asn  Asn Tyr Gly Gly Gly  Lys Lys Ser Tyr Thr  Leu
            5750                5755                5760

gaa gta aga gac  ccc acc act tta gca  cca cat acc act ttc  tcc       29765
Glu Val Arg Asp  Pro Thr Thr Leu Ala  Pro His Thr Thr Phe  Ser
            5765                5770                5775

agc agc acg tct  aga aac aca cat gag  gca gct tat gcc aga  gca       29810
Ser Ser Thr Ser  Arg Asn Thr His Glu  Ala Ala Tyr Ala Arg  Ala
            5780                5785                5790

atg ctt caa aaa  att aat gaa aca ata  aat tct aca atc tct  cat       29855
Met Leu Gln Lys  Ile Asn Glu Thr Ile  Asn Ser Thr Ile Ser  His
            5795                5800                5805

aat cca gac gaa  att ccc aaa tca atg  att ggc att att gta  gcc       29900
Asn Pro Asp Glu  Ile Pro Lys Ser Met  Ile Gly Ile Ile Val  Ala
            5810                5815                5820

gtg gca gtt gga  atg gca atc ata ata  att tgt atg atc gtc  tat       29945
Val Ala Val Gly  Met Ala Ile Ile Ile  Ile Cys Met Ile Val  Tyr
            5825                5830                5835

gct tgc tgc tat  aga aag ttt caa gat  gaa aaa gga gac cca  cta       29990
Ala Cys Cys Tyr  Arg Lys Phe Gln Asp  Glu Lys Gly Asp Pro  Leu
            5840                5845                5850

cta agc ttt gat  att taatttcttt atagaaac atg aaa gga gta  ggt atc    30041
Leu Ser Phe Asp  Ile                    Met Lys Gly Val  Gly Ile
            5855                                    5860

cta gtt ctt  tca act tta atc tac  tca gtg atc cct atc  agc atc       30086
Leu Val Leu  Ser Thr Leu Ile Tyr  Ser Val Ile Pro Ile  Ser Ile
        5865                5870                5875

aat gtg cag  act act tta aat gaa  act gga aac cac tca  act acc       30131
Asn Val Gln  Thr Thr Leu Asn Glu  Thr Gly Asn His Ser  Thr Thr
        5880                5885                5890

tca cat aca  cct ccc ccg ctt tct  acc cac cct caa tcc  aaa gat       30176
Ser His Thr  Pro Pro Pro Leu Ser  Thr His Pro Gln Ser  Lys Asp
        5895                5900                5905

gcc ata caa  cta caa ctc acc atc  ctt att gtg att ggg  tta act       30221
Ala Ile Gln  Leu Gln Leu Thr Ile  Leu Ile Val Ile Gly  Leu Thr
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        5910                5915                5920

atc ctt gct  gtt atc ctt tac ttt  atc ttt tgc cgc caa  ata ccc       30266
Ile Leu Ala  Val Ile Leu Tyr Phe  Ile Phe Cys Arg Gln  Ile Pro
        5925                5930                5935

aat gta gtt  aag aaa cct acc aga  cgt ccc atc tat cga  tca ata       30311
Asn Val Val  Lys Lys Pro Thr Arg  Arg Pro Ile Tyr Arg  Ser Ile
        5940                5945                5950

atc agc aaa  ccc cac atg gct cta  aat gaa att taatctttct            30354
Ile Ser Lys  Pro His Met Ala Leu  Asn Glu Ile
        5955                5960

cttcacagta tggtgatcaa ct atg atc  cct aga aat ttc ttc  ttc acc       30403
                          Met Ile  Pro Arg Asn Phe Phe  Phe Thr
                              5965                5970

ata ctt atc  tgc gct ttc aat gtc  tgt gct aca ttc gcc  aca gtc       30448
Ile Leu Ile  Cys Ala Phe Asn Val  Cys Ala Thr Phe Ala  Thr Val
        5975                5980                5985

gcc aat gtg  aca cca gat tgt ata  ggg gca ttt gct tcc  tac gta       30493
Ala Asn Val  Thr Pro Asp Cys Ile  Gly Ala Phe Ala Ser  Tyr Val
        5990                5995                6000

cta ttt gcc  ttc att acc tgc atc  tgc gtt tgt agc ata  gtc tgc       30538
Leu Phe Ala  Phe Ile Thr Cys Ile  Cys Val Cys Ser Ile  Val Cys
        6005                6010                6015

ctg gtt atc  aac ttc ttt caa cta  gta gac tgg gtt ttt  gta cgc       30583
Leu Val Ile  Asn Phe Phe Gln Leu  Val Asp Trp Val Phe  Val Arg
        6020                6025                6030

att gcc tac  cta cga cat cac cct  gaa tac cgc aac caa  aat gtt       30628
Ile Ala Tyr  Leu Arg His His Pro  Glu Tyr Arg Asn Gln  Asn Val
        6035                6040                6045

gca gca att  ctt agg ctc att taaaaccatg caaactctgc tactgcttct       30679
Ala Ala Ile  Leu Arg Leu Ile
        6050

gctagttata caccaatgtg cctcaaaccc cacaagcccc acaagattag atctaagaaa   30739

atgtaaattt caagaaccat ggaaattcct tgattgctat catgaaacat ctgatttccc   30799

cacatactgg attacaatca ttggggttgt taatctagtc tcttgcacac tattctcttt   30859

ccttgtttac cacttatttg attttggatg gaacgccctt aatgcactca cttacccaca   30919

agaaccagag gaacatatac cactacagaa catacaacca ttagcactag tagaatatga   30979

aaatgagcca cagcctccac tactccctgc cattagctac ttcaacctaa ccggtggag    31038

atg  act gac cca cac gcc  gct gct gag gaa cta  ctt gat atg gac       31083
Met  Thr Asp Pro His Ala  Ala Ala Glu Glu Leu  Leu Asp Met Asp
6055                6060                6065

ggc  cgt gcc tcc gaa cag  cgc ctc gct caa cta  cgc att cgc cag       31128
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Gly  Arg Ala Ser Glu Gln  Arg Leu Ala Gln Leu  Arg Ile Arg Gln
6070                 6075                 6080

cag  cag gaa cgt gcc gcc  aag gag ctc agg gat  gcc att gag att       31173
Gln  Gln Glu Arg Ala Ala  Lys Glu Leu Arg Asp  Ala Ile Glu Ile
6085                 6090                 6095

cac  cag tgc aaa aaa ggc  ata ttc tgc ttg gta  aaa caa gcc aag       31218
His  Gln Cys Lys Lys Gly  Ile Phe Cys Leu Val  Lys Gln Ala Lys
6100                 6105                 6110

atc  tcc tac gag atc acc  gct aac gac cac cgc  ctc tca tat gag       31263
Ile  Ser Tyr Glu Ile Thr  Ala Asn Asp His Arg  Leu Ser Tyr Glu
6115                 6120                 6125

ctt  ggc ccg cag cgt cag  aaa ttc act tgc atg  gtg gga atc aac       31308
Leu  Gly Pro Gln Arg Gln  Lys Phe Thr Cys Met  Val Gly Ile Asn
6130                 6135                 6140

ccc  ata gtc atc acc cag  caa gct gga gat acc  aag ggt tgc atc       31353
Pro  Ile Val Ile Thr Gln  Gln Ala Gly Asp Thr  Lys Gly Cys Ile
6145                 6150                 6155

cat  tgt tcc tgt gaa tcc  acc gag tgc atc tac  acc ctg ctg aag       31398
His  Cys Ser Cys Glu Ser  Thr Glu Cys Ile Tyr  Thr Leu Leu Lys
6160                 6165                 6170

acc  ctc tgc ggc ctt cga  gac ctc cta ccc atg  aac taatcaacaa       31444
Thr  Leu Cys Gly Leu Arg  Asp Leu Leu Pro Met  Asn
6175                 6180                 6185

cccctaccct cttcccatta aaatccaatt aataaaattc acttacttaa aatcagaaac   31504

aaagtttttg tccaagttgt tttcaaccag cacctcactt ccctcttccc aactctggta   31564

ctctaagcct cggcgggtgg catacttcct ccacactttg aaagggatgt caaattttag   31624

ttcttctttt cccacaatct tcatttcttt attcccag atg gcc aaa cga  gct      31677
                                        Met Ala Lys Arg  Ala
                                                    6190

cgt cta agc agc  tcc ttc aac ccg gtc  tac ccc tat gaa gat  gaa      31722
Arg Leu Ser Ser  Ser Phe Asn Pro Val  Tyr Pro Tyr Glu Asp  Glu
            6195                 6200                 6205

agc agt tca caa  cac cca ttt ata aac  cct ggt ttc att tcc  cct      31767
Ser Ser Ser Gln  His Pro Phe Ile Asn  Pro Gly Phe Ile Ser  Pro
            6210                 6215                 6220

aat ggg ttt aca  caa agt cca gac gga  gct ctt aca ctc aag  tgt      31812
Asn Gly Phe Thr  Gln Ser Pro Asp Gly  Ala Leu Thr Leu Lys  Cys
            6225                 6230                 6235

gtt gcc cct ctt  act acc acc agt ggc  tcc ctg gat att aaa  gta      31857
Val Ala Pro Leu  Thr Thr Thr Ser Gly  Ser Leu Asp Ile Lys  Val
            6240                 6245                 6250

gga ggg ggg ctt  aag gta gac tcc act  gat ggg tcc tta gaa  gaa      31902
Gly Gly Gly Leu  Lys Val Asp Ser Thr  Asp Gly Ser Leu Glu  Glu
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            6255                6260                6265

aac ata agc act  aca gca cca ctt aac  aaa tct aat cat tcc  ata       31947
Asn Ile Ser Thr  Thr Ala Pro Leu Asn  Lys Ser Asn His Ser  Ile
            6270                6275                6280

gga tta gca gtg  gga aat gga tta caa  aca aat gaa agc aaa  cta       31992
Gly Leu Ala Val  Gly Asn Gly Leu Gln  Thr Asn Glu Ser Lys  Leu
            6285                6290                6295

tgt gcc aaa tta  gga gag gaa ctt acc  ttt gat tct tcc aat  gcc       32037
Cys Ala Lys Leu  Gly Glu Glu Leu Thr  Phe Asp Ser Ser Asn  Ala
            6300                6305                6310

att aca ata aaa  aat aac act tta tgg  aca gga gca aaa cca  agt       32082
Ile Thr Ile Lys  Asn Asn Thr Leu Trp  Thr Gly Ala Lys Pro  Ser
            6315                6320                6325

act aac tgt aaa  att caa gaa gat gca  gat gcc cta gac tgc  aag       32127
Thr Asn Cys Lys  Ile Gln Glu Asp Ala  Asp Ala Leu Asp Cys  Lys
            6330                6335                6340

cta act cta gtc  ctt gta aaa aat gga  gga cta gta aat gca  tat       32172
Leu Thr Leu Val  Leu Val Lys Asn Gly  Gly Leu Val Asn Ala  Tyr
            6345                6350                6355

gtg tca tta ata  gga gac tca gac tat  gtt aat aca cta ttc  act       32217
Val Ser Leu Ile  Gly Asp Ser Asp Tyr  Val Asn Thr Leu Phe  Thr
            6360                6365                6370

aaa aag act gca  tca atc agc gta gaa  ctt gcc ttt gat agc  tcc       32262
Lys Lys Thr Ala  Ser Ile Ser Val Glu  Leu Ala Phe Asp Ser  Ser
            6375                6380                6385

ggt caa ata ctt  act agc cta tct tct  cta aaa act agt ctc  aac       32307
Gly Gln Ile Leu  Thr Ser Leu Ser Ser  Leu Lys Thr Ser Leu  Asn
            6390                6395                6400

ttt aaa cac aac  caa gac atg gcc act  gaa act atc agt gcc  aaa       32352
Phe Lys His Asn  Gln Asp Met Ala Thr  Glu Thr Ile Ser Ala  Lys
            6405                6410                6415

ggc ttc atg cct  agt acc act gct tat  ccc ttt aac acc cag  gct       32397
Gly Phe Met Pro  Ser Thr Thr Ala Tyr  Pro Phe Asn Thr Gln  Ala
            6420                6425                6430

act tct tct aga  gac aat gaa gat tac  att ttt ggt aaa tgt  tac       32442
Thr Ser Ser Arg  Asp Asn Glu Asp Tyr  Ile Phe Gly Lys Cys  Tyr
            6435                6440                6445

tac aga gcc tca  tat gga gct cta tac  act ttg gat gtt act  gta       32487
Tyr Arg Ala Ser  Tyr Gly Ala Leu Tyr  Thr Leu Asp Val Thr  Val
            6450                6455                6460

ata ctc aac aga  cgt atg acc gct gct  gga atg gct tat gca  atg       32532
Ile Leu Asn Arg  Arg Met Thr Ala Ala  Gly Met Ala Tyr Ala  Met
            6465                6470                6475

aac ttt acg tgg  ctt ctt gac gcg aca  gat gcc cca gaa aat  acc       32577
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Asn Phe Thr Trp  Leu Leu Asp Ala Thr  Asp Ala Pro Glu Asn  Thr
            6480                 6485                 6490

aca acc acc ctg  gtc acc tcc ccc ttc  tcc ttt tcc tat att  aga      32622
Thr Thr Thr Leu  Val Thr Ser Pro Phe  Ser Phe Ser Tyr Ile  Arg
            6495                 6500                 6505

gaa gat gat gac  tgacaaagaa taaagttcaa ctttttttatt gaaaatcagt        32674
Glu Asp Asp Asp
            6510

ttacaggata cgagtagtta ttttgcctcc cccttcccat ttcatagaat acaccaatct    32734

ctccccacgc acagctttaa acatttggat tccatttgag atagtcatgg atttagattc    32794

cacattccac acagtttcag agctagataa tcttggatca gtgatagata taaatccatc    32854

ggggcagtcc ttcaaggtga tttcacagtc cagttgctgt ggctgcggct ccggagtctg    32914

gatcagagtc atctggaaga agaacgatgg gagtcataat ccgagaacgg gatcgggcgg    32974

ttgtgtctca tcaaaccccg aagcagtcgc tgtctgcgcc gctccgtgcg actgctgcta    33034

atgggatcgg ggtccacagt ctctcgaagc atgattctaa tagccctcaa cattaacatc    33094

ctggtacgat gcgcacagca acgcatcctg atctcactta ggtcacagca gtaagtacaa    33154

cacatcacca caatgttgtt taacaggcca taattaaagg cgctccagcc aaaactcatt    33214

tcaggaataa tttgccccgc gtggccatcg taccaaatcc tgatgaaaat caaatggcgc    33274

cccctccaga atacactgcc cacatacatg atctccttag gcatatgcat attcacaatc    33334

tctcggtacc atggacagcg ctggttaatc atgcagcccc gaataacctt ccggaaccaa    33394

atggccagca atgcgccccc agcaatacat tgaagagaac cctgtcgatt acagtgacaa    33454

tggagaaccc acttctctcg cccatggatc acttgggaat aaaatatatc tattgtggca    33514

caacacagac ataaatgcat acatcttctc atcaccctta actcttcagg ggttaaaaac    33574

atatcccagg gaataggaag ctcttgcaaa acagtaaagg tggcagaaca aggcagaccg    33634

cgaacataac ttacactgtg catggtcaag gtattgcaat ctggtaacag cggatgctct    33694

tcagtcatag aagctctggt ttcactttcc tcacaacgtg gtaaaggggc cctcagttga    33754

ggttccctgg tgtaaggatg gtgtctggcg cacgatgtcg agcgtgcacg cgacctcgtt    33814

gtaatggagc tgcttcctga cattctcgta ttttgcatgg cagaacctag ccttggcaca    33874

acacacttct cttcgccttc tatcccgtcg cctagcacgt tcagtatggt aattgaagta    33934

cagccattcc cgtagattgg tcaaaagctc ctcggcttca gttgtcataa aaactccatc    33994

atatcttact gctctgataa aatcattcac tgtagaatgg gcaatgccca gccaggcaat    34054

gcaattagct tgtgtttcaa ccaaaggagg gggaggaaga catggaagaa ccataattaa    34114
```

ttttattcc agacgatccc gcagtatttc tacatggaga tcacgaagat ggcacctctc 34174

gcccccactg tgttgatgaa aaatgacagc taggtcaaac ataatgcgat tttccaggtg 34234

ctcaacggtg gcttcaagca aagcctccaa acgtacatcc aaaaacaaaa gaacagcaaa 34294

agcaggagca ttttctaatt cctcaatcat catattacat tcctgtacca ttcccaaata 34354

attttcatct ttccatcctt gaattattcg tgttatttca tctggtaaat ccaatccaca 34414

catgagaaat agctcccgaa gggcgccctc caccggcatt cttaagcaca ccctcatagt 34474

gaaaaaatat cgtgctcctc tgtcacctgc agcaaattaa gaatggcaac atcatactgg 34534

atgccactgg ctctaagttc ttctctaagt tccagttgta aaaactcttg catatcatcg 34594

ccaaactgct tggccatagg tcctccagga ataagagctg gggacgctac agtgcagaac 34654

aagcgcatgc caccccaatt gcctccagca aaagttaggt tgcaatatgc atactgagaa 34714

cctccagtga tatcatccag tgtactggaa agataatcag gcagagcttc tcgtatacaa 34774

ttaataatag aaaagtctgc cagatgaaca tttaaagcct gtgggatgca gatgcaataa 34834

gttatcgcgc tgcgctccaa cattgttagt atggttagtc tgtaaaaaca aaaaacaaaa 34894

attacatcac gctgtactgg cgaacgggtg gataaatcac tctctccaac accaggcagg 34954

ctacagggtc tccagcgcga ccctcgtaaa acctgtcagt atgattaaaa agcatcaccg 35014

aaagagattg ttgatggcca gcatatatta tttgcgatga agcatacaaa ccagaagtgt 35074

tagtatcagt taaagaaaaa aatcggccaa gatagcatct cggaacgatt atgctcaatc 35134

tcaaatgcag caaagcgaca cctcgcggat gcaaagtaaa atccacagga gcataaaaaa 35194

tgtaattatt cccctcttgc acaggcagcc tagctcccgg cccctccagg atcacataca 35254

aagcctcagc agccatagct taccgcgcaa atcaggcaca gcagtcagat aacgagaaag 35314

ctgtgaactg actgcccagc cgtgcgcaat atatagagaa cccttacact gacgtaattg 35374

gacaaagtct aaaaaatccc gccaaaaacc agcacacgcc cagaactgtg tcacccgcta 35434

aaaaataatt ttcacttcct cgttccgtga atgacgtcag ttccccttc ccacgagccg 35494

tcacttccgg gcatcttgca acgtcacctc cccgcgccgg cccgcccctt ttgaccgttg 35554

aacccgctgg ccaatcccct tccgccctcc attttcaaaa gctcatttgc atgttggcac 35614

cgttccattt ataaggtata ttattgatga tg 35646

<210> 72
<211> 495
<212> PRT
<213> Simian adenovirus 29

<400> 72

```
Met Asp Pro Thr Asn Pro Leu Gln Gln Gly Ile Arg Leu Gly Phe His
1               5                  10                  15

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

Leu Arg Leu Leu Ala Ser Ala Ala Ser Gly Arg Ser Ser Asn Pro Glu
        35                  40                  45

Thr Pro Thr Gly His Ala Ser Gly Phe Gly Gly Gly Ala Ala Gly Gly
    50                  55                  60

Gln Pro Glu Ser Arg Leu Gly Pro Ser Gly Gly Gly Gly Gly Gly Val
65                  70                  75                  80

Ala Asp Leu Phe Pro Glu Leu Arg Arg Val Leu Thr Arg Ser Thr Ser
                85                  90                  95

Ser Gly Gln Asp Arg Gly Ile Lys Arg Glu Arg Asn Ala Ser Gly His
            100                 105                 110

Asn Ser Arg Thr Glu Leu Ala Leu Ser Leu Met Ser Arg Ser Arg Pro
        115                 120                 125

Glu Thr Ile Trp Trp His Glu Val Gln Ser Glu Gly Arg Asp Glu Val
    130                 135                 140

Ser Ile Leu Gln Glu Lys Tyr Ser Leu Glu Gln Ile Lys Thr Cys Trp
145                 150                 155                 160

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

Ile Ser Leu Arg Pro Asp Lys Gln Tyr Lys Ile Thr Lys Lys Ile Asn
            180                 185                 190

Ile Arg Asn Ala Cys Tyr Ile Ala Gly Asn Gly Ala Glu Val Ile Ile
        195                 200                 205

Asp Thr Pro Asp Lys Thr Ala Phe Arg Cys Cys Met Met Gly Met Trp
    210                 215                 220

Pro Gly Val Ala Gly Met Glu Ala Val Thr Leu Met Asn Ile Arg Phe
225                 230                 235                 240
```

```
Arg Gly Asp Gly Tyr Asn Gly Ile Val Phe Met Ala Asn Thr Lys Leu
                245                 250                 255

Ile Leu His Gly Cys Ser Phe Phe Gly Phe Asn Asn Thr Cys Val Glu
            260                 265                 270

Ser Trp Gly Gln Val Ser Ile Arg Gly Cys Ser Phe Tyr Ala Cys Trp
        275                 280                 285

Ile Ala Leu Ser Gly Arg Thr Lys Ser Gln Leu Ser Val Lys Lys Cys
    290                 295                 300

Met Phe Glu Arg Cys Asn Leu Gly Ile Leu Asn Glu Gly Glu Ala Arg
305                 310                 315                 320

Val Arg His Cys Ala Ala Thr Glu Thr Gly Cys Phe Ile Leu Ile Lys
                325                 330                 335

Gly Asn Ala Ser Val Lys His Asn Met Ile Cys Gly Pro Ser Asp Glu
            340                 345                 350

Arg Pro Tyr Gln Met Leu Thr Cys Ala Gly Gly His Cys Asn Met Leu
        355                 360                 365

Ala Thr Val His Ile Val Ser His Ala Arg Lys Lys Trp Pro Val Phe
    370                 375                 380

Glu His Asn Val Met Thr Lys Cys Thr Met His Ala Gly Gly Arg Arg
385                 390                 395                 400

Gly Met Phe Met Pro Tyr Gln Cys Asn Met Asn His Val Lys Val Met
                405                 410                 415

Leu Glu Pro Asp Ala Phe Ser Arg Met Ser Leu Thr Gly Ile Phe Asp
            420                 425                 430

Met Asn Val Gln Leu Trp Lys Ile Leu Arg Tyr Asp Glu Thr Lys Ser
        435                 440                 445

Arg Val Arg Ala Cys Glu Cys Gly Gly Lys His Ala Arg Phe Gln Pro
    450                 455                 460

Val Cys Val Asp Val Thr Glu Asp Leu Arg Pro Asp His Leu Val Leu
```

```
465                 470                 475                 480

Ala Cys Thr Gly Ala Glu Phe Gly Ser Ser Gly Glu Glu Thr Asp
                485                 490                 495


<210>  73
<211>  138
<212>  PRT
<213>  Simian adenovirus 29

<400>  73

Met Ser Gly Ser Ala Ser Phe Glu Gly Gly Val Phe Ser Pro Tyr Leu
1               5                   10                  15


Thr Gly Arg Leu Pro Pro Trp Ala Gly Val Arg Gln Asn Val Met Gly
            20                  25                  30


Ser Thr Val Asp Gly Arg Pro Val Gln Pro Ala Asn Ser Ser Thr Leu
        35                  40                  45


Thr Tyr Ala Thr Leu Ser Ser Ser Ser Leu Asp Ala Ala Ala Ala Ala
    50                  55                  60


Ala Ala Ser Ala Ala Ala Asn Thr Val Leu Gly Met Gly Tyr Tyr Gly
65                  70                  75                  80


Ser Ile Val Ala Asn Ser Ser Ser Ser Asn Asn Pro Ser Thr Leu Ala
                85                  90                  95


Glu Asp Lys Leu Leu Val Leu Leu Ala Gln Leu Glu Ala Leu Thr Gln
            100                 105                 110


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


Glu Ser Ala Val Ala Thr Ala Lys Ser Lys
    130                 135


<210>  74
<211>  389
<212>  PRT
<213>  Simian adenovirus 29

<400>  74

Met His Pro Val Leu Arg Gln Met Arg Pro Gln Gln Gln Val Pro Ser
1               5                   10                  15
```

```
Gln Gln Gln Gln Gln Pro Gln Lys Ala Leu Pro Ala Pro Ala Pro Ala
            20                  25                  30

Thr Thr Ala Val Ala Ala Val Cys Gly Ala Gly Gln Pro Ala Tyr Asp
        35                  40                  45

Leu Asp Leu Glu Glu Gly Glu Gly Leu Ala Arg Leu Gly Ala Pro Ser
    50                  55                  60

Pro Glu Arg His Pro Arg Val Gln Leu Lys Lys Asp Ser Arg Glu Ala
65                  70                  75                  80

Tyr Val Pro Gln Gln Asn Leu Phe Arg Asp Arg Ser Gly Glu Glu Pro
                85                  90                  95

Glu Glu Met Arg Ala Ser Arg Phe Asn Ala Gly Arg Glu Leu Arg His
            100                 105                 110

Gly Leu Asp Arg Arg Arg Val Leu Arg Asp Glu Asp Phe Glu Val Asp
        115                 120                 125

Glu Val Thr Gly Ile Ser Pro Ala Arg Ala His Val Ala Ala Ala Asn
    130                 135                 140

Leu Val Ser Ala Tyr Glu Gln Thr Val Lys Glu Glu Arg Asn Phe Gln
145                 150                 155                 160

Lys Ser Phe Asn Asn His Val Arg Thr Leu Ile Ala Arg Glu Glu Val
                165                 170                 175

Thr Leu Gly Leu Met His Leu Trp Asp Leu Met Glu Ala Ile Thr Gln
            180                 185                 190

Asn Pro Thr Ser Lys Pro Leu Thr Ala Gln Leu Phe Leu Val Val Gln
        195                 200                 205

His Ser Arg Asp Asn Glu Ala Phe Arg Glu Ala Leu Leu Asn Ile Thr
    210                 215                 220

Glu Pro Glu Gly Arg Trp Leu Tyr Asp Leu Ile Asn Ile Leu Gln Ser
225                 230                 235                 240

Ile Ile Val Gln Glu Arg Ser Leu Gly Leu Ala Glu Lys Val Ala Ala
```

245 250 255

Ile Asn Tyr Ser Val Leu Ser Leu Gly Lys Tyr Tyr Ala Arg Lys Ile
260 265 270

Tyr Lys Thr Pro Tyr Val Pro Ile Asp Lys Glu Val Lys Ile Asp Gly
275 280 285

Phe Tyr Met Arg Met Thr Leu Lys Val Leu Thr Leu Ser Asp Asp Leu
290 295 300

Gly Val Tyr Arg Asn Asp Arg Met His Arg Ala Val Ser Ala Ser Arg
305 310 315 320

Arg Arg Glu Leu Ser Asp Arg Glu Leu Met His Ser Leu Gln Arg Ala
325 330 335

Leu Thr Gly Ala Gly Thr Asp Gly Glu Asn Tyr Phe Asp Met Gly Ala
340 345 350

Asp Leu Gln Trp Gln Pro Ser Arg Arg Thr Leu Asp Ala Ala Gly Cys
355 360 365

Glu Leu Pro Tyr Val Glu Glu Val Asp Glu Gly Glu Glu Glu Glu Gly
370 375 380

Glu Tyr Leu Glu Asp
385

<210> 75
<211> 587
<212> PRT
<213> Simian adenovirus 29

<400> 75

Met Glu Gln Gln Ala Pro Asp Pro Ala Met Arg Ala Ala Leu Gln Ser
1 5 10 15

Gln Pro Ser Gly Ile Asn Ser Ser Asp Asp Trp Thr Gln Ala Met Gln
20 25 30

Arg Ile Met Ala Leu Thr Thr Arg Asn Pro Glu Ala Phe Arg Gln Gln
35 40 45

Pro Gln Ala Asn Arg Leu Ser Ala Ile Leu Glu Ala Val Val Pro Ser

```
    50                  55                  60

Arg Ser Asn Pro Thr His Glu Lys Val Leu Ala Ile Val Asn Ala Leu
65                  70                  75                  80

Val Glu Asn Lys Ala Ile Arg Pro Asp Glu Ala Gly Leu Val Tyr Asn
                85                  90                  95

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

Asn Leu Asp Arg Met Val Thr Asp Val Arg Glu Ala Val Ser Gln Arg
        115                 120                 125

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

Ala Phe Leu Ser Thr Gln Pro Ala Asn Val Pro Arg Gly Gln Gln Asp
145                 150                 155                 160

Tyr Thr Asn Phe Leu Ser Ala Leu Arg Leu Met Val Thr Glu Val Pro
                165                 170                 175

Gln Ser Glu Val Tyr Gln Ser Gly Pro Asp Tyr Phe Phe Gln Thr Ser
            180                 185                 190

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

Lys Gly Leu Trp Gly Val His Ala Pro Val Gly Asp Arg Ala Thr Val
    210                 215                 220

Ser Ser Leu Leu Thr Pro Asn Ser Arg Leu Leu Leu Leu Leu Val Ala
225                 230                 235                 240

Pro Phe Thr Asp Ser Gly Ser Ile Asp Arg Asn Ser Tyr Leu Gly Tyr
                245                 250                 255

Leu Leu Asn Leu Tyr Arg Glu Ala Ile Gly Gln Ser Gln Val Asp Glu
            260                 265                 270

Gln Thr Tyr Gln Glu Ile Thr Gln Val Ser Arg Ala Leu Gly Gln Glu
        275                 280                 285
```

```
Asp Thr Gly Ser Leu Glu Ala Thr Leu Asn Phe Leu Leu Thr Asn Arg
    290                 295                 300

Ser Gln Lys Ile Pro Pro Gln Tyr Ala Leu Thr Ala Glu Glu Glu Arg
305                 310                 315                 320

Ile Leu Arg Tyr Val Gln Gln Ser Val Gly Leu Phe Leu Met Gln Glu
                325                 330                 335

Gly Ala Thr Pro Ser Ala Ala Leu Asp Met Thr Ala Arg Asn Met Glu
            340                 345                 350

Pro Ser Met Tyr Ala Ser Asn Arg Pro Phe Ile Asn Lys Leu Leu Asp
        355                 360                 365

Tyr Leu His Arg Ala Ala Ala Met Asn Ser Asp Tyr Phe Thr Asn Ala
    370                 375                 380

Ile Leu Asn Pro His Trp Leu Pro Pro Pro Gly Phe Tyr Thr Gly Glu
385                 390                 395                 400

Tyr Asp Met Pro Asp Pro Asn Asp Gly Phe Leu Trp Asp Asp Val Asp
                405                 410                 415

Ser Ser Ile Phe Ser Pro Pro Pro Gly Tyr Asn Thr Trp Lys Lys Glu
            420                 425                 430

Gly Gly Asp Arg Arg His Ser Ser Val Ser Leu Ser Gly Ser Arg Gly
        435                 440                 445

Ala Ala Ala Ala Val Pro Glu Ala Ala Ser Pro Phe Pro Ser Leu Pro
    450                 455                 460

Phe Ser Leu Asn Ser Val Arg Ser Ser Glu Leu Gly Arg Ile Thr Arg
465                 470                 475                 480

Pro Arg Leu Met Gly Glu Asp Glu Tyr Leu Asn Asp Ser Leu Leu Arg
                485                 490                 495

Pro Glu Arg Glu Lys Asn Phe Pro Asn Asn Gly Ile Glu Ser Leu Val
            500                 505                 510

Asp Lys Met Ser Arg Trp Lys Thr Tyr Ala Gln Asp His Lys Asp Glu
        515                 520                 525
```

```
Pro Arg Ile Leu Gly Ala Ala Ser Gly Thr Thr Arg Arg Arg Gln Arg
    530                 535                 540

His Asp Arg Gln Arg Gly Leu Val Trp Asp Asp Glu Asp Ser Ala Asp
545                 550                 555                 560

Asp Ser Ser Val Leu Asp Leu Gly Gly Arg Gly Gly Gly Asn Pro Phe
                565                 570                 575

Ala His Leu Arg Pro His Phe Gly Arg Met Leu
            580                 585
```

<210> 76
<211> 576
<212> PRT
<213> Simian adenovirus 29

<400> 76

```
Met Met Arg Arg Ala Val Leu Gly Gly Ala Val Val Tyr Pro Glu Gly
1               5                   10                  15

Pro Pro Pro Ser Tyr Glu Ser Val Met Gln Gln Gln Ala Ala Ala Val
            20                  25                  30

Met Gln Pro Ser Leu Glu Ala Pro Phe Val Pro Pro Arg Tyr Leu Ala
        35                  40                  45

Pro Thr Glu Gly Arg Asn Ser Ile Arg Tyr Ser Glu Leu Ala Pro Gln
    50                  55                  60

Tyr Asp Thr Thr Arg Leu Tyr Leu Val Asp Asn Lys Ser Ala Asp Ile
65                  70                  75                  80

Ala Ser Leu Asn Tyr Gln Asn Asp His Ser Asn Phe Leu Thr Thr Val
                85                  90                  95

Val Gln Asn Asn Asp Phe Thr Pro Thr Glu Ala Ser Thr Gln Thr Ile
            100                 105                 110

Asn Phe Asp Glu Arg Ser Arg Trp Gly Gly Gln Leu Lys Thr Ile Met
        115                 120                 125

His Thr Asn Met Pro Asn Val Asn Glu Tyr Met Phe Ser Asn Lys Phe
    130                 135                 140
```

```
Lys Ala Arg Val Met Val Ser Arg Glu Ala Ser Lys Ile Asp Ser Glu
145                 150                 155                 160

Lys Asn Asp Arg Ser Lys Asp Thr Leu Lys Tyr Glu Trp Phe Glu Phe
                165                 170                 175

Thr Leu Pro Glu Gly Asn Phe Ser Ala Thr Met Thr Ile Asp Leu Met
            180                 185                 190

Asn Asn Ala Ile Ile Asp Asn Tyr Leu Ala Val Gly Arg Gln Asn Gly
        195                 200                 205

Val Leu Gln Ser Asp Ile Gly Val Lys Phe Asp Thr Arg Asn Phe Arg
    210                 215                 220

Leu Gly Trp Asp Pro Val Thr Lys Leu Val Met Pro Gly Val Tyr Thr
225                 230                 235                 240

Tyr Glu Ala Phe His Pro Asp Ile Val Leu Leu Pro Asp Cys Gly Val
                245                 250                 255

Asp Phe Thr Glu Ser Arg Leu Ser Asn Leu Leu Gly Ile Arg Lys Arg
            260                 265                 270

His Pro Phe Gln Glu Gly Phe Lys Ile Met Tyr Glu Asp Leu Glu Gly
        275                 280                 285

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

Lys Glu Ile Ala Ser Ser Thr Thr Thr Thr Thr Ala Val Thr Thr Val
305                 310                 315                 320

Ala Arg Asn Val Ala Asp Thr Ser Val Glu Ala Val Ala Val Ala Val
                325                 330                 335

Val Asp Thr Ile Lys Ala Glu Asn Asp Ser Ala Val Arg Gly Asp Asn
            340                 345                 350

Phe Gln Ser Lys Asn Asp Met Lys Ala Ser Glu Glu Val Thr Val Val
        355                 360                 365

Pro Val Ser Pro Pro Thr Val Thr Glu Thr Glu Thr Lys Glu Pro Thr
    370                 375                 380
```

```
Ile Lys Pro Leu Glu Lys Asp Thr Lys Asp Arg Ser Tyr Asn Val Ile
385                 390                 395                 400

Ser Gly Thr Asn Asp Thr Ala Tyr Arg Ser Trp Tyr Leu Ala Tyr Asn
                405                 410                 415

Tyr Gly Asp Pro Glu Lys Gly Val Arg Ser Trp Thr Leu Leu Thr Thr
            420                 425                 430

Ser Asp Val Thr Cys Gly Ala Glu Gln Val Tyr Trp Ser Leu Pro Asp
        435                 440                 445

Met Met Gln Asp Pro Val Thr Phe Arg Ser Thr Arg Gln Val Ser Asn
    450                 455                 460

Tyr Pro Val Val Gly Ala Glu Leu Met Pro Val Phe Ser Lys Ser Phe
465                 470                 475                 480

Tyr Asn Glu Gln Ala Val Tyr Ser Gln Gln Leu Arg Gln Thr Thr Ser
                485                 490                 495

Leu Thr His Val Phe Asn Arg Phe Pro Glu Asn Gln Ile Leu Ile Arg
            500                 505                 510

Pro Pro Ala Pro Thr Ile Thr Thr Val Ser Glu Asn Val Pro Ala Leu
        515                 520                 525

Thr Asp His Gly Thr Leu Pro Leu Arg Ser Ser Ile Arg Gly Val Gln
    530                 535                 540

Arg Val Thr Val Thr Asp Ala Arg Arg Arg Thr Cys Pro Tyr Val Tyr
545                 550                 555                 560

Lys Ala Leu Gly Ile Val Ala Pro Arg Val Leu Ser Ser Arg Thr Phe
                565                 570                 575
```

<210> 77
<211> 192
<212> PRT
<213> Simian adenovirus 29

<400> 77

```
Met Ser Ile Leu Ile Ser Pro Ser Asn Asn Thr Gly Trp Gly Leu Arg
1               5                   10                  15
```

```
Thr Pro Thr Arg Met Tyr Gly Gly Ala Arg Lys Arg Ser Thr Gln His
            20                  25                  30

Pro Val Arg Val Arg Gly His Phe Arg Ala Pro Trp Gly Ala Leu Lys
        35                  40                  45

Gly Arg Ala Arg Thr Arg Thr Thr Val Asp Asp Val Ile Asp Gln Val
    50                  55                  60

Val Ala Asp Ala Arg Asn Tyr Thr Pro Ala Ala Pro Ala Ser Thr Val
65                  70                  75                  80

Asp Ala Val Ile Asp Ser Val Val Ala Asp Ala Arg Asp Tyr Ala Arg
                85                  90                  95

Arg Lys Ser Arg Arg Arg Arg Ile Ala Arg Arg His Arg Ala Thr Pro
            100                 105                 110

Ala Met Arg Ala Ala Arg Ala Leu Leu Arg Arg Ala Lys Arg Val Gly
        115                 120                 125

Arg Arg Ala Met Leu Arg Ala Ala Arg Arg Ala Ala Ser Gly Ala Ser
    130                 135                 140

Ala Gly Arg Ser Arg Arg Arg Ala Ala Thr Ala Ala Ala Ala Ala Ile
145                 150                 155                 160

Ala Asn Met Ala Gln Pro Arg Arg Gly Asn Val Tyr Trp Val Arg Asp
                165                 170                 175

Ala Thr Thr Gly Gln Arg Val Pro Val Arg Thr Arg Pro Pro Arg Thr
            180                 185                 190
```

<210> 78
<211> 350
<212> PRT
<213> Simian adenovirus 29

<400> 78

```
Met Ser Lys Arg Lys Tyr Lys Glu Glu Met Leu Gln Val Ile Ala Pro
1               5                   10                  15

Glu Ile Tyr Gly Pro Pro Val Lys Asp Glu Lys Lys Pro Arg Lys Ile
            20                  25                  30
```

```
Lys Arg Val Lys Lys Asp Lys Lys Glu Glu Asp Gly Asp Asp Gly Leu
        35                  40                  45

Val Glu Phe Val Arg Glu Phe Ala Pro Arg Arg Arg Val Gln Trp Arg
    50                  55                  60

Gly Arg Arg Val Arg Pro Val Leu Arg Pro Gly Thr Thr Val Val Phe
65                  70                  75                  80

Thr Pro Gly Glu Arg Ser Ser Thr Thr Phe Lys Arg Ser Tyr Asp Glu
                85                  90                  95

Val Tyr Gly Asp Asp Asp Ile Leu Glu Gln Ala Ala Asp Arg Leu Gly
            100                 105                 110

Glu Phe Ala Tyr Gly Lys Arg Ser Arg Ser Ser Pro Lys Asp Glu Ala
        115                 120                 125

Val Ser Ile Pro Leu Asp His Gly Asn Pro Thr Pro Ser Leu Lys Pro
    130                 135                 140

Val Thr Leu Gln Gln Val Leu Pro Val Pro Pro Arg Arg Gly Val Lys
145                 150                 155                 160

Arg Glu Gly Glu Asp Leu Tyr Pro Thr Met Gln Leu Met Val Pro Lys
                165                 170                 175

Arg Gln Lys Leu Glu Asp Val Leu Glu Lys Met Lys Val Asp Pro Asp
            180                 185                 190

Ile Gln Pro Glu Val Lys Val Arg Pro Ile Lys Gln Val Ala Pro Gly
        195                 200                 205

Leu Gly Val Gln Thr Val Asp Ile Lys Ile Pro Thr Glu Ser Met Glu
    210                 215                 220

Val Gln Thr Glu Pro Ala Lys Pro Thr Ala Thr Ser Ile Glu Val Gln
225                 230                 235                 240

Thr Asp Pro Trp Met Pro Ala Pro Ile Ala Thr Thr Ala Ser Thr Ala
                245                 250                 255

Arg Arg Pro Arg Arg Lys Tyr Gly Pro Ala Ser Leu Leu Met Pro Asn
```

260 265 270

Tyr Ala Leu His Pro Ser Ile Ile Pro Thr Pro Gly Tyr Arg Gly Thr
275 280 285

Arg Tyr Tyr Arg Ser Arg Ser Thr Thr Ser Arg Arg Arg Lys Thr Pro
290 295 300

Ala Ser Arg Ser Arg Arg Arg Arg Arg Arg Thr Ala Ser Lys Leu Thr
305 310 315 320

Pro Ala Ala Leu Val Arg Arg Val Tyr Arg Asp Gly Arg Ala Glu Pro
325 330 335

Leu Met Leu Pro Arg Ala Arg Tyr His Pro Ser Ile Thr Thr
340 345 350

<210> 79
<211> 75
<212> PRT
<213> Simian adenovirus 29

<400> 79

Met Ala Leu Thr Cys Arg Leu Arg Val Pro Ile Thr Gly Tyr Arg Gly
1 5 10 15

Arg Asn Ser Arg Arg Arg Arg Met Leu Gly Arg Gly Met Arg Arg His
20 25 30

Arg Arg Arg Arg Ala Ile Ser Lys Arg Leu Gly Gly Gly Phe Leu Thr
35 40 45

Ala Leu Ile Pro Ile Ile Ala Ala Ala Ile Gly Ala Val Pro Gly Ile
50 55 60

Ala Ser Val Ala Val Gln Ala Ser Gln Arg His
65 70 75

<210> 80
<211> 250
<212> PRT
<213> Simian adenovirus 29

<400> 80

Met Glu Asp Ile Asn Phe Ser Ser Leu Ala Pro Arg His Gly Thr Arg
1 5 10 15

```
Pro Tyr Met Gly Thr Trp Ser Asp Ile Gly Thr Ser Gln Leu Asn Gly
            20                  25                  30

Gly Ala Phe Asn Trp Ser Ser Ile Trp Ser Gly Leu Lys Asn Phe Gly
        35                  40                  45

Ser Thr Ile Lys Thr Tyr Gly Asn Lys Ala Trp Asn Ser Ser Thr Gly
    50                  55                  60

Gln Ala Leu Arg Asn Lys Leu Lys Glu Gln Asn Phe Gln Gln Lys Val
65                  70                  75                  80

Val Asp Gly Ile Ala Ser Gly Ile Asn Gly Val Val Asp Leu Ala Asn
                85                  90                  95

Gln Ala Val Gln Lys Gln Ile Asn Ser Arg Leu Asp Ala Pro Pro Ala
            100                 105                 110

Ala Pro Gly Glu Met Glu Val Glu Glu Glu Leu Pro Pro Leu Glu Lys
        115                 120                 125

Arg Gly Asp Lys Arg Pro Arg Pro Asp Met Glu Glu Thr Leu Val Thr
    130                 135                 140

Arg Gly Asp Glu Pro Pro Pro Tyr Glu Glu Ala Ile Lys Leu Gly Met
145                 150                 155                 160

Pro Thr Thr Arg Pro Ile Ala Pro Met Ala Thr Gly Val Met Lys Pro
                165                 170                 175

Ser Gln Ser His Arg Pro Ala Thr Leu Asp Leu Pro Pro Ser Pro Ala
            180                 185                 190

Ala Val Ala Ser Ala Pro Lys Pro Val Ala Thr Pro Lys Pro Thr Thr
        195                 200                 205

Val Gln Pro Val Ala Val Ala Arg Pro Arg Pro Gly Gly Thr Pro Arg
    210                 215                 220

Pro Asn Ala Asn Trp Gln Ser Thr Leu Asn Ser Ile Val Gly Leu Gly
225                 230                 235                 240

Val Gln Ser Val Lys Arg Arg Arg Cys Tyr
```

245 250

<210> 81
<211> 954
<212> PRT
<213> Simian adenovirus 29

<400> 81

Met Ala Thr Pro Ser Met Leu Pro Gln Trp Ala Tyr Met His Ile Ala
1 5 10 15

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

Arg Ala Thr Asp Thr Tyr Phe Asn Leu Gly Asn Lys Phe Arg Asn Pro
35 40 45

Thr Val Ala Pro Thr His Asp Val Thr Thr Asp Arg Ser Gln Arg Leu
50 55 60

Met Leu Arg Phe Val Pro Val Asp Arg Glu Asp Asn Thr Tyr Ser Tyr
65 70 75 80

Lys Val Arg Tyr Thr Leu Ala Val Gly Asp Asn Arg Val Leu Asp Met
85 90 95

Ala Ser Thr Phe Phe Asp Ile Arg Gly Val Leu Asp Arg Gly Pro Ser
100 105 110

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

Ala Pro Asn Thr Ser Gln Trp Val Asp Glu Gly Lys Lys Ile Thr Asp
130 135 140

Asn Gly Val Glu Ala Ala Asp Asp Asn Ala Lys Ala Thr Tyr Thr Phe
145 150 155 160

Gly Asn Ala Pro Val Lys Ala Glu Asp Asp Ile Thr Lys Asp Gly Leu
165 170 175

Pro Val Ala Val Glu Val Thr Gly Glu Asp Asp Glu Thr Lys Pro Ile
180 185 190

Tyr Ala Asp Lys Leu Tyr Gln Pro Glu Pro Gln Val Gly Glu Glu Thr

```
        195                 200                 205

Trp Thr Asp Thr Asp Ala Thr Thr Glu Lys Tyr Gly Gly Arg Ala Leu
    210                 215                 220

Lys Pro Asp Thr Lys Met Lys Pro Cys Tyr Gly Ser Phe Ala Lys Pro
225                 230                 235                 240

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

Thr Val Asp Pro Thr Lys Val Gln Tyr Asp Ile Asp Met Asn Phe Phe
            260                 265                 270

Glu Glu Arg Ser Gln Lys Asn Gly Ser Pro Lys Ile Val Met Tyr Ala
        275                 280                 285

Glu Asn Val Asp Leu Glu Thr Pro Asp Thr His Val Val Tyr Lys Pro
    290                 295                 300

Gly Thr Ser Glu Asp Ser Ser His Ala Asn Leu Gly Gln Gln Ser Met
305                 310                 315                 320

Pro Asn Arg Pro Asn Tyr Ile Gly Phe Arg Asp Asn Phe Ile Gly Leu
                325                 330                 335

Met Tyr Tyr Asn Ser Thr Gly Asn Met Gly Val Leu Ala Gly Gln Ala
            340                 345                 350

Ser Gln Leu Asn Ala Val Val Asp Leu Gln Asp Arg Asn Thr Glu Leu
        355                 360                 365

Ser Tyr Gln Leu Leu Leu Asp Ser Leu Gly Asp Arg Thr Arg Tyr Phe
    370                 375                 380

Ser Met Trp Asn Gln Ala Val Asp Ser Tyr Asp Pro Asp Val Arg Ile
385                 390                 395                 400

Ile Glu Asn His Gly Val Glu Asp Glu Leu Pro Asn Tyr Cys Phe Pro
                405                 410                 415

Leu Asp Gly Val Gly Pro Arg Thr Val Ser Tyr Lys Gln Met Glu Pro
            420                 425                 430
```

```
Asn Gly Thr Asp Ala Ala Asp Ala Asn Gly Trp Lys Asn Val Thr Pro
        435                 440                 445

Thr Gly Ile Ser Glu Ile Ala Lys Gly Asn Pro Phe Ala Met Glu Ile
    450                 455                 460

Asn Leu Gln Ala Asn Leu Trp Arg Ser Phe Leu Tyr Ser Asn Val Ala
465                 470                 475                 480

Leu Tyr Leu Pro Asp Ser Tyr Lys Tyr Thr Pro Ala Asn Val Thr Leu
                485                 490                 495

Pro Thr Asn Thr Asn Thr Tyr Asp Tyr Leu Asn Gly Arg Val Val Pro
            500                 505                 510

Pro Ser Leu Val Asp Thr Tyr Val Asn Ile Gly Ala Arg Trp Ser Leu
        515                 520                 525

Asp Ala Met Asp Asn Val Asn Pro Phe Asn His His Arg Asn Ala Gly
    530                 535                 540

Leu Arg Tyr Arg Ser Met Leu Leu Gly Asn Gly Arg Tyr Val Pro Phe
545                 550                 555                 560

His Ile Gln Val Pro Gln Lys Phe Phe Ala Ile Lys Asn Leu Leu Leu
                565                 570                 575

Leu Pro Gly Ser Tyr Thr Tyr Glu Trp Asn Phe Arg Lys Asp Val Asn
            580                 585                 590

Met Val Leu Gln Ser Ser Leu Gly Asn Asp Leu Arg Thr Asp Gly Ala
        595                 600                 605

Ser Ile Ser Phe Thr Ser Ile Asn Leu Tyr Ala Thr Phe Phe Pro Met
    610                 615                 620

Ala His Asn Thr Ala Ser Thr Leu Glu Ala Met Leu Arg Asn Asp Thr
625                 630                 635                 640

Asn Asp Gln Ser Phe Asn Asp Tyr Leu Ser Ala Ala Asn Met Leu Tyr
                645                 650                 655

Pro Ile Pro Ala Asn Ala Thr Asn Ile Pro Ile Ser Ile Pro Ser Arg
            660                 665                 670
```

```
Asn Trp Ala Ala Phe Arg Gly Trp Ser Phe Thr Arg Leu Lys Thr Lys
        675                 680                 685

Glu Thr Pro Ser Leu Gly Ser Gly Phe Asp Pro Tyr Phe Val Tyr Ser
    690                 695                 700

Gly Ser Ile Pro Tyr Leu Asp Gly Thr Phe Tyr Leu Asn His Thr Phe
705                 710                 715                 720

Lys Lys Val Ser Ile Met Phe Asp Ser Ser Val Ser Trp Pro Gly Asn
                725                 730                 735

Asp Arg Leu Leu Thr Pro Asn Glu Phe Glu Ile Lys Arg Thr Val Asp
            740                 745                 750

Gly Glu Gly Tyr Asn Val Ala Gln Cys Asn Met Thr Lys Asp Trp Phe
        755                 760                 765

Leu Val Gln Met Leu Ala Asn Tyr Asn Ile Gly Tyr Gln Gly Phe Tyr
    770                 775                 780

Ile Pro Glu Gly Tyr Lys Asp Arg Met Tyr Ser Phe Phe Arg Asn Phe
785                 790                 795                 800

Gln Pro Met Ser Arg Gln Val Val Asp Glu Ile Asn Tyr Lys Asp Tyr
                805                 810                 815

Lys Ala Val Ala Val Pro Tyr Gln His Asn Asn Ser Gly Phe Val Gly
            820                 825                 830

Tyr Met Ala Pro Thr Met Arg Gln Gly Gln Ala Tyr Pro Ala Asn Tyr
        835                 840                 845

Pro Tyr Pro Leu Ile Gly Thr Thr Ala Val Lys Ser Val Thr Gln Lys
    850                 855                 860

Lys Phe Leu Cys Asp Arg Thr Met Trp Arg Ile Pro Phe Ser Ser Asn
865                 870                 875                 880

Phe Met Ser Met Gly Ala Leu Thr Asp Leu Gly Gln Asn Met Leu Tyr
                885                 890                 895

Ala Asn Ser Ala His Ala Leu Asp Met Thr Phe Glu Val Asp Pro Met
            900                 905                 910
```

```
Asp Glu Pro Thr Leu Leu Tyr Leu Leu Phe Glu Val Phe Asp Val Val
        915                 920                 925

Arg Val His Gln Pro His Arg Gly Val Ile Glu Ala Val Tyr Leu Arg
    930                 935                 940

Thr Pro Phe Ser Ala Gly Asn Ala Thr Thr
945                 950

<210>  82
<211>  209
<212>  PRT
<213>  Simian adenovirus 29

<400>  82

Met Ala Cys Gly Ser Gly Asn Gly Ser Ser Glu Gln Glu Leu Arg Ala
1               5                   10                  15

Ile Ala Arg Asp Leu Gly Cys Gly Pro Tyr Phe Leu Gly Thr Phe Asp
            20                  25                  30

Lys Arg Phe Pro Gly Phe Met Ala Pro Asp Lys Leu Ala Cys Ala Ile
        35                  40                  45

Val Asn Thr Ala Gly Arg Glu Thr Gly Gly Glu His Trp Leu Ala Phe
    50                  55                  60

Gly Trp Asn Pro Arg Ser Asn Thr Cys Tyr Leu Phe Asp Pro Phe Gly
65                  70                  75                  80

Phe Ser Asp Glu Arg Leu Lys Gln Ile Tyr Gln Phe Glu Tyr Glu Gly
                85                  90                  95

Leu Leu Arg Arg Ser Ala Leu Ala Thr Lys Asp Arg Cys Ile Thr Leu
            100                 105                 110

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

Leu Phe Cys Cys Met Phe Leu His Ala Phe Val His Trp Pro Asp Arg
    130                 135                 140

Pro Met Asp Gly Asn Pro Thr Met Lys Leu Leu Thr Gly Val Pro Asn
145                 150                 155                 160
```

```
Ser Met Leu Gln Ser Pro Gln Val Gln Pro Thr Leu Arg His Asn Gln
                165                 170                 175

Glu Ala Leu Tyr Arg Phe Leu Asn Thr His Ser Ser Tyr Phe Arg Ser
            180                 185                 190

His Arg Ala Arg Ile Glu Lys Ala Thr Ala Phe Asp Arg Met Asp Met
        195                 200                 205

Gln
```

<210> 83
<211> 832
<212> PRT
<213> Simian adenovirus 29

<400> 83

```
Met Glu Thr Gln Pro Ser Leu Pro Thr Pro Leu Gln Ala Pro Ser His
1               5                   10                  15

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

Pro Ser Pro Ala Thr Thr Thr Ser Thr Leu Glu Asp Glu Glu Glu Val
        35                  40                  45

Asp Ala Pro Gln Glu Met Gln Asp Met Glu Asp Glu Lys Ala Glu Glu
    50                  55                  60

Ile Glu Ala Asp Val Glu Gln Asp Pro Gly Tyr Val Thr Pro Ala Glu
65                  70                  75                  80

His Glu Glu Glu Leu Arg Arg Phe Leu Asp Arg Glu Asp Asn Asn Arg
                85                  90                  95

Pro Glu Gln Gln Ala Asp Gly Asp His Gln Glu Ala Gly Leu Gly Asp
            100                 105                 110

His Val Ala Asp Tyr Leu Thr Gly Leu Gly Gly Glu Asp Val Leu Leu
        115                 120                 125

Lys His Leu Ala Arg Gln Ser Ile Ile Val Lys Asp Ala Leu Leu Gly
    130                 135                 140
```

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

Leu Asn Leu Phe Ser Pro Arg Val Pro Pro Lys Arg Gln Pro Asn Gly
                165                 170                 175

Thr Cys Glu Pro Asn Pro Arg Leu Asn Phe Tyr Pro Ala Phe Ala Val
            180                 185                 190

Pro Glu Val Leu Ala Thr Tyr His Ile Phe Phe Lys Asn Gln Lys Ile
        195                 200                 205

Pro Val Ser Cys Arg Ala Asn Arg Thr Arg Ala Asp Ala Leu Leu Asn
    210                 215                 220

Leu Gly Pro Gly Ala Arg Leu Pro Asp Ile Ala Ser Leu Glu Glu Val
225                 230                 235                 240

Pro Lys Ile Phe Glu Gly Leu Gly Ser Asp Glu Thr Arg Ala Ala Asn
                245                 250                 255

Ala Leu Gln Gln Gly Glu Asn Gly Met Asp Glu His His Ser Ala Leu
            260                 265                 270

Val Glu Leu Glu Gly Asp Asn Ala Arg Leu Ala Val Leu Lys Arg Ser
        275                 280                 285

Ile Glu Val Thr His Phe Ala Tyr Pro Ala Val Asn Leu Pro Pro Lys
    290                 295                 300

Val Met Ser Ala Val Met Asp Gln Leu Leu Ile Lys Arg Ala Ser Pro
305                 310                 315                 320

Leu Ser Glu Asp Gln Asn Met Gln Asp Pro Asp Ala Ser Asp Glu Gly
                325                 330                 335

Lys Pro Val Val Ser Asp Glu Gln Leu Ser Arg Trp Leu Gly Thr Asn
            340                 345                 350

Ser Pro Arg Asp Leu Glu Glu Arg Arg Lys Leu Met Met Ala Val Val
        355                 360                 365

Leu Val Thr Val Glu Leu Glu Cys Leu Arg Arg Phe Phe Thr Asp Pro
```

```
    370                 375                 380

Glu Thr Leu Arg Lys Leu Glu Glu Asn Leu His Tyr Thr Phe Arg His
385                 390                 395                 400

Gly Phe Val Arg Gln Ala Cys Lys Ile Ser Asn Val Glu Leu Thr Asn
                405                 410                 415

Leu Val Ser Tyr Met Gly Ile Leu His Glu Asn Arg Leu Gly Gln Ser
            420                 425                 430

Val Leu His Thr Thr Leu Lys Gly Glu Ala Arg Arg Asp Tyr Ile Arg
        435                 440                 445

Asp Cys Val Tyr Leu Tyr Leu Cys His Thr Trp Gln Thr Gly Met Gly
    450                 455                 460

Val Trp Gln Gln Cys Leu Glu Glu Gln Asn Leu Lys Glu Leu Asp Lys
465                 470                 475                 480

Leu Leu Gln Arg Ser Leu Lys Ala Leu Trp Thr Gly Phe Asp Glu Arg
                485                 490                 495

Thr Val Ala Ser Asp Leu Ala Asp Ile Ile Phe Pro Glu Arg Leu Arg
            500                 505                 510

Val Thr Leu Arg Asn Gly Leu Pro Asp Phe Met Ser Gln Ser Met Leu
        515                 520                 525

Asn Asn Phe Arg Ser Phe Ile Leu Glu Arg Ser Gly Ile Leu Pro Ala
    530                 535                 540

Thr Cys Cys Ala Leu Pro Ser Asp Phe Val Pro Leu Thr Tyr Arg Glu
545                 550                 555                 560

Cys Pro Pro Pro Leu Trp Ser His Cys Tyr Leu Phe Arg Leu Ala Asn
                565                 570                 575

Tyr Leu Ser Tyr His Ser Asp Val Ile Glu Asp Val Ser Gly Asp Gly
            580                 585                 590

Leu Leu Glu Cys His Cys Arg Cys Asn Leu Cys Thr Pro His Arg Ser
        595                 600                 605
```

```
Leu Ala Cys Asn Pro Gln Leu Leu Ser Glu Thr Gln Ile Ile Gly Thr
    610                 615                 620

Phe Glu Leu Gln Gly Pro Ser Ser Glu Gly Glu Gly Ser Ser Pro Gly
625                 630                 635                 640

Gln Ser Leu Lys Leu Thr Pro Gly Leu Trp Thr Ser Ala Tyr Leu Arg
                645                 650                 655

Lys Phe Ala Pro Glu Asp Tyr His Pro Tyr Glu Ile Arg Phe Tyr Glu
            660                 665                 670

Asp Gln Ser Gln Pro Pro Lys Ala Glu Leu Ser Ala Cys Val Ile Thr
        675                 680                 685

Gln Gly Ala Ile Leu Ala Gln Leu Gln Ala Ile Gln Lys Ser Arg Gln
    690                 695                 700

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

Gly Glu Glu Leu Asn Thr Arg Phe Pro Gln Asp Val Pro Ala Pro Arg
                725                 730                 735

Lys Gln Glu Val Glu Ser Ala Ala Ala Ala Pro Arg Gly His Gly Gly
            740                 745                 750

Arg Leu Gly Gln Ser Gly Arg Gly Gly Gly Asp Gly Arg Leu Gly Gln
        755                 760                 765

Pro Gly Arg Gly Gly Gly Gln Pro Gly Gly Arg Gln Phe Gly Gly Gly
    770                 775                 780

Arg Arg Gly Gly Arg Gly Gly Gly Arg Ser Ser Arg Arg Gln Thr Val
785                 790                 795                 800

Val Leu Gly Ser Gly Asp Lys Gln Gly Pro Arg Gln Gln Gln Gln His
                805                 810                 815

Gly Tyr Asn Leu Arg Ser Gly Ser Gly Gly Pro Ala Ala Ser Gln Gln
            820                 825                 830
```

<210> 84
<211> 227
<212> PRT

<213> Simian adenovirus 29

<400> 84

```
Met Ser Lys Glu Ile Pro Thr Pro Tyr Met Trp Ser Tyr Gln Pro Gln
1               5                  10                  15

Met Gly Leu Ala Ala Gly Ala Ser Gln Asp Tyr Ser Thr Arg Met Asn
            20                  25                  30

Trp Leu Ser Ala Gly Pro Ser Met Ile Ser Arg Val Asn Asp Ile Arg
        35                  40                  45

Ala Tyr Arg Asn Gln Leu Leu Leu Glu Gln Ser Ala Leu Thr Thr Thr
    50                  55                  60

Pro Arg Gln His Leu Asn Pro Arg Asn Trp Pro Ala Ala Leu Val Tyr
65                  70                  75                  80

Gln Glu Thr Pro Ala Pro Thr Thr Val Leu Leu Pro Arg Asp Ala Gln
                85                  90                  95

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

Ala Leu Cys Arg His Arg Pro Gln Gln Ser Ile Lys Arg Leu Val Ile
        115                 120                 125

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

Gly Leu Arg Pro Asp Gly Val Phe Gln Ile Ala Gly Cys Gly Arg Ser
145                 150                 155                 160

Ser Phe Thr Pro Arg Gln Ala Val Leu Thr Leu Glu Ser Ser Ser Ser
                165                 170                 175

Gln Pro Arg Ser Gly Gly Ile Gly Thr Leu Gln Phe Val Glu Glu Phe
            180                 185                 190

Thr Pro Ser Val Tyr Phe Asn Pro Phe Ser Gly Ser Pro Gly Gln Tyr
        195                 200                 205

Pro Asp Glu Phe Ile Pro Asn Phe Asp Ala Ile Ser Glu Ser Val Asp
    210                 215                 220
```

Gly Tyr Asp
225

<210> 85
<211> 148
<212> PRT
<213> Simian adenovirus 29

<400> 85

Met Lys Ala Phe Ala Val Leu Phe Val Leu Ser Leu Ile Lys Thr Glu
1 5 10 15

Leu Arg Leu Thr Phe Gly Leu Pro Leu Leu Gln Pro Gly Leu Tyr Asn
20 25 30

Thr Ser Gln Thr Leu Arg Ser Ser Gln Lys Asn Gln Thr Leu Pro Leu
35 40 45

Ile Gln Asp Ser Asn Ser Thr Ser Pro Ala Pro Phe Pro Thr Asn Leu
50 55 60

Pro Val Thr Asn Asn Leu Gly Ala Gln Leu His His Arg Phe Ser Arg
65 70 75 80

Ser Leu Leu Ser Ala Asn Ile Thr Thr Pro Arg Thr Gly Gly Glu Leu
85 90 95

Arg Gly Leu Pro Thr Asp Asn Pro Trp Val Val Ala Gly Phe Val Ala
100 105 110

Leu Gly Val Val Ala Gly Gly Leu Val Leu Ile Leu Cys Tyr Leu Tyr
115 120 125

Thr Pro Cys Cys Ala Tyr Leu Val Val Leu Cys Cys Trp Phe Lys Lys
130 135 140

Trp Gly Ser Tyr
145

<210> 86
<211> 246
<212> PRT
<213> Simian adenovirus 29

<400> 86

```
Met Ala Ser Gln Gln Arg Glu His Cys Gly Phe Leu His Cys Leu Leu
1               5                  10                  15

Leu Val Tyr Leu His His His Cys Tyr His Val Cys Glu His Thr Leu
            20                  25                  30

Ala Tyr Ser His Ser Pro Lys Lys Gln Ser Arg Lys Arg Glu Asn Ala
        35                  40                  45

Leu Ile Ile Asn Phe Tyr Leu Gln Lys Met Thr Ser Val Ser Ala Leu
    50                  55                  60

Ile Phe Ala Thr Ile Met Ala Val Gln Gly Gln Ala Ala Gln Gly Gln
65                  70                  75                  80

Thr Leu Ile Asn Val His Pro Gly Thr Asn His Thr Leu Val Val Pro
                85                  90                  95

Asn Asn Tyr Ser Asn Ile Glu Trp Gln Trp Phe Thr Asn Asn Val Trp
            100                 105                 110

Tyr Glu Pro Cys Glu His Tyr Ser Leu Phe Ile Cys Asn His Asn Leu
        115                 120                 125

Thr Leu Ile Asn Val Ser Thr Ile His Lys Gly Tyr Tyr Tyr Arg Tyr
    130                 135                 140

Asp Asn His Ser Ile Asp Pro Thr Ile Tyr Leu Val Arg Val Asn Pro
145                 150                 155                 160

Ile Asn Lys Pro Ile Pro Lys Ala Phe Ser Arg Thr Thr Ile Gln Asn
                165                 170                 175

Phe Lys Thr Ala Ile Leu Leu Asn Phe Lys Thr Lys Asn Ile Thr Gly
            180                 185                 190

Asn Ile Leu Pro Thr Thr Pro Thr Glu Lys Asn Thr Pro Asn Ser Ile
        195                 200                 205

Phe Glu Ile Ile Ile Ala Leu Leu Ala Val Gly Ile Thr Ile Ile Leu
    210                 215                 220

Cys Met Ile Ile Tyr Ala His Cys Tyr Lys Lys Ile His His Lys Lys
225                 230                 235                 240
```

```
Glu Pro Leu Leu Ser Phe
                245


<210>  87
<211>  188
<212>  PRT
<213>  Simian adenovirus 29

<400>  87

Met Ile Phe Phe Ala Thr Leu Ile Thr Ile Gly Ile Val Gln Gly Gln
1               5                   10                  15


Asp Ile Thr Ile Gly Tyr Val Gly Asn Asn Ile Thr Leu Leu Gly Pro
            20                  25                  30


Pro Thr Gly Thr Ile Pro Thr Trp Tyr Lys Ile Tyr Glu Arg Gly Trp
        35                  40                  45


Trp Ile Arg Pro Cys Asp Gln Gly Gly Ser Lys Tyr Ile Cys Gly Arg
    50                  55                  60


Asp Ile Thr Ile Thr Asn Leu Asn Lys Asn Asp Asn Gly Tyr Tyr Phe
65                  70                  75                  80


Cys Asn Asn Tyr Gly Gly Gly Lys Lys Ser Tyr Thr Leu Glu Val Arg
                85                  90                  95


Asp Pro Thr Thr Leu Ala Pro His Thr Thr Phe Ser Ser Ser Thr Ser
            100                 105                 110


Arg Asn Thr His Glu Ala Ala Tyr Ala Arg Ala Met Leu Gln Lys Ile
        115                 120                 125


Asn Glu Thr Ile Asn Ser Thr Ile Ser His Asn Pro Asp Glu Ile Pro
    130                 135                 140


Lys Ser Met Ile Gly Ile Ile Val Ala Val Ala Val Gly Met Ala Ile
145                 150                 155                 160


Ile Ile Ile Cys Met Ile Val Tyr Ala Cys Cys Tyr Arg Lys Phe Gln
                165                 170                 175


Asp Glu Lys Gly Asp Pro Leu Leu Ser Phe Asp Ile
            180                 185
```

<210> 88
<211> 107
<212> PRT
<213> Simian adenovirus 29

<400> 88

Met Lys Gly Val Gly Ile Leu Val Leu Ser Thr Leu Ile Tyr Ser Val
1 5 10 15

Ile Pro Ile Ser Ile Asn Val Gln Thr Thr Leu Asn Glu Thr Gly Asn
20 25 30

His Ser Thr Thr Ser His Thr Pro Pro Pro Leu Ser Thr His Pro Gln
35 40 45

Ser Lys Asp Ala Ile Gln Leu Gln Leu Thr Ile Leu Ile Val Ile Gly
50 55 60

Leu Thr Ile Leu Ala Val Ile Leu Tyr Phe Ile Phe Cys Arg Gln Ile
65 70 75 80

Pro Asn Val Val Lys Lys Pro Thr Arg Arg Pro Ile Tyr Arg Ser Ile
85 90 95

Ile Ser Lys Pro His Met Ala Leu Asn Glu Ile
100 105

<210> 89
<211> 91
<212> PRT
<213> Simian adenovirus 29

<400> 89

Met Ile Pro Arg Asn Phe Phe Phe Thr Ile Leu Ile Cys Ala Phe Asn
1 5 10 15

Val Cys Ala Thr Phe Ala Thr Val Ala Asn Val Thr Pro Asp Cys Ile
20 25 30

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

Val Cys Ser Ile Val Cys Leu Val Ile Asn Phe Phe Gln Leu Val Asp
50 55 60

```
Trp Val Phe Val Arg Ile Ala Tyr Leu Arg His His Pro Glu Tyr Arg
65                  70                  75                  80


Asn Gln Asn Val Ala Ala Ile Leu Arg Leu Ile
                85                  90


<210>  90
<211>  132
<212>  PRT
<213>  Simian adenovirus 29

<400>  90

Met Thr Asp Pro His Ala Ala Ala Glu Glu Leu Leu Asp Met Asp Gly
1               5                   10                  15


Arg Ala Ser Glu Gln Arg Leu Ala Gln Leu Arg Ile Arg Gln Gln Gln
            20                  25                  30


Glu Arg Ala Ala Lys Glu Leu Arg Asp Ala Ile Glu Ile His Gln Cys
        35                  40                  45


Lys Lys Gly Ile Phe Cys Leu Val Lys Gln Ala Lys Ile Ser Tyr Glu
    50                  55                  60


Ile Thr Ala Asn Asp His Arg Leu Ser Tyr Glu Leu Gly Pro Gln Arg
65                  70                  75                  80


Gln Lys Phe Thr Cys Met Val Gly Ile Asn Pro Ile Val Ile Thr Gln
                85                  90                  95


Gln Ala Gly Asp Thr Lys Gly Cys Ile His Cys Ser Cys Glu Ser Thr
            100                 105                 110


Glu Cys Ile Tyr Thr Leu Leu Lys Thr Leu Cys Gly Leu Arg Asp Leu
        115                 120                 125


Leu Pro Met Asn
    130


<210>  91
<211>  324
<212>  PRT
<213>  Simian adenovirus 29

<400>  91

Met Ala Lys Arg Ala Arg Leu Ser Ser Ser Phe Asn Pro Val Tyr Pro
```

```
1               5                   10                  15

Tyr Glu Asp Glu Ser Ser Ser Gln His Pro Phe Ile Asn Pro Gly Phe
            20                  25                  30

Ile Ser Pro Asn Gly Phe Thr Gln Ser Pro Asp Gly Ala Leu Thr Leu
        35                  40                  45

Lys Cys Val Ala Pro Leu Thr Thr Thr Ser Gly Ser Leu Asp Ile Lys
    50                  55                  60

Val Gly Gly Gly Leu Lys Val Asp Ser Thr Asp Gly Ser Leu Glu Glu
65                  70                  75                  80

Asn Ile Ser Thr Thr Ala Pro Leu Asn Lys Ser Asn His Ser Ile Gly
                85                  90                  95

Leu Ala Val Gly Asn Gly Leu Gln Thr Asn Glu Ser Lys Leu Cys Ala
            100                 105                 110

Lys Leu Gly Glu Glu Leu Thr Phe Asp Ser Ser Asn Ala Ile Thr Ile
        115                 120                 125

Lys Asn Asn Thr Leu Trp Thr Gly Ala Lys Pro Ser Thr Asn Cys Lys
    130                 135                 140

Ile Gln Glu Asp Ala Asp Ala Leu Asp Cys Lys Leu Thr Leu Val Leu
145                 150                 155                 160

Val Lys Asn Gly Gly Leu Val Asn Ala Tyr Val Ser Leu Ile Gly Asp
                165                 170                 175

Ser Asp Tyr Val Asn Thr Leu Phe Thr Lys Lys Thr Ala Ser Ile Ser
            180                 185                 190

Val Glu Leu Ala Phe Asp Ser Ser Gly Gln Ile Leu Thr Ser Leu Ser
        195                 200                 205

Ser Leu Lys Thr Ser Leu Asn Phe Lys His Asn Gln Asp Met Ala Thr
    210                 215                 220

Glu Thr Ile Ser Ala Lys Gly Phe Met Pro Ser Thr Thr Ala Tyr Pro
225                 230                 235                 240
```

```
Phe Asn Thr Gln Ala Thr Ser Ser Arg Asp Asn Glu Asp Tyr Ile Phe
                245                 250                 255

Gly Lys Cys Tyr Tyr Arg Ala Ser Tyr Gly Ala Leu Tyr Thr Leu Asp
            260                 265                 270

Val Thr Val Ile Leu Asn Arg Arg Met Thr Ala Ala Gly Met Ala Tyr
        275                 280                 285

Ala Met Asn Phe Thr Trp Leu Leu Asp Ala Thr Asp Ala Pro Glu Asn
    290                 295                 300

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

Glu Asp Asp Asp
```

<210> 92
<211> 550
<212> DNA
<213> Simian adenovirus 29

<220>
<221> CDS
<222> (5)..(547)
<223> label=Elb\19K

<400> 92

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atcc atg gag gtt tgg gct atc ttg gaa gat ctc agg cag act aga caa        49
     Met Glu Val Trp Ala Ile Leu Glu Asp Leu Arg Gln Thr Arg Gln
     1               5                  10                  15

ctg cta gaa aac gcc tcg gac gga gtc tct agt ctt tgg aga ttc tgg         97
Leu Leu Glu Asn Ala Ser Asp Gly Val Ser Ser Leu Trp Arg Phe Trp
                20                  25                  30

ttc ggt ggt gat cta gct agg cta gtc ttt agg gta aaa cgg gag tat        145
Phe Gly Gly Asp Leu Ala Arg Leu Val Phe Arg Val Lys Arg Glu Tyr
            35                  40                  45

agt gaa gaa ttt gaa aag tta ttg gaa gac agt cca gga ctt ttt gaa        193
Ser Glu Glu Phe Glu Lys Leu Leu Glu Asp Ser Pro Gly Leu Phe Glu
        50                  55                  60

gcc ctt aac ttg ggc cac cag gct cat ttt aag gag aag gtt tta tca        241
Ala Leu Asn Leu Gly His Gln Ala His Phe Lys Glu Lys Val Leu Ser
    65                  70                  75

gtt tta gat ttt tct acc cct ggt aga act gct gct gct gta gct ttc        289
Val Leu Asp Phe Ser Thr Pro Gly Arg Thr Ala Ala Ala Val Ala Phe
80                  85                  90                  95
```

```
ctt act ttt ata ttg gat aaa tgg atc cca caa acc cac ttc agc aag        337
Leu Thr Phe Ile Leu Asp Lys Trp Ile Pro Gln Thr His Phe Ser Lys
                100                 105                 110

gga tac gtc ttg gat ttc ata gca gca gct ttg tgg aga aca tgg aag        385
Gly Tyr Val Leu Asp Phe Ile Ala Ala Ala Leu Trp Arg Thr Trp Lys
            115                 120                 125

gcc cgc agg ctg agg ata atc tta gat tac tgg cca gtg cag cct ctg        433
Ala Arg Arg Leu Arg Ile Ile Leu Asp Tyr Trp Pro Val Gln Pro Leu
        130                 135                 140

ggc gta gca gca atc ctg aga cac cca ccg gcc atg cca gcg gtt ttg        481
Gly Val Ala Ala Ile Leu Arg His Pro Pro Ala Met Pro Ala Val Leu
    145                 150                 155

gag gag gag cag cag gag gac aac ccg aga gcc ggc ttg gac cct ccg        529
Glu Glu Glu Gln Gln Glu Asp Asn Pro Arg Ala Gly Leu Asp Pro Pro
160                 165                 170                 175

gtg gag gag gcg gag gag tag                                           550
Val Glu Glu Ala Glu Glu
                180
```

<210> 93
<211> 181
<212> PRT
<213> Simian adenovirus 29

<400> 93

```
Met Glu Val Trp Ala Ile Leu Glu Asp Leu Arg Gln Thr Arg Gln Leu
1               5                   10                  15

Leu Glu Asn Ala Ser Asp Gly Val Ser Ser Leu Trp Arg Phe Trp Phe
            20                  25                  30

Gly Gly Asp Leu Ala Arg Leu Val Phe Arg Val Lys Arg Glu Tyr Ser
        35                  40                  45

Glu Glu Phe Glu Lys Leu Leu Glu Asp Ser Pro Gly Leu Phe Glu Ala
    50                  55                  60

Leu Asn Leu Gly His Gln Ala His Phe Lys Glu Lys Val Leu Ser Val
65                  70                  75                  80

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

Thr Phe Ile Leu Asp Lys Trp Ile Pro Gln Thr His Phe Ser Lys Gly
            100                 105                 110
```

```
Tyr Val Leu Asp Phe Ile Ala Ala Ala Leu Trp Arg Thr Trp Lys Ala
        115                 120                 125

Arg Arg Leu Arg Ile Ile Leu Asp Tyr Trp Pro Val Gln Pro Leu Gly
    130                 135                 140

Val Ala Ala Ile Leu Arg His Pro Pro Ala Met Pro Ala Val Leu Glu
145                 150                 155                 160

Glu Glu Gln Gln Glu Asp Asn Pro Arg Ala Gly Leu Asp Pro Pro Val
                165                 170                 175

Glu Glu Ala Glu Glu
            180
```

<210> 94
<211> 1450
<212> DNA
<213> Simian adenovirus 29

<220>
<221> CDS
<222> (574)..(1150)
<223> label=Ela

<220>
<221> CDS
<222> (1239)..(1444)
<223> label=Ela

<400> 94

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catcatcaat aatatacctt ataaatggaa cggtgccaac atgcaaatga gcttttgaaa       60

atggagggcg gaaggggatt ggccagcggg ttcaacggtc aaaaggggcg ggccggcgcg      120

gggaggtgac gtatttcgtg tgggaggagt tatgttgcaa gttatcgcgg caaaagtgac      180

gtaaaacgag gtgtggtttg aacacggaag tagacagttt tcccgcgctg actgacagga      240

tatgaggtag ttttgggcgg atgcaagtga aaattctcca ttttcgcgcg aaaactgaat      300

gaggaagtga atttctgagt aatttcgagt ttatgacagg gtggagtatt taccgagggc      360

cgagtagact ttgaccgatt acgtggaggt ttcgattacc gtgtttttca cctaaatttc      420

cgcgtacggt gtcaaagtcc tgtgttttta cgtaggcgtc agctgatcgc tagggtattt      480

aaacctgacg agttccgtca agaggccact cttgagtgcc agcgagaaga gatttctcct      540

ccgcgccgcg agtcagatct ccactttgaa aaa atg aga cac ctg cga ttc ctg       594
                                      Met Arg His Leu Arg Phe Leu
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                                        1               5

cct cag gaa atc tcc atc gag acc ggg aat gaa ata cta cag ctt gtg        642
Pro Gln Glu Ile Ser Ile Glu Thr Gly Asn Glu Ile Leu Gln Leu Val
        10                  15                  20

gta aat gcc ctg atg gga gac gat ccg gag ccg cct gcg cat ccg ttc        690
Val Asn Ala Leu Met Gly Asp Asp Pro Glu Pro Pro Ala His Pro Phe
    25                  30                  35

gat cct cct acg ctt cat gaa ctg tat gat tta gag gta gat ggg ccg        738
Asp Pro Pro Thr Leu His Glu Leu Tyr Asp Leu Glu Val Asp Gly Pro
40                  45                  50                  55

gat gat cct aac gag gaa gct gtg aat ggt ttt ttt agc gaa tct atg        786
Asp Asp Pro Asn Glu Glu Ala Val Asn Gly Phe Phe Ser Glu Ser Met
                60                  65                  70

cta ttg gct gct aat gaa gga gtg gac ata gac cca cct tct gag acc        834
Leu Leu Ala Ala Asn Glu Gly Val Asp Ile Asp Pro Pro Ser Glu Thr
            75                  80                  85

ctc gat acc cca ggg gtg att gtg gag agc ggc aga ggt ggg aaa aaa        882
Leu Asp Thr Pro Gly Val Ile Val Glu Ser Gly Arg Gly Gly Lys Lys
        90                  95                  100

ttg cct gaa ctt ggt gct gct gaa atg gac ttg cac tgt tat gaa gag        930
Leu Pro Glu Leu Gly Ala Ala Glu Met Asp Leu His Cys Tyr Glu Glu
    105                 110                 115

ggt ttt cct ccg agt gat gat gaa gag gag gaa aat gtg cag tcg atc        978
Gly Phe Pro Pro Ser Asp Asp Glu Glu Glu Glu Asn Val Gln Ser Ile
120                 125                 130                 135

cag acc gca gcg ggt gag gga atg aaa gct gcc aat gat ggt ttt aag       1026
Gln Thr Ala Ala Gly Glu Gly Met Lys Ala Ala Asn Asp Gly Phe Lys
                140                 145                 150

ttg gac tgc ccg gag ctg cct gga cat ggc tgt aag tct tgt gaa ttt       1074
Leu Asp Cys Pro Glu Leu Pro Gly His Gly Cys Lys Ser Cys Glu Phe
            155                 160                 165

cac agg aat agt act gga cta aaa gaa ctg ttg tgc tcg ctt tgc tat       1122
His Arg Asn Ser Thr Gly Leu Lys Glu Leu Leu Cys Ser Leu Cys Tyr
        170                 175                 180

atg aga acg cac tgc cat ttt att tac a gtaagtgtgt ctaacttaaa           1170
Met Arg Thr His Cys His Phe Ile Tyr
    185                 190

tttaaaggga cagtgtagca gtttaatgtc tgttgaatgt gggatttatg tttttgtgat     1230

ttttatag gt  cct gtg tct gat gct gat gaa tcg cct tct cct gat tca       1279
         Ser Pro Val Ser Asp Ala Asp Glu Ser Pro Ser Pro Asp Ser
                195                 200                 205

act acc tca cct cct gaa att cag gcg cca gtc cct gca aac gta tgc       1327
Thr Thr Ser Pro Pro Glu Ile Gln Ala Pro Val Pro Ala Asn Val Cys
            210                 215                 220
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aag ccc att cct gtg aag gct aag cct ggg aaa cgc cct gct gtg gat       1375
Lys Pro Ile Pro Val Lys Ala Lys Pro Gly Lys Arg Pro Ala Val Asp
        225                 230                 235

aaa ctg gag gac ttg ctt gag ggt ggg gat gga cct ttg gac ttg agt       1423
Lys Leu Glu Asp Leu Leu Glu Gly Gly Asp Gly Pro Leu Asp Leu Ser
    240                 245                 250

acc cgg aaa ctg cca agg caa tgagtg                                    1450
Thr Arg Lys Leu Pro Arg Gln
255                 260
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Asn Glu Ile Leu Gln Leu Val Val Asn Ala Leu Met Gly Asp Asp Pro
            20                  25                  30

Glu Pro Pro Ala His Pro Phe Asp Pro Pro Thr Leu His Glu Leu Tyr
        35                  40                  45

Asp Leu Glu Val Asp Gly Pro Asp Asp Pro Asn Glu Glu Ala Val Asn
    50                  55                  60

Gly Phe Phe Ser Glu Ser Met Leu Leu Ala Ala Asn Glu Gly Val Asp
65                  70                  75                  80

Ile Asp Pro Pro Ser Glu Thr Leu Asp Thr Pro Gly Val Ile Val Glu
                85                  90                  95

Ser Gly Arg Gly Gly Lys Lys Leu Pro Glu Leu Gly Ala Ala Glu Met
            100                 105                 110

Asp Leu His Cys Tyr Glu Glu Gly Phe Pro Pro Ser Asp Asp Glu Glu
        115                 120                 125

Glu Glu Asn Val Gln Ser Ile Gln Thr Ala Ala Gly Glu Gly Met Lys
    130                 135                 140

Ala Ala Asn Asp Gly Phe Lys Leu Asp Cys Pro Glu Leu Pro Gly His
145                 150                 155                 160
```

```
Gly Cys Lys Ser Cys Glu Phe His Arg Asn Ser Thr Gly Leu Lys Glu
                165                 170                 175

Leu Leu Cys Ser Leu Cys Tyr Met Arg Thr His Cys His Phe Ile Tyr
            180                 185                 190

Ser Pro Val Ser Asp Ala Asp Glu Ser Pro Ser Pro Asp Ser Thr Thr
        195                 200                 205

Ser Pro Pro Glu Ile Gln Ala Pro Val Pro Ala Asn Val Cys Lys Pro
    210                 215                 220

Ile Pro Val Lys Ala Lys Pro Gly Lys Arg Pro Ala Val Asp Lys Leu
225                 230                 235                 240

Glu Asp Leu Leu Glu Gly Gly Asp Gly Pro Leu Asp Leu Ser Thr Arg
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Lys Leu Pro Arg Gln
            260


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           Met Ser Gln Arg Arg Gly Ser Lys Lys Leu Lys Val Gln
           1               5                   10

ctg ccg ccc cca gag gac atg gag gaa gac tgg gac agt cag gca gag         97
Leu Pro Pro Pro Glu Asp Met Glu Glu Asp Trp Asp Ser Gln Ala Glu
    15                  20                  25

gag gag gag atg gaa gat tgg gac agc cag gca gag gag gtg gac agc        145
Glu Glu Glu Met Glu Asp Trp Asp Ser Gln Ala Glu Glu Val Asp Ser
30                  35                  40                  45
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ctg gag gaa gac agt ttg gag gag gaa gac gag gag gca gag gag gtg        193
Leu Glu Glu Asp Ser Leu Glu Glu Glu Asp Glu Glu Ala Glu Glu Val
                50                  55                  60

gaa gaa gca gcc gcc gcc aaa cag ttg tcc tcg gca gcg gag aca agc        241
Glu Glu Ala Ala Ala Ala Lys Gln Leu Ser Ser Ala Ala Glu Thr Ser
            65                  70                  75

aag gtc cca gac agc agc agc agc acg gct aca atc tcc gct ccg ggt        289
Lys Val Pro Asp Ser Ser Ser Ser Thr Ala Thr Ile Ser Ala Pro Gly
        80                  85                  90

cgg ggg gcc cag cgg cgt ccc aac agt aga tgg gac gag acc ggg cga        337
Arg Gly Ala Gln Arg Arg Pro Asn Ser Arg Trp Asp Glu Thr Gly Arg
    95                  100                 105

ttc ccg aac ccg acc acc gct tcc aag acc g gtaagaagga gcggcaggga        388
Phe Pro Asn Pro Thr Thr Ala Ser Lys Thr
110                 115

tacaagtcct ggcgggggca taagaatgcc atcatctcct gcttgcatga atgcgggggc      448

aacatatcct tcacccggcg ctacctgctc ttccaccacg gggtgaactt cccccgcaat      508

gtcttgcatt actaccgtca cctccacag cc  cct act aca gcc agc aag tcc        560
                                Ala Pro Thr Thr Ala Ser Lys Ser
                                                    125

cgg cag cct cgg cag aga aag aca gca gca gca gcg ggg acc tcc agc        608
Arg Gln Pro Arg Gln Arg Lys Thr Ala Ala Ala Ala Gly Thr Ser Ser
        130                 135                 140

aga aaa cca gca gca gca gtt aga aaa tcc agt gca gca gga gga gga        656
Arg Lys Pro Ala Ala Ala Val Arg Lys Ser Ser Ala Ala Gly Gly Gly
    145                 150                 155

ctg agg atc aca gcg aac gag cca gcg cag acc cga gag ctg aga aac        704
Leu Arg Ile Thr Ala Asn Glu Pro Ala Gln Thr Arg Glu Leu Arg Asn
160                 165                 170                 175

agg atc ttt cca acc ctc tat gcc atc ttc cag cag agt cgg ggg caa        752
Arg Ile Phe Pro Thr Leu Tyr Ala Ile Phe Gln Gln Ser Arg Gly Gln
                180                 185                 190

gag cag gaa ctg aaa gta aaa aac cga tct ctg cgc tcg ctc acc cga        800
Glu Gln Glu Leu Lys Val Lys Asn Arg Ser Leu Arg Ser Leu Thr Arg
            195                 200                 205

agt tgt ttg tat cac aag agc gaa gac caa ctt cag cgc act ctc gag        848
Ser Cys Leu Tyr His Lys Ser Glu Asp Gln Leu Gln Arg Thr Leu Glu
        210                 215                 220

gac gcc gag gct ctc ttc aac aag tac tgc gcg ctg act ctt aaa gag        896
Asp Ala Glu Ala Leu Phe Asn Lys Tyr Cys Ala Leu Thr Leu Lys Glu
    225                 230                 235

tagc                                                                   900
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            20                  25                  30

Met Glu Asp Trp Asp Ser Gln Ala Glu Glu Val Asp Ser Leu Glu Glu
        35                  40                  45

Asp Ser Leu Glu Glu Glu Asp Glu Glu Ala Glu Glu Val Glu Glu Ala
    50                  55                  60

Ala Ala Ala Lys Gln Leu Ser Ser Ala Ala Glu Thr Ser Lys Val Pro
65                  70                  75                  80

Asp Ser Ser Ser Ser Thr Ala Thr Ile Ser Ala Pro Gly Arg Gly Ala
                85                  90                  95

Gln Arg Arg Pro Asn Ser Arg Trp Asp Glu Thr Gly Arg Phe Pro Asn
            100                 105                 110

Pro Thr Thr Ala Ser Lys Thr Ala Pro Thr Thr Ala Ser Lys Ser Arg
        115                 120                 125

Gln Pro Arg Gln Arg Lys Thr Ala Ala Ala Ala Gly Thr Ser Ser Arg
    130                 135                 140

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

Arg Ile Thr Ala Asn Glu Pro Ala Gln Thr Arg Glu Leu Arg Asn Arg
                165                 170                 175

Ile Phe Pro Thr Leu Tyr Ala Ile Phe Gln Gln Ser Arg Gly Gln Glu
            180                 185                 190

Gln Glu Leu Lys Val Lys Asn Arg Ser Leu Arg Ser Leu Thr Arg Ser
        195                 200                 205
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Cys Leu Tyr His Lys Ser Glu Asp Gln Leu Gln Arg Thr Leu Glu Asp
    210                 215                 220


Ala Glu Ala Leu Phe Asn Lys Tyr Cys Ala Leu Thr Leu Lys Glu
225                 230                 235


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

cca gag gac atg gag gaa gac tgg gac agt cag gca gag gag gag gag         96
Pro Glu Asp Met Glu Glu Asp Trp Asp Ser Gln Ala Glu Glu Glu Glu
            20                  25                  30

atg gaa gat tgg gac agc cag gca gag gag gtg gac agc ctg gag gaa        144
Met Glu Asp Trp Asp Ser Gln Ala Glu Glu Val Asp Ser Leu Glu Glu
        35                  40                  45

gac agt ttg gag gag gaa gac gag gag gca gag gag gtg gaa gaa gca        192
Asp Ser Leu Glu Glu Glu Asp Glu Glu Ala Glu Glu Val Glu Glu Ala
    50                  55                  60

gcc gcc gcc aaa cag ttg tcc tcg gca gcg gag aca agc aag gtc cca        240
Ala Ala Ala Lys Gln Leu Ser Ser Ala Ala Glu Thr Ser Lys Val Pro
65                  70                  75                  80

gac agc agc agc agc acg gct aca atc tcc gct ccg ggt cgg ggg gcc        288
Asp Ser Ser Ser Ser Thr Ala Thr Ile Ser Ala Pro Gly Arg Gly Ala
                85                  90                  95
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cag cgg cgt ccc aac agt aga tgg gac gag acc ggg cga ttc ccg aac        336
Gln Arg Arg Pro Asn Ser Arg Trp Asp Glu Thr Gly Arg Phe Pro Asn
            100                 105                 110

ccg acc acc gct tcc aag acc ggt aag aag gag cgg cag gga tac aag        384
Pro Thr Thr Ala Ser Lys Thr Gly Lys Lys Glu Arg Gln Gly Tyr Lys
        115                 120                 125

tcc tgg cgg ggg cat aag aat gcc atc atc tcc tgc ttg cat gaa tgc        432
Ser Trp Arg Gly His Lys Asn Ala Ile Ile Ser Cys Leu His Glu Cys
    130                 135                 140

ggg ggc aac ata tcc ttc acc cgg cgc tac ctg ctc ttc cac cac ggg        480
Gly Gly Asn Ile Ser Phe Thr Arg Arg Tyr Leu Leu Phe His His Gly
145                 150                 155                 160

gtg aac ttc ccc cgc aat gtc ttg cat tac tac cgt cac ctc cac agc        528
Val Asn Phe Pro Arg Asn Val Leu His Tyr Tyr Arg His Leu His Ser
                165                 170                 175

ccc tac tac agc cag caa gtc ccg gca gcc tcg gca gag aaa gac agc        576
Pro Tyr Tyr Ser Gln Gln Val Pro Ala Ala Ser Ala Glu Lys Asp Ser
            180                 185                 190

agc agc agc ggg gac ctc cag cag aaa acc agc agc agc agt                618
Ser Ser Ser Gly Asp Leu Gln Gln Lys Thr Ser Ser Ser Ser
        195                 200                 205

tagaaaatcc agtgcagcag gaggaggact gaggatcaca gcgaacgagc cagcgcagac      678

ccgagagctg agaaacagga tctttccaac cctctatgcc atcttccagc agagtcgggg      738

gcaagagcag gaactgaaag taaaaaaccg atctctgcgc tcgctcaccc gaagttgttt      798

gtatcacaag agcgaagacc aacttcagcg cactctcgag gacgccgagg ctctcttcaa      858

caagtactgc gcgctgactc ttaaagagta gcccgcgccc gcgctcgctc gaaaaaggcg      918

ggaattacgt cacccttggc acctgtcctt tgccctcgtc atgagtaaag aaattcccac      978

gccttacatg tggagctatc agccccaaat gggactggca gccggcgcct cccaggacta     1038

ctccacccgc atgaattggc tcagcgccgg cccctcgatg atctcacggg ttaatgatat     1098

acgagcttac cgaaaccagt tactcctaga acagtcagct ctcaccacca caccccgcca     1158

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caccgtacta cttcctcgag acgcccaggc cgaagttcag atgactaacg caggtgtaca     1278

gctggcgggc ggttccgccc tgtgtcgtca ccggcctcag cagagtataa aacgcctggt     1338

gatcagaggc cgaggtatcc agctcaacga cgagtcggtg agctcttcgc ttggtctgcg     1398

accagacgga gtcttccaga tcgccggctg tgggagatct tccttcactc ctcgtcaggc     1458

tgtcctgact ttggagagtt cgtcctcgca gccccgctcg ggcggcatcg ggactctcca     1518

gtttgtggag gagtttactc cctctgtcta cttcaacccc ttctccggct ctcctggcca     1578
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gtacccggac gagttcatac cgaacttcga cgcaatcagc gagtcagtgg atggctatga     1638

ttg atg tct ggt ggc gcg gct gag tta gct cga ctg cga cat cta gac       1686
    Met Ser Gly Gly Ala Ala Glu Leu Ala Arg Leu Arg His Leu Asp
                210                 215                 220

cac tgc cgc cgc ttt cgc tgt ttc gcc cgg gaa ctc acc gag ttc atc       1734
His Cys Arg Arg Phe Arg Cys Phe Ala Arg Glu Leu Thr Glu Phe Ile
            225                 230                 235

tac ttc gaa ctc ccc gag gag cac cct cag gga ccg gcc cac gga gtg       1782
Tyr Phe Glu Leu Pro Glu Glu His Pro Gln Gly Pro Ala His Gly Val
        240                 245                 250

cgg att acc atc gaa ggg ggg ata gac tct cac ctg cat cgg atc ttc       1830
Arg Ile Thr Ile Glu Gly Gly Ile Asp Ser His Leu His Arg Ile Phe
    255                 260                 265

tgc cag cga ccc gtg ctg atc gag cgc gac cag gga act aca aca gtc       1878
Cys Gln Arg Pro Val Leu Ile Glu Arg Asp Gln Gly Thr Thr Thr Val
270                 275                 280                 285

tcc atc tac tgc atc tgt aac cac ccc gga ttg cat gaa agc ctt tgc       1926
Ser Ile Tyr Cys Ile Cys Asn His Pro Gly Leu His Glu Ser Leu Cys
                290                 295                 300

tgt ctt att tgt gct gag ttt aat aaa aac tgagttaaga ctcaccttcg         1976
Cys Leu Ile Cys Ala Glu Phe Asn Lys Asn
            305                 310

gactaccgct tcttcaaccc ggactttaca acaccagcca gaccctccgt tccagccaga     2036

agaaccagac ccttcctctg atccaggact ctaattctac ctccccagcg cctttcccta     2096

ctaaccttcc cgttactaac aacctcggag ctcagctgca tcaccgcttc tccagaagcc     2156

tcctttctgc caatattact actcccagaa ccggaggtga gctccgtggt ctccctactg     2216

acaacccctg ggtggtagcg ggttttgtag cgctaggagt agttgcgggt gggttggtgc     2276

ttatactctg ctacctatac acaccttgct gtgcttattt agtagtgttg tgttgctggt     2336

ttaagaa atg ggg gtc gta cta gta tcg ctt gct tta ctt tcg ctt ttg       2385
        Met Gly Val Val Leu Val Ser Leu Ala Leu Leu Ser Leu Leu
                    315                 320                 325

ggt ctg ggc tct gct acg cta aga aat cag cct ttg cta tta gat ccc       2433
Gly Leu Gly Ser Ala Thr Leu Arg Asn Gln Pro Leu Leu Leu Asp Pro
                330                 335                 340

gat gat gtt gat cca tgt ctg gac ttt gat cca gag aac tgc aca ctc       2481
Asp Asp Val Asp Pro Cys Leu Asp Phe Asp Pro Glu Asn Cys Thr Leu
            345                 350                 355

act ttt gca cct gaa aca agt cgc ttc tgt gga gtt gtt att agg tgc       2529
Thr Phe Ala Pro Glu Thr Ser Arg Phe Cys Gly Val Val Ile Arg Cys
        360                 365                 370
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gga ttt gaa tgc agg tcc att gag att aca cac aat aac aaa act tgg       2577
Gly Phe Glu Cys Arg Ser Ile Glu Ile Thr His Asn Asn Lys Thr Trp
    375                 380                 385

aac aat acc tta ttc aca ata tgg caa cca gga gat cct cag tgg tat       2625
Asn Asn Thr Leu Phe Thr Ile Trp Gln Pro Gly Asp Pro Gln Trp Tyr
390                 395                 400                 405

act gtc tct gtc cgg ggt cct gac ggt tcc atc cgc atg gct aat aac       2673
Thr Val Ser Val Arg Gly Pro Asp Gly Ser Ile Arg Met Ala Asn Asn
                410                 415                 420

act ttc att ttt gct gaa atg tgc gat atg gcc atg ttc atg agc aga       2721
Thr Phe Ile Phe Ala Glu Met Cys Asp Met Ala Met Phe Met Ser Arg
            425                 430                 435

cag tat gac cta tgg cct ccc agc aaa gag aac att gtg gct ttc tcc       2769
Gln Tyr Asp Leu Trp Pro Pro Ser Lys Glu Asn Ile Val Ala Phe Ser
        440                 445                 450

att gct tat tgc ttg tgt act tgc atc atc act gct atc atg tgt gtg       2817
Ile Ala Tyr Cys Leu Cys Thr Cys Ile Ile Thr Ala Ile Met Cys Val
    455                 460                 465

agc ata cac ttg ctt ata gcc att cgc cca aaa aac aat caa gaa aaa       2865
Ser Ile His Leu Leu Ile Ala Ile Arg Pro Lys Asn Asn Gln Glu Lys
470                 475                 480                 485

gag aaa atg ccc tgattataaa tttctattta cagaaaatga cctctgtttc           2917
Glu Lys Met Pro

agctctcata tttgctacta ttatggctgt tcaaggacag gctgctcaag gacagacact    2977

tattaatgtt catcctggaa ctaatcatac cttggtggtt cctaataact attcaaatat    3037

tgaatggcaa tggttcacaa acaacgtatg gtatgaacca tgcgaacatt acagcctatt    3097

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caaacctata cccaaagctt tctctagaac tacaatacaa aactttaaaa cagcaatttt    3277

acttaatttt aaaaccaaaa atattacagg caatatactt cccactactc ccactgaaaa    3337

aaatacacct aattcaatat ttgaaatcat cattgcactg ttagcagtag gcataacaat    3397

catactatgt atgataattt atgctcactg ttataaaaaa attcaccaca aaaaagaacc    3457

actactaagc ttttaatttc ttttttatac agccatgatt ttcttcgcaa ctcttattac    3517

tattggcatt gttcaagggc aagatatcac aattggatat gtaggcaata atattaccct    3577

attaggtccc ccaacaggaa caatccctac ctggtacaaa atatatgaaa gagggtggtg    3637

gattagaccc tgcgaccaag gaggtagtaa atacatttgt ggtagagaca taaccatcac    3697

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gtcttacaca cttgaagtaa gagaccccac cactttagca ccacatacca ctttctccag     3817

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tgaaacaata aattctacaa tctctcataa tccagacgaa attcccaaat caatgattgg     3937

cattattgta gccgtggcag ttggaatggc aatcataata atttgtatga tcgtctatgc     3997

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atttctttat agaaacatga aaggagtagg tatcctagtt ctttcaactt taatctactc     4117

agtgatccct atcagcatca atgtgcagac tactttaaat gaaactggaa accactcaac     4177

tacctcacat acacctcccc cgctttctac ccaccctcaa tccaaagatg ccatacaact     4237

acaactcacc atccttattg tgattgggtt aactatcctt gctgttatcc tttactttat     4297

cttttgccgc caaataccca atgtagttaa gaaacctacc agacgtccca tctatcgatc     4357

aataatcagc aaaccccaca tggctctaaa tgaaatttaa tctttctctt cacagtatgg     4417

tgatcaacta tgatccctag aaatttcttc ttcaccatac ttatctgcgc tttcaatgtc     4477

tgtgctacat tcgccacagt cgccaatgtg acaccagatt gtataggggc atttgcttcc     4537

tacgtactat ttgccttcat tacctgcatc tgcgtttgta gcatagtctg cctggttatc     4597

aacttctttc aactagtaga ctgggttttt gtacgcattg cctacctacg acatcaccct     4657

gaataccgca accaaa atg ttg cag caa ttc tta ggc tca ttt aaa acc atg     4709
                  Met Leu Gln Gln Phe Leu Gly Ser Phe Lys Thr Met
                  490                 495                 500

caa act ctg cta ctg ctt ctg cta gtt ata cac caa tgt gcc tca aac       4757
Gln Thr Leu Leu Leu Leu Leu Leu Val Ile His Gln Cys Ala Ser Asn
            505                 510                 515

ccc aca agc ccc aca aga tta gat cta aga aaa tgt aaa ttt caa gaa       4805
Pro Thr Ser Pro Thr Arg Leu Asp Leu Arg Lys Cys Lys Phe Gln Glu
        520                 525                 530

cca tgg aaa ttc ctt gat tgc tat cat gaa aca tct gat ttc ccc aca       4853
Pro Trp Lys Phe Leu Asp Cys Tyr His Glu Thr Ser Asp Phe Pro Thr
    535                 540                 545

tac tgg att aca atc att ggg gtt gtt aat cta gtc tct tgc aca cta       4901
Tyr Trp Ile Thr Ile Ile Gly Val Val Asn Leu Val Ser Cys Thr Leu
550                 555                 560                 565

ttc tct ttc ctt gtt tac cac tta ttt gat ttt gga tgg aac gcc ctt       4949
Phe Ser Phe Leu Val Tyr His Leu Phe Asp Phe Gly Trp Asn Ala Leu
                570                 575                 580

aat gca ctc act tac cca caa gaa cca gag gaa cat ata cca cta cag       4997
Asn Ala Leu Thr Tyr Pro Gln Glu Pro Glu Glu His Ile Pro Leu Gln
            585                 590                 595
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aac ata caa cca tta gca cta gta gaa tat gaa aat gag cca cag cct       5045
Asn Ile Gln Pro Leu Ala Leu Val Glu Tyr Glu Asn Glu Pro Gln Pro
        600                 605                 610

cca cta ctc cct gcc att agc tac ttc aac cta acc ggt gga gat gac       5093
Pro Leu Leu Pro Ala Ile Ser Tyr Phe Asn Leu Thr Gly Gly Asp Asp
    615                 620                 625
```

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<212> PRT
<213> Simian adenovirus 29

<400> 99

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

Pro Glu Asp Met Glu Glu Asp Trp Asp Ser Gln Ala Glu Glu Glu Glu
            20                  25                  30

Met Glu Asp Trp Asp Ser Gln Ala Glu Glu Val Asp Ser Leu Glu Glu
        35                  40                  45

Asp Ser Leu Glu Glu Glu Asp Glu Glu Ala Glu Glu Val Glu Glu Ala
    50                  55                  60

Ala Ala Ala Lys Gln Leu Ser Ser Ala Ala Glu Thr Ser Lys Val Pro
65                  70                  75                  80

Asp Ser Ser Ser Ser Thr Ala Thr Ile Ser Ala Pro Gly Arg Gly Ala
                85                  90                  95

Gln Arg Arg Pro Asn Ser Arg Trp Asp Glu Thr Gly Arg Phe Pro Asn
            100                 105                 110

Pro Thr Thr Ala Ser Lys Thr Gly Lys Lys Glu Arg Gln Gly Tyr Lys
        115                 120                 125

Ser Trp Arg Gly His Lys Asn Ala Ile Ile Ser Cys Leu His Glu Cys
    130                 135                 140

Gly Gly Asn Ile Ser Phe Thr Arg Arg Tyr Leu Leu Phe His His Gly
145                 150                 155                 160

Val Asn Phe Pro Arg Asn Val Leu His Tyr Tyr Arg His Leu His Ser
                165                 170                 175
```

```
Pro Tyr Tyr Ser Gln Gln Val Pro Ala Ala Ser Ala Glu Lys Asp Ser
            180                 185                 190

Ser Ser Ser Gly Asp Leu Gln Gln Lys Thr Ser Ser Ser Ser
        195                 200                 205
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<210> 100
<211> 105
<212> PRT
<213> Simian adenovirus 29

<400> 100

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Met Ser Gly Gly Ala Ala Glu Leu Ala Arg Leu Arg His Leu Asp His
1               5                   10                  15

Cys Arg Arg Phe Arg Cys Phe Ala Arg Glu Leu Thr Glu Phe Ile Tyr
            20                  25                  30

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

Ile Thr Ile Glu Gly Gly Ile Asp Ser His Leu His Arg Ile Phe Cys
    50                  55                  60

Gln Arg Pro Val Leu Ile Glu Arg Asp Gln Gly Thr Thr Thr Val Ser
65                  70                  75                  80

Ile Tyr Cys Ile Cys Asn His Pro Gly Leu His Glu Ser Leu Cys Cys
                85                  90                  95

Leu Ile Cys Ala Glu Phe Asn Lys Asn
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<210> 101
<211> 178
<212> PRT
<213> Simian adenovirus 29

<400> 101

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Gly Ser Ala Thr Leu Arg Asn Gln Pro Leu Leu Leu Asp Pro Asp Asp
            20                  25                  30
```

```
Val Asp Pro Cys Leu Asp Phe Asp Pro Glu Asn Cys Thr Leu Thr Phe
        35                  40                  45

Ala Pro Glu Thr Ser Arg Phe Cys Gly Val Val Ile Arg Cys Gly Phe
    50                  55                  60

Glu Cys Arg Ser Ile Glu Ile Thr His Asn Asn Lys Thr Trp Asn Asn
65                  70                  75                  80

Thr Leu Phe Thr Ile Trp Gln Pro Gly Asp Pro Gln Trp Tyr Thr Val
                85                  90                  95

Ser Val Arg Gly Pro Asp Gly Ser Ile Arg Met Ala Asn Asn Thr Phe
            100                 105                 110

Ile Phe Ala Glu Met Cys Asp Met Ala Met Phe Met Ser Arg Gln Tyr
        115                 120                 125

Asp Leu Trp Pro Pro Ser Lys Glu Asn Ile Val Ala Phe Ser Ile Ala
    130                 135                 140

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

His Leu Leu Ile Ala Ile Arg Pro Lys Asn Asn Gln Glu Lys Glu Lys
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Met Pro
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<210> 102
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<212> PRT
<213> Simian adenovirus 29

<400> 102

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1               5                   10                  15

Leu Leu Leu Leu Val Ile His Gln Cys Ala Ser Asn Pro Thr Ser Pro
            20                  25                  30

Thr Arg Leu Asp Leu Arg Lys Cys Lys Phe Gln Glu Pro Trp Lys Phe
        35                  40                  45
```

```
Leu Asp Cys Tyr His Glu Thr Ser Asp Phe Pro Thr Tyr Trp Ile Thr
    50                  55                  60

Ile Ile Gly Val Val Asn Leu Val Ser Cys Thr Leu Phe Ser Phe Leu
65                  70                  75                  80

Val Tyr His Leu Phe Asp Phe Gly Trp Asn Ala Leu Asn Ala Leu Thr
                85                  90                  95

Tyr Pro Gln Glu Pro Glu Glu His Ile Pro Leu Gln Asn Ile Gln Pro
            100                 105                 110

Leu Ala Leu Val Glu Tyr Glu Asn Glu Pro Gln Pro Pro Leu Leu Pro
        115                 120                 125

Ala Ile Ser Tyr Phe Asn Leu Thr Gly Gly Asp Asp
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tatgaggtag ttttgggcgg atgcaagtga aaattctcca ttttcgcgcg aaaactgaat 300

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cgagtagact ttgaccgatt acgtggaggt ttcgattacc gtgtttttca cctaaatttc 420

cgcgtacggt gtcaaagtcc tgtgttttta cgtaggcgtc agctgatcgc tagggtattt 480

aaacctgacg agttccgtca agaggccact cttgagtgcc agcgagaaga gatttctcct 540

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gtatgcaagc ccattcctgt gaaggctaag cctgggaaac gccctgctgt ggataaactg 1380

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taaaacggga gtatagtgaa gaatttgaaa agttattgga agacagtcca ggacttttg      1800

aagcccttaa cttgggccac caggctcatt ttaaggagaa ggttttatca gttttagatt     1860

tttctacccc tggtagaact gctgctgctg tagctttcct tacttttata ttggataa       1918

atg gat ccc aca aac cca ctt cag caa ggg ata cgt ctt gga ttt cat       1966
Met Asp Pro Thr Asn Pro Leu Gln Gln Gly Ile Arg Leu Gly Phe His
1               5                   10                  15

agc agc agc ttt gtg gag aac atg gaa ggc ccg cag gct gag gat aat       2014
Ser Ser Ser Phe Val Glu Asn Met Glu Gly Pro Gln Ala Glu Asp Asn
            20                  25                  30

ctt aga tta ctg gcc agt gca gcc tct ggg cgt agc agc aat cct gag       2062
Leu Arg Leu Leu Ala Ser Ala Ala Ser Gly Arg Ser Ser Asn Pro Glu
        35                  40                  45

aca ccc acc ggc cat gcc agc ggt ttt gga gga gga gca gca gga gga       2110
Thr Pro Thr Gly His Ala Ser Gly Phe Gly Gly Gly Ala Ala Gly Gly
    50                  55                  60

caa ccc gag agc cgg cct gga ccc tcc ggt gga gga ggc gga gga gta       2158
Gln Pro Glu Ser Arg Pro Gly Pro Ser Gly Gly Gly Gly Gly Gly Val
65                  70                  75                  80

gct gac ctg ttt cct gaa ctg cga cgg gtg ctt act agg tct acg tcc       2206
Ala Asp Leu Phe Pro Glu Leu Arg Arg Val Leu Thr Arg Ser Thr Ser
                85                  90                  95

agt gga cag gac agg ggc att aag agg gag agg aat gct agt ggg cat       2254
Ser Gly Gln Asp Arg Gly Ile Lys Arg Glu Arg Asn Ala Ser Gly His
            100                 105                 110

aat tca aga act gag ttg gct tta agt tta atg agt cgc agc cgc cct       2302
Asn Ser Arg Thr Glu Leu Ala Leu Ser Leu Met Ser Arg Ser Arg Pro
        115                 120                 125

gaa act atc tgg tgg cat gag gtt cag agc gag ggc agg gat gaa gtt       2350
Glu Thr Ile Trp Trp His Glu Val Gln Ser Glu Gly Arg Asp Glu Val
    130                 135                 140

tca ata ttg cag gaa aaa tat tct cta gaa caa att aaa acc tgt tgg       2398
Ser Ile Leu Gln Glu Lys Tyr Ser Leu Glu Gln Ile Lys Thr Cys Trp
145                 150                 155                 160
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ttg gaa cct gag gat gat tgg gag gtg gcc att agg aat tat gct aag       2446
Leu Glu Pro Glu Asp Asp Trp Glu Val Ala Ile Arg Asn Tyr Ala Lys
                165                 170                 175

ata tct ctg agg cct gat aaa cag tat aaa att acc aaa aag att aat       2494
Ile Ser Leu Arg Pro Asp Lys Gln Tyr Lys Ile Thr Lys Lys Ile Asn
            180                 185                 190

atc aga aat gca tgc tac ata gca ggg aat ggg gcc gag gtt ata ata       2542
Ile Arg Asn Ala Cys Tyr Ile Ala Gly Asn Gly Ala Glu Val Ile Ile
        195                 200                 205

gat aca cca gat aaa aca gct ttt agg tgt tgc atg atg ggt atg tgg       2590
Asp Thr Pro Asp Lys Thr Ala Phe Arg Cys Cys Met Met Gly Met Trp
    210                 215                 220

cca ggg gtg gct ggc atg gag gcg gtg acc ctt atg aat ata agg ttt       2638
Pro Gly Val Ala Gly Met Glu Ala Val Thr Leu Met Asn Ile Arg Phe
225                 230                 235                 240

agg gga gat ggg tat aat ggg att gtc ttt atg gct aac act aag ctg       2686
Arg Gly Asp Gly Tyr Asn Gly Ile Val Phe Met Ala Asn Thr Lys Leu
                245                 250                 255

att ctg cat ggt tgt agc ttt ttt ggg ttt aat aat act tgt gtg gaa       2734
Ile Leu His Gly Cys Ser Phe Phe Gly Phe Asn Asn Thr Cys Val Glu
            260                 265                 270

tct tgg gga caa gtc agt atc agg ggt tgt agt ttc tat gca tgc tgg       2782
Ser Trp Gly Gln Val Ser Ile Arg Gly Cys Ser Phe Tyr Ala Cys Trp
        275                 280                 285

att gca cta tca ggc aga acc aag agt cag ttg tct gtg aag aaa tgc       2830
Ile Ala Leu Ser Gly Arg Thr Lys Ser Gln Leu Ser Val Lys Lys Cys
    290                 295                 300

atg ttc gag aga tgt aac ctg ggc ata ctg aat gaa ggt gaa gca agg       2878
Met Phe Glu Arg Cys Asn Leu Gly Ile Leu Asn Glu Gly Glu Ala Arg
305                 310                 315                 320

gtc cgc cac tgt gct gct aca gaa act ggc tgc ttc att cta ata aag       2926
Val Arg His Cys Ala Ala Thr Glu Thr Gly Cys Phe Ile Leu Ile Lys
                325                 330                 335

gga aat gcc agt gtg agg cat aac atg atc tgt gga ccc tcg gat gag       2974
Gly Asn Ala Ser Val Arg His Asn Met Ile Cys Gly Pro Ser Asp Glu
            340                 345                 350

agg cct tat cag atg ctg acc tgt gct gga gga cat tgc aat atg ctg       3022
Arg Pro Tyr Gln Met Leu Thr Cys Ala Gly Gly His Cys Asn Met Leu
        355                 360                 365

gct act gtg cat att gtt tct cat gca cgc aag aaa tgg cct gtt ttt       3070
Ala Thr Val His Ile Val Ser His Ala Arg Lys Lys Trp Pro Val Phe
    370                 375                 380

gag cat aat gtg atg acc aag tgc acc atg cac ata ggt ggt cgc agg       3118
Glu His Asn Val Met Thr Lys Cys Thr Met His Ile Gly Gly Arg Arg
385                 390                 395                 400
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gga atg ttt atg cct tac cag tgt aac atg aat cat gtg aag gtg atg       3166
Gly Met Phe Met Pro Tyr Gln Cys Asn Met Asn His Val Lys Val Met
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ttg gaa cca gat gcc ttt tcc aga atg agc tta aca gga atc ttt gat       3214
Leu Glu Pro Asp Ala Phe Ser Arg Met Ser Leu Thr Gly Ile Phe Asp
            420                 425                 430

atg aat gtg caa cta tgg aag atc ctg aga tat gat gag acc aaa tcg       3262
Met Asn Val Gln Leu Trp Lys Ile Leu Arg Tyr Asp Glu Thr Lys Ser
        435                 440                 445

agg gta cgc gca tgc gaa tgc ggg ggc aag cat gcc agg ttc cag ccg       3310
Arg Val Arg Ala Cys Glu Cys Gly Gly Lys His Ala Arg Phe Gln Pro
    450                 455                 460

gtg tgt gtg gat gtg acg gaa gac ctg aga ccc gat cat ttg gtg ctt       3358
Val Cys Val Asp Val Thr Glu Asp Leu Arg Pro Asp His Leu Val Leu
465                 470                 475                 480

gcc tgc act gga gcg gag ttc ggt tct agt ggg gaa gaa act gac           3403
Ala Cys Thr Gly Ala Glu Phe Gly Ser Ser Gly Glu Glu Thr Asp
                485                 490                 495

taaagtgagt agtgtgggga tgctgtggag ggggcttcca ggcgggtaag gtgggcagat     3463

tgggtaaatt ctgtttgttt ctgtcttgca gctgtc atg agt gga agc gct tct       3517
                                        Met Ser Gly Ser Ala Ser
                                                        500

ttt gag ggg gga gtc ttt agc cct tat ctg acg ggc agg ctc cca ccc       3565
Phe Glu Gly Gly Val Phe Ser Pro Tyr Leu Thr Gly Arg Leu Pro Pro
            505                 510                 515

tgg gca gga gtt cgt cag aat gtc atg gga tcc act gtg gat ggg aga       3613
Trp Ala Gly Val Arg Gln Asn Val Met Gly Ser Thr Val Asp Gly Arg
        520                 525                 530

ccc gtc cag ccc gcc aat tcc tca acg ctg acc tat gcc act ttg agc       3661
Pro Val Gln Pro Ala Asn Ser Ser Thr Leu Thr Tyr Ala Thr Leu Ser
    535                 540                 545

tct tca ccc ttg gat gca gcc gca gcc gct gcc gcc tct gct gcc gcc       3709
Ser Ser Pro Leu Asp Ala Ala Ala Ala Ala Ala Ala Ser Ala Ala Ala
550                 555                 560                 565

aac acc gtc ctt gga atg ggc tat tat gga agc atc gtt gcc aat tcc       3757
Asn Thr Val Leu Gly Met Gly Tyr Tyr Gly Ser Ile Val Ala Asn Ser
                570                 575                 580

agt tcc tct aat aac cct tcg acc ctg gct gag gac aag cta ctt gtc       3805
Ser Ser Ser Asn Asn Pro Ser Thr Leu Ala Glu Asp Lys Leu Leu Val
            585                 590                 595

ctc ttg gct cag ctc gag gcc ttg acc cag cgc cta ggc gaa ctg tct       3853
Leu Leu Ala Gln Leu Glu Ala Leu Thr Gln Arg Leu Gly Glu Leu Ser
        600                 605                 610
```

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Gln Gln Val Ala Gln Leu Arg Glu Gln Thr Glu Ser Ala Val Ala Thr
    615                 620                 625

gca aag tct aaa taaagattcc caaatcaata aataaaggag atccttgttg         3953
Ala Lys Ser Lys
630

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gaatgtttag atacatgggc attaggccgt ctcgggggtg gagatagctc cattgaagag    4133

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cctggagcga ggagaagttt ttcagcggct tcagcccgtc agccatgggc attttggaga    5033

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ttggcagccc cgtcatttct aagaccccgc cagccgactt ctccagttta cgggagcgag    10853

ccctcttttt ttttgttttt gtcgcccag atg cat ccc gtg ctg cga cag atg      10906
                                Met His Pro Val Leu Arg Gln Met
                                    635                 640

cgc ccc cag caa cag gcc cct tct cag caa cag cag cag cca caa aag      10954
Arg Pro Gln Gln Gln Ala Pro Ser Gln Gln Gln Gln Gln Pro Gln Lys
            645                 650                 655

gct ctt cct gct cct gct cct gca act act gca gcc gca gcc gtg tgc      11002
Ala Leu Pro Ala Pro Ala Pro Ala Thr Thr Ala Ala Ala Ala Val Cys
        660                 665                 670

ggc gcg gga cag tcc gcc tat gat ctg gac ttg gaa gag ggc gag gga      11050
Gly Ala Gly Gln Ser Ala Tyr Asp Leu Asp Leu Glu Glu Gly Glu Gly
    675                 680                 685

ctg gca cgc ctg ggt gca cca tcg ccc gag cgg cac ccg cgg gtg caa      11098
Leu Ala Arg Leu Gly Ala Pro Ser Pro Glu Arg His Pro Arg Val Gln
690                 695                 700                 705

ctg aaa aag gac tct cgc gag gca tac gtg ccc cag cag aac ctg ttc      11146
Leu Lys Lys Asp Ser Arg Glu Ala Tyr Val Pro Gln Gln Asn Leu Phe
                710                 715                 720

agg gac agg agc ggc gag gag ccc gag gag atg cga gcc tct cgc ttt      11194
Arg Asp Arg Ser Gly Glu Glu Pro Glu Glu Met Arg Ala Ser Arg Phe
            725                 730                 735

aac gcg ggt cgc gag ctg cgc cac ggt ctg gac cga aga cgg gtg ctg      11242
Asn Ala Gly Arg Glu Leu Arg His Gly Leu Asp Arg Arg Arg Val Leu
        740                 745                 750

cgg gac gag gat ttc gag gtc gat gaa gtg aca ggg atc agc ccc gct      11290
Arg Asp Glu Asp Phe Glu Val Asp Glu Val Thr Gly Ile Ser Pro Ala
    755                 760                 765

agg gca cat gtg gcc gcg gcc aac ctc gtc tcg gcc tac gag cag acc      11338
Arg Ala His Val Ala Ala Ala Asn Leu Val Ser Ala Tyr Glu Gln Thr
770                 775                 780                 785

gtg aag gag gag cgc aac ttc caa aaa tct ttc aac aac cat gtg cgc      11386
Val Lys Glu Glu Arg Asn Phe Gln Lys Ser Phe Asn Asn His Val Arg
                790                 795                 800

acc ctg atc gcc cgc gag gaa gtg acc ctg ggt ctg atg cac ctg tgg      11434
Thr Leu Ile Ala Arg Glu Glu Val Thr Leu Gly Leu Met His Leu Trp
            805                 810                 815

gac ctg atg gaa gct atc acc cag aac ccc act agc aaa ccc ctg acc      11482
Asp Leu Met Glu Ala Ile Thr Gln Asn Pro Thr Ser Lys Pro Leu Thr
        820                 825                 830

gct cag ctg ttt ctg gtg gtg caa cat agc agg gac aat gag gca ttc      11530
Ala Gln Leu Phe Leu Val Val Gln His Ser Arg Asp Asn Glu Ala Phe
    835                 840                 845

agg gag gcg ctg ctg aac atc acc gag ccc gag ggg aga tgg ttg tat      11578
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Arg Glu Ala Leu Leu Asn Ile Thr Glu Pro Glu Gly Arg Trp Leu Tyr
850                 855                 860                 865

gat ctg atc aat atc ctg caa agt att ata gta cag gaa cgt agc ctg      11626
Asp Leu Ile Asn Ile Leu Gln Ser Ile Ile Val Gln Glu Arg Ser Leu
                870                 875                 880

ggt ctg gct gag aaa gtg gca gcc atc aac tac tcg gtc ttg agc ctg      11674
Gly Leu Ala Glu Lys Val Ala Ala Ile Asn Tyr Ser Val Leu Ser Leu
            885                 890                 895

ggc aag tac tac gct cgc aag atc tac aag acc ccc tac gtg ccc ata      11722
Gly Lys Tyr Tyr Ala Arg Lys Ile Tyr Lys Thr Pro Tyr Val Pro Ile
        900                 905                 910

gac aag gag gtg aag ata gat ggg ttt tac atg cgc atg act ctg aag      11770
Asp Lys Glu Val Lys Ile Asp Gly Phe Tyr Met Arg Met Thr Leu Lys
    915                 920                 925

gtg ctg act ctc agt gac gat ctg ggg gtg tac cgc aac gac agg atg      11818
Val Leu Thr Leu Ser Asp Asp Leu Gly Val Tyr Arg Asn Asp Arg Met
930                 935                 940                 945

cac cgc gcg gtg agc gcc agc agg agg cgc gag ctg agc gac aga gaa      11866
His Arg Ala Val Ser Ala Ser Arg Arg Arg Glu Leu Ser Asp Arg Glu
                950                 955                 960

ctt atg cac agc ttg caa aga gct ctg acg ggg gca ggg acc gag ggg      11914
Leu Met His Ser Leu Gln Arg Ala Leu Thr Gly Ala Gly Thr Glu Gly
            965                 970                 975

gag aac tac ttt gac atg gga gcg gac ttg caa tgg cag cct agc cgc      11962
Glu Asn Tyr Phe Asp Met Gly Ala Asp Leu Gln Trp Gln Pro Ser Arg
        980                 985                 990

agg gcc ctg gac gca gca ggg  tgt gag ctt cct tac  ata gaa gag gtg    12010
Arg Ala Leu Asp Ala Ala Gly  Cys Glu Leu Pro Tyr  Ile Glu Glu Val
    995                1000                1005

gat  gaa ggc gag gag gag  gag ggc gag tac ctg  gaa gac tgatggcgcg    12059
Asp  Glu Gly Glu Glu Glu  Glu Gly Glu Tyr Leu  Glu Asp
1010                1015                1020

acccgtattt ttgctag atg gaa cag  cag gca ccg gac ccc  gca atg cgg     12109
                  Met Glu Gln  Gln Ala Pro Asp Pro  Ala Met Arg
                         1025                1030

gct gcg  ctg cag agc cag ccg  tcc ggc att aac tcc  tcg gac gat       12154
Ala Ala  Leu Gln Ser Gln Pro  Ser Gly Ile Asn Ser  Ser Asp Asp
    1035                1040                1045

tgg acc  cag gcc atg caa cgc  atc atg gcg ctg acg  acc cgc aac       12199
Trp Thr  Gln Ala Met Gln Arg  Ile Met Ala Leu Thr  Thr Arg Asn
    1050                1055                1060

ccc gaa  gcc ttt aga cag caa  ccc cag gcc aac cgc  ctt tcg gcc       12244
Pro Glu  Ala Phe Arg Gln Gln  Pro Gln Ala Asn Arg  Leu Ser Ala
    1065                1070                1075
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atc ctg  gag gcc gta gtt cct  tcc cga tcc aac ccc  acc cac gag       12289
Ile Leu  Glu Ala Val Val Pro  Ser Arg Ser Asn Pro  Thr His Glu
    1080                 1085                 1090

aag gtc  ctg gcc atc gtg aac  gcg ctg gtg gag aac  aag gcc atc       12334
Lys Val  Leu Ala Ile Val Asn  Ala Leu Val Glu Asn  Lys Ala Ile
    1095                 1100                 1105

cgt ccc  gat gag gcc ggg ctg  gta tac aat gcc ctc  ttg gag cgc       12379
Arg Pro  Asp Glu Ala Gly Leu  Val Tyr Asn Ala Leu  Leu Glu Arg
    1110                 1115                 1120

gtg gcc  cgc tac aac agc agc  aac gtg cag acc aac  ctg gac cgg       12424
Val Ala  Arg Tyr Asn Ser Ser  Asn Val Gln Thr Asn  Leu Asp Arg
    1125                 1130                 1135

atg gtg  acc gat gtg cgc gag  gca gtg tct cag cgc  gag cgg ttc       12469
Met Val  Thr Asp Val Arg Glu  Ala Val Ser Gln Arg  Glu Arg Phe
    1140                 1145                 1150

cag cgc  gat gcc aac ttg ggg  tcg ctg gtg gcg ctg  aac gcc ttc       12514
Gln Arg  Asp Ala Asn Leu Gly  Ser Leu Val Ala Leu  Asn Ala Phe
    1155                 1160                 1165

ctc agc  acc cag cct gcc aac  gtg ccc cgc ggc cag  caa gac tat       12559
Leu Ser  Thr Gln Pro Ala Asn  Val Pro Arg Gly Gln  Gln Asp Tyr
    1170                 1175                 1180

aca aac  ttc cta agt gca ctg  aga ctc atg gta acc  gaa gtc cct       12604
Thr Asn  Phe Leu Ser Ala Leu  Arg Leu Met Val Thr  Glu Val Pro
    1185                 1190                 1195

cag agc  gag gtg tac cag tcc  gga cca gac tac ttc  ttc cag acc       12649
Gln Ser  Glu Val Tyr Gln Ser  Gly Pro Asp Tyr Phe  Phe Gln Thr
    1200                 1205                 1210

agc aga  cag ggc ttg cag aca  gtg aac ctg agc cag  gct ttc aaa       12694
Ser Arg  Gln Gly Leu Gln Thr  Val Asn Leu Ser Gln  Ala Phe Lys
    1215                 1220                 1225

aac ctc  aga ggc ctg tgg gga  gtg cac gcc cca gta  gga gat cgc       12739
Asn Leu  Arg Gly Leu Trp Gly  Val His Ala Pro Val  Gly Asp Arg
    1230                 1235                 1240

gcg acc  gtg tct agc ttg ctg  act ccc aac tcc cgc  cta ctg ctg       12784
Ala Thr  Val Ser Ser Leu Leu  Thr Pro Asn Ser Arg  Leu Leu Leu
    1245                 1250                 1255

ctg ctg  gta tcc ccc ttc act  gac agc ggt agc atc  gac cgc aac       12829
Leu Leu  Val Ser Pro Phe Thr  Asp Ser Gly Ser Ile  Asp Arg Asn
    1260                 1265                 1270

tcc tac  ttg ggc tac ctg ctg  aac ttg tat cgc gag  gcc ata ggg       12874
Ser Tyr  Leu Gly Tyr Leu Leu  Asn Leu Tyr Arg Glu  Ala Ile Gly
    1275                 1280                 1285

cag agc  cag gtg gac gag cag  acc tac caa gaa atc  acc caa gtg       12919
Gln Ser  Gln Val Asp Glu Gln  Thr Tyr Gln Glu Ile  Thr Gln Val
    1290                 1295                 1300
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agc cgc  gcc ctg ggt cag gaa  gac acg ggc agc ttg  gaa gcc acc       12964
Ser Arg  Ala Leu Gly Gln Glu  Asp Thr Gly Ser Leu  Glu Ala Thr
    1305                 1310                 1315

ctg aac  ttc ttg ctg acc aac  cgg tcg cag aag atc  cct cct cag       13009
Leu Asn  Phe Leu Leu Thr Asn  Arg Ser Gln Lys Ile  Pro Pro Gln
    1320                 1325                 1330

tat gcg  ctt acc gcg gag gag  gag cgg atc ctc aga  tat gtg cag       13054
Tyr Ala  Leu Thr Ala Glu Glu  Glu Arg Ile Leu Arg  Tyr Val Gln
    1335                 1340                 1345

cag agc  gtg gga ctg ttc ctg  atg cag gag ggg gcg  acc cct agt       13099
Gln Ser  Val Gly Leu Phe Leu  Met Gln Glu Gly Ala  Thr Pro Ser
    1350                 1355                 1360

gcc gcg  ctg gac atg aca gcg  cga aac atg gag ccc  agc atg tat       13144
Ala Ala  Leu Asp Met Thr Ala  Arg Asn Met Glu Pro  Ser Met Tyr
    1365                 1370                 1375

gcc agt  aac cgg cct ttc att  aac aaa ctg ctg gac  tac ctg cac       13189
Ala Ser  Asn Arg Pro Phe Ile  Asn Lys Leu Leu Asp  Tyr Leu His
    1380                 1385                 1390

agg gca  gcc gct atg aac tct  gat tat ttc acc aat  gct atc cta       13234
Arg Ala  Ala Ala Met Asn Ser  Asp Tyr Phe Thr Asn  Ala Ile Leu
    1395                 1400                 1405

aac cca  cac tgg ctg ccc ccg  cct gga ttt tac acg  ggc gag tat       13279
Asn Pro  His Trp Leu Pro Pro  Pro Gly Phe Tyr Thr  Gly Glu Tyr
    1410                 1415                 1420

gat atg  ccc gac ccc aat gac  ggg ttt ctg tgg gac  gat gtt gac       13324
Asp Met  Pro Asp Pro Asn Asp  Gly Phe Leu Trp Asp  Asp Val Asp
    1425                 1430                 1435

agc agc  ata ttc tcc cca cct  cct ggt tat aac act  tgg aag aag       13369
Ser Ser  Ile Phe Ser Pro Pro  Pro Gly Tyr Asn Thr  Trp Lys Lys
    1440                 1445                 1450

gaa ggg  ggc gat aga aga cac  tct tcc gtg tcg ctg  tcc ggg tcg       13414
Glu Gly  Gly Asp Arg Arg His  Ser Ser Val Ser Leu  Ser Gly Ser
    1455                 1460                 1465

agg ggt  gct gcc gct gcg gtg  ccc gag gct gca agt  cct ttc cct       13459
Arg Gly  Ala Ala Ala Ala Val  Pro Glu Ala Ala Ser  Pro Phe Pro
    1470                 1475                 1480

agc ctg  ccc ttt tct ctg aac  agc gtg cgc agc agt  gaa ctg ggg       13504
Ser Leu  Pro Phe Ser Leu Asn  Ser Val Arg Ser Ser  Glu Leu Gly
    1485                 1490                 1495

aga ata  acc cgc ccg cgc ttg  atg ggc gag gat gag  tac ttg aac       13549
Arg Ile  Thr Arg Pro Arg Leu  Met Gly Glu Asp Glu  Tyr Leu Asn
    1500                 1505                 1510

gac tcc  ttg ctt aga ccc gag  agg gaa aag aac ttc  ccc aac aat       13594
Asp Ser  Leu Leu Arg Pro Glu  Arg Glu Lys Asn Phe  Pro Asn Asn
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    1515                1520                1525

ggg ata  gag agc ctg gtg gat  aag atg agt aga tgg  aag acc tat       13639
Gly Ile  Glu Ser Leu Val Asp  Lys Met Ser Arg Trp  Lys Thr Tyr
    1530                1535                1540

gca cag  gat cac aaa gat gag  cct agg atc ttg gga  gct gca agc       13684
Ala Gln  Asp His Lys Asp Glu  Pro Arg Ile Leu Gly  Ala Ala Ser
    1545                1550                1555

ggg acg  acc cgt aga cgc cag  cgc cat gac agg cag  agg ggt ctt       13729
Gly Thr  Thr Arg Arg Arg Gln  Arg His Asp Arg Gln  Arg Gly Leu
    1560                1565                1570

gta tgg  gac gat gag gac tcg  gcc gat gac agc agc  gtg ttg gac       13774
Val Trp  Asp Asp Glu Asp Ser  Ala Asp Asp Ser Ser  Val Leu Asp
    1575                1580                1585

ttg ggt  ggg aga gga ggt ggc  aac ccg ttc gct cat  ctg cgc ccg       13819
Leu Gly  Gly Arg Gly Gly Gly  Asn Pro Phe Ala His  Leu Arg Pro
    1590                1595                1600

cac ttt  ggg cgc atg ttg taaaagtgaa agtaaaataa aaaaggcaac           13867
His Phe  Gly Arg Met Leu
    1605

tcaccaaggc catggcgacg agcgtgcgtt cgttcttttc tgttatct atg  tct agt    13924
                                                    Met  Ser Ser
                                                    1610

atg atg agg  cga gcc gtg cta ggc  gga gcg gtg gtg tat  ccg gag       13969
Met Met Arg  Arg Ala Val Leu Gly  Gly Ala Val Val Tyr  Pro Glu
        1615                1620                1625

ggt cct cct  cct tcg tac gag agc  gtg atg cag cag cag  gcg gcg       14014
Gly Pro Pro  Pro Ser Tyr Glu Ser  Val Met Gln Gln Gln  Ala Ala
        1630                1635                1640

gcg gtg atg  cag ccc tcg ctg gag  gct ccc ttt gta ccc  ccg cgg       14059
Ala Val Met  Gln Pro Ser Leu Glu  Ala Pro Phe Val Pro  Pro Arg
        1645                1650                1655

tac ctg gcg  cct aca gag ggg aga  aac agc att cgt tac  tcg gag       14104
Tyr Leu Ala  Pro Thr Glu Gly Arg  Asn Ser Ile Arg Tyr  Ser Glu
        1660                1665                1670

ctg gca ccc  cag tac gat acc acc  agg ttg tat ctg gtg  gac aac       14149
Leu Ala Pro  Gln Tyr Asp Thr Thr  Arg Leu Tyr Leu Val  Asp Asn
        1675                1680                1685

aag tcg gcg  gac atc gcc tca ttg  aac tat cag aac gac  cac agc       14194
Lys Ser Ala  Asp Ile Ala Ser Leu  Asn Tyr Gln Asn Asp  His Ser
        1690                1695                1700

aac ttc ctg  acc acg gtg gtg cag  aac aat gac ttt acc  ccc acg       14239
Asn Phe Leu  Thr Thr Val Val Gln  Asn Asn Asp Phe Thr  Pro Thr
        1705                1710                1715

gag gcc agc  acc cag acc atc aac  ttt gac gag cgg tcg  cgg tgg       14284
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Glu Ala Ser  Thr Gln Thr Ile Asn  Phe Asp Glu Arg Ser  Arg Trp
        1720                1725                1730

ggc ggt cag  ctg aag acc atc atg  cac acc aac atg ccc  aac gta       14329
Gly Gly Gln  Leu Lys Thr Ile Met  His Thr Asn Met Pro  Asn Val
        1735                1740                1745

aac gag tac  atg ttc agt aac aag  ttc aag gcg cgg gtg  atg gtg       14374
Asn Glu Tyr  Met Phe Ser Asn Lys  Phe Lys Ala Arg Val  Met Val
        1750                1755                1760

tcc aga aag  gct cct gaa ggt gtt  aca gta gat gac acc  tat gat       14419
Ser Arg Lys  Ala Pro Glu Gly Val  Thr Val Asp Asp Thr  Tyr Asp
        1765                1770                1775

cat aag cag  gat ata ctg gag tat  gag tgg ttt gag ttc  act ctg       14464
His Lys Gln  Asp Ile Leu Glu Tyr  Glu Trp Phe Glu Phe  Thr Leu
        1780                1785                1790

cca gaa ggc  aac ttc tca gcc acc  atg acc atc gac ctg  atg aac       14509
Pro Glu Gly  Asn Phe Ser Ala Thr  Met Thr Ile Asp Leu  Met Asn
        1795                1800                1805

aat gcc atc  att gac aac tac ctg  gaa att gga aga cag  aat gga       14554
Asn Ala Ile  Ile Asp Asn Tyr Leu  Glu Ile Gly Arg Gln  Asn Gly
        1810                1815                1820

gtg ctg gaa  agt gac att ggt gtc  aag ttt gat acc aga  aac ttc       14599
Val Leu Glu  Ser Asp Ile Gly Val  Lys Phe Asp Thr Arg  Asn Phe
        1825                1830                1835

agg ctt ggc  tgg gac ccc gaa act  aag tta att atg cct  ggg gtt       14644
Arg Leu Gly  Trp Asp Pro Glu Thr  Lys Leu Ile Met Pro  Gly Val
        1840                1845                1850

tac acc tat  gag gcc ttc cat cct  gac att gtg cta ctg  cct ggt       14689
Tyr Thr Tyr  Glu Ala Phe His Pro  Asp Ile Val Leu Leu  Pro Gly
        1855                1860                1865

tgc ggg gtg  gac ttc act gaa agc  cgc ctt agc aac ttg  ctt gga       14734
Cys Gly Val  Asp Phe Thr Glu Ser  Arg Leu Ser Asn Leu  Leu Gly
        1870                1875                1880

atc agg aag  aga cac cca ttc cag  gaa ggc ttt cag ata  ctg tat       14779
Ile Arg Lys  Arg His Pro Phe Gln  Glu Gly Phe Gln Ile  Leu Tyr
        1885                1890                1895

gaa gat ctc  gaa ggg ggt aat atc  ccc gcc ctt ctg gat  gta gaa       14824
Glu Asp Leu  Glu Gly Gly Asn Ile  Pro Ala Leu Leu Asp  Val Glu
        1900                1905                1910

acc tat gag  aaa agc aaa aag gaa  aat gca ggc acc act  act gaa       14869
Thr Tyr Glu  Lys Ser Lys Lys Glu  Asn Ala Gly Thr Thr  Thr Glu
        1915                1920                1925

ggg aca aca  act gtc gct gtt gct  aat gca cta acg aca  gct aaa       14914
Gly Thr Thr  Thr Val Ala Val Ala  Asn Ala Leu Thr Thr  Ala Lys
        1930                1935                1940
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gcg gca gca  aat gtg aca gta gat  gtt att act gaa ata  aac aat       14959
Ala Ala Ala  Asn Val Thr Val Asp  Val Ile Thr Glu Ile  Asn Asn
        1945                 1950                 1955

aat tcg gtt  aga gga gat aat tac  cta tct gct aat gac  atg aaa       15004
Asn Ser Val  Arg Gly Asp Asn Tyr  Leu Ser Ala Asn Asp  Met Lys
        1960                 1965                 1970

gac tct agt  gaa aca act gtg gag  ccg gca gtt cct att  gta gta       15049
Asp Ser Ser  Glu Thr Thr Val Glu  Pro Ala Val Pro Ile  Val Val
        1975                 1980                 1985

cct gga act  aaa act gaa act gaa  acc gaa acc aaa aca  cca acc       15094
Pro Gly Thr  Lys Thr Glu Thr Glu  Thr Glu Thr Lys Thr  Pro Thr
        1990                 1995                 2000

atc cag ccg  cta aaa aaa gat agc  aaa agt agg agt tat  aat gtc       15139
Ile Gln Pro  Leu Lys Lys Asp Ser  Lys Ser Arg Ser Tyr  Asn Val
        2005                 2010                 2015

ttg gaa gat  gaa gtc aac aca gcc  tat cgc agt tgg tac  ttg tcc       15184
Leu Glu Asp  Glu Val Asn Thr Ala  Tyr Arg Ser Trp Tyr  Leu Ser
        2020                 2025                 2030

tac aac tat  ggc gac cct gaa aaa  gga gtc cgc tcc tgg  aca ctg       15229
Tyr Asn Tyr  Gly Asp Pro Glu Lys  Gly Val Arg Ser Trp  Thr Leu
        2035                 2040                 2045

ctc acc act  tca gat gtc acc tgc  gga gcg gag caa gtc  tat tgg       15274
Leu Thr Thr  Ser Asp Val Thr Cys  Gly Ala Glu Gln Val  Tyr Trp
        2050                 2055                 2060

tcc ctc cct  gac atg atg cag gac  ccc gtc acc ttc cgc  tct acg       15319
Ser Leu Pro  Asp Met Met Gln Asp  Pro Val Thr Phe Arg  Ser Thr
        2065                 2070                 2075

aga caa gtc  agc aac tac ccc gtg  gtg ggt gca gag ctc  atg ccc       15364
Arg Gln Val  Ser Asn Tyr Pro Val  Val Gly Ala Glu Leu  Met Pro
        2080                 2085                 2090

gtc ttc tca  aag agt ttc tac aac  gag caa gcc gtg tac  tcc cag       15409
Val Phe Ser  Lys Ser Phe Tyr Asn  Glu Gln Ala Val Tyr  Ser Gln
        2095                 2100                 2105

cag ctc cgc  cag acc acc tcg ctc  acg cac gtc ttc aat  cgc ttc       15454
Gln Leu Arg  Gln Thr Thr Ser Leu  Thr His Val Phe Asn  Arg Phe
        2110                 2115                 2120

cct gag aat  cag atc ctc atc cgc  ccg ccg gcg ccc acc  att acc       15499
Pro Glu Asn  Gln Ile Leu Ile Arg  Pro Pro Ala Pro Thr  Ile Thr
        2125                 2130                 2135

acc gtt agt  gaa aac gtt cct gct  ctc aca gat cac ggg  acc ctg       15544
Thr Val Ser  Glu Asn Val Pro Ala  Leu Thr Asp His Gly  Thr Leu
        2140                 2145                 2150

ccg ttg cgc  agc agt atc cgg gga  gtc cag cgc gtg acc  gtt act       15589
Pro Leu Arg  Ser Ser Ile Arg Gly  Val Gln Arg Val Thr  Val Thr
        2155                 2160                 2165
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gac gcc aga  cgc cgc acc tgc ccc  tac gtc tac aag gcc  ctg ggc       15634
Asp Ala Arg  Arg Arg Thr Cys Pro  Tyr Val Tyr Lys Ala  Leu Gly
        2170                 2175                 2180

ata gtc gcg  ccg cgc gtc ctt tca  agc cgc act ttc taaaaaaaaa aa      15682
Ile Val Ala  Pro Arg Val Leu Ser  Ser Arg Thr Phe
        2185                 2190

atg  tcc att ctc atc tca  ccc agt aat aac acc  ggt tgg ggg ctg       15727
Met  Ser Ile Leu Ile Ser  Pro Ser Asn Asn Thr  Gly Trp Gly Leu
2195                 2200                 2205

cgc  aca ccc acc agg atg  tac gga ggc gct cgc  aaa cgg tct acc       15772
Arg  Thr Pro Thr Arg Met  Tyr Gly Gly Ala Arg  Lys Arg Ser Thr
2210                 2215                 2220

cag  cac cct gtg cgt gta  cgc ggg cat ttc cgc  gct ccc tgg ggc       15817
Gln  His Pro Val Arg Val  Arg Gly His Phe Arg  Ala Pro Trp Gly
2225                 2230                 2235

gcc  ctc aag ggc cgt gct  cgc act cgg acc acc  gtc gat gat gtg       15862
Ala  Leu Lys Gly Arg Ala  Arg Thr Arg Thr Thr  Val Asp Asp Val
2240                 2245                 2250

atc  gac cag gtg gtt gca  gat gct cgt aat tat  act cct gct gca       15907
Ile  Asp Gln Val Val Ala  Asp Ala Arg Asn Tyr  Thr Pro Ala Ala
2255                 2260                 2265

cct  gca tct act gtg gat  gca gtt att gac agc  gtg gtg gct gac       15952
Pro  Ala Ser Thr Val Asp  Ala Val Ile Asp Ser  Val Val Ala Asp
2270                 2275                 2280

gct  cgc gac tat gct cgc  agg aag agc agg cga  aga cgc att gcc       15997
Ala  Arg Asp Tyr Ala Arg  Arg Lys Ser Arg Arg  Arg Arg Ile Ala
2285                 2290                 2295

agg  cgc cac cgg act acc  ccc gcc atg cga gct  gca aga gct ctg       16042
Arg  Arg His Arg Thr Thr  Pro Ala Met Arg Ala  Ala Arg Ala Leu
2300                 2305                 2310

ctg  cgg aaa gcc aaa cgc  gtg ggg cga aga gcc  atg ctt aga gcg       16087
Leu  Arg Lys Ala Lys Arg  Val Gly Arg Arg Ala  Met Leu Arg Ala
2315                 2320                 2325

gcc  aga cgc gcg gct tca  ggt gcc atc gca ggc  agg tcc cgc agg       16132
Ala  Arg Arg Ala Ala Ser  Gly Ala Ile Ala Gly  Arg Ser Arg Arg
2330                 2335                 2340

cgc  gcg gcc acg gcg gca  gca gcg gcc att gcc  aac atg gcc caa       16177
Arg  Ala Ala Thr Ala Ala  Ala Ala Ala Ile Ala  Asn Met Ala Gln
2345                 2350                 2355

ccg  cga aga ggc aat gtg  tac tgg gtg cgc gat  gcc act acc ggc       16222
Pro  Arg Arg Gly Asn Val  Tyr Trp Val Arg Asp  Ala Thr Thr Gly
2360                 2365                 2370

cag  cgc gtg ccc gtg cgc  acc cgt ccc cct cgc  act tagaagatac       16268
Gln  Arg Val Pro Val Arg  Thr Arg Pro Pro Arg  Thr
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2375                2380                2385

tgagcagtct ccgatgttgt gtcccagcgg cgagg atg tcc aag cgc  aaa tac      16321
                                        Met Ser Lys Arg  Lys Tyr
                                                     2390

aag gaa gag  atg ctc cag gtc atc  gcg cct gaa atc tac  ggt cca      16366
Lys Glu Glu  Met Leu Gln Val Ile  Ala Pro Glu Ile Tyr  Gly Pro
        2395                2400                2405

ccg gtg aag  gat gaa aaa aag ccc  cgc aaa atc aag cgg  gtc aaa      16411
Pro Val Lys  Asp Glu Lys Lys Pro  Arg Lys Ile Lys Arg  Val Lys
        2410                2415                2420

aag gac aaa  aag gaa gaa gat ggc  gat gat ggg ctg gtg  gag ttt      16456
Lys Asp Lys  Lys Glu Glu Asp Gly  Asp Asp Gly Leu Val  Glu Phe
        2425                2430                2435

gtg cgc gag  ttc gct cca agg cgg  cgc gtg cag tgg cgc  ggg cgc      16501
Val Arg Glu  Phe Ala Pro Arg Arg  Arg Val Gln Trp Arg  Gly Arg
        2440                2445                2450

agg gtg cgg  ccg gtg ctg aga ccc  gga acc acg gtg gtc  ttc acg      16546
Arg Val Arg  Pro Val Leu Arg Pro  Gly Thr Thr Val Val  Phe Thr
        2455                2460                2465

ccc ggc gag  cgc tcc agc act act  ttt aaa cgc tct tat  gat gag      16591
Pro Gly Glu  Arg Ser Ser Thr Thr  Phe Lys Arg Ser Tyr  Asp Glu
        2470                2475                2480

gtg tac ggt  gac gat gat att ctg  gag cag gca gcc gac  cgc ctg      16636
Val Tyr Gly  Asp Asp Asp Ile Leu  Glu Gln Ala Ala Asp  Arg Leu
        2485                2490                2495

ggc gag ttt  gct tat ggc aaa cgc  agc cgc tct agt ccc  aag gag      16681
Gly Glu Phe  Ala Tyr Gly Lys Arg  Ser Arg Ser Ser Pro  Lys Glu
        2500                2505                2510

gag gcg gtg  tcc atc ccc ttg gat  cat gga aat ccc acc  ccg agt      16726
Glu Ala Val  Ser Ile Pro Leu Asp  His Gly Asn Pro Thr  Pro Ser
        2515                2520                2525

ctc aaa cca  gtc acc ctg cag caa  gtg ctg ccc gtg cct  cca cgg      16771
Leu Lys Pro  Val Thr Leu Gln Gln  Val Leu Pro Val Pro  Pro Arg
        2530                2535                2540

aga ggt gtc  aag cga gag ggc gag  gat ctg tat ccc acc  atg caa      16816
Arg Gly Val  Lys Arg Glu Gly Glu  Asp Leu Tyr Pro Thr  Met Gln
        2545                2550                2555

ttg atg gtg  ccc aag cgc cag aag  ctg gag gac gtg ctg  gag aaa      16861
Leu Met Val  Pro Lys Arg Gln Lys  Leu Glu Asp Val Leu  Glu Lys
        2560                2565                2570

atg aaa gtg  gat ccc gat atc cag  cct gaa gta aaa gtc  aga ccc      16906
Met Lys Val  Asp Pro Asp Ile Gln  Pro Glu Val Lys Val  Arg Pro
        2575                2580                2585

atc aag cag  gtg gcg ccc ggt ctg  gga gta caa acc gtg  gac atc      16951
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Ile Lys Gln  Val Ala Pro Gly Leu  Gly Val Gln Thr Val  Asp Ile
        2590                 2595                 2600

aag att ccc  acc gag tcc atg gaa  gtc cag act gaa cct  gca aag       16996
Lys Ile Pro  Thr Glu Ser Met Glu  Val Gln Thr Glu Pro  Ala Lys
        2605                 2610                 2615

cct aca gcc  acc tcc att gag gtg  cag aca gat cca tgg  atg ccc       17041
Pro Thr Ala  Thr Ser Ile Glu Val  Gln Thr Asp Pro Trp  Met Pro
        2620                 2625                 2630

gcg ccc att  gca acc acc gcc agt  acc gct cga aga ccc  cgg cga       17086
Ala Pro Ile  Ala Thr Thr Ala Ser  Thr Ala Arg Arg Pro  Arg Arg
        2635                 2640                 2645

aag tat ggt  cca gcg agt ctg ctg  atg ccc aac tat gct  ctg cac       17131
Lys Tyr Gly  Pro Ala Ser Leu Leu  Met Pro Asn Tyr Ala  Leu His
        2650                 2655                 2660

cca tcc att  att cca act ccg ggt  tac cga ggc act cgc  tac tac       17176
Pro Ser Ile  Ile Pro Thr Pro Gly  Tyr Arg Gly Thr Arg  Tyr Tyr
        2665                 2670                 2675

cgc agc cgg  agc acc act tcc cgc  cgt cgc aaa aca cct  gca agc       17221
Arg Ser Arg  Ser Thr Thr Ser Arg  Arg Arg Lys Thr Pro  Ala Ser
        2680                 2685                 2690

cgc agc cgc  cgt cgc cgc cgc cgc  gcc acc agc aaa ctg  act ccc       17266
Arg Ser Arg  Arg Arg Arg Arg Arg  Ala Thr Ser Lys Leu  Thr Pro
        2695                 2700                 2705

gcc gct ctg  gtg cgg agg gtg tat  cgc gat ggc cgc gca  gag ccc       17311
Ala Ala Leu  Val Arg Arg Val Tyr  Arg Asp Gly Arg Ala  Glu Pro
        2710                 2715                 2720

ctg atg ctg  ccg cgc gca cgc tac  cat cca agc atc acc  act           17353
Leu Met Leu  Pro Arg Ala Arg Tyr  His Pro Ser Ile Thr  Thr
        2725                 2730                 2735

taatgactgt tgccactgcc tccttgcaga t atg gcc ctc act  tgc cgc ctt      17405
                                    Met Ala Leu Thr  Cys Arg Leu
                                                2740

cgc gtc  ccc att act ggc tac  cga gga aga aac tcg  cgc cgt aga       17450
Arg Val  Pro Ile Thr Gly Tyr  Arg Gly Arg Asn Ser  Arg Arg Arg
    2745                 2750                 2755

agg atg  ttg ggg cgc ggg atg  cgt cgc cac agg cgg  cgg cgc gct       17495
Arg Met  Leu Gly Arg Gly Met  Arg Arg His Arg Arg  Arg Arg Ala
    2760                 2765                 2770

atc agc  aag agg ctg ggg ggt  ggc ttt ctg acc gct  ttg att ccc       17540
Ile Ser  Lys Arg Leu Gly Gly  Gly Phe Leu Thr Ala  Leu Ile Pro
    2775                 2780                 2785

atc atc  gcc gcg gcg att ggg  gca gta cca ggc ata  gct tcc gtg       17585
Ile Ile  Ala Ala Ala Ile Gly  Ala Val Pro Gly Ile  Ala Ser Val
    2790                 2795                 2800
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gcg gtt  cag gcc tcg cag cgc  cac tgacattgga aaaaaactta              17629
Ala Val  Gln Ala Ser Gln Arg  His
    2805                2810

taaataaaat agaatggact ctgacgctcc tggtcctgtg actatgtttt tgtagag      17686

atg gaa gac atc  aat ttt tca tcc ctg  gct ccg cga cac ggc  acg      17731
Met Glu Asp Ile  Asn Phe Ser Ser Leu  Ala Pro Arg His Gly  Thr
            2815                2820                2825

agg ccg tac atg  ggc acc tgg agc gac  atc ggc acc agc caa  ctg      17776
Arg Pro Tyr Met  Gly Thr Trp Ser Asp  Ile Gly Thr Ser Gln  Leu
            2830                2835                2840

aac ggg ggc gcc  ttc aat tgg agc agt  atc tgg agc ggg ctt  aaa      17821
Asn Gly Gly Ala  Phe Asn Trp Ser Ser  Ile Trp Ser Gly Leu  Lys
            2845                2850                2855

aat ttt ggc tct  acc ata aaa acc tat  ggg aac aaa gct tgg  aac      17866
Asn Phe Gly Ser  Thr Ile Lys Thr Tyr  Gly Asn Lys Ala Trp  Asn
            2860                2865                2870

agc agc aca ggg  cag gcg ctg agg aat  aag ctt aaa gag caa  aac      17911
Ser Ser Thr Gly  Gln Ala Leu Arg Asn  Lys Leu Lys Glu Gln  Asn
            2875                2880                2885

ttc cag cag aag  gtg gtc gat ggg atc  gcc tct ggt atc aat  ggg      17956
Phe Gln Gln Lys  Val Val Asp Gly Ile  Ala Ser Gly Ile Asn  Gly
            2890                2895                2900

gtg gtg gat ctg  gcc aac cag gcc gtg  cag aaa cag ata aac  agc      18001
Val Val Asp Leu  Ala Asn Gln Ala Val  Gln Lys Gln Ile Asn  Ser
            2905                2910                2915

cgc ctg gac ccg  ccg cct gca gcc cct  ggc gaa atg gaa gtg  gag      18046
Arg Leu Asp Pro  Pro Pro Ala Ala Pro  Gly Glu Met Glu Val  Glu
            2920                2925                2930

gaa gag ctc cct  ccc ctg gaa aag cgg  gga gac aag cgc ccg  cgt      18091
Glu Glu Leu Pro  Pro Leu Glu Lys Arg  Gly Asp Lys Arg Pro  Arg
            2935                2940                2945

ccc gat atg gag  gag acg ctg gtg acg  cgc gga gac gag ccg  cct      18136
Pro Asp Met Glu  Glu Thr Leu Val Thr  Arg Gly Asp Glu Pro  Pro
            2950                2955                2960

cca tac gag gag  gcg ata aag ctt gga  atg ccc act acc agg  cct      18181
Pro Tyr Glu Glu  Ala Ile Lys Leu Gly  Met Pro Thr Thr Arg  Pro
            2965                2970                2975

ata gct ccc atg  gcc acc ggg gta atg  aaa cct tct cag tcg  cat      18226
Ile Ala Pro Met  Ala Thr Gly Val Met  Lys Pro Ser Gln Ser  His
            2980                2985                2990

cga cct gcc acc  ttg gac ttg cct cct  gcc cct gct gct gca  gcg      18271
Arg Pro Ala Thr  Leu Asp Leu Pro Pro  Ala Pro Ala Ala Ala  Ala
            2995                3000                3005

ccc gct cca aag  cct gtc gct acc ccg  aag ccc acc acc gta  cag      18316
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Pro Ala Pro Lys  Pro Val Ala Thr Pro  Lys Pro Thr Thr Val  Gln
            3010                3015                3020

ccc gtc gcc gta  gcc aga ccg cgt ccc  ggg ggc act ccg cgc  ccg       18361
Pro Val Ala Val  Ala Arg Pro Arg Pro  Gly Gly Thr Pro Arg  Pro
            3025                3030                3035

aat gca aac tgg  cag agt act ctg aac  agc atc gtg ggt ctg  ggc       18406
Asn Ala Asn Trp  Gln Ser Thr Leu Asn  Ser Ile Val Gly Leu  Gly
            3040                3045                3050

gtg cag agt gta  aag cgc cgt cgc tgc  tat taattaaatg tggagtagcg      18456
Val Gln Ser Val  Lys Arg Arg Arg Cys  Tyr
            3055                3060

cttaacttgc ttgtctgtgt gtatgtgtca tcaccacgcc gccgcagcag cagaggagaa    18516

aggaagaggt cgcgcgccga ggctgagttg ctttcaag atg gcc acc cca  tcg       18569
                                          Met Ala Thr Pro  Ser
                                                      3065

atg ctg ccc cag  tgg gca tac atg cac  atc gcc gga cag gat  gct       18614
Met Leu Pro Gln  Trp Ala Tyr Met His  Ile Ala Gly Gln Asp  Ala
            3070                3075                3080

tcg gag tac ctg  agt ccg ggt ctg gtg  cag ttc gcc cgt gcc  aca       18659
Ser Glu Tyr Leu  Ser Pro Gly Leu Val  Gln Phe Ala Arg Ala  Thr
            3085                3090                3095

gac acc tac ttc  aat ctg ggg aac aag  ttt agg aac ccc acc  gtg       18704
Asp Thr Tyr Phe  Asn Leu Gly Asn Lys  Phe Arg Asn Pro Thr  Val
            3100                3105                3110

gcc ccc acc cac  gat gtg acc acc gac  cga agc cag cgg ctg  atg       18749
Ala Pro Thr His  Asp Val Thr Thr Asp  Arg Ser Gln Arg Leu  Met
            3115                3120                3125

ctg cgc ttt gtg  ccc gtt gat cgg gag  gac aat act tac tct  tac       18794
Leu Arg Phe Val  Pro Val Asp Arg Glu  Asp Asn Thr Tyr Ser  Tyr
            3130                3135                3140

aaa gtt cgc tac  aca ctg gct gtg ggc  gac aac aga gtg ctg  gat       18839
Lys Val Arg Tyr  Thr Leu Ala Val Gly  Asp Asn Arg Val Leu  Asp
            3145                3150                3155

atg gcc agc acc  ttc ttt gac att cgg  ggc gtg ctt gac aga  ggt       18884
Met Ala Ser Thr  Phe Phe Asp Ile Arg  Gly Val Leu Asp Arg  Gly
            3160                3165                3170

cct agc ttc aag  cca tac tct ggc aca  gct tac aac tcc cta  gca       18929
Pro Ser Phe Lys  Pro Tyr Ser Gly Thr  Ala Tyr Asn Ser Leu  Ala
            3175                3180                3185

cct aag gga gcc  ccc aat aca tct cag  tgg ctt gcc gaa ggg  aca       18974
Pro Lys Gly Ala  Pro Asn Thr Ser Gln  Trp Leu Ala Glu Gly  Thr
            3190                3195                3200

aat aat gct gca  gag ggg gag gct gaa  caa gat gag gag gac  ggg       19019
Asn Asn Ala Ala  Glu Gly Glu Ala Glu  Gln Asp Glu Glu Asp  Gly
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            3205                3210                3215

ggc gaa gaa gaa  aca aaa atg gct aca  tac act ttt ggc aat  gct       19064
Gly Glu Glu Glu  Thr Lys Met Ala Thr  Tyr Thr Phe Gly Asn  Ala
            3220                3225                3230

cca gta aaa gct  gac gct gaa att aca  aag gaa ggg ttg gca  gta       19109
Pro Val Lys Ala  Asp Ala Glu Ile Thr  Lys Glu Gly Leu Ala  Val
            3235                3240                3245

gga gta gag cta  tta gct gat aac aac  act aaa cca att tat  gca       19154
Gly Val Glu Leu  Leu Ala Asp Asn Asn  Thr Lys Pro Ile Tyr  Ala
            3250                3255                3260

gat aaa ctg tat  caa cct gaa ccc caa  gtt gga gag gaa act  tgg       19199
Asp Lys Leu Tyr  Gln Pro Glu Pro Gln  Val Gly Glu Glu Thr  Trp
            3265                3270                3275

act gat aca gac  ggg aca aat gaa cag  tat gga ggc agg gct  tta       19244
Thr Asp Thr Asp  Gly Thr Asn Glu Gln  Tyr Gly Gly Arg Ala  Leu
            3280                3285                3290

aag cct gag act  aag atg aaa cca tgc  tac gga tct ttt gcc  agg       19289
Lys Pro Glu Thr  Lys Met Lys Pro Cys  Tyr Gly Ser Phe Ala  Arg
            3295                3300                3305

cca acc aat act  aaa ggc ggt cag gca  aaa cta aaa aac cca  gac       19334
Pro Thr Asn Thr  Lys Gly Gly Gln Ala  Lys Leu Lys Asn Pro  Asp
            3310                3315                3320

gaa aaa gac ata  acc aaa att gaa tat  gat gtt gag atg gac  ttt       19379
Glu Lys Asp Ile  Thr Lys Ile Glu Tyr  Asp Val Glu Met Asp  Phe
            3325                3330                3335

tat gag ctt aaa  tcg cag gta aat ggc  agt cca aaa att gtg  atg       19424
Tyr Glu Leu Lys  Ser Gln Val Asn Gly  Ser Pro Lys Ile Val  Met
            3340                3345                3350

tat gca gaa aat  gta aat cta gaa act  cca gac act cac gtg  gtg       19469
Tyr Ala Glu Asn  Val Asn Leu Glu Thr  Pro Asp Thr His Val  Val
            3355                3360                3365

tac aag cct gga  act tca gat gat agt  tct cat gcc aat ctt  ggt       19514
Tyr Lys Pro Gly  Thr Ser Asp Asp Ser  Ser His Ala Asn Leu  Gly
            3370                3375                3380

caa caa tcc atg  ccc aat aga cct aac  tac att ggc ttc aga  gac       19559
Gln Gln Ser Met  Pro Asn Arg Pro Asn  Tyr Ile Gly Phe Arg  Asp
            3385                3390                3395

aac ttc att ggt  ctc gca tac tat aac  agt act ggc aat atg  gga       19604
Asn Phe Ile Gly  Leu Ala Tyr Tyr Asn  Ser Thr Gly Asn Met  Gly
            3400                3405                3410

gta ctg gct ggg  cag gca tca cag cta  aat gca gtg gtt gac  tta       19649
Val Leu Ala Gly  Gln Ala Ser Gln Leu  Asn Ala Val Val Asp  Leu
            3415                3420                3425

caa gac aga aac  acc gaa ttg tca tac  caa cta ctg ctt gac  tct       19694
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Gln Asp Arg Asn  Thr Glu Leu Ser Tyr  Gln Leu Leu Leu Asp  Ser
            3430                 3435                 3440

ttg ggc gac aga  acc agg tac ttt agc  atg tgg aac cag gcc  gtg       19739
Leu Gly Asp Arg  Thr Arg Tyr Phe Ser  Met Trp Asn Gln Ala  Val
            3445                 3450                 3455

gat agc tat gat  ccc gat gta cgc att  att gaa aat cat ggt  gtg       19784
Asp Ser Tyr Asp  Pro Asp Val Arg Ile  Ile Glu Asn His Gly  Val
            3460                 3465                 3470

gaa gac gaa ctt  ccc aat tat tgc ttt  cca ctg aat ggc gtt  ggt       19829
Glu Asp Glu Leu  Pro Asn Tyr Cys Phe  Pro Leu Asn Gly Val  Gly
            3475                 3480                 3485

tcg gaa aca gaa  aga tac aaa gaa atg  caa gct aaa aat ggg  aat       19874
Ser Glu Thr Glu  Arg Tyr Lys Glu Met  Gln Ala Lys Asn Gly  Asn
            3490                 3495                 3500

gaa aat gga tgg  gat aat gct aat cct  act gga aca agt gag  att       19919
Glu Asn Gly Trp  Asp Asn Ala Asn Pro  Thr Gly Thr Ser Glu  Ile
            3505                 3510                 3515

gct aaa ggc aat  ccc tat gct atg gaa  att aat ctt cag gct  aac       19964
Ala Lys Gly Asn  Pro Tyr Ala Met Glu  Ile Asn Leu Gln Ala  Asn
            3520                 3525                 3530

ctt tgg aga agt  ttt ctt tat tct aat  gtt gct ttg tac ctc  cct       20009
Leu Trp Arg Ser  Phe Leu Tyr Ser Asn  Val Ala Leu Tyr Leu  Pro
            3535                 3540                 3545

gat tct tac aaa  tac act cca gct aat  atc act ctc cct tcc  aac       20054
Asp Ser Tyr Lys  Tyr Thr Pro Ala Asn  Ile Thr Leu Pro Ser  Asn
            3550                 3555                 3560

act aac act tat  gac tac ctg aac ggg  cgg gtg gtt ccc ccc  tcc       20099
Thr Asn Thr Tyr  Asp Tyr Leu Asn Gly  Arg Val Val Pro Pro  Ser
            3565                 3570                 3575

cta gtg gat aca  tat ata aac att ggc  gcc aga tgg tct ctg  gat       20144
Leu Val Asp Thr  Tyr Ile Asn Ile Gly  Ala Arg Trp Ser Leu  Asp
            3580                 3585                 3590

gcc atg gac aat  gtc aac cca ttc aac  cac cac cgc aac gct  gga       20189
Ala Met Asp Asn  Val Asn Pro Phe Asn  His His Arg Asn Ala  Gly
            3595                 3600                 3605

ttg cgc tac cgg  tcc atg ctt ttg ggc  aat ggt cgc tat gtg  cct       20234
Leu Arg Tyr Arg  Ser Met Leu Leu Gly  Asn Gly Arg Tyr Val  Pro
            3610                 3615                 3620

ttc cac atc caa  gtg cca caa aaa ttc  ttt gcc gtc aag aac  ctg       20279
Phe His Ile Gln  Val Pro Gln Lys Phe  Phe Ala Val Lys Asn  Leu
            3625                 3630                 3635

ctg ctt ctc cct  ggt tcc tac acc tat  gag tgg aac ttc aga  aag       20324
Leu Leu Leu Pro  Gly Ser Tyr Thr Tyr  Glu Trp Asn Phe Arg  Lys
            3640                 3645                 3650
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gac gtg aac atg  gtt ttg cag agt tca  ctt ggc aac gac ctc  cgg       20369
Asp Val Asn Met  Val Leu Gln Ser Ser  Leu Gly Asn Asp Leu  Arg
            3655                 3660                 3665

gtc gac ggt gcc  agc atc agt ttt acc  agc atc aac ctc tat  gct       20414
Val Asp Gly Ala  Ser Ile Ser Phe Thr  Ser Ile Asn Leu Tyr  Ala
            3670                 3675                 3680

acc ttt ttc ccc  atg gct cac aac act  gct tcc acc ctt gaa  gcc       20459
Thr Phe Phe Pro  Met Ala His Asn Thr  Ala Ser Thr Leu Glu  Ala
            3685                 3690                 3695

atg ttg cgc aat  gac acc aat gac cag  tca ttc aat gac tac  ctc       20504
Met Leu Arg Asn  Asp Thr Asn Asp Gln  Ser Phe Asn Asp Tyr  Leu
            3700                 3705                 3710

tct gcg gct aac  atg ctc tac ccc att  cca gca aat gcc acc  aac       20549
Ser Ala Ala Asn  Met Leu Tyr Pro Ile  Pro Ala Asn Ala Thr  Asn
            3715                 3720                 3725

att ccc atc tcc  att ccc tct cgc aac  tgg gct gcc ttt agg  gga       20594
Ile Pro Ile Ser  Ile Pro Ser Arg Asn  Trp Ala Ala Phe Arg  Gly
            3730                 3735                 3740

tgg tca ttc acc  aga ctc aaa acc aag  gaa aca ccc tct ttg  gga       20639
Trp Ser Phe Thr  Arg Leu Lys Thr Lys  Glu Thr Pro Ser Leu  Gly
            3745                 3750                 3755

tca ggc ttt gat  ccc tac ttt gtt tac  tct ggc tct att ccc  tac       20684
Ser Gly Phe Asp  Pro Tyr Phe Val Tyr  Ser Gly Ser Ile Pro  Tyr
            3760                 3765                 3770

ctg gat ggt acc  ttc tac ctc aac cac  act ttc aag aag gtg  tcc       20729
Leu Asp Gly Thr  Phe Tyr Leu Asn His  Thr Phe Lys Lys Val  Ser
            3775                 3780                 3785

atc atg ttt gac  tcc tca gtc agc tgg  cct ggc aat gac aga  ctg       20774
Ile Met Phe Asp  Ser Ser Val Ser Trp  Pro Gly Asn Asp Arg  Leu
            3790                 3795                 3800

cta tct cca aat  gag ttt gaa atc aag  cgc act gtg gat ggg  gaa       20819
Leu Ser Pro Asn  Glu Phe Glu Ile Lys  Arg Thr Val Asp Gly  Glu
            3805                 3810                 3815

ggg tac aat gtg  gct caa tgc aac atg  acc aag gac tgg ttc  ctg       20864
Gly Tyr Asn Val  Ala Gln Cys Asn Met  Thr Lys Asp Trp Phe  Leu
            3820                 3825                 3830

gtt cag atg ctg  gcc aac tac aac att  ggc tac cag ggc ttc  tac       20909
Val Gln Met Leu  Ala Asn Tyr Asn Ile  Gly Tyr Gln Gly Phe  Tyr
            3835                 3840                 3845

att cca gaa gga  tac aag gat cgc atg  tat tcc ttc ttt aga  aac       20954
Ile Pro Glu Gly  Tyr Lys Asp Arg Met  Tyr Ser Phe Phe Arg  Asn
            3850                 3855                 3860

ttc cag ccc atg  agc aga cag gtg gtt  gat gag gtt aac tac  act       20999
Phe Gln Pro Met  Ser Arg Gln Val Val  Asp Glu Val Asn Tyr  Thr
            3865                 3870                 3875
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gac tac aag gct  gtt gcc gtt cct tac  cag cac aac aat tct  ggt       21044
Asp Tyr Lys Ala  Val Ala Val Pro Tyr  Gln His Asn Asn Ser  Gly
            3880                3885                3890

ttt gtg ggt tac  atg gct cct aca atg  cgc cag gga caa gct  tat       21089
Phe Val Gly Tyr  Met Ala Pro Thr Met  Arg Gln Gly Gln Ala  Tyr
            3895                3900                3905

cca gct aac tac  ccc tac cca ctt att  gga acc act gct gtt  aaa       21134
Pro Ala Asn Tyr  Pro Tyr Pro Leu Ile  Gly Thr Thr Ala Val  Lys
            3910                3915                3920

agc gtc acc cag  aaa aag ttc ctg tgt  gac agg acc atg tgg  cgc       21179
Ser Val Thr Gln  Lys Lys Phe Leu Cys  Asp Arg Thr Met Trp  Arg
            3925                3930                3935

atc ccc ttc tcc  agc aac ttc atg tcc  atg ggt gcc ctt acc  gac       21224
Ile Pro Phe Ser  Ser Asn Phe Met Ser  Met Gly Ala Leu Thr  Asp
            3940                3945                3950

ctg gga cag aac  atg ctt tat gcc aac  tca gcc cat gcg ctg  gat       21269
Leu Gly Gln Asn  Met Leu Tyr Ala Asn  Ser Ala His Ala Leu  Asp
            3955                3960                3965

atg act ttt gag  gtg gat ccc atg gat  gag ccc acc ctg ctt  tat       21314
Met Thr Phe Glu  Val Asp Pro Met Asp  Glu Pro Thr Leu Leu  Tyr
            3970                3975                3980

ctt ctt ttc gaa  gtt ttc gac gtg gtc  aga gtg cac cag cca  cac       21359
Leu Leu Phe Glu  Val Phe Asp Val Val  Arg Val His Gln Pro  His
            3985                3990                3995

cgc ggc gtc atc  gag gct gtc tac ctg  cgt acc cca ttc tca  gct       21404
Arg Gly Val Ile  Glu Ala Val Tyr Leu  Arg Thr Pro Phe Ser  Ala
            4000                4005                4010

ggt aac gcc act  aca taagcccctt gcttcttgca agcagtagct gcagc atg      21457
Gly Asn Ala Thr  Thr                                        Met
            4015

gcc tgc ggg  tcc ggc aac gga tcc  agt gag caa gag ctc  agg gcc       21502
Ala Cys Gly  Ser Gly Asn Gly Ser  Ser Glu Gln Glu Leu  Arg Ala
        4020                4025                4030

atc gct aga  gat ttg ggc tgc gga  ccc tat ttc ctg gga  act ttt       21547
Ile Ala Arg  Asp Leu Gly Cys Gly  Pro Tyr Phe Leu Gly  Thr Phe
        4035                4040                4045

gac aag cga  ttc ccg ggg ttc atg  gct ccc gac aag ctc  gcc tgt       21592
Asp Lys Arg  Phe Pro Gly Phe Met  Ala Pro Asp Lys Leu  Ala Cys
        4050                4055                4060

gcc att gtc  aat acg gcc ggt cgc  gag acg ggg ggt gaa  cat tgg       21637
Ala Ile Val  Asn Thr Ala Gly Arg  Glu Thr Gly Gly Glu  His Trp
        4065                4070                4075

ctg gct ttt  ggt tgg aat ccg cgc  tcc aac acc tgc tac  ctt ttt       21682
Leu Ala Phe  Gly Trp Asn Pro Arg  Ser Asn Thr Cys Tyr  Leu Phe
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        4080                4085                4090

gat cct ttt  ggc ttc tcg gac gag  cgc ctt aag caa atc  tac cag       21727
Asp Pro Phe  Gly Phe Ser Asp Glu  Arg Leu Lys Gln Ile  Tyr Gln
        4095                4100                4105

ttc gaa tat  gag ggg ctc ctg cgc  cgc agc gcc ctt gct  acc aag       21772
Phe Glu Tyr  Glu Gly Leu Leu Arg  Arg Ser Ala Leu Ala  Thr Lys
        4110                4115                4120

gac cgc tgt  atc acc ctc gaa aag  tca acc cag acc gtg  cag ggt       21817
Asp Arg Cys  Ile Thr Leu Glu Lys  Ser Thr Gln Thr Val  Gln Gly
        4125                4130                4135

ccg cgc tcc  gca gcc tgt gga ctt  ttt tgc tgc atg ttc  ctc cac       21862
Pro Arg Ser  Ala Ala Cys Gly Leu  Phe Cys Cys Met Phe  Leu His
        4140                4145                4150

gct ttt gtg  cac tgg ccc gac cgc  ccc atg gac gga aac  ccc acc       21907
Ala Phe Val  His Trp Pro Asp Arg  Pro Met Asp Gly Asn  Pro Thr
        4155                4160                4165

atg aag ttg  cta act ggg gta ccc  aac agc atg ctt caa  tca ccc       21952
Met Lys Leu  Leu Thr Gly Val Pro  Asn Ser Met Leu Gln  Ser Pro
        4170                4175                4180

caa gtc cag  ccc acc ctg cgc cac  aac cag gag gcg ctc  tac cgc       21997
Gln Val Gln  Pro Thr Leu Arg His  Asn Gln Glu Ala Leu  Tyr Arg
        4185                4190                4195

ttc ctc aac  acc cac tca tct tac  ttt cgt tct cac cgc  gcg cgc       22042
Phe Leu Asn  Thr His Ser Ser Tyr  Phe Arg Ser His Arg  Ala Arg
        4200                4205                4210

atc gaa aag  gct acc gcg ttt gac  cgt atg gat atg caa  taataagtca    22091
Ile Glu Lys  Ala Thr Ala Phe Asp  Arg Met Asp Met Gln
        4215                4220                4225

tgtaaaaccg tgttcaaata aacagcactt tatttttac atgcactgtg gctctgggtt    22151

gctcattcat tcatcattcg ctcagaagtc gaaggggttc tggcgggaat cagcgtgacc    22211

cgcgggcagg gatacgttgc ggaactggaa cctgttctgc cacttgaact cggggatcac    22271

cagcttggga actggaatct cggggaaggt gtcttgccac agctttctgg tcagttgcag    22331

agcgccgagc aggtcaggag cagagatctt gaaatcacag ttggggccag cattctgggc    22391

acgggagttg cggtacactg ggttgcagca ctggaacacc atcagggcgg ggtgtctcac    22451

gctcgccagc acggtcgggt cgctgatggt agtcacatcc aagtcttcag cattggccat    22511

tccaaagggg gtcatcttac aggtctgcct gcccatcacg ggagcgcagc cgggcttgtg    22571

gttgcaatcg cagcgaatgg gtatcagcat catcctggcc tggtcggggg ttatccctgg    22631

atacaccgcc ttcataaagg cttcgtactg cttgaaagct tcctgggcct tgcttccctc    22691

ggtgtagaac atcccacagg acttgctgga aaattgatta gtagcacagt tggcatcatt    22751
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cacacagcag cgggcatcgt tgttggccag ctggaccaca ttcctgcccc agcggttctg    22811

ggtgatcttg gctcggtctg ggttctcctt catcgcgcgc tgcccgttct cgctcgccac    22871

atccatctcg atgatgtgat ccttctggat catgatagtg ccatgcaggc atttcacctt    22931

gccttcataa tcggtgcagc catgagccca tagagcgcac ccggtgcact cccaattgtt    22991

gtgggcgatc tccgaatacg aatgcaccaa tccctgcagg aatcttccca tcattgcagt    23051

cagggtcttc aagctggtaa atgtcagcgg gatgccacgg tgctcctcgt tcacatactg    23111

gtggcagata cgcctgtact gctcgtgctg ctctggcatc agcttgaaag aggttctcag    23171

gtcattatcc agcctgtacc tctccatcag tacggccatt acttccatgc ccttctccca    23231

ggcagagacc aagggcaggc tcatgggatt cctaacagca atagcagcag atgctccttt    23291

agccagaggg tcattcttgt caatcttctc gacacttctc ttgccatcct tctcagtgat    23351

gcgcacgggt gggtagctga agcccacggc caccagctcc gcctgttctc tttcttcttc    23411

gctgtcctgg ctgatgtctt gcagagggac atgcttggtc tttctgggtt tcttcttggg    23471

agggatcggg ggagggctgt tgctccgctc tgaagacagg gaggaccgcg aagtttcgct    23531

caccagcacc acctggctct cggtagaaga acctgacccc acacggcggt aggtgttcct    23591

cttcgggggc agaggtggag gcgactgcga tgggctgcgg tccggcctgg gaggcggatg    23651

gctggcagag cctcttccgc gttcgggggt gtgctcccgg tggcggtcgc ttgactgatt    23711

tcctccgcgg ctggccattg tgttctccta ggcagagaaa caacagac atg gag act     23768
                                                      Met Glu Thr

cag cca  tcg ctg cca aca ccg  ctg caa gcg cca tca  cac ctc gcc       23813
Gln Pro  Ser Leu Pro Thr Pro  Leu Gln Ala Pro Ser  His Leu Ala
    4230                 4235                 4240

ccc agc  agc gac gag gag gaa  cag agc tta acc acc  cca cca ccc       23858
Pro Ser  Ser Asp Glu Glu Glu  Gln Ser Leu Thr Thr  Pro Pro Pro
    4245                 4250                 4255

agt ccc  gcc acc acc acc tct  acc ctc gat gag gag  gag gag gtc       23903
Ser Pro  Ala Thr Thr Thr Ser  Thr Leu Asp Glu Glu  Glu Glu Val
    4260                 4265                 4270

gac gca  ccc cag gag atg cag  gtt atg gag gat gag  aaa gcg gaa       23948
Asp Ala  Pro Gln Glu Met Gln  Val Met Glu Asp Glu  Lys Ala Glu
    4275                 4280                 4285

gag att  gag gca gat gtc gag  cag gac ccg ggc tat  gtg aca ccg       23993
Glu Ile  Glu Ala Asp Val Glu  Gln Asp Pro Gly Tyr  Val Thr Pro
    4290                 4295                 4300

gcg gag  cac gag gag gag ctg  aga cgc ttt cta gac  aga gag gat       24038
Ala Glu  His Glu Glu Glu Leu  Arg Arg Phe Leu Asp  Arg Glu Asp
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    4305                4310                4315

aac aac  cgc cca gag cag caa  gca gat ggc gat cac  cag gag gct       24083
Asn Asn  Arg Pro Glu Gln Gln  Ala Asp Gly Asp His  Gln Glu Ala
    4320                4325                4330

ggg ctc  ggg gat cat gtc gcc  gaa tac ctc acc ggg  ctt ggc ggg       24128
Gly Leu  Gly Asp His Val Ala  Glu Tyr Leu Thr Gly  Leu Gly Gly
    4335                4340                4345

gag gac  gtg ctc ctc aaa cat  cta gca agg cag acg  atc ata gtc       24173
Glu Asp  Val Leu Leu Lys His  Leu Ala Arg Gln Thr  Ile Ile Val
    4350                4355                4360

aaa gac  gca ctg ctc gac cgc  acc gaa gtg ccc atc  agt gtg gaa       24218
Lys Asp  Ala Leu Leu Asp Arg  Thr Glu Val Pro Ile  Ser Val Glu
    4365                4370                4375

gag ctc  agc cgc gcc tac gag  ctc aac ctg ttc tcg  cct cgg gtg       24263
Glu Leu  Ser Arg Ala Tyr Glu  Leu Asn Leu Phe Ser  Pro Arg Val
    4380                4385                4390

ccc ccc  aag cgt cag caa aac  ggc acc tgc gag ccc  aac cct cgc       24308
Pro Pro  Lys Arg Gln Gln Asn  Gly Thr Cys Glu Pro  Asn Pro Arg
    4395                4400                4405

ctc aac  ttc tat ccg gcc ttt  gct gtc cca gaa gtg  ctt gct acc       24353
Leu Asn  Phe Tyr Pro Ala Phe  Ala Val Pro Glu Val  Leu Ala Thr
    4410                4415                4420

tac cac  atc ttt ttc aag aac  caa aag att cca gtc  tcc tgc cgt       24398
Tyr His  Ile Phe Phe Lys Asn  Gln Lys Ile Pro Val  Ser Cys Arg
    4425                4430                4435

gcc aac  cgc acc cgc gcc gat  gcc ctg ctc aac ttg  gga cct ggc       24443
Ala Asn  Arg Thr Arg Ala Asp  Ala Leu Leu Asn Leu  Gly Pro Gly
    4440                4445                4450

gct cgc  tta cct gat ata gct  tcc ttg gaa gag gtt  cca aag atc       24488
Ala Arg  Leu Pro Asp Ile Ala  Ser Leu Glu Glu Val  Pro Lys Ile
    4455                4460                4465

ttc gag  ggt ctg ggc agt gat  gag act cgg gcc gca  aat gct ctg       24533
Phe Glu  Gly Leu Gly Ser Asp  Glu Thr Arg Ala Ala  Asn Ala Leu
    4470                4475                4480

caa cag  gga gaa aat ggc atg  gat gaa cat cac agc  gct ctg gtg       24578
Gln Gln  Gly Glu Asn Gly Met  Asp Glu His His Ser  Ala Leu Val
    4485                4490                4495

gag ttg  gag gga gac aat gcc  cgg ctt gca gtg ctc  aag cgc agt       24623
Glu Leu  Glu Gly Asp Asn Ala  Arg Leu Ala Val Leu  Lys Arg Ser
    4500                4505                4510

atc gag  gtc acc cat ttt gcc  tac ccc gct gtc aac  ctg ccc ccc       24668
Ile Glu  Val Thr His Phe Ala  Tyr Pro Ala Val Asn  Leu Pro Pro
    4515                4520                4525

aaa gtc  atg agc gct gtc atg  gac cag ctg ctc atc  aag cga gca       24713
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Lys Val  Met Ser Ala Val Met  Asp Gln Leu Leu Ile  Lys Arg Ala
    4530                4535                4540

agc ccc  ctt tcc gaa gac cag  aac atg cag gat cca  gac gcc tct       24758
Ser Pro  Leu Ser Glu Asp Gln  Asn Met Gln Asp Pro  Asp Ala Ser
    4545                4550                4555

gac gag  ggc aag ccg gtg gtc  agt gac gag cag ctg  tct cgc tgg       24803
Asp Glu  Gly Lys Pro Val Val  Ser Asp Glu Gln Leu  Ser Arg Trp
    4560                4565                4570

ctg agt  act aac tcc cca cga  gac ttg gaa gag agg  cgc aag ctt       24848
Leu Ser  Thr Asn Ser Pro Arg  Asp Leu Glu Glu Arg  Arg Lys Leu
    4575                4580                4585

atg atg  gct gta gtg cta gtc  act gtg gag ctg gag  tgt ctc cgc       24893
Met Met  Ala Val Val Leu Val  Thr Val Glu Leu Glu  Cys Leu Arg
    4590                4595                4600

cgc ttt  ttc acc gac cct gag  acc ctg cgc aag ctc  gag gag aac       24938
Arg Phe  Phe Thr Asp Pro Glu  Thr Leu Arg Lys Leu  Glu Glu Asn
    4605                4610                4615

ctg cac  tat act ttc aga cat  ggc ttc gtg cgc cag  gca tgc aag       24983
Leu His  Tyr Thr Phe Arg His  Gly Phe Val Arg Gln  Ala Cys Lys
    4620                4625                4630

atc tcc  aac gtg gag ctc acc  aac ctg gtc tcc tac  atg ggc att       25028
Ile Ser  Asn Val Glu Leu Thr  Asn Leu Val Ser Tyr  Met Gly Ile
    4635                4640                4645

ttg cat  gag aac cgc ctg ggg  cag agc gtg ttg cat  acc acc ctg       25073
Leu His  Glu Asn Arg Leu Gly  Gln Ser Val Leu His  Thr Thr Leu
    4650                4655                4660

aaa ggg  gag gcc cgc cgc gac  tac atc cgc gac tgt  gtc tac ctc       25118
Lys Gly  Glu Ala Arg Arg Asp  Tyr Ile Arg Asp Cys  Val Tyr Leu
    4665                4670                4675

tac ctc  tgc cat acc tgg cag  act ggc atg ggt gta  tgg cag cag       25163
Tyr Leu  Cys His Thr Trp Gln  Thr Gly Met Gly Val  Trp Gln Gln
    4680                4685                4690

tgt ttg  gaa gag cag aac ctg  aaa gag ctg gac aag  ctc ttg cag       25208
Cys Leu  Glu Glu Gln Asn Leu  Lys Glu Leu Asp Lys  Leu Leu Gln
    4695                4700                4705

aga tcc  ctt aaa gcc ctg tgg  aca ggt ttt gac gag  cgc acc gtc       25253
Arg Ser  Leu Lys Ala Leu Trp  Thr Gly Phe Asp Glu  Arg Thr Val
    4710                4715                4720

gcc tca  gac ctg gca gac atc  atc ttc ccc gag cgt  ctc agg gtt       25298
Ala Ser  Asp Leu Ala Asp Ile  Ile Phe Pro Glu Arg  Leu Arg Val
    4725                4730                4735

act ctg  cgc aac ggc ctg cct  gac ttc atg agc caa  agc atg ctt       25343
Thr Leu  Arg Asn Gly Leu Pro  Asp Phe Met Ser Gln  Ser Met Leu
    4740                4745                4750
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aac aac  ttt cgc tct ttc atc  ctg gaa cgc tcc ggt  atc ctg ccc       25388
Asn Asn  Phe Arg Ser Phe Ile  Leu Glu Arg Ser Gly  Ile Leu Pro
    4755                 4760                 4765

gcc acc  tgc tgc gcg ctg ccc  tcc gac ttt gtg cct  ctc acc tac       25433
Ala Thr  Cys Cys Ala Leu Pro  Ser Asp Phe Val Pro  Leu Thr Tyr
    4770                 4775                 4780

cgc gag  tgc ccc ccg ccg cta  tgg agc cac tgc tac  ctg ttc cgc       25478
Arg Glu  Cys Pro Pro Pro Leu  Trp Ser His Cys Tyr  Leu Phe Arg
    4785                 4790                 4795

ctg gcc  aac tac ctt tcc tac  cac tcg gat gtg atc  gag gat gtg       25523
Leu Ala  Asn Tyr Leu Ser Tyr  His Ser Asp Val Ile  Glu Asp Val
    4800                 4805                 4810

agc gga  gac ggc ctg ctg gag  tgc cac tgc cgc tgc  aat ctc tgc       25568
Ser Gly  Asp Gly Leu Leu Glu  Cys His Cys Arg Cys  Asn Leu Cys
    4815                 4820                 4825

aca ccc  cac cgt tcc ctc gcc  tgc aac ccc cag ttg  ctg agc gag       25613
Thr Pro  His Arg Ser Leu Ala  Cys Asn Pro Gln Leu  Leu Ser Glu
    4830                 4835                 4840

acc cag  atc atc ggc acc ttc  gag ttg cag ggt ccc  agc agc gaa       25658
Thr Gln  Ile Ile Gly Thr Phe  Glu Leu Gln Gly Pro  Ser Ser Glu
    4845                 4850                 4855

ggc gag  ggg tct tct tcg ggg  cag agt ctg aaa ctg  acc ccg ggg       25703
Gly Glu  Gly Ser Ser Ser Gly  Gln Ser Leu Lys Leu  Thr Pro Gly
    4860                 4865                 4870

cta tgg  acc tcc gcc tac ctg  cgc aag ttc gcc ccc  gaa gac tac       25748
Leu Trp  Thr Ser Ala Tyr Leu  Arg Lys Phe Ala Pro  Glu Asp Tyr
    4875                 4880                 4885

cac ccc  tat gag att agg ttc  tat gag gac caa tca  cag ccg ccc       25793
His Pro  Tyr Glu Ile Arg Phe  Tyr Glu Asp Gln Ser  Gln Pro Pro
    4890                 4895                 4900

aaa gcc  gag ctc tca gcc tgc  gtc atc act cag ggg  gca att ctc       25838
Lys Ala  Glu Leu Ser Ala Cys  Val Ile Thr Gln Gly  Ala Ile Leu
    4905                 4910                 4915

gcc caa  ttg caa gcc atc caa  aaa tcc cgc caa gaa  ttt ctg ctg       25883
Ala Gln  Leu Gln Ala Ile Gln  Lys Ser Arg Gln Glu  Phe Leu Leu
    4920                 4925                 4930

aaa agg  ggg aac ggg gtc tac  ctc gac ccc cag acc  ggt gag gag       25928
Lys Arg  Gly Asn Gly Val Tyr  Leu Asp Pro Gln Thr  Gly Glu Glu
    4935                 4940                 4945

ctc aac  aca agg ttc cct cag  gat gtc cca gcg ccg  agg aag caa       25973
Leu Asn  Thr Arg Phe Pro Gln  Asp Val Pro Ala Pro  Arg Lys Gln
    4950                 4955                 4960

gaa gtt  gaa ggt gca gct gcc  gcc ccc aga gga tat  gga gga aga       26018
Glu Val  Glu Gly Ala Ala Ala  Ala Pro Arg Gly Tyr  Gly Gly Arg
    4965                 4970                 4975
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ctg gga  cag tca ggc aga gga  gga gga gat gga aga  ttg gga cag       26063
Leu Gly  Gln Ser Gly Arg Gly  Gly Gly Asp Gly Arg  Leu Gly Gln
    4980                 4985                 4990

cca ggc  aga gga ggc gga cag  cct gga gga aga cag  ttt gga gga       26108
Pro Gly  Arg Gly Gly Gly Gln  Pro Gly Gly Arg Gln  Phe Gly Gly
    4995                 5000                 5005

gga aga  cga gga ggc aga gga  ggt gga aga agc aac  cgc cgc caa       26153
Gly Arg  Arg Gly Gly Arg Gly  Gly Gly Arg Ser Asn  Arg Arg Gln
    5010                 5015                 5020

aca gtt  gtc ctc gac agc gga  gac aag cag ggc ccc  aga cag cag       26198
Thr Val  Val Leu Asp Ser Gly  Asp Lys Gln Gly Pro  Arg Gln Gln
    5025                 5030                 5035

cag cag  cac ggc tac aat ctc  cgc tcc ggg tcg ggg  ggc cca gcg       26243
Gln Gln  His Gly Tyr Asn Leu  Arg Ser Gly Ser Gly  Gly Pro Ala
    5040                 5045                 5050

gcg tcc  caa cag tagatgggac gagaccgggc gattcccgaa cccgaccacc        26295
Ala Ser  Gln Gln
    5055

gcttccaaga ccggtaagaa ggagcggcag ggatacaagt cctggcgggg gcataagaat   26355

gccatcatct cctgcttgca tgaatgtggg ggcaacatat ccttcacccg gcgctacctg   26415

ctcttccacc acggggtgaa cttcccccgc aatgtcttgc attactaccg tcacctccac   26475

agcccctact acagccagca agtcccaaca gcctcggcag agaaaaacag cagcagcggg   26535

gacctccagc agaaaaccag cagcagcagt tagaaagtcc agtgcagcag gaggaggact   26595

gaggatcaca gcgaacgagc cagcgcagac ccgagagctg agaaacagga tctttccaac   26655

cctctatgcc atcttccagc agagtcgggg gcaagagcag gaactgaaag taaaaaaccg   26715

atctctgcgc tcgctcaccc gaagttgttt gtatcacaag agcgaagacc aacttcagcg   26775

cactctcgag gacgccgagg ctctcttcaa caagtactgc gcgctgactc ttaaagagta   26835

gcccgcgccc gcgctcgctc gaaaaaggcg ggaattacgt cacccttggc acctgtcctt   26895

tgccccgtc atg agt aaa  gaa att ccc acg cct  tac atg tgg agc tat      26943
          Met Ser Lys  Glu Ile Pro Thr Pro  Tyr Met Trp Ser Tyr
                  5060                 5065                 5070

cag ccc caa atg gga  ctg gca gca ggc gcc  tcc cag gac tac tcc       26988
Gln Pro Gln Met Gly  Leu Ala Ala Gly Ala  Ser Gln Asp Tyr Ser
                5075                 5080                 5085

acc cgc atg aat tgg  ctc agc gcc ggg ccc  tcg atg atc tca cgg       27033
Thr Arg Met Asn Trp  Leu Ser Ala Gly Pro  Ser Met Ile Ser Arg
                5090                 5095                 5100

gtt aat gat ata cga  gct tac cga aac cag  tta ctc cta gaa cag       27078
Val Asn Asp Ile Arg  Ala Tyr Arg Asn Gln  Leu Leu Leu Glu Gln
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                5105                5110                5115

tca gct ctc acc acc  aca ccc cgc caa cac  ctt aat ccc cgg aat        27123
Ser Ala Leu Thr Thr  Thr Pro Arg Gln His  Leu Asn Pro Arg Asn
                5120                5125                5130

tgg ccc gcc gcc ctg  gtg tac cag gaa acc  ccc gct ccc acc acc        27168
Trp Pro Ala Ala Leu  Val Tyr Gln Glu Thr  Pro Ala Pro Thr Thr
                5135                5140                5145

gta cta ctt cct cga  gac gcc cag gcc gaa  gtt cag atg act aac        27213
Val Leu Leu Pro Arg  Asp Ala Gln Ala Glu  Val Gln Met Thr Asn
                5150                5155                5160

gca ggt gta cag ctg  gcg ggc ggt tcc gcc  ctg tgt cgt cac cgg        27258
Ala Gly Val Gln Leu  Ala Gly Gly Ser Ala  Leu Cys Arg His Arg
                5165                5170                5175

cct cag cag agt ata  aaa cgc ctg gtg atc  aga ggc cga ggt atc        27303
Pro Gln Gln Ser Ile  Lys Arg Leu Val Ile  Arg Gly Arg Gly Ile
                5180                5185                5190

cag ctc aac gac gag  tcg gtg agc tct tcg  ctt ggt ctg cga cca        27348
Gln Leu Asn Asp Glu  Ser Val Ser Ser Ser  Leu Gly Leu Arg Pro
                5195                5200                5205

gac gga gtc ttc caa  atc gcc ggc tgt ggg  aga tct tcc ttc act        27393
Asp Gly Val Phe Gln  Ile Ala Gly Cys Gly  Arg Ser Ser Phe Thr
                5210                5215                5220

cct cgt cag gct gtc  ctg act ttg gag agt  tcg tcc tcg cag ccc        27438
Pro Arg Gln Ala Val  Leu Thr Leu Glu Ser  Ser Ser Ser Gln Pro
                5225                5230                5235

cgc tcg ggc ggc atc  ggg act ctc cag ttt  gtg gag gag ttt act        27483
Arg Ser Gly Gly Ile  Gly Thr Leu Gln Phe  Val Glu Glu Phe Thr
                5240                5245                5250

ccc tct gtc tac ttc  aac ccc ttc tcc ggc  tct cct ggc cag tac        27528
Pro Ser Val Tyr Phe  Asn Pro Phe Ser Gly  Ser Pro Gly Gln Tyr
                5255                5260                5265

ccg gac gag ttc ata  ccg aac ttc gac gca  atc agc gag tca gtg        27573
Pro Asp Glu Phe Ile  Pro Asn Phe Asp Ala  Ile Ser Glu Ser Val
                5270                5275                5280

gat ggc tat gat tg atg  tct ggt ggc gcg gct  gag tta gct cga ctg     27620
Asp Gly Tyr Asp    Met  Ser Gly Gly Ala Ala  Glu Leu Ala Arg Leu
                   5285                5290                5295

cga cat cta gac cac  tgc cgc cgc ttt cgc  tgt ttc gcc cgg gaa        27665
Arg His Leu Asp His  Cys Arg Arg Phe Arg  Cys Phe Ala Arg Glu
                5300                5305                5310

ctc acc gag ttc atc  tac ttc gaa ctc ccc  gag gag cac cct cag        27710
Leu Thr Glu Phe Ile  Tyr Phe Glu Leu Pro  Glu Glu His Pro Gln
                5315                5320                5325

gga ccg gcc cac gga  gtg cgg att acc atc  gaa ggg gga ata gac        27755
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Gly Pro Ala His Gly  Val Arg Ile Thr Ile  Glu Gly Gly Ile Asp
                5330                5335                5340

tct cgc ctg cat cgg  atc ttc tgc cag cga  cct gtg ctg att gag        27800
Ser Arg Leu His Arg  Ile Phe Cys Gln Arg  Pro Val Leu Ile Glu
                5345                5350                5355

cgc gac cag gga act  aca aca gtc tcc atc  tac tgc atc tgt aac        27845
Arg Asp Gln Gly Thr  Thr Thr Val Ser Ile  Tyr Cys Ile Cys Asn
                5360                5365                5370

cac ccc gga ttg cat  gaa agc ctt tgc tgt  ctt att tgt gct gag        27890
His Pro Gly Leu His  Glu Ser Leu Cys Cys  Leu Ile Cys Ala Glu
                5375                5380                5385

ttt aat aaa aac tgagttaaga ctcaccttcg gactaccgct tcttcaaccc          27942
Phe Asn Lys Asn


ggaccttaca acaccagcca gaccctccgt tccagccaga agaaccagac ccttcctcta    28002

atccaggact ctaattctac ctccccagcg ccttttccta ctaaccttcc cgatactaac    28062

aacctcggag ctcagctgca acaccgcttc tccagaagcc tcctttctgc caatactact    28122

actcccaaaa ccggaggtga gctccgtggt ctccctactg acaacccctg ggtggtagcg    28182

ggttttgtag cactaggagt agttgcgggt gggctggtgc ttatcctctg ctacctatac    28242

acaccttgct gtgcttattt agtagtcttg tgctgttggt ttaagaa atg  ggg gtc     28298
                                                    Met  Gly Val
                                                    5390

gta cta gtc  gcg ctt gct tta ctt  tcg ctt ttg ggt ctg  ggc tct       28343
Val Leu Val  Ala Leu Ala Leu Leu  Ser Leu Leu Gly Leu  Gly Ser
        5395                5400                5405

act acg cta  gcg aat cag cct tta  cta tta gat cct gat  aat gtt       28388
Thr Thr Leu  Ala Asn Gln Pro Leu  Leu Leu Asp Pro Asp  Asn Val
        5410                5415                5420

gat cca tgc  cta aca ttt gat cca  gaa aac tgc aca ctt  act ttt       28433
Asp Pro Cys  Leu Thr Phe Asp Pro  Glu Asn Cys Thr Leu  Thr Phe
        5425                5430                5435

gca cct gaa  aca agt cgc tac tgt  gga gtt ctt att agg  tgc gga       28478
Ala Pro Glu  Thr Ser Arg Tyr Cys  Gly Val Leu Ile Arg  Cys Gly
        5440                5445                5450

cgg gaa tgc  agg ccc att gag att  aca cac aat aac aaa  act tgg       28523
Arg Glu Cys  Arg Pro Ile Glu Ile  Thr His Asn Asn Lys  Thr Trp
        5455                5460                5465

aac aac aca  tta ttc acc aca tgg  tct cca gga gat cct  cag tgg       28568
Asn Asn Thr  Leu Phe Thr Thr Trp  Ser Pro Gly Asp Pro  Gln Trp
        5470                5475                5480

tat act gtc  tct gtc cgg ggt cct  gac ggt tcc gtc cgc  ata gct       28613
Tyr Thr Val  Ser Val Arg Gly Pro  Asp Gly Ser Val Arg  Ile Ala
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        5485                5490                5495

aat aac act  ttc att ttt gct gaa  atg tgc gat atg gtc  atg ttc       28658
Asn Asn Thr  Phe Ile Phe Ala Glu  Met Cys Asp Met Val  Met Phe
        5500                5505                5510

atg agc aga  cag tat aac cta tgg  cct ccc agc gag gaa  aac att       28703
Met Ser Arg  Gln Tyr Asn Leu Trp  Pro Pro Ser Glu Glu  Asn Ile
        5515                5520                5525

gtg gca ttc  tcc att gct tat tgc  tta tgt act tgc ctt  atc act       28748
Val Ala Phe  Ser Ile Ala Tyr Cys  Leu Cys Thr Cys Leu  Ile Thr
        5530                5535                5540

gct atc ttg  tgt gcg tgc ttg cat  ttg ctt att gct att  cgc tcc       28793
Ala Ile Leu  Cys Ala Cys Leu His  Leu Leu Ile Ala Ile  Arg Ser
        5545                5550                5555

aga aac aat  gag gaa aaa gaa aaa  atg cct taacctttt cctcatacct      28843
Arg Asn Asn  Glu Glu Lys Glu Lys  Met Pro
        5560                5565

tttttacagc atg act tct  gtc gca gtc att ttt  act att att acc ggc    28892
           Met Thr Ser  Val Ala Val Ile Phe  Thr Ile Ile Thr Gly
                  5570                5575                5580

ttt act act gcc gtg  cat gga atg aaa aat  gtt aaa cta act gtc       28937
Phe Thr Thr Ala Val  His Gly Met Lys Asn  Val Lys Leu Thr Val
                5585                5590                5595

tat act aac acc aac  caa aca ctg gag ggg  cct aaa ggg aca gtt       28982
Tyr Thr Asn Thr Asn  Gln Thr Leu Glu Gly  Pro Lys Gly Thr Val
                5600                5605                5610

tca tgg tat tgg tat  caa aat ttt ggc gat  ctg tct gta tgg ttg       29027
Ser Trp Tyr Trp Tyr  Gln Asn Phe Gly Asp  Leu Ser Val Trp Leu
                5615                5620                5625

tgc gat gga aca acc  att aat aag acc att  gat tta att aaa tac       29072
Cys Asp Gly Thr Thr  Ile Asn Lys Thr Ile  Asp Leu Ile Lys Tyr
                5630                5635                5640

agt tgc gat tca gat  tta aca cta atc aac  att aat gct cat tat       29117
Ser Cys Asp Ser Asp  Leu Thr Leu Ile Asn  Ile Asn Ala His Tyr
                5645                5650                5655

gaa ggt tac tat tat  gga act gac ata aat  gat gta aac ttc tac       29162
Glu Gly Tyr Tyr Tyr  Gly Thr Asp Ile Asn  Asp Val Asn Phe Tyr
                5660                5665                5670

aac att tat gta tca  gac cca aca acc att  cca act aaa ccc tcc       29207
Asn Ile Tyr Val Ser  Asp Pro Thr Thr Ile  Pro Thr Lys Pro Ser
                5675                5680                5685

aca cac act aaa act  tac act aaa act tcc  aca cac aca agc atc       29252
Thr His Thr Lys Thr  Tyr Thr Lys Thr Ser  Thr His Thr Ser Ile
                5690                5695                5700

aat gag tta caa ttt  cta aaa gct aac ata  aca tac aat tct acc       29297
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Asn Glu Leu Gln Phe  Leu Lys Ala Asn Ile  Thr Tyr Asn Ser Thr
                5705                5710                5715

atc tcg cct act att  ccc aat gaa aca aat  att cct aat tca atg       29342
Ile Ser Pro Thr Ile  Pro Asn Glu Thr Asn  Ile Pro Asn Ser Met
                5720                5725                5730

att gga att att gct  gca gtt gct att gga  atg gcg atc ata ata       29387
Ile Gly Ile Ile Ala  Ala Val Ala Ile Gly  Met Ala Ile Ile Ile
                5735                5740                5745

ata tgt atg atc gtt  tat gct tgc tgc tat  aaa aaa ctt caa gaa       29432
Ile Cys Met Ile Val  Tyr Ala Cys Cys Tyr  Lys Lys Leu Gln Glu
                5750                5755                5760

gaa aaa tta gat cca  cta cta agc ttt gat  ttt taaatttttt            29475
Glu Lys Leu Asp Pro  Leu Leu Ser Phe Asp  Phe
                5765                5770

tttgtagaaa c atg ctt ctt cat  act tta gct ttt att  tcc att ttt      29522
             Met Leu Leu His  Thr Leu Ala Phe Ile  Ser Ile Phe
                         5775                5780

ggt ttc  tca ctt gga ggt aaa  ata cat aag aat gtt  acc gtg tta      29567
Gly Phe  Ser Leu Gly Gly Lys  Ile His Lys Asn Val  Thr Val Leu
    5785                5790                5795

gag ggc  gct cca aat ata aca  ctc caa gga gtt tat  gtc cca ccc      29612
Glu Gly  Ala Pro Asn Ile Thr  Leu Gln Gly Val Tyr  Val Pro Pro
    5800                5805                5810

agt caa  aaa aga agc act att  aac ata act tgg gaa  act gta ata      29657
Ser Gln  Lys Arg Ser Thr Ile  Asn Ile Thr Trp Glu  Thr Val Ile
    5815                5820                5825

aat gga  agc aga cca aat gta  tgt gct tta aat tta  aca aaa ttc      29702
Asn Gly  Ser Arg Pro Asn Val  Cys Ala Leu Asn Leu  Thr Lys Phe
    5830                5835                5840

aaa tgt  gag ggt ttt gat ctt  act atc ttt aat tta  act aaa caa      29747
Lys Cys  Glu Gly Phe Asp Leu  Thr Ile Phe Asn Leu  Thr Lys Gln
    5845                5850                5855

gac tcc  aaa aat tat ttt ggt  gaa agt ata act gtc  tta act tct      29792
Asp Ser  Lys Asn Tyr Phe Gly  Glu Ser Ile Thr Val  Leu Thr Ser
    5860                5865                5870

ggt tat  caa aaa aat tat ata  acc cac aat tat gca  gtt tat cat      29837
Gly Tyr  Gln Lys Asn Tyr Ile  Thr His Asn Tyr Ala  Val Tyr His
    5875                5880                5885

gtt att  gtt ata tct cca act  act cat gcg ccc tct  acc aca caa      29882
Val Ile  Val Ile Ser Pro Thr  Thr His Ala Pro Ser  Thr Thr Gln
    5890                5895                5900

gta act  aca gct cat tct aac  act tac acc cat gta  aag gta tta      29927
Val Thr  Thr Ala His Ser Asn  Thr Tyr Thr His Val  Lys Val Leu
    5905                5910                5915
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aaa gaa  aca tac agt act acc  aat gtg cag act act  ata atc aca       29972
Lys Glu  Thr Tyr Ser Thr Thr  Asn Val Gln Thr Thr  Ile Ile Thr
    5920                 5925                 5930

aaa ata  ccc aca aca gct acc  tca ttt gct tta cac  aaa tca gca       30017
Lys Ile  Pro Thr Thr Ala Thr  Ser Phe Ala Leu His  Lys Ser Ala
    5935                 5940                 5945

ctt tca  tgc gcc cca acg ctc  acc act ttg cat gct  act aaa cct       30062
Leu Ser  Cys Ala Pro Thr Leu  Thr Thr Leu His Ala  Thr Lys Pro
    5950                 5955                 5960

ttt act  aat ata tct act ccc  tta aaa caa ttt gat  cga act atg       30107
Phe Thr  Asn Ile Ser Thr Pro  Leu Lys Gln Phe Asp  Arg Thr Met
    5965                 5970                 5975

aaa ata  gaa att acc ttt ctt  att gtc ata gga ata  att atc att       30152
Lys Ile  Glu Ile Thr Phe Leu  Ile Val Ile Gly Ile  Ile Ile Ile
    5980                 5985                 5990

gca atc  ttg ctt tac tac ata  ttc tgt cgc caa atc  ccc aat gct       30197
Ala Ile  Leu Leu Tyr Tyr Ile  Phe Cys Arg Gln Ile  Pro Asn Ala
    5995                 6000                 6005

caa aga  cga cct ata tat aga  cct atc ata ggt gaa  ccc caa caa       30242
Gln Arg  Arg Pro Ile Tyr Arg  Pro Ile Ile Gly Glu  Pro Gln Gln
    6010                 6015                 6020

ctt caa  gtg gag gga ggc tta  aga aat ctt ctg ttc  tct ttt aca       30287
Leu Gln  Val Glu Gly Gly Leu  Arg Asn Leu Leu Phe  Ser Phe Thr
    6025                 6030                 6035

gta tgg  tgatcaacaa tc atg atc cct aga aat  ttc ctc ttc acc ata      30335
Val Trp               Met Ile Pro Arg Asn  Phe Leu Phe Thr Ile
    6040                              6045                 6050

ctc atc tgt gct ttt  aat gtt tgt gct act  ttc gcc aca gtt gcc       30380
Leu Ile Cys Ala Phe  Asn Val Cys Ala Thr  Phe Ala Thr Val Ala
                6055                 6060                 6065

aat gtc act cca gac  tgt ata gga gca ttt  gcc tcc tat gtg ctt       30425
Asn Val Thr Pro Asp  Cys Ile Gly Ala Phe  Ala Ser Tyr Val Leu
                6070                 6075                 6080

ttc gca ttt att acc  tgc atc tgt gtt tgt  agc ata gtt tgc ctg       30470
Phe Ala Phe Ile Thr  Cys Ile Cys Val Cys  Ser Ile Val Cys Leu
                6085                 6090                 6095

gtt att aat ttc ttt  caa ctt gta gac tgg  gtt ttt gta cgc gtt       30515
Val Ile Asn Phe Phe  Gln Leu Val Asp Trp  Val Phe Val Arg Val
                6100                 6105                 6110

gcc tac ctg cgg cat  cac cct gaa tac cgc  aac caa aat gtt gca       30560
Ala Tyr Leu Arg His  His Pro Glu Tyr Arg  Asn Gln Asn Val Ala
                6115                 6120                 6125

gca att ctt agg ctc  att taaaaccatg caaactctgc tactacttct           30608
Ala Ile Leu Arg Leu  Ile
                6130
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gctagttata catccatgtg cctccttaaa ccccacaagc cccacaaaat tacacctaag    30668

aaaatgtaaa tttcaagaac catggaaatt ccttgaatgc tatcatgaaa catctgattt    30728

ccccacatac tggattacaa tcattgggat tgttaatcta gtttcttgca cactattctc    30788

tttccttgtt taccacttat ttgattttgg atggaatgcc ctcaatgcac tcacttaccc    30848

acaagaacca gaggaacata taccactaca aaacatgcaa ccactagcac tagtagaata    30908

tgaaaatgaa ccacagcccc cgatgctccc tgctattagt tacttcaacc taactggagg    30968

ag atg act gac cca  ctc gcc gcc tcc gct  gct gag gaa cta ctt  gat    31015
   Met Thr Asp Pro  Leu Ala Ala Ser Ala  Ala Glu Glu Leu Leu  Asp
               6135                 6140                 6145

atg gat ggc cgt  gcc tcc gaa cag cga  ctc gcc cac cta cgc  att      31060
Met Asp Gly Arg  Ala Ser Glu Gln Arg  Leu Ala His Leu Arg  Ile
            6150                 6155                 6160

cgc cag cag cag  gaa cgt gca gtc aag  gag ctc agg gat gcc  att      31105
Arg Gln Gln Gln  Glu Arg Ala Val Lys  Glu Leu Arg Asp Ala  Ile
            6165                 6170                 6175

gag att cac cag  tgc aaa aaa ggc ata  ttc tgc ttg gta aaa  caa      31150
Glu Ile His Gln  Cys Lys Lys Gly Ile  Phe Cys Leu Val Lys  Gln
            6180                 6185                 6190

gcc aag atc tca  tac gag atc acc gct  aac gac cac cgc ctc  tca      31195
Ala Lys Ile Ser  Tyr Glu Ile Thr Ala  Asn Asp His Arg Leu  Ser
            6195                 6200                 6205

tat gag ctt ggc  ctg cag cgt cag aaa  ttc acc tgc atg gtt  gga      31240
Tyr Glu Leu Gly  Leu Gln Arg Gln Lys  Phe Thr Cys Met Val  Gly
            6210                 6215                 6220

atc aat ccc ata  gtc atc acc cag caa  gct gga gat acc aag  ggt      31285
Ile Asn Pro Ile  Val Ile Thr Gln Gln  Ala Gly Asp Thr Lys  Gly
            6225                 6230                 6235

tgt atc cat tgt  tcc tgt gaa tcc acc  gag tgc atc tac acc  ctg      31330
Cys Ile His Cys  Ser Cys Glu Ser Thr  Glu Cys Ile Tyr Thr  Leu
            6240                 6245                 6250

ctg aag acc ctc  tgc ggc ctt cga gac  cta cta ccc atg aac          31372
Leu Lys Thr Leu  Cys Gly Leu Arg Asp  Leu Leu Pro Met Asn
            6255                 6260                 6265

taatcaataa ccccctaccc ctttccatca aacccaaaaa acaattaata aaatcactta    31432

cttaaaatca gaaacaaggt ttttgtccaa gttgttttta agcagcacct cacttccctc    31492

ttcccaactc tggtactcta agcctcggcg ggtggcatac ttcctccaca ctttaaaagg    31552

gatgtcaaat tttagttcct cttctttgcc cacaatcttc atttctttat ccccag atg    31611
                                                                Met
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gcc aaa cga gct  cga cta agc agc tcc  ttc aat ccg gtc tac  ccc       31656
Ala Lys Arg Ala  Arg Leu Ser Ser Ser  Phe Asn Pro Val Tyr  Pro
            6270                 6275                 6280

tat gaa gac gaa  agc agc tca caa cac  cca ttt ata aac cct  ggc       31701
Tyr Glu Asp Glu  Ser Ser Ser Gln His  Pro Phe Ile Asn Pro  Gly
            6285                 6290                 6295

ttc att tcc cct  aat ggg ttt aca caa  agt cca gac gga gct  ctt       31746
Phe Ile Ser Pro  Asn Gly Phe Thr Gln  Ser Pro Asp Gly Ala  Leu
            6300                 6305                 6310

aca ctc aag tgt  gtt gct cct ctt act  acc acc agt ggc gcc  ctg       31791
Thr Leu Lys Cys  Val Ala Pro Leu Thr  Thr Thr Ser Gly Ala  Leu
            6315                 6320                 6325

gac att aaa gta  gga ggg ggg ctt aag  gta gac tcc act gat  ggg       31836
Asp Ile Lys Val  Gly Gly Gly Leu Lys  Val Asp Ser Thr Asp  Gly
            6330                 6335                 6340

tcc tta gaa gaa  aac ata ggc act aca  gaa cca ctc aac aaa  tct       31881
Ser Leu Glu Glu  Asn Ile Gly Thr Thr  Glu Pro Leu Asn Lys  Ser
            6345                 6350                 6355

aat cat tcc ata  gga tta gca gtg gga  aat gga tta caa aca  aat       31926
Asn His Ser Ile  Gly Leu Ala Val Gly  Asn Gly Leu Gln Thr  Asn
            6360                 6365                 6370

gaa agc aaa cta  tgt gcc aaa tta gga  gat gga ctt att ttt  gac       31971
Glu Ser Lys Leu  Cys Ala Lys Leu Gly  Asp Gly Leu Ile Phe  Asp
            6375                 6380                 6385

tct tcc aac gcc  atc gca ata aaa aac  aac act tta tgg aca  gga       32016
Ser Ser Asn Ala  Ile Ala Ile Lys Asn  Asn Thr Leu Trp Thr  Gly
            6390                 6395                 6400

gca aaa cca gaa  gct aat tgc ata att  gag tat gga aaa gaa  agc       32061
Ala Lys Pro Glu  Ala Asn Cys Ile Ile  Glu Tyr Gly Lys Glu  Ser
            6405                 6410                 6415

aca gac agc aag  ctt act cta gtt ctt  gta aaa aat gga gga  att       32106
Thr Asp Ser Lys  Leu Thr Leu Val Leu  Val Lys Asn Gly Gly  Ile
            6420                 6425                 6430

gta aat ggc tat  gtg acc cta atg gga  gcc tcg gac tat gtt  aat       32151
Val Asn Gly Tyr  Val Thr Leu Met Gly  Ala Ser Asp Tyr Val  Asn
            6435                 6440                 6445

aca tta ttt aca  aac aag tat gcc tcc  att aat gta gaa cta  tac       32196
Thr Leu Phe Thr  Asn Lys Tyr Ala Ser  Ile Asn Val Glu Leu  Tyr
            6450                 6455                 6460

ttt gac gcc aat  ggt cac ctc cta aca  gac tcg tct tct ctc  aaa       32241
Phe Asp Ala Asn  Gly His Leu Leu Thr  Asp Ser Ser Ser Leu  Lys
            6465                 6470                 6475

act gat tta caa  cta aaa tcc caa acc  act gag tct agt aca  aaa       32286
Thr Asp Leu Gln  Leu Lys Ser Gln Thr  Thr Glu Ser Ser Thr  Lys
            6480                 6485                 6490
```

```
ggt ttt atg ccc  agt act ata gca tat  cca ttt gtc ctt cct  aat       32331
Gly Phe Met Pro  Ser Thr Ile Ala Tyr  Pro Phe Val Leu Pro  Asn
            6495                 6500                 6505

gct gga aga gat  aat gaa gac tat att  tat ggt caa tgc tat  tac       32376
Ala Gly Arg Asp  Asn Glu Asp Tyr Ile  Tyr Gly Gln Cys Tyr  Tyr
            6510                 6515                 6520

aaa gca agt agt  gat gga acc ctt ttt  cca ctg gaa gtt act  gtt       32421
Lys Ala Ser Ser  Asp Gly Thr Leu Phe  Pro Leu Glu Val Thr  Val
            6525                 6530                 6535

atg ctt aat aaa  cgc ctg cca gat agt  agg aca tcc tat gtt  atg       32466
Met Leu Asn Lys  Arg Leu Pro Asp Ser  Arg Thr Ser Tyr Val  Met
            6540                 6545                 6550

acc ttc tct tgg  tct ttg aat gca act  caa gca cca gaa acc  act       32511
Thr Phe Ser Trp  Ser Leu Asn Ala Thr  Gln Ala Pro Glu Thr  Thr
            6555                 6560                 6565

caa gcc acc ctc  att acc tcc ccc ttc  ttt ttt tct tac att  aga       32556
Gln Ala Thr Leu  Ile Thr Ser Pro Phe  Phe Phe Ser Tyr Ile  Arg
            6570                 6575                 6580

gaa gat gac tgacaacaaa aaaataaagt tcaacttttt tattgaacaa             32605
Glu Asp Asp
```

```
tcagtttaca ggattcgagt agttattttg cctccccctt cccatttcat agaatacacc    32665

aatctctccc cacgcacagc tttaaacatt tggattccat ttgagatagt catggatttg    32725

gattccacat tccacacagt ttcagagcta gataatcttg gatcagtgat agatataaat    32785

ccatcggggc agtccttcaa ggtgatttca cagtccagtt gctgtggctg cggctccgga    32845

gtctggatca gagtcatctg gaagaagaac gatgggagtc ataatccgag aacgggatcg    32905

ggcggttgtg tctcatcaaa ccccgaagca gtcgctgtct gcgccgctcc gtacgactgc    32965

tgctgatggg atcggggtcc acagtctctc gaagcatgat tctaatagcc ctcaacatta    33025

acattctggt acgatgcgca cagcagcgca tcctgatctc acttaagtca cagcagtagg    33085

tacaacacaa caccacaatg ttgtttaaca ggccataatt aaaggcgctc cagccaaaac    33145

tcatttcagg aataatttgc ccagcgtggc catcgtacca aatcctgatg taaatcaaat    33205

ggcgcccccc ccagaacaca ctgcccacat acatgatctc cttaggcata tgcatattca    33265

caatctctcg gtaccatgga cagcgctggt taatcatgca gccccaaata accttccgga    33325

accaaatggc cagcactgcg cccccagcaa tacattgaag agaaccctgt cgattacagt    33385

gacaatggag aacccacttt tctcgcccat ggattacttg ggaataaaat atatctattg    33445

tggcacaaca cagacataaa tgcatacatc ttctcatcac ccttaactct tcaggggtta    33505
```

aaaacatatc ccagggaata ggaagctctt gcaaaacagt gaaggtggca gaacaaggca 33565

gaccgcgaac ataacttaca ctgtgcatgg tcaaggtatt gcaatctggt aacagcggat 33625

gctcctcagt catagaagct ctggtttcac tttcctcaca gcgtggtaaa ggggccctca 33685

gttgaggttc cctggtgtaa ggatggtgtc tggcgcacga tgtcgagcgt gcccgcgacc 33745

tcgttgtaat ggagcttctt cctgacattc tcgtattttg caaagcagaa cctagtcttg 33805

gcacagcaca cgtcccgtcg cctcctgtcc cgccgcctag cacgttcagt gtggtaatta 33865

tagtacaacc attcccgtag attggtcaaa agatcttcag cctcagttgt cataaaaact 33925

ccatcatatc ttactgctct gataaaatca ttcacggtag aaagtgcaat gcccagccag 33985

gcaatgcaat tagcttgtgt ttcaaccaaa ggaggggggag gaagacatgg aagaaccata 34045

attaattttt atgccagacg atcccgcagt atttctatat ggagatcacg gagatggcac 34105

ctctcgcccc cactgtgttg atgaaaaatg acagctaggt caaacataat gcgattttcc 34165

aggtgctcaa cggtggcttc aagcaaagcc tccaaacgta catccaaaaa caaaagaaca 34225

gcaaaagcag gagcattttc taattcctca atcatcatat tacattcctg taccattccc 34285

aaataatttt catctttcca tccttgaatt attcgtgtta tttcatctgg taaatccaat 34345

ccacacatga gaaatagctc ccggagggcg ccctccaccg gtaatcttaa gcacaccctc 34405

atagtgagaa aatatcgtgc tcctctgtca cctgcagcaa attgagaatg gcaacatcat 34465

actggatgcc actggctcta agttcttctc taagttccag ttgtaaaaac tcttgcatat 34525

catcgccaaa ctgcttagcc ataggtcctc caggaataag agcgggggac gctacagtgc 34585

agaacaagcg catgccaccc caattgcctc cagcaaaagt gaggttgcaa taagcatact 34645

gagaacctcc agtaatatca tccagtgtac tggaaagata atcaggcaga gcttctctta 34705

tacaattaat aatagaaaag tctgccagat gaacatttaa agcctgtggg atgcagatgc 34765

aataagttat cgcgctgcgc tccaacattg ttagtatggt tagtctgtaa aaacaaaaaa 34825

acaaaaaatt acatcacgct gtgctggcga acgggtggat aaatcactct ctccatcacc 34885

aggcaggcta cagggtctcc agcgcgaccc tcgtaaaacc tatcagtatg attaaaaagc 34945

atcaccgaaa ggggttgttg atggccagca tatattattt gcgatgaagc atacaaacca 35005

gaagtgttag tatcagttaa agaaaaaaat cggccaagat agcatctcgg aacgattatg 35065

ctcaatctca aatgcagcaa agcgacacca cgcggatgca aagtaaaatc cacaggagca 35125

taaaaaaagt aattattccc ctcttgcaca ggcagtctag ctcccggtcc ctccaaaatc 35185

acatataaag cttcagcagc catagcttac cgcgcaaatc aggcacagca gtcagataga 35245

gaaaaagctg tgaactgact gcccagcctg tgcgcaatat atagagaacc cttacactga 35305

cgtaattggg caaagtctaa aaaatcccgc caaaaaaaac agcacacgcc caaaagtgtg 35365

tcactcgcta aaaaaatatt tttcacttcc tcgttccgta tatgacgtca attccgcttt 35425

cccacgaatc gtcacttccg gccatcttgc agcgtcacct ccccgcgccg gcccgcccct 35485

tttgaccgtt gaacccgctg gccaatcccc ttccgccctc cattttcaaa agctcatttg 35545

catgttggca ccgttccatt tataaggtat attattgatg atg 35588

<210> 104
<211> 495
<212> PRT
<213> Simian adenovirus 32

<400> 104

Met Asp Pro Thr Asn Pro Leu Gln Gln Gly Ile Arg Leu Gly Phe His
1 5 10 15

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

Leu Arg Leu Leu Ala Ser Ala Ala Ser Gly Arg Ser Ser Asn Pro Glu
35 40 45

Thr Pro Thr Gly His Ala Ser Gly Phe Gly Gly Gly Ala Ala Gly Gly
50 55 60

Gln Pro Glu Ser Arg Pro Gly Pro Ser Gly Gly Gly Gly Gly Gly Val
65 70 75 80

Ala Asp Leu Phe Pro Glu Leu Arg Arg Val Leu Thr Arg Ser Thr Ser
85 90 95

Ser Gly Gln Asp Arg Gly Ile Lys Arg Glu Arg Asn Ala Ser Gly His
100 105 110

Asn Ser Arg Thr Glu Leu Ala Leu Ser Leu Met Ser Arg Ser Arg Pro
115 120 125

Glu Thr Ile Trp Trp His Glu Val Gln Ser Glu Gly Arg Asp Glu Val
130 135 140

Ser Ile Leu Gln Glu Lys Tyr Ser Leu Glu Gln Ile Lys Thr Cys Trp
145 150 155 160

```
Leu Glu Pro Glu Asp Asp Trp Glu Val Ala Ile Arg Asn Tyr Ala Lys
                165                 170                 175

Ile Ser Leu Arg Pro Asp Lys Gln Tyr Lys Ile Thr Lys Lys Ile Asn
            180                 185                 190

Ile Arg Asn Ala Cys Tyr Ile Ala Gly Asn Gly Ala Glu Val Ile Ile
        195                 200                 205

Asp Thr Pro Asp Lys Thr Ala Phe Arg Cys Cys Met Met Gly Met Trp
    210                 215                 220

Pro Gly Val Ala Gly Met Glu Ala Val Thr Leu Met Asn Ile Arg Phe
225                 230                 235                 240

Arg Gly Asp Gly Tyr Asn Gly Ile Val Phe Met Ala Asn Thr Lys Leu
                245                 250                 255

Ile Leu His Gly Cys Ser Phe Phe Gly Phe Asn Asn Thr Cys Val Glu
            260                 265                 270

Ser Trp Gly Gln Val Ser Ile Arg Gly Cys Ser Phe Tyr Ala Cys Trp
        275                 280                 285

Ile Ala Leu Ser Gly Arg Thr Lys Ser Gln Leu Ser Val Lys Lys Cys
    290                 295                 300

Met Phe Glu Arg Cys Asn Leu Gly Ile Leu Asn Glu Gly Glu Ala Arg
305                 310                 315                 320

Val Arg His Cys Ala Ala Thr Glu Thr Gly Cys Phe Ile Leu Ile Lys
                325                 330                 335

Gly Asn Ala Ser Val Arg His Asn Met Ile Cys Gly Pro Ser Asp Glu
            340                 345                 350

Arg Pro Tyr Gln Met Leu Thr Cys Ala Gly Gly His Cys Asn Met Leu
        355                 360                 365

Ala Thr Val His Ile Val Ser His Ala Arg Lys Lys Trp Pro Val Phe
    370                 375                 380

Glu His Asn Val Met Thr Lys Cys Thr Met His Ile Gly Gly Arg Arg
385                 390                 395                 400
```

```
Gly Met Phe Met Pro Tyr Gln Cys Asn Met Asn His Val Lys Val Met
                405                 410                 415

Leu Glu Pro Asp Ala Phe Ser Arg Met Ser Leu Thr Gly Ile Phe Asp
            420                 425                 430

Met Asn Val Gln Leu Trp Lys Ile Leu Arg Tyr Asp Glu Thr Lys Ser
        435                 440                 445

Arg Val Arg Ala Cys Glu Cys Gly Gly Lys His Ala Arg Phe Gln Pro
    450                 455                 460

Val Cys Val Asp Val Thr Glu Asp Leu Arg Pro Asp His Leu Val Leu
465                 470                 475                 480

Ala Cys Thr Gly Ala Glu Phe Gly Ser Ser Gly Glu Glu Thr Asp
                485                 490                 495
```

<210> 105
<211> 138
<212> PRT
<213> Simian adenovirus 32

<400> 105

```
Met Ser Gly Ser Ala Ser Phe Glu Gly Gly Val Phe Ser Pro Tyr Leu
1               5                   10                  15

Thr Gly Arg Leu Pro Pro Trp Ala Gly Val Arg Gln Asn Val Met Gly
            20                  25                  30

Ser Thr Val Asp Gly Arg Pro Val Gln Pro Ala Asn Ser Ser Thr Leu
        35                  40                  45

Thr Tyr Ala Thr Leu Ser Ser Ser Pro Leu Asp Ala Ala Ala Ala Ala
    50                  55                  60

Ala Ala Ser Ala Ala Ala Asn Thr Val Leu Gly Met Gly Tyr Tyr Gly
65                  70                  75                  80

Ser Ile Val Ala Asn Ser Ser Ser Ser Asn Asn Pro Ser Thr Leu Ala
                85                  90                  95

Glu Asp Lys Leu Leu Val Leu Leu Ala Gln Leu Glu Ala Leu Thr Gln
            100                 105                 110
```

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


Glu Ser Ala Val Ala Thr Ala Lys Ser Lys
    130                 135


<210>  106
<211>  389
<212>  PRT
<213>  Simian adenovirus 32

<400>  106

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


Gln Gln Gln Gln Gln Pro Gln Lys Ala Leu Pro Ala Pro Ala Pro Ala
            20                  25                  30


Thr Thr Ala Ala Ala Ala Val Cys Gly Ala Gly Gln Ser Ala Tyr Asp
        35                  40                  45


Leu Asp Leu Glu Glu Gly Glu Gly Leu Ala Arg Leu Gly Ala Pro Ser
    50                  55                  60


Pro Glu Arg His Pro Arg Val Gln Leu Lys Lys Asp Ser Arg Glu Ala
65                  70                  75                  80


Tyr Val Pro Gln Gln Asn Leu Phe Arg Asp Arg Ser Gly Glu Glu Pro
                85                  90                  95


Glu Glu Met Arg Ala Ser Arg Phe Asn Ala Gly Arg Glu Leu Arg His
            100                 105                 110


Gly Leu Asp Arg Arg Arg Val Leu Arg Asp Glu Asp Phe Glu Val Asp
        115                 120                 125


Glu Val Thr Gly Ile Ser Pro Ala Arg Ala His Val Ala Ala Ala Asn
    130                 135                 140


Leu Val Ser Ala Tyr Glu Gln Thr Val Lys Glu Glu Arg Asn Phe Gln
145                 150                 155                 160


Lys Ser Phe Asn Asn His Val Arg Thr Leu Ile Ala Arg Glu Glu Val
                165                 170                 175
```

```
Thr Leu Gly Leu Met His Leu Trp Asp Leu Met Glu Ala Ile Thr Gln
            180                 185                 190

Asn Pro Thr Ser Lys Pro Leu Thr Ala Gln Leu Phe Leu Val Val Gln
        195                 200                 205

His Ser Arg Asp Asn Glu Ala Phe Arg Glu Ala Leu Leu Asn Ile Thr
    210                 215                 220

Glu Pro Glu Gly Arg Trp Leu Tyr Asp Leu Ile Asn Ile Leu Gln Ser
225                 230                 235                 240

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

Ile Asn Tyr Ser Val Leu Ser Leu Gly Lys Tyr Tyr Ala Arg Lys Ile
            260                 265                 270

Tyr Lys Thr Pro Tyr Val Pro Ile Asp Lys Glu Val Lys Ile Asp Gly
        275                 280                 285

Phe Tyr Met Arg Met Thr Leu Lys Val Leu Thr Leu Ser Asp Asp Leu
    290                 295                 300

Gly Val Tyr Arg Asn Asp Arg Met His Arg Ala Val Ser Ala Ser Arg
305                 310                 315                 320

Arg Arg Glu Leu Ser Asp Arg Glu Leu Met His Ser Leu Gln Arg Ala
                325                 330                 335

Leu Thr Gly Ala Gly Thr Glu Gly Glu Asn Tyr Phe Asp Met Gly Ala
            340                 345                 350

Asp Leu Gln Trp Gln Pro Ser Arg Arg Ala Leu Asp Ala Ala Gly Cys
        355                 360                 365

Glu Leu Pro Tyr Ile Glu Glu Val Asp Glu Gly Glu Glu Glu Glu Gly
    370                 375                 380

Glu Tyr Leu Glu Asp
385

<210>  107
<211>  587
```

<212> PRT
<213> Simian adenovirus 32

<400> 107

```
Met Glu Gln Gln Ala Pro Asp Pro Ala Met Arg Ala Ala Leu Gln Ser
1               5                   10                  15

Gln Pro Ser Gly Ile Asn Ser Ser Asp Asp Trp Thr Gln Ala Met Gln
            20                  25                  30

Arg Ile Met Ala Leu Thr Thr Arg Asn Pro Glu Ala Phe Arg Gln Gln
        35                  40                  45

Pro Gln Ala Asn Arg Leu Ser Ala Ile Leu Glu Ala Val Val Pro Ser
    50                  55                  60

Arg Ser Asn Pro Thr His Glu Lys Val Leu Ala Ile Val Asn Ala Leu
65                  70                  75                  80

Val Glu Asn Lys Ala Ile Arg Pro Asp Glu Ala Gly Leu Val Tyr Asn
                85                  90                  95

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

Asn Leu Asp Arg Met Val Thr Asp Val Arg Glu Ala Val Ser Gln Arg
        115                 120                 125

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

Ala Phe Leu Ser Thr Gln Pro Ala Asn Val Pro Arg Gly Gln Gln Asp
145                 150                 155                 160

Tyr Thr Asn Phe Leu Ser Ala Leu Arg Leu Met Val Thr Glu Val Pro
                165                 170                 175

Gln Ser Glu Val Tyr Gln Ser Gly Pro Asp Tyr Phe Phe Gln Thr Ser
            180                 185                 190

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

Arg Gly Leu Trp Gly Val His Ala Pro Val Gly Asp Arg Ala Thr Val
    210                 215                 220
```

```
Ser Ser Leu Leu Thr Pro Asn Ser Arg Leu Leu Leu Leu Leu Val Ser
225                 230                 235                 240

Pro Phe Thr Asp Ser Gly Ser Ile Asp Arg Asn Ser Tyr Leu Gly Tyr
                245                 250                 255

Leu Leu Asn Leu Tyr Arg Glu Ala Ile Gly Gln Ser Gln Val Asp Glu
            260                 265                 270

Gln Thr Tyr Gln Glu Ile Thr Gln Val Ser Arg Ala Leu Gly Gln Glu
        275                 280                 285

Asp Thr Gly Ser Leu Glu Ala Thr Leu Asn Phe Leu Leu Thr Asn Arg
    290                 295                 300

Ser Gln Lys Ile Pro Pro Gln Tyr Ala Leu Thr Ala Glu Glu Glu Arg
305                 310                 315                 320

Ile Leu Arg Tyr Val Gln Gln Ser Val Gly Leu Phe Leu Met Gln Glu
                325                 330                 335

Gly Ala Thr Pro Ser Ala Ala Leu Asp Met Thr Ala Arg Asn Met Glu
            340                 345                 350

Pro Ser Met Tyr Ala Ser Asn Arg Pro Phe Ile Asn Lys Leu Leu Asp
        355                 360                 365

Tyr Leu His Arg Ala Ala Ala Met Asn Ser Asp Tyr Phe Thr Asn Ala
    370                 375                 380

Ile Leu Asn Pro His Trp Leu Pro Pro Pro Gly Phe Tyr Thr Gly Glu
385                 390                 395                 400

Tyr Asp Met Pro Asp Pro Asn Asp Gly Phe Leu Trp Asp Asp Val Asp
                405                 410                 415

Ser Ser Ile Phe Ser Pro Pro Pro Gly Tyr Asn Thr Trp Lys Lys Glu
            420                 425                 430

Gly Gly Asp Arg Arg His Ser Ser Val Ser Leu Ser Gly Ser Arg Gly
        435                 440                 445

Ala Ala Ala Ala Val Pro Glu Ala Ala Ser Pro Phe Pro Ser Leu Pro
```

```
    450                 455                 460

Phe Ser Leu Asn Ser Val Arg Ser Ser Glu Leu Gly Arg Ile Thr Arg
465                 470                 475                 480

Pro Arg Leu Met Gly Glu Asp Glu Tyr Leu Asn Asp Ser Leu Leu Arg
                485                 490                 495

Pro Glu Arg Glu Lys Asn Phe Pro Asn Asn Gly Ile Glu Ser Leu Val
            500                 505                 510

Asp Lys Met Ser Arg Trp Lys Thr Tyr Ala Gln Asp His Lys Asp Glu
        515                 520                 525

Pro Arg Ile Leu Gly Ala Ala Ser Gly Thr Thr Arg Arg Arg Gln Arg
    530                 535                 540

His Asp Arg Gln Arg Gly Leu Val Trp Asp Asp Glu Asp Ser Ala Asp
545                 550                 555                 560

Asp Ser Ser Val Leu Asp Leu Gly Gly Arg Gly Gly Gly Asn Pro Phe
                565                 570                 575

Ala His Leu Arg Pro His Phe Gly Arg Met Leu
            580                 585


<210>  108
<211>  585
<212>  PRT
<213>  Simian adenovirus 32

<400>  108

Met Ser Ser Met Met Arg Arg Ala Val Leu Gly Gly Ala Val Val Tyr
1               5                   10                  15

Pro Glu Gly Pro Pro Pro Ser Tyr Glu Ser Val Met Gln Gln Gln Ala
            20                  25                  30

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

Tyr Leu Ala Pro Thr Glu Gly Arg Asn Ser Ile Arg Tyr Ser Glu Leu
    50                  55                  60

Ala Pro Gln Tyr Asp Thr Thr Arg Leu Tyr Leu Val Asp Asn Lys Ser
```

65 70 75 80

Ala Asp Ile Ala Ser Leu Asn Tyr Gln Asn Asp His Ser Asn Phe Leu
85 90 95

Thr Thr Val Val Gln Asn Asn Asp Phe Thr Pro Thr Glu Ala Ser Thr
100 105 110

Gln Thr Ile Asn Phe Asp Glu Arg Ser Arg Trp Gly Gly Gln Leu Lys
115 120 125

Thr Ile Met His Thr Asn Met Pro Asn Val Asn Glu Tyr Met Phe Ser
130 135 140

Asn Lys Phe Lys Ala Arg Val Met Val Ser Arg Lys Ala Pro Glu Gly
145 150 155 160

Val Thr Val Asp Asp Thr Tyr Asp His Lys Gln Asp Ile Leu Glu Tyr
165 170 175

Glu Trp Phe Glu Phe Thr Leu Pro Glu Gly Asn Phe Ser Ala Thr Met
180 185 190

Thr Ile Asp Leu Met Asn Asn Ala Ile Ile Asp Asn Tyr Leu Glu Ile
195 200 205

Gly Arg Gln Asn Gly Val Leu Glu Ser Asp Ile Gly Val Lys Phe Asp
210 215 220

Thr Arg Asn Phe Arg Leu Gly Trp Asp Pro Glu Thr Lys Leu Ile Met
225 230 235 240

Pro Gly Val Tyr Thr Tyr Glu Ala Phe His Pro Asp Ile Val Leu Leu
245 250 255

Pro Gly Cys Gly Val Asp Phe Thr Glu Ser Arg Leu Ser Asn Leu Leu
260 265 270

Gly Ile Arg Lys Arg His Pro Phe Gln Glu Gly Phe Gln Ile Leu Tyr
275 280 285

Glu Asp Leu Glu Gly Gly Asn Ile Pro Ala Leu Leu Asp Val Glu Thr
290 295 300

```
Tyr Glu Lys Ser Lys Lys Glu Asn Ala Gly Thr Thr Thr Glu Gly Thr
305                 310                 315                 320

Thr Thr Val Ala Val Ala Asn Ala Leu Thr Thr Ala Lys Ala Ala Ala
                325                 330                 335

Asn Val Thr Val Asp Val Ile Thr Glu Ile Asn Asn Asn Ser Val Arg
            340                 345                 350

Gly Asp Asn Tyr Leu Ser Ala Asn Asp Met Lys Asp Ser Ser Glu Thr
        355                 360                 365

Thr Val Glu Pro Ala Val Pro Ile Val Val Pro Gly Thr Lys Thr Glu
    370                 375                 380

Thr Glu Thr Glu Thr Lys Thr Pro Thr Ile Gln Pro Leu Lys Lys Asp
385                 390                 395                 400

Ser Lys Ser Arg Ser Tyr Asn Val Leu Glu Asp Glu Val Asn Thr Ala
                405                 410                 415

Tyr Arg Ser Trp Tyr Leu Ser Tyr Asn Tyr Gly Asp Pro Glu Lys Gly
            420                 425                 430

Val Arg Ser Trp Thr Leu Leu Thr Thr Ser Asp Val Thr Cys Gly Ala
        435                 440                 445

Glu Gln Val Tyr Trp Ser Leu Pro Asp Met Met Gln Asp Pro Val Thr
    450                 455                 460

Phe Arg Ser Thr Arg Gln Val Ser Asn Tyr Pro Val Val Gly Ala Glu
465                 470                 475                 480

Leu Met Pro Val Phe Ser Lys Ser Phe Tyr Asn Glu Gln Ala Val Tyr
                485                 490                 495

Ser Gln Gln Leu Arg Gln Thr Thr Ser Leu Thr His Val Phe Asn Arg
            500                 505                 510

Phe Pro Glu Asn Gln Ile Leu Ile Arg Pro Pro Ala Pro Thr Ile Thr
        515                 520                 525

Thr Val Ser Glu Asn Val Pro Ala Leu Thr Asp His Gly Thr Leu Pro
    530                 535                 540
```

```
Leu Arg Ser Ser Ile Arg Gly Val Gln Arg Val Thr Val Thr Asp Ala
545                 550                 555                 560


Arg Arg Arg Thr Cys Pro Tyr Val Tyr Lys Ala Leu Gly Ile Val Ala
                565                 570                 575


Pro Arg Val Leu Ser Ser Arg Thr Phe
            580                 585


<210>  109
<211>  192
<212>  PRT
<213>  Simian adenovirus 32

<400>  109

Met Ser Ile Leu Ile Ser Pro Ser Asn Asn Thr Gly Trp Gly Leu Arg
1               5                   10                  15


Thr Pro Thr Arg Met Tyr Gly Gly Ala Arg Lys Arg Ser Thr Gln His
            20                  25                  30


Pro Val Arg Val Arg Gly His Phe Arg Ala Pro Trp Gly Ala Leu Lys
        35                  40                  45


Gly Arg Ala Arg Thr Arg Thr Thr Val Asp Asp Val Ile Asp Gln Val
    50                  55                  60


Val Ala Asp Ala Arg Asn Tyr Thr Pro Ala Ala Pro Ala Ser Thr Val
65                  70                  75                  80


Asp Ala Val Ile Asp Ser Val Val Ala Asp Ala Arg Asp Tyr Ala Arg
                85                  90                  95


Arg Lys Ser Arg Arg Arg Arg Ile Ala Arg Arg His Arg Thr Thr Pro
            100                 105                 110


Ala Met Arg Ala Ala Arg Ala Leu Leu Arg Lys Ala Lys Arg Val Gly
        115                 120                 125


Arg Arg Ala Met Leu Arg Ala Ala Arg Arg Ala Ala Ser Gly Ala Ile
    130                 135                 140


Ala Gly Arg Ser Arg Arg Arg Ala Ala Thr Ala Ala Ala Ala Ala Ile
145                 150                 155                 160
```

```
Ala Asn Met Ala Gln Pro Arg Arg Gly Asn Val Tyr Trp Val Arg Asp
                165                 170                 175

Ala Thr Thr Gly Gln Arg Val Pro Val Arg Thr Arg Pro Pro Arg Thr
            180                 185                 190
```

<210> 110
<211> 350
<212> PRT
<213> Simian adenovirus 32

<400> 110

```
Met Ser Lys Arg Lys Tyr Lys Glu Glu Met Leu Gln Val Ile Ala Pro
1               5                   10                  15

Glu Ile Tyr Gly Pro Pro Val Lys Asp Glu Lys Lys Pro Arg Lys Ile
            20                  25                  30

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

Val Glu Phe Val Arg Glu Phe Ala Pro Arg Arg Arg Val Gln Trp Arg
    50                  55                  60

Gly Arg Arg Val Arg Pro Val Leu Arg Pro Gly Thr Thr Val Val Phe
65                  70                  75                  80

Thr Pro Gly Glu Arg Ser Ser Thr Thr Phe Lys Arg Ser Tyr Asp Glu
                85                  90                  95

Val Tyr Gly Asp Asp Asp Ile Leu Glu Gln Ala Ala Asp Arg Leu Gly
            100                 105                 110

Glu Phe Ala Tyr Gly Lys Arg Ser Arg Ser Ser Pro Lys Glu Glu Ala
        115                 120                 125

Val Ser Ile Pro Leu Asp His Gly Asn Pro Thr Pro Ser Leu Lys Pro
    130                 135                 140

Val Thr Leu Gln Gln Val Leu Pro Val Pro Pro Arg Arg Gly Val Lys
145                 150                 155                 160

Arg Glu Gly Glu Asp Leu Tyr Pro Thr Met Gln Leu Met Val Pro Lys
                165                 170                 175
```

```
Arg Gln Lys Leu Glu Asp Val Leu Glu Lys Met Lys Val Asp Pro Asp
            180                 185                 190

Ile Gln Pro Glu Val Lys Val Arg Pro Ile Lys Gln Val Ala Pro Gly
        195                 200                 205

Leu Gly Val Gln Thr Val Asp Ile Lys Ile Pro Thr Glu Ser Met Glu
    210                 215                 220

Val Gln Thr Glu Pro Ala Lys Pro Thr Ala Thr Ser Ile Glu Val Gln
225                 230                 235                 240

Thr Asp Pro Trp Met Pro Ala Pro Ile Ala Thr Thr Ala Ser Thr Ala
                245                 250                 255

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

Tyr Ala Leu His Pro Ser Ile Ile Pro Thr Pro Gly Tyr Arg Gly Thr
        275                 280                 285

Arg Tyr Tyr Arg Ser Arg Ser Thr Thr Ser Arg Arg Arg Lys Thr Pro
    290                 295                 300

Ala Ser Arg Ser Arg Arg Arg Arg Arg Arg Ala Thr Ser Lys Leu Thr
305                 310                 315                 320

Pro Ala Ala Leu Val Arg Arg Val Tyr Arg Asp Gly Arg Ala Glu Pro
                325                 330                 335

Leu Met Leu Pro Arg Ala Arg Tyr His Pro Ser Ile Thr Thr
            340                 345                 350
```

<210> 111
<211> 75
<212> PRT
<213> Simian adenovirus 32

<400> 111

```
Met Ala Leu Thr Cys Arg Leu Arg Val Pro Ile Thr Gly Tyr Arg Gly
1               5                   10                  15

Arg Asn Ser Arg Arg Arg Arg Met Leu Gly Arg Gly Met Arg Arg His
            20                  25                  30
```

```
Arg Arg Arg Arg Ala Ile Ser Lys Arg Leu Gly Gly Gly Phe Leu Thr
        35                  40                  45

Ala Leu Ile Pro Ile Ile Ala Ala Ala Ile Gly Ala Val Pro Gly Ile
    50                  55                  60

Ala Ser Val Ala Val Gln Ala Ser Gln Arg His
65                  70                  75


<210>  112
<211>  250
<212>  PRT
<213>  Simian adenovirus 32

<400>  112

Met Glu Asp Ile Asn Phe Ser Ser Leu Ala Pro Arg His Gly Thr Arg
1               5                   10                  15

Pro Tyr Met Gly Thr Trp Ser Asp Ile Gly Thr Ser Gln Leu Asn Gly
            20                  25                  30

Gly Ala Phe Asn Trp Ser Ser Ile Trp Ser Gly Leu Lys Asn Phe Gly
        35                  40                  45

Ser Thr Ile Lys Thr Tyr Gly Asn Lys Ala Trp Asn Ser Ser Thr Gly
    50                  55                  60

Gln Ala Leu Arg Asn Lys Leu Lys Glu Gln Asn Phe Gln Gln Lys Val
65                  70                  75                  80

Val Asp Gly Ile Ala Ser Gly Ile Asn Gly Val Val Asp Leu Ala Asn
                85                  90                  95

Gln Ala Val Gln Lys Gln Ile Asn Ser Arg Leu Asp Pro Pro Pro Ala
            100                 105                 110

Ala Pro Gly Glu Met Glu Val Glu Glu Glu Leu Pro Pro Leu Glu Lys
        115                 120                 125

Arg Gly Asp Lys Arg Pro Arg Pro Asp Met Glu Glu Thr Leu Val Thr
    130                 135                 140

Arg Gly Asp Glu Pro Pro Pro Tyr Glu Glu Ala Ile Lys Leu Gly Met
145                 150                 155                 160
```

```
Pro Thr Thr Arg Pro Ile Ala Pro Met Ala Thr Gly Val Met Lys Pro
                165                 170                 175

Ser Gln Ser His Arg Pro Ala Thr Leu Asp Leu Pro Pro Ala Pro Ala
            180                 185                 190

Ala Ala Ala Pro Ala Pro Lys Pro Val Ala Thr Pro Lys Pro Thr Thr
        195                 200                 205

Val Gln Pro Val Ala Val Ala Arg Pro Arg Pro Gly Gly Thr Pro Arg
    210                 215                 220

Pro Asn Ala Asn Trp Gln Ser Thr Leu Asn Ser Ile Val Gly Leu Gly
225                 230                 235                 240

Val Gln Ser Val Lys Arg Arg Arg Cys Tyr
                245                 250
```

<210> 113
<211> 955
<212> PRT
<213> Simian adenovirus 32

<400> 113

```
Met Ala Thr Pro Ser Met Leu Pro Gln Trp Ala Tyr Met His Ile Ala
1               5                   10                  15

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

Arg Ala Thr Asp Thr Tyr Phe Asn Leu Gly Asn Lys Phe Arg Asn Pro
        35                  40                  45

Thr Val Ala Pro Thr His Asp Val Thr Thr Asp Arg Ser Gln Arg Leu
    50                  55                  60

Met Leu Arg Phe Val Pro Val Asp Arg Glu Asp Asn Thr Tyr Ser Tyr
65                  70                  75                  80

Lys Val Arg Tyr Thr Leu Ala Val Gly Asp Asn Arg Val Leu Asp Met
                85                  90                  95

Ala Ser Thr Phe Phe Asp Ile Arg Gly Val Leu Asp Arg Gly Pro Ser
            100                 105                 110
```

```
Phe Lys Pro Tyr Ser Gly Thr Ala Tyr Asn Ser Leu Ala Pro Lys Gly
        115                 120                 125

Ala Pro Asn Thr Ser Gln Trp Leu Ala Glu Gly Thr Asn Asn Ala Ala
    130                 135                 140

Glu Gly Glu Ala Glu Gln Asp Glu Glu Asp Gly Gly Glu Glu Glu Thr
145                 150                 155                 160

Lys Met Ala Thr Tyr Thr Phe Gly Asn Ala Pro Val Lys Ala Asp Ala
                165                 170                 175

Glu Ile Thr Lys Glu Gly Leu Ala Val Gly Val Glu Leu Leu Ala Asp
            180                 185                 190

Asn Asn Thr Lys Pro Ile Tyr Ala Asp Lys Leu Tyr Gln Pro Glu Pro
        195                 200                 205

Gln Val Gly Glu Glu Thr Trp Thr Asp Thr Asp Gly Thr Asn Glu Gln
    210                 215                 220

Tyr Gly Gly Arg Ala Leu Lys Pro Glu Thr Lys Met Lys Pro Cys Tyr
225                 230                 235                 240

Gly Ser Phe Ala Arg Pro Thr Asn Thr Lys Gly Gly Gln Ala Lys Leu
                245                 250                 255

Lys Asn Pro Asp Glu Lys Asp Ile Thr Lys Ile Glu Tyr Asp Val Glu
            260                 265                 270

Met Asp Phe Tyr Glu Leu Lys Ser Gln Val Asn Gly Ser Pro Lys Ile
        275                 280                 285

Val Met Tyr Ala Glu Asn Val Asn Leu Glu Thr Pro Asp Thr His Val
    290                 295                 300

Val Tyr Lys Pro Gly Thr Ser Asp Asp Ser Ser His Ala Asn Leu Gly
305                 310                 315                 320

Gln Gln Ser Met Pro Asn Arg Pro Asn Tyr Ile Gly Phe Arg Asp Asn
                325                 330                 335

Phe Ile Gly Leu Ala Tyr Tyr Asn Ser Thr Gly Asn Met Gly Val Leu
            340                 345                 350
```

```
Ala Gly Gln Ala Ser Gln Leu Asn Ala Val Val Asp Leu Gln Asp Arg
        355                 360                 365

Asn Thr Glu Leu Ser Tyr Gln Leu Leu Leu Asp Ser Leu Gly Asp Arg
    370                 375                 380

Thr Arg Tyr Phe Ser Met Trp Asn Gln Ala Val Asp Ser Tyr Asp Pro
385                 390                 395                 400

Asp Val Arg Ile Ile Glu Asn His Gly Val Glu Asp Glu Leu Pro Asn
                405                 410                 415

Tyr Cys Phe Pro Leu Asn Gly Val Gly Ser Glu Thr Glu Arg Tyr Lys
            420                 425                 430

Glu Met Gln Ala Lys Asn Gly Asn Glu Asn Gly Trp Asp Asn Ala Asn
        435                 440                 445

Pro Thr Gly Thr Ser Glu Ile Ala Lys Gly Asn Pro Tyr Ala Met Glu
    450                 455                 460

Ile Asn Leu Gln Ala Asn Leu Trp Arg Ser Phe Leu Tyr Ser Asn Val
465                 470                 475                 480

Ala Leu Tyr Leu Pro Asp Ser Tyr Lys Tyr Thr Pro Ala Asn Ile Thr
                485                 490                 495

Leu Pro Ser Asn Thr Asn Thr Tyr Asp Tyr Leu Asn Gly Arg Val Val
            500                 505                 510

Pro Pro Ser Leu Val Asp Thr Tyr Ile Asn Ile Gly Ala Arg Trp Ser
        515                 520                 525

Leu Asp Ala Met Asp Asn Val Asn Pro Phe Asn His His Arg Asn Ala
    530                 535                 540

Gly Leu Arg Tyr Arg Ser Met Leu Leu Gly Asn Gly Arg Tyr Val Pro
545                 550                 555                 560

Phe His Ile Gln Val Pro Gln Lys Phe Phe Ala Val Lys Asn Leu Leu
                565                 570                 575

Leu Leu Pro Gly Ser Tyr Thr Tyr Glu Trp Asn Phe Arg Lys Asp Val
```

```
            580                 585                 590

Asn Met Val Leu Gln Ser Ser Leu Gly Asn Asp Leu Arg Val Asp Gly
        595                 600                 605

Ala Ser Ile Ser Phe Thr Ser Ile Asn Leu Tyr Ala Thr Phe Phe Pro
    610                 615                 620

Met Ala His Asn Thr Ala Ser Thr Leu Glu Ala Met Leu Arg Asn Asp
625                 630                 635                 640

Thr Asn Asp Gln Ser Phe Asn Asp Tyr Leu Ser Ala Ala Asn Met Leu
                645                 650                 655

Tyr Pro Ile Pro Ala Asn Ala Thr Asn Ile Pro Ile Ser Ile Pro Ser
            660                 665                 670

Arg Asn Trp Ala Ala Phe Arg Gly Trp Ser Phe Thr Arg Leu Lys Thr
        675                 680                 685

Lys Glu Thr Pro Ser Leu Gly Ser Gly Phe Asp Pro Tyr Phe Val Tyr
    690                 695                 700

Ser Gly Ser Ile Pro Tyr Leu Asp Gly Thr Phe Tyr Leu Asn His Thr
705                 710                 715                 720

Phe Lys Lys Val Ser Ile Met Phe Asp Ser Ser Val Ser Trp Pro Gly
                725                 730                 735

Asn Asp Arg Leu Leu Ser Pro Asn Glu Phe Glu Ile Lys Arg Thr Val
            740                 745                 750

Asp Gly Glu Gly Tyr Asn Val Ala Gln Cys Asn Met Thr Lys Asp Trp
        755                 760                 765

Phe Leu Val Gln Met Leu Ala Asn Tyr Asn Ile Gly Tyr Gln Gly Phe
    770                 775                 780

Tyr Ile Pro Glu Gly Tyr Lys Asp Arg Met Tyr Ser Phe Phe Arg Asn
785                 790                 795                 800

Phe Gln Pro Met Ser Arg Gln Val Val Asp Glu Val Asn Tyr Thr Asp
                805                 810                 815
```

```
Tyr Lys Ala Val Ala Val Pro Tyr Gln His Asn Asn Ser Gly Phe Val
            820                 825                 830

Gly Tyr Met Ala Pro Thr Met Arg Gln Gly Gln Ala Tyr Pro Ala Asn
        835                 840                 845

Tyr Pro Tyr Pro Leu Ile Gly Thr Thr Ala Val Lys Ser Val Thr Gln
    850                 855                 860

Lys Lys Phe Leu Cys Asp Arg Thr Met Trp Arg Ile Pro Phe Ser Ser
865                 870                 875                 880

Asn Phe Met Ser Met Gly Ala Leu Thr Asp Leu Gly Gln Asn Met Leu
                885                 890                 895

Tyr Ala Asn Ser Ala His Ala Leu Asp Met Thr Phe Glu Val Asp Pro
            900                 905                 910

Met Asp Glu Pro Thr Leu Leu Tyr Leu Leu Phe Glu Val Phe Asp Val
        915                 920                 925

Val Arg Val His Gln Pro His Arg Gly Val Ile Glu Ala Val Tyr Leu
    930                 935                 940

Arg Thr Pro Phe Ser Ala Gly Asn Ala Thr Thr
945                 950                 955


<210>  114
<211>  209
<212>  PRT
<213>  Simian adenovirus 32

<400>  114

Met Ala Cys Gly Ser Gly Asn Gly Ser Ser Glu Gln Glu Leu Arg Ala
1               5                   10                  15

Ile Ala Arg Asp Leu Gly Cys Gly Pro Tyr Phe Leu Gly Thr Phe Asp
            20                  25                  30

Lys Arg Phe Pro Gly Phe Met Ala Pro Asp Lys Leu Ala Cys Ala Ile
        35                  40                  45

Val Asn Thr Ala Gly Arg Glu Thr Gly Gly Glu His Trp Leu Ala Phe
    50                  55                  60
```

```
Gly Trp Asn Pro Arg Ser Asn Thr Cys Tyr Leu Phe Asp Pro Phe Gly
65                  70                  75                  80

Phe Ser Asp Glu Arg Leu Lys Gln Ile Tyr Gln Phe Glu Tyr Glu Gly
                85                  90                  95

Leu Leu Arg Arg Ser Ala Leu Ala Thr Lys Asp Arg Cys Ile Thr Leu
            100                 105                 110

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

Leu Phe Cys Cys Met Phe Leu His Ala Phe Val His Trp Pro Asp Arg
    130                 135                 140

Pro Met Asp Gly Asn Pro Thr Met Lys Leu Leu Thr Gly Val Pro Asn
145                 150                 155                 160

Ser Met Leu Gln Ser Pro Gln Val Gln Pro Thr Leu Arg His Asn Gln
                165                 170                 175

Glu Ala Leu Tyr Arg Phe Leu Asn Thr His Ser Ser Tyr Phe Arg Ser
            180                 185                 190

His Arg Ala Arg Ile Glu Lys Ala Thr Ala Phe Asp Arg Met Asp Met
        195                 200                 205

Gln
```

<210> 115
<211> 832
<212> PRT
<213> Simian adenovirus 32

<400> 115

```
Met Glu Thr Gln Pro Ser Leu Pro Thr Pro Leu Gln Ala Pro Ser His
1               5                   10                  15

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

Pro Ser Pro Ala Thr Thr Thr Ser Thr Leu Asp Glu Glu Glu Glu Val
        35                  40                  45
```

```
Asp Ala Pro Gln Glu Met Gln Val Met Glu Asp Glu Lys Ala Glu Glu
    50                  55                  60

Ile Glu Ala Asp Val Glu Gln Asp Pro Gly Tyr Val Thr Pro Ala Glu
65                  70                  75                  80

His Glu Glu Glu Leu Arg Arg Phe Leu Asp Arg Glu Asp Asn Asn Arg
                85                  90                  95

Pro Glu Gln Gln Ala Asp Gly Asp His Gln Glu Ala Gly Leu Gly Asp
            100                 105                 110

His Val Ala Glu Tyr Leu Thr Gly Leu Gly Gly Glu Asp Val Leu Leu
        115                 120                 125

Lys His Leu Ala Arg Gln Thr Ile Ile Val Lys Asp Ala Leu Leu Asp
    130                 135                 140

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

Leu Asn Leu Phe Ser Pro Arg Val Pro Pro Lys Arg Gln Gln Asn Gly
                165                 170                 175

Thr Cys Glu Pro Asn Pro Arg Leu Asn Phe Tyr Pro Ala Phe Ala Val
            180                 185                 190

Pro Glu Val Leu Ala Thr Tyr His Ile Phe Phe Lys Asn Gln Lys Ile
        195                 200                 205

Pro Val Ser Cys Arg Ala Asn Arg Thr Arg Ala Asp Ala Leu Leu Asn
    210                 215                 220

Leu Gly Pro Gly Ala Arg Leu Pro Asp Ile Ala Ser Leu Glu Glu Val
225                 230                 235                 240

Pro Lys Ile Phe Glu Gly Leu Gly Ser Asp Glu Thr Arg Ala Ala Asn
                245                 250                 255

Ala Leu Gln Gln Gly Glu Asn Gly Met Asp Glu His His Ser Ala Leu
            260                 265                 270

Val Glu Leu Glu Gly Asp Asn Ala Arg Leu Ala Val Leu Lys Arg Ser
        275                 280                 285
```

```
Ile Glu Val Thr His Phe Ala Tyr Pro Ala Val Asn Leu Pro Pro Lys
    290                 295                 300

Val Met Ser Ala Val Met Asp Gln Leu Leu Ile Lys Arg Ala Ser Pro
305                 310                 315                 320

Leu Ser Glu Asp Gln Asn Met Gln Asp Pro Asp Ala Ser Asp Glu Gly
                325                 330                 335

Lys Pro Val Val Ser Asp Glu Gln Leu Ser Arg Trp Leu Ser Thr Asn
            340                 345                 350

Ser Pro Arg Asp Leu Glu Glu Arg Arg Lys Leu Met Met Ala Val Val
        355                 360                 365

Leu Val Thr Val Glu Leu Glu Cys Leu Arg Arg Phe Phe Thr Asp Pro
    370                 375                 380

Glu Thr Leu Arg Lys Leu Glu Glu Asn Leu His Tyr Thr Phe Arg His
385                 390                 395                 400

Gly Phe Val Arg Gln Ala Cys Lys Ile Ser Asn Val Glu Leu Thr Asn
                405                 410                 415

Leu Val Ser Tyr Met Gly Ile Leu His Glu Asn Arg Leu Gly Gln Ser
            420                 425                 430

Val Leu His Thr Thr Leu Lys Gly Glu Ala Arg Arg Asp Tyr Ile Arg
        435                 440                 445

Asp Cys Val Tyr Leu Tyr Leu Cys His Thr Trp Gln Thr Gly Met Gly
    450                 455                 460

Val Trp Gln Gln Cys Leu Glu Glu Gln Asn Leu Lys Glu Leu Asp Lys
465                 470                 475                 480

Leu Leu Gln Arg Ser Leu Lys Ala Leu Trp Thr Gly Phe Asp Glu Arg
                485                 490                 495

Thr Val Ala Ser Asp Leu Ala Asp Ile Ile Phe Pro Glu Arg Leu Arg
            500                 505                 510

Val Thr Leu Arg Asn Gly Leu Pro Asp Phe Met Ser Gln Ser Met Leu
        515                 520                 525
```

```
Asn Asn Phe Arg Ser Phe Ile Leu Glu Arg Ser Gly Ile Leu Pro Ala
    530                 535                 540

Thr Cys Cys Ala Leu Pro Ser Asp Phe Val Pro Leu Thr Tyr Arg Glu
545                 550                 555                 560

Cys Pro Pro Pro Leu Trp Ser His Cys Tyr Leu Phe Arg Leu Ala Asn
                565                 570                 575

Tyr Leu Ser Tyr His Ser Asp Val Ile Glu Asp Val Ser Gly Asp Gly
            580                 585                 590

Leu Leu Glu Cys His Cys Arg Cys Asn Leu Cys Thr Pro His Arg Ser
        595                 600                 605

Leu Ala Cys Asn Pro Gln Leu Leu Ser Glu Thr Gln Ile Ile Gly Thr
    610                 615                 620

Phe Glu Leu Gln Gly Pro Ser Ser Glu Gly Glu Gly Ser Ser Ser Gly
625                 630                 635                 640

Gln Ser Leu Lys Leu Thr Pro Gly Leu Trp Thr Ser Ala Tyr Leu Arg
                645                 650                 655

Lys Phe Ala Pro Glu Asp Tyr His Pro Tyr Glu Ile Arg Phe Tyr Glu
            660                 665                 670

Asp Gln Ser Gln Pro Pro Lys Ala Glu Leu Ser Ala Cys Val Ile Thr
        675                 680                 685

Gln Gly Ala Ile Leu Ala Gln Leu Gln Ala Ile Gln Lys Ser Arg Gln
    690                 695                 700

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

Gly Glu Glu Leu Asn Thr Arg Phe Pro Gln Asp Val Pro Ala Pro Arg
                725                 730                 735

Lys Gln Glu Val Glu Gly Ala Ala Ala Ala Pro Arg Gly Tyr Gly Gly
            740                 745                 750

Arg Leu Gly Gln Ser Gly Arg Gly Gly Gly Asp Gly Arg Leu Gly Gln
```

```
        755                 760                 765

Pro Gly Arg Gly Gly Gly Gln Pro Gly Gly Arg Gln Phe Gly Gly Gly
    770                 775                 780

Arg Arg Gly Gly Arg Gly Gly Gly Arg Ser Asn Arg Arg Gln Thr Val
785                 790                 795                 800

Val Leu Asp Ser Gly Asp Lys Gln Gly Pro Arg Gln Gln Gln Gln His
                805                 810                 815

Gly Tyr Asn Leu Arg Ser Gly Ser Gly Gly Pro Ala Ala Ser Gln Gln
            820                 825                 830
```

<210> 116
<211> 227
<212> PRT
<213> Simian adenovirus 32

<400> 116

```
Met Ser Lys Glu Ile Pro Thr Pro Tyr Met Trp Ser Tyr Gln Pro Gln
1               5                   10                  15

Met Gly Leu Ala Ala Gly Ala Ser Gln Asp Tyr Ser Thr Arg Met Asn
            20                  25                  30

Trp Leu Ser Ala Gly Pro Ser Met Ile Ser Arg Val Asn Asp Ile Arg
        35                  40                  45

Ala Tyr Arg Asn Gln Leu Leu Leu Glu Gln Ser Ala Leu Thr Thr Thr
    50                  55                  60

Pro Arg Gln His Leu Asn Pro Arg Asn Trp Pro Ala Ala Leu Val Tyr
65                  70                  75                  80

Gln Glu Thr Pro Ala Pro Thr Thr Val Leu Leu Pro Arg Asp Ala Gln
                85                  90                  95

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

Ala Leu Cys Arg His Arg Pro Gln Gln Ser Ile Lys Arg Leu Val Ile
        115                 120                 125

Arg Gly Arg Gly Ile Gln Leu Asn Asp Glu Ser Val Ser Ser Ser Leu
```

130 135 140

Gly Leu Arg Pro Asp Gly Val Phe Gln Ile Ala Gly Cys Gly Arg Ser
145 150 155 160

Ser Phe Thr Pro Arg Gln Ala Val Leu Thr Leu Glu Ser Ser Ser Ser
165 170 175

Gln Pro Arg Ser Gly Gly Ile Gly Thr Leu Gln Phe Val Glu Glu Phe
180 185 190

Thr Pro Ser Val Tyr Phe Asn Pro Phe Ser Gly Ser Pro Gly Gln Tyr
195 200 205

Pro Asp Glu Phe Ile Pro Asn Phe Asp Ala Ile Ser Glu Ser Val Asp
210 215 220

Gly Tyr Asp
225

<210> 117
<211> 105
<212> PRT
<213> Simian adenovirus 32

<400> 117

Met Ser Gly Gly Ala Ala Glu Leu Ala Arg Leu Arg His Leu Asp His
1 5 10 15

Cys Arg Arg Phe Arg Cys Phe Ala Arg Glu Leu Thr Glu Phe Ile Tyr
20 25 30

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

Ile Thr Ile Glu Gly Gly Ile Asp Ser Arg Leu His Arg Ile Phe Cys
50 55 60

Gln Arg Pro Val Leu Ile Glu Arg Asp Gln Gly Thr Thr Thr Val Ser
65 70 75 80

Ile Tyr Cys Ile Cys Asn His Pro Gly Leu His Glu Ser Leu Cys Cys
85 90 95

Leu Ile Cys Ala Glu Phe Asn Lys Asn

100 105

<210> 118
<211> 178
<212> PRT
<213> Simian adenovirus 32

<400> 118

Met Gly Val Val Leu Val Ala Leu Ala Leu Leu Ser Leu Leu Gly Leu
1 5 10 15

Gly Ser Thr Thr Leu Ala Asn Gln Pro Leu Leu Leu Asp Pro Asp Asn
20 25 30

Val Asp Pro Cys Leu Thr Phe Asp Pro Glu Asn Cys Thr Leu Thr Phe
35 40 45

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

Glu Cys Arg Pro Ile Glu Ile Thr His Asn Asn Lys Thr Trp Asn Asn
65 70 75 80

Thr Leu Phe Thr Thr Trp Ser Pro Gly Asp Pro Gln Trp Tyr Thr Val
85 90 95

Ser Val Arg Gly Pro Asp Gly Ser Val Arg Ile Ala Asn Asn Thr Phe
100 105 110

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

Asn Leu Trp Pro Pro Ser Glu Glu Asn Ile Val Ala Phe Ser Ile Ala
130 135 140

Tyr Cys Leu Cys Thr Cys Leu Ile Thr Ala Ile Leu Cys Ala Cys Leu
145 150 155 160

His Leu Leu Ile Ala Ile Arg Ser Arg Asn Asn Glu Glu Lys Glu Lys
165 170 175

Met Pro

<210> 119

<211> 204
<212> PRT
<213> Simian adenovirus 32

<400> 119

Met Thr Ser Val Ala Val Ile Phe Thr Ile Ile Thr Gly Phe Thr Thr
1 5 10 15

Ala Val His Gly Met Lys Asn Val Lys Leu Thr Val Tyr Thr Asn Thr
20 25 30

Asn Gln Thr Leu Glu Gly Pro Lys Gly Thr Val Ser Trp Tyr Trp Tyr
35 40 45

Gln Asn Phe Gly Asp Leu Ser Val Trp Leu Cys Asp Gly Thr Thr Ile
50 55 60

Asn Lys Thr Ile Asp Leu Ile Lys Tyr Ser Cys Asp Ser Asp Leu Thr
65 70 75 80

Leu Ile Asn Ile Asn Ala His Tyr Glu Gly Tyr Tyr Tyr Gly Thr Asp
85 90 95

Ile Asn Asp Val Asn Phe Tyr Asn Ile Tyr Val Ser Asp Pro Thr Thr
100 105 110

Ile Pro Thr Lys Pro Ser Thr His Thr Lys Thr Tyr Thr Lys Thr Ser
115 120 125

Thr His Thr Ser Ile Asn Glu Leu Gln Phe Leu Lys Ala Asn Ile Thr
130 135 140

Tyr Asn Ser Thr Ile Ser Pro Thr Ile Pro Asn Glu Thr Asn Ile Pro
145 150 155 160

Asn Ser Met Ile Gly Ile Ile Ala Ala Val Ala Ile Gly Met Ala Ile
165 170 175

Ile Ile Ile Cys Met Ile Val Tyr Ala Cys Cys Tyr Lys Lys Leu Gln
180 185 190

Glu Glu Lys Leu Asp Pro Leu Leu Ser Phe Asp Phe
195 200

<210> 120

<211> 269
<212> PRT
<213> Simian adenovirus 32

<400> 120

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

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

Ile Thr Leu Gln Gly Val Tyr Val Pro Pro Ser Gln Lys Arg Ser Thr
        35                  40                  45

Ile Asn Ile Thr Trp Glu Thr Val Ile Asn Gly Ser Arg Pro Asn Val
    50                  55                  60

Cys Ala Leu Asn Leu Thr Lys Phe Lys Cys Glu Gly Phe Asp Leu Thr
65                  70                  75                  80

Ile Phe Asn Leu Thr Lys Gln Asp Ser Lys Asn Tyr Phe Gly Glu Ser
                85                  90                  95

Ile Thr Val Leu Thr Ser Gly Tyr Gln Lys Asn Tyr Ile Thr His Asn
            100                 105                 110

Tyr Ala Val Tyr His Val Ile Val Ile Ser Pro Thr Thr His Ala Pro
        115                 120                 125

Ser Thr Thr Gln Val Thr Thr Ala His Ser Asn Thr Tyr Thr His Val
    130                 135                 140

Lys Val Leu Lys Glu Thr Tyr Ser Thr Thr Asn Val Gln Thr Thr Ile
145                 150                 155                 160

Ile Thr Lys Ile Pro Thr Thr Ala Thr Ser Phe Ala Leu His Lys Ser
                165                 170                 175

Ala Leu Ser Cys Ala Pro Thr Leu Thr Thr Leu His Ala Thr Lys Pro
            180                 185                 190

Phe Thr Asn Ile Ser Thr Pro Leu Lys Gln Phe Asp Arg Thr Met Lys
        195                 200                 205

Ile Glu Ile Thr Phe Leu Ile Val Ile Gly Ile Ile Ile Ile Ala Ile
```

```
    210                 215                 220

Leu Leu Tyr Tyr Ile Phe Cys Arg Gln Ile Pro Asn Ala Gln Arg Arg
225                 230                 235                 240

Pro Ile Tyr Arg Pro Ile Ile Gly Glu Pro Gln Gln Leu Gln Val Glu
                245                 250                 255

Gly Gly Leu Arg Asn Leu Leu Phe Ser Phe Thr Val Trp
            260                 265
```

<210> 121
<211> 91
<212> PRT
<213> Simian adenovirus 32

<400> 121

```
Met Ile Pro Arg Asn Phe Leu Phe Thr Ile Leu Ile Cys Ala Phe Asn
1               5                   10                  15

Val Cys Ala Thr Phe Ala Thr Val Ala Asn Val Thr Pro Asp Cys Ile
            20                  25                  30

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

Val Cys Ser Ile Val Cys Leu Val Ile Asn Phe Phe Gln Leu Val Asp
    50                  55                  60

Trp Val Phe Val Arg Val Ala Tyr Leu Arg His His Pro Glu Tyr Arg
65                  70                  75                  80

Asn Gln Asn Val Ala Ala Ile Leu Arg Leu Ile
                85                  90
```

<210> 122
<211> 134
<212> PRT
<213> Simian adenovirus 32

<400> 122

```
Met Thr Asp Pro Leu Ala Ala Ser Ala Ala Glu Glu Leu Leu Asp Met
1               5                   10                  15

Asp Gly Arg Ala Ser Glu Gln Arg Leu Ala His Leu Arg Ile Arg Gln
            20                  25                  30
```

```
Gln Gln Glu Arg Ala Val Lys Glu Leu Arg Asp Ala Ile Glu Ile His
        35                  40                  45

Gln Cys Lys Lys Gly Ile Phe Cys Leu Val Lys Gln Ala Lys Ile Ser
    50                  55                  60

Tyr Glu Ile Thr Ala Asn Asp His Arg Leu Ser Tyr Glu Leu Gly Leu
65                  70                  75                  80

Gln Arg Gln Lys Phe Thr Cys Met Val Gly Ile Asn Pro Ile Val Ile
                85                  90                  95

Thr Gln Gln Ala Gly Asp Thr Lys Gly Cys Ile His Cys Ser Cys Glu
            100                 105                 110

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

Asp Leu Leu Pro Met Asn
    130
```

<210> 123
<211> 319
<212> PRT
<213> Simian adenovirus 32

<400> 123

```
Met Ala Lys Arg Ala Arg Leu Ser Ser Ser Phe Asn Pro Val Tyr Pro
1               5                   10                  15

Tyr Glu Asp Glu Ser Ser Ser Gln His Pro Phe Ile Asn Pro Gly Phe
            20                  25                  30

Ile Ser Pro Asn Gly Phe Thr Gln Ser Pro Asp Gly Ala Leu Thr Leu
        35                  40                  45

Lys Cys Val Ala Pro Leu Thr Thr Thr Ser Gly Ala Leu Asp Ile Lys
    50                  55                  60

Val Gly Gly Gly Leu Lys Val Asp Ser Thr Asp Gly Ser Leu Glu Glu
65                  70                  75                  80

Asn Ile Gly Thr Thr Glu Pro Leu Asn Lys Ser Asn His Ser Ile Gly
                85                  90                  95
```

```
Leu Ala Val Gly Asn Gly Leu Gln Thr Asn Glu Ser Lys Leu Cys Ala
            100                 105                 110

Lys Leu Gly Asp Gly Leu Ile Phe Asp Ser Ser Asn Ala Ile Ala Ile
        115                 120                 125

Lys Asn Asn Thr Leu Trp Thr Gly Ala Lys Pro Glu Ala Asn Cys Ile
    130                 135                 140

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

Val Lys Asn Gly Gly Ile Val Asn Gly Tyr Val Thr Leu Met Gly Ala
                165                 170                 175

Ser Asp Tyr Val Asn Thr Leu Phe Thr Asn Lys Tyr Ala Ser Ile Asn
            180                 185                 190

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

Ser Leu Lys Thr Asp Leu Gln Leu Lys Ser Gln Thr Thr Glu Ser Ser
    210                 215                 220

Thr Lys Gly Phe Met Pro Ser Thr Ile Ala Tyr Pro Phe Val Leu Pro
225                 230                 235                 240

Asn Ala Gly Arg Asp Asn Glu Asp Tyr Ile Tyr Gly Gln Cys Tyr Tyr
                245                 250                 255

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

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

Ser Trp Ser Leu Asn Ala Thr Gln Ala Pro Glu Thr Thr Gln Ala Thr
    290                 295                 300

Leu Ile Thr Ser Pro Phe Phe Phe Ser Tyr Ile Arg Glu Asp Asp
305                 310                 315
```

<210> 124

<211> 550
<212> DNA
<213> Simian adenovirus 32

<220>
<221> CDS
<222> (4)..(546)
<223> label=Elb\19K

<400> 124

```
tcc atg gag gtt tgg gct atc ttg gaa gat ctc agg cag act aga caa          48
    Met Glu Val Trp Ala Ile Leu Glu Asp Leu Arg Gln Thr Arg Gln
    1               5                   10                  15

ctg cta gaa aac gcc tcg gac gga gtc tct agt ctt tgg aga ttc tgg          96
Leu Leu Glu Asn Ala Ser Asp Gly Val Ser Ser Leu Trp Arg Phe Trp
                20                  25                  30

ttc ggt ggt gat cta gct agg cta gtc ttt agg gta aaa cgg gag tat         144
Phe Gly Gly Asp Leu Ala Arg Leu Val Phe Arg Val Lys Arg Glu Tyr
            35                  40                  45

agt gaa gaa ttt gaa aag tta ttg gaa gac agt cca gga ctt ttt gaa         192
Ser Glu Glu Phe Glu Lys Leu Leu Glu Asp Ser Pro Gly Leu Phe Glu
        50                  55                  60

gcc ctt aac ttg ggc cac cag gct cat ttt aag gag aag gtt tta tca         240
Ala Leu Asn Leu Gly His Gln Ala His Phe Lys Glu Lys Val Leu Ser
    65                  70                  75

gtt tta gat ttt tct acc cct ggt aga act gct gct gct gta gct ttc         288
Val Leu Asp Phe Ser Thr Pro Gly Arg Thr Ala Ala Ala Val Ala Phe
80                  85                  90                  95

ctt act ttt ata ttg gat aaa tgg atc cca caa acc cac ttc agc aag         336
Leu Thr Phe Ile Leu Asp Lys Trp Ile Pro Gln Thr His Phe Ser Lys
                100                 105                 110

gga tac gtc ttg gat ttc ata gca gca gct ttg tgg aga aca tgg aag         384
Gly Tyr Val Leu Asp Phe Ile Ala Ala Ala Leu Trp Arg Thr Trp Lys
            115                 120                 125

gcc cgc agg ctg agg ata atc tta gat tac tgg cca gtg cag cct ctg         432
Ala Arg Arg Leu Arg Ile Ile Leu Asp Tyr Trp Pro Val Gln Pro Leu
        130                 135                 140

ggc gta gca gca atc ctg aga cac cca ccg gcc atg cca gcg gtt ttg         480
Gly Val Ala Ala Ile Leu Arg His Pro Pro Ala Met Pro Ala Val Leu
    145                 150                 155

gag gag gag cag cag gag gac aac ccg aga gcc ggc ctg gac cct ccg         528
Glu Glu Glu Gln Gln Glu Asp Asn Pro Arg Ala Gly Leu Asp Pro Pro
160                 165                 170                 175

gtg gag gag gcg gag gag tagc                                           550
Val Glu Glu Ala Glu Glu
                180
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<210> 125
<211> 181
<212> PRT
<213> Simian adenovirus 32

<400> 125

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Met Glu Val Trp Ala Ile Leu Glu Asp Leu Arg Gln Thr Arg Gln Leu
1               5                  10                  15


Leu Glu Asn Ala Ser Asp Gly Val Ser Ser Leu Trp Arg Phe Trp Phe
            20                  25                  30


Gly Gly Asp Leu Ala Arg Leu Val Phe Arg Val Lys Arg Glu Tyr Ser
        35                  40                  45


Glu Glu Phe Glu Lys Leu Leu Glu Asp Ser Pro Gly Leu Phe Glu Ala
    50                  55                  60


Leu Asn Leu Gly His Gln Ala His Phe Lys Glu Lys Val Leu Ser Val
65                  70                  75                  80


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


Thr Phe Ile Leu Asp Lys Trp Ile Pro Gln Thr His Phe Ser Lys Gly
            100                 105                 110


Tyr Val Leu Asp Phe Ile Ala Ala Ala Leu Trp Arg Thr Trp Lys Ala
        115                 120                 125


Arg Arg Leu Arg Ile Ile Leu Asp Tyr Trp Pro Val Gln Pro Leu Gly
    130                 135                 140


Val Ala Ala Ile Leu Arg His Pro Pro Ala Met Pro Ala Val Leu Glu
145                 150                 155                 160


Glu Glu Gln Gln Glu Asp Asn Pro Arg Ala Gly Leu Asp Pro Pro Val
                165                 170                 175


Glu Glu Ala Glu Glu
            180
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<210> 126
<211> 5030
<212> DNA

<213> Simian adenovirus 32

<220>
<221> CDS
<222> (1)..(615)
<223> label=22K

<220>
<221> CDS
<222> (1909)..(2352)
<223> label=E3\CR1\alpha

<220>
<221> CDS
<222> (4603)..(5025)
<223> label=E3\RID\beta

<400> 126

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atg tcc cag cgc cga gga agc aag aag ttg aag gtg cag ctg ccg ccc          48
Met Ser Gln Arg Arg Gly Ser Lys Lys Leu Lys Val Gln Leu Pro Pro
1               5                   10                  15

cca gag gat atg gag gaa gac tgg gac agt cag gca gag gag gag gag          96
Pro Glu Asp Met Glu Glu Asp Trp Asp Ser Gln Ala Glu Glu Glu Glu
            20                  25                  30

atg gaa gat tgg gac agc cag gca gag gag gcg gac agc ctg gag gaa         144
Met Glu Asp Trp Asp Ser Gln Ala Glu Glu Ala Asp Ser Leu Glu Glu
        35                  40                  45

gac agt ttg gag gag gaa gac gag gag gca gag gag gtg gaa gaa gca         192
Asp Ser Leu Glu Glu Glu Asp Glu Glu Ala Glu Glu Val Glu Glu Ala
    50                  55                  60

acc gcc gcc aaa cag ttg tcc tcg aca gcg gag aca agc agg gcc cca         240
Thr Ala Ala Lys Gln Leu Ser Ser Thr Ala Glu Thr Ser Arg Ala Pro
65                  70                  75                  80

gac agc agc agc agc acg gct aca atc tcc gct ccg ggt cgg ggg gcc         288
Asp Ser Ser Ser Ser Thr Ala Thr Ile Ser Ala Pro Gly Arg Gly Ala
                85                  90                  95

cag cgg cgt ccc aac agt aga tgg gac gag acc ggg cga ttc ccg aac         336
Gln Arg Arg Pro Asn Ser Arg Trp Asp Glu Thr Gly Arg Phe Pro Asn
            100                 105                 110

ccg acc acc gct tcc aag acc ggt aag aag gag cgg cag gga tac aag         384
Pro Thr Thr Ala Ser Lys Thr Gly Lys Lys Glu Arg Gln Gly Tyr Lys
        115                 120                 125

tcc tgg cgg ggg cat aag aat gcc atc atc tcc tgc ttg cat gaa tgt         432
Ser Trp Arg Gly His Lys Asn Ala Ile Ile Ser Cys Leu His Glu Cys
    130                 135                 140

ggg ggc aac ata tcc ttc acc cgg cgc tac ctg ctc ttc cac cac ggg         480
Gly Gly Asn Ile Ser Phe Thr Arg Arg Tyr Leu Leu Phe His His Gly
145                 150                 155                 160
```

```
gtg aac ttc ccc cgc aat gtc ttg cat tac tac cgt cac ctc cac agc        528
Val Asn Phe Pro Arg Asn Val Leu His Tyr Tyr Arg His Leu His Ser
                165                 170                 175

ccc tac tac agc cag caa gtc cca aca gcc tcg gca gag aaa aac agc        576
Pro Tyr Tyr Ser Gln Gln Val Pro Thr Ala Ser Ala Glu Lys Asn Ser
            180                 185                 190

agc agc ggg gac ctc cag cag aaa acc agc agc agc agt tagaaagtcc        625
Ser Ser Gly Asp Leu Gln Gln Lys Thr Ser Ser Ser Ser
        195                 200                 205

agtgcagcag gaggaggact gaggatcaca gcgaacgagc cagcgcagac ccgagagctg      685

agaaacagga tctttccaac cctctatgcc atcttccagc agagtcgggg gcaagagcag      745

gaactgaaag taaaaaaccg atctctgcgc tcgctcaccc gaagttgttt gtatcacaag      805

agcgaagacc aacttcagcg cactctcgag gacgccgagg ctctcttcaa caagtactgc      865

gcgctgactc ttaaagagta gcccgcgccc gcgctcgctc gaaaaaggcg ggaattacgt      925

cacccttggc acctgtcctt tgccccgtca tgagtaaaga aattcccacg ccttacatgt      985

ggagctatca gccccaaatg ggactggcag caggcgcctc ccaggactac tccacccgca     1045

tgaattggct cagcgccggg ccctcgatga tctcacgggt taatgatata cgagcttacc     1105

gaaaccagtt actcctagaa cagtcagctc tcaccaccac accccgccaa caccttaatc     1165

cccggaattg gcccgccgcc ctggtgtacc aggaaacccc cgctcccacc accgtactac     1225

ttcctcgaga cgcccaggcc gaagttcaga tgactaacgc aggtgtacag ctggcgggcg     1285

gttccgccct gtgtcgtcac cggcctcagc agagtataaa acgcctggtg atcagaggcc     1345

gaggtatcca gctcaacgac gagtcggtga gctcttcgct tggtctgcga ccagacggag     1405

tcttccaaat cgccggctgt gggagatctt ccttcactcc tcgtcaggct gtcctgactt     1465

tggagagttc gtcctcgcag ccccgctcgg gcggcatcgg gactctccag tttgtggagg     1525

agtttactcc ctctgtctac ttcaacccct tctccggctc tcctggccag tacccggacg     1585

agttcatacc gaacttcgac gcaatcagcg agtcagtgga tggctatgat tgatgtctgg     1645

tggcgcggct gagttagctc gactgcgaca tctagaccac tgccgccgct ttcgctgttt     1705

cgcccgggaa ctcaccgagt tcatctactt cgaactcccc gaggagcacc ctcagggacc     1765

ggcccacgga gtgcggatta ccatcgaagg gggaatagac tctcgcctgc atcggatctt     1825

ctgccagcga cctgtgctga ttgagcgcga ccagggaact acaacagtct ccatctactg     1885

catctgtaac caccccggat tgc atg aaa gcc ttt gct gtc tta ttt gtg ctg     1938
                        Met Lys Ala Phe Ala Val Leu Phe Val Leu
                                            210                 215

agt tta ata aaa act gag tta aga ctc acc ttc gga cta ccg ctt ctt      1986
```

```
Ser Leu Ile Lys Thr Glu Leu Arg Leu Thr Phe Gly Leu Pro Leu Leu
                220                 225                 230

caa ccc gga cct tac aac acc agc cag acc ctc cgt tcc agc cag aag      2034
Gln Pro Gly Pro Tyr Asn Thr Ser Gln Thr Leu Arg Ser Ser Gln Lys
            235                 240                 245

aac cag acc ctt cct cta atc cag gac tct aat tct acc tcc cca gcg      2082
Asn Gln Thr Leu Pro Leu Ile Gln Asp Ser Asn Ser Thr Ser Pro Ala
        250                 255                 260

cct ttt cct act aac ctt ccc gat act aac aac ctc gga gct cag ctg      2130
Pro Phe Pro Thr Asn Leu Pro Asp Thr Asn Asn Leu Gly Ala Gln Leu
    265                 270                 275

caa cac cgc ttc tcc aga agc ctc ctt tct gcc aat act act act ccc      2178
Gln His Arg Phe Ser Arg Ser Leu Leu Ser Ala Asn Thr Thr Thr Pro
280                 285                 290                 295

aaa acc gga ggt gag ctc cgt ggt ctc cct act gac aac ccc tgg gtg      2226
Lys Thr Gly Gly Glu Leu Arg Gly Leu Pro Thr Asp Asn Pro Trp Val
                300                 305                 310

gta gcg ggt ttt gta gca cta gga gta gtt gcg ggt ggg ctg gtg ctt      2274
Val Ala Gly Phe Val Ala Leu Gly Val Val Ala Gly Gly Leu Val Leu
            315                 320                 325

atc ctc tgc tac cta tac aca cct tgc tgt gct tat tta gta gtc ttg      2322
Ile Leu Cys Tyr Leu Tyr Thr Pro Cys Cys Ala Tyr Leu Val Val Leu
        330                 335                 340

tgc tgt tgg ttt aag aaa tgg ggg tcg tac tagtcgcgct tgctttactt        2372
Cys Cys Trp Phe Lys Lys Trp Gly Ser Tyr
    345                 350

tcgcttttgg gtctgggctc tactacgcta gcgaatcagc ctttactatt agatcctgat    2432

aatgttgatc catgcctaac atttgatcca gaaaactgca cacttacttt tgcacctgaa    2492

acaagtcgct actgtggagt tcttattagg tgcggacggg aatgcaggcc cattgagatt    2552

acacacaata acaaaacttg gaacaacaca ttattcacca catggtctcc aggagatcct    2612

cagtggtata ctgtctctgt ccggggtcct gacggttccg tccgcatagc taataacact    2672

ttcatttttg ctgaaatgtg cgatatggtc atgttcatga gcagacagta taacctatgg    2732

cctcccagcg aggaaaacat tgtggcattc tccattgctt attgcttatg tacttgcctt    2792

atcactgcta tcttgtgtgc gtgcttgcat ttgcttattg ctattcgctc cagaaacaat    2852

gaggaaaaag aaaaaatgcc ttaacctttt tcctcatacc ttttttacag catgacttct    2912

gtcgcagtca tttttactat tattaccggc tttactactg ccgtgcatgg aatgaaaaat    2972

gttaaactaa ctgtctatac taacaccaac caaacactgg aggggcctaa agggacagtt    3032

tcatggtatt ggtatcaaaa ttttggcgat ctgtctgtat ggttgtgcga tggaacaacc    3092
```

```
attaataaga ccattgattt aattaaatac agttgcgatt cagatttaac actaatcaac     3152

attaatgctc attatgaagg ttactattat ggaactgaca taaatgatgt aaacttctac     3212

aacatttatg tatcagaccc aacaaccatt ccaactaaac cctccacaca cactaaaact     3272

tacactaaaa cttccacaca cacaagcatc aatgagttac aatttctaaa agctaacata     3332

acatacaatt ctaccatctc gcctactatt cccaatgaaa caaatattcc taattcaatg     3392

attggaatta ttgctgcagt tgctattgga atggcgatca taataatatg tatgatcgtt     3452

tatgcttgct gctataaaaa acttcaagaa gaaaaattag atccactact aagctttgat     3512

ttttaaattt ttttttgtag aaacatgctt cttcatactt tagcttttat ttccattttt     3572

ggtttctcac ttggaggtaa aatacataag aatgttaccg tgttagaggg cgctccaaat     3632

ataacactcc aaggagttta tgtcccaccc agtcaaaaaa gaagcactat taacataact     3692

tgggaaactg taataaatgg aagcagacca aatgtatgtg ctttaaattt aacaaaattc     3752

aaatgtgagg gttttgatct tactatcttt aatttaacta aacaagactc caaaaattat     3812

tttggtgaaa gtataactgt cttaacttct ggttatcaaa aaaattatat aacccacaat     3872

tatgcagttt atcatgttat tgttatatct ccaactactc atgcgccctc taccacacaa     3932

gtaactacag ctcattctaa cacttacacc catgtaaagg tattaaaaga aacatacagt     3992

actaccaatg tgcagactac tataatcaca aaaataccca caacagctac ctcatttgct     4052

ttacacaaat cagcactttc atgcgcccca acgctcacca ctttgcatgc tactaaacct     4112

tttactaata tatctactcc cttaaaacaa tttgatcgaa ctatgaaaat agaaattacc     4172

tttcttattg tcataggaat aattatcatt gcaatcttgc tttactacat attctgtcgc     4232

caaatcccca atgctcaaag acgacctata tatagaccta tcataggtga accccaacaa     4292

cttcaagtgg agggaggctt aagaaatctt ctgttctctt ttacagtatg gtgatcaaca     4352

atcatgatcc ctagaaattt cctcttcacc atactcatct gtgcttttaa tgtttgtgct     4412

actttcgcca cagttgccaa tgtcactcca gactgtatag gagcatttgc ctcctatgtg     4472

cttttcgcat ttattacctg catctgtgtt tgtagcatag tttgcctggt tattaatttc     4532

tttcaacttg tagactgggt ttttgtacgc gttgcctacc tgcggcatca ccctgaatac     4592

cgcaaccaaa atg ttg cag caa ttc tta ggc tca ttt aaa acc atg caa          4641
           Met Leu Gln Gln Phe Leu Gly Ser Phe Lys Thr Met Gln
               355                 360                 365

act ctg cta cta ctt ctg cta gtt ata cat cca tgt gcc tcc tta aac       4689
Thr Leu Leu Leu Leu Leu Leu Val Ile His Pro Cys Ala Ser Leu Asn
            370                 375                 380

ccc aca agc ccc aca aaa tta cac cta aga aaa tgt aaa ttt caa gaa       4737
```

```
Pro Thr Ser Pro Thr Lys Leu His Leu Arg Lys Cys Lys Phe Gln Glu
        385                 390                 395

cca tgg aaa ttc ctt gaa tgc tat cat gaa aca tct gat ttc ccc aca       4785
Pro Trp Lys Phe Leu Glu Cys Tyr His Glu Thr Ser Asp Phe Pro Thr
    400                 405                 410

tac tgg att aca atc att ggg att gtt aat cta gtt tct tgc aca cta       4833
Tyr Trp Ile Thr Ile Ile Gly Ile Val Asn Leu Val Ser Cys Thr Leu
415                 420                 425                 430

ttc tct ttc ctt gtt tac cac tta ttt gat ttt gga tgg aat gcc ctc       4881
Phe Ser Phe Leu Val Tyr His Leu Phe Asp Phe Gly Trp Asn Ala Leu
                435                 440                 445

aat gca ctc act tac cca caa gaa cca gag gaa cat ata cca cta caa       4929
Asn Ala Leu Thr Tyr Pro Gln Glu Pro Glu Glu His Ile Pro Leu Gln
            450                 455                 460

aac atg caa cca cta gca cta gta gaa tat gaa aat gaa cca cag ccc       4977
Asn Met Gln Pro Leu Ala Leu Val Glu Tyr Glu Asn Glu Pro Gln Pro
        465                 470                 475

ccg atg ctc cct gct att agt tac ttc aac cta act gga gga gat gac       5025
Pro Met Leu Pro Ala Ile Ser Tyr Phe Asn Leu Thr Gly Gly Asp Asp
    480                 485                 490

tgacc                                                                5030


<210>  127
<211>  205
<212>  PRT
<213>  Simian adenovirus 32

<400>  127

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


Pro Glu Asp Met Glu Glu Asp Trp Asp Ser Gln Ala Glu Glu Glu Glu
            20                  25                  30


Met Glu Asp Trp Asp Ser Gln Ala Glu Glu Ala Asp Ser Leu Glu Glu
        35                  40                  45


Asp Ser Leu Glu Glu Glu Asp Glu Glu Ala Glu Glu Val Glu Glu Ala
    50                  55                  60


Thr Ala Ala Lys Gln Leu Ser Ser Thr Ala Glu Thr Ser Arg Ala Pro
65                  70                  75                  80


Asp Ser Ser Ser Ser Thr Ala Thr Ile Ser Ala Pro Gly Arg Gly Ala
                85                  90                  95
```

```
Gln Arg Arg Pro Asn Ser Arg Trp Asp Glu Thr Gly Arg Phe Pro Asn
            100                 105                 110

Pro Thr Thr Ala Ser Lys Thr Gly Lys Lys Glu Arg Gln Gly Tyr Lys
        115                 120                 125

Ser Trp Arg Gly His Lys Asn Ala Ile Ile Ser Cys Leu His Glu Cys
    130                 135                 140

Gly Gly Asn Ile Ser Phe Thr Arg Arg Tyr Leu Leu Phe His His Gly
145                 150                 155                 160

Val Asn Phe Pro Arg Asn Val Leu His Tyr Tyr Arg His Leu His Ser
                165                 170                 175

Pro Tyr Tyr Ser Gln Gln Val Pro Thr Ala Ser Ala Glu Lys Asn Ser
            180                 185                 190

Ser Ser Gly Asp Leu Gln Gln Lys Thr Ser Ser Ser Ser
        195                 200                 205
```

<210> 128
<211> 148
<212> PRT
<213> Simian adenovirus 32

<400> 128

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Met Lys Ala Phe Ala Val Leu Phe Val Leu Ser Leu Ile Lys Thr Glu
1               5                   10                  15

Leu Arg Leu Thr Phe Gly Leu Pro Leu Leu Gln Pro Gly Pro Tyr Asn
            20                  25                  30

Thr Ser Gln Thr Leu Arg Ser Ser Gln Lys Asn Gln Thr Leu Pro Leu
        35                  40                  45

Ile Gln Asp Ser Asn Ser Thr Ser Pro Ala Pro Phe Pro Thr Asn Leu
    50                  55                  60

Pro Asp Thr Asn Asn Leu Gly Ala Gln Leu Gln His Arg Phe Ser Arg
65                  70                  75                  80

Ser Leu Leu Ser Ala Asn Thr Thr Thr Pro Lys Thr Gly Gly Glu Leu
                85                  90                  95
```

```
Arg Gly Leu Pro Thr Asp Asn Pro Trp Val Val Ala Gly Phe Val Ala
            100                 105                 110

Leu Gly Val Val Ala Gly Gly Leu Val Leu Ile Leu Cys Tyr Leu Tyr
        115                 120                 125

Thr Pro Cys Cys Ala Tyr Leu Val Val Leu Cys Cys Trp Phe Lys Lys
    130                 135                 140

Trp Gly Ser Tyr
145
```

<210> 129
<211> 141
<212> PRT
<213> Simian adenovirus 32

<400> 129

```
Met Leu Gln Gln Phe Leu Gly Ser Phe Lys Thr Met Gln Thr Leu Leu
1               5                   10                  15

Leu Leu Leu Leu Val Ile His Pro Cys Ala Ser Leu Asn Pro Thr Ser
            20                  25                  30

Pro Thr Lys Leu His Leu Arg Lys Cys Lys Phe Gln Glu Pro Trp Lys
        35                  40                  45

Phe Leu Glu Cys Tyr His Glu Thr Ser Asp Phe Pro Thr Tyr Trp Ile
    50                  55                  60

Thr Ile Ile Gly Ile Val Asn Leu Val Ser Cys Thr Leu Phe Ser Phe
65                  70                  75                  80

Leu Val Tyr His Leu Phe Asp Phe Gly Trp Asn Ala Leu Asn Ala Leu
                85                  90                  95

Thr Tyr Pro Gln Glu Pro Glu Glu His Ile Pro Leu Gln Asn Met Gln
            100                 105                 110

Pro Leu Ala Leu Val Glu Tyr Glu Asn Glu Pro Gln Pro Pro Met Leu
        115                 120                 125

Pro Ala Ile Ser Tyr Phe Asn Leu Thr Gly Gly Asp Asp
    130                 135                 140
```

<210> 130
<211> 880
<212> DNA
<213> Simian adenovirus 32

<220>
<221> CDS
<222> (3)..(579)
<223> label=Ela

<220>
<221> CDS
<222> (668)..(873)
<223> label=Ela

<400> 130

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aa atg aga cac ctg cga ttc ctg cct cag gaa atc tcc atc gag acc          47
   Met Arg His Leu Arg Phe Leu Pro Gln Glu Ile Ser Ile Glu Thr
   1               5                  10                  15

ggg aat gaa ata cta cag ctt gtg gta aat gcc ctg atg gga gac gat          95
Gly Asn Glu Ile Leu Gln Leu Val Val Asn Ala Leu Met Gly Asp Asp
                20                  25                  30

ccg gag ccg cct gcg cat ccg ttc gat cct cct acg ctt cat gaa ctg         143
Pro Glu Pro Pro Ala His Pro Phe Asp Pro Pro Thr Leu His Glu Leu
            35                  40                  45

tat gat tta gag gta gac ggg ccg gag gat cct aac gag gaa gct gtg         191
Tyr Asp Leu Glu Val Asp Gly Pro Glu Asp Pro Asn Glu Glu Ala Val
        50                  55                  60

aat ggt ttt ttt agc gaa tct atg cta ttg gct gct aat gaa gga gtg         239
Asn Gly Phe Phe Ser Glu Ser Met Leu Leu Ala Ala Asn Glu Gly Val
    65                  70                  75

gac ata gac cca ccg tcg gag acc ctc gat acc cca ggg gtg att gtg         287
Asp Ile Asp Pro Pro Ser Glu Thr Leu Asp Thr Pro Gly Val Ile Val
80                  85                  90                  95

gag agc ggc aga ggt ggg aaa aca ttg cct gaa ctt ggt gct gct gaa         335
Glu Ser Gly Arg Gly Gly Lys Thr Leu Pro Glu Leu Gly Ala Ala Glu
                100                 105                 110

atg gac ttg cgc tgt tat gaa gag ggc ttt cct ccg agt gat gat gaa         383
Met Asp Leu Arg Cys Tyr Glu Glu Gly Phe Pro Pro Ser Asp Asp Glu
            115                 120                 125

gag gag gaa aat gtg cag tcg atc cag acc gca gcg ggt gag gga atg         431
Glu Glu Glu Asn Val Gln Ser Ile Gln Thr Ala Ala Gly Glu Gly Met
        130                 135                 140

aaa gct gcc aat gat ggt ttt aag ttg gac tgc ccg gag ctg cct gga         479
Lys Ala Ala Asn Asp Gly Phe Lys Leu Asp Cys Pro Glu Leu Pro Gly
    145                 150                 155
```

```
cat ggc tgt aag tct tgt gaa ttt cac agg aat agt act gga cta aaa        527
His Gly Cys Lys Ser Cys Glu Phe His Arg Asn Ser Thr Gly Leu Lys
160                 165                 170                 175

gaa ctg ttg tgc tcg ctt tgc tat atg aga acg cac tgc cat ttt att        575
Glu Leu Leu Cys Ser Leu Cys Tyr Met Arg Thr His Cys His Phe Ile
                180                 185                 190

tac a gtaagtgtgt ctaacttaaa tttaaaggga cagtgtagca gtttagtgtc           629
Tyr


tgttgaatgt gggatttatg tctttgtgat ttttatag gt  cct gtg tct gat gct      684
                                        Ser Pro Val Ser Asp Ala
                                                195

gat gaa tcg cct tct cct gat tca act acc tca cct cct gaa att cag        732
Asp Glu Ser Pro Ser Pro Asp Ser Thr Thr Ser Pro Pro Glu Ile Gln
    200                 205                 210

gcg cca gtc cct gca aac gta tgc aag ccc att cct gtg aag gct aag        780
Ala Pro Val Pro Ala Asn Val Cys Lys Pro Ile Pro Val Lys Ala Lys
215                 220                 225                 230

cct ggg aaa cgc cct gct gtg gat aaa ctg gag gac ttg ctt gag ggt        828
Pro Gly Lys Arg Pro Ala Val Asp Lys Leu Glu Asp Leu Leu Glu Gly
                235                 240                 245

ggg gat gga cct ttg gac ttg agt acc cgg aaa ctg cca agg caa            873
Gly Asp Gly Pro Leu Asp Leu Ser Thr Arg Lys Leu Pro Arg Gln
            250                 255                 260

tgagtgc                                                               880


<210>  131
<211>  261
<212>  PRT
<213>  Simian adenovirus 32

<400>  131

Met Arg His Leu Arg Phe Leu Pro Gln Glu Ile Ser Ile Glu Thr Gly
1               5                   10                  15


Asn Glu Ile Leu Gln Leu Val Val Asn Ala Leu Met Gly Asp Asp Pro
            20                  25                  30


Glu Pro Pro Ala His Pro Phe Asp Pro Pro Thr Leu His Glu Leu Tyr
        35                  40                  45


Asp Leu Glu Val Asp Gly Pro Glu Asp Pro Asn Glu Glu Ala Val Asn
    50                  55                  60


Gly Phe Phe Ser Glu Ser Met Leu Leu Ala Ala Asn Glu Gly Val Asp
```

65 70 75 80

Ile Asp Pro Pro Ser Glu Thr Leu Asp Thr Pro Gly Val Ile Val Glu
85 90 95

Ser Gly Arg Gly Gly Lys Thr Leu Pro Glu Leu Gly Ala Ala Glu Met
100 105 110

Asp Leu Arg Cys Tyr Glu Glu Gly Phe Pro Pro Ser Asp Asp Glu Glu
115 120 125

Glu Glu Asn Val Gln Ser Ile Gln Thr Ala Ala Gly Glu Gly Met Lys
130 135 140

Ala Ala Asn Asp Gly Phe Lys Leu Asp Cys Pro Glu Leu Pro Gly His
145 150 155 160

Gly Cys Lys Ser Cys Glu Phe His Arg Asn Ser Thr Gly Leu Lys Glu
165 170 175

Leu Leu Cys Ser Leu Cys Tyr Met Arg Thr His Cys His Phe Ile Tyr
180 185 190

Ser Pro Val Ser Asp Ala Asp Glu Ser Pro Ser Pro Asp Ser Thr Thr
195 200 205

Ser Pro Pro Glu Ile Gln Ala Pro Val Pro Ala Asn Val Cys Lys Pro
210 215 220

Ile Pro Val Lys Ala Lys Pro Gly Lys Arg Pro Ala Val Asp Lys Leu
225 230 235 240

Glu Asp Leu Leu Glu Gly Gly Asp Gly Pro Leu Asp Leu Ser Thr Arg
245 250 255

Lys Leu Pro Arg Gln
260

<210> 132
<211> 890
<212> DNA
<213> Simian adenovirus 32

<220>
<221> CDS

<222> (1)..(358)
<223> label=33K

<220>
<221> CDS
<222> (528)..(883)
<223> label=33K

<400> 132
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atg tcc cag cgc cga gga agc aag aag ttg aag gtg cag ctg ccg ccc          48
Met Ser Gln Arg Arg Gly Ser Lys Lys Leu Lys Val Gln Leu Pro Pro
1               5                   10                  15

cca gag gat atg gag gaa gac tgg gac agt cag gca gag gag gag gag          96
Pro Glu Asp Met Glu Glu Asp Trp Asp Ser Gln Ala Glu Glu Glu Glu
            20                  25                  30

atg gaa gat tgg gac agc cag gca gag gag gcg gac agc ctg gag gaa         144
Met Glu Asp Trp Asp Ser Gln Ala Glu Glu Ala Asp Ser Leu Glu Glu
        35                  40                  45

gac agt ttg gag gag gaa gac gag gag gca gag gag gtg gaa gaa gca         192
Asp Ser Leu Glu Glu Glu Asp Glu Glu Ala Glu Glu Val Glu Glu Ala
    50                  55                  60

acc gcc gcc aaa cag ttg tcc tcg aca gcg gag aca agc agg gcc cca         240
Thr Ala Ala Lys Gln Leu Ser Ser Thr Ala Glu Thr Ser Arg Ala Pro
65                  70                  75                  80

gac agc agc agc agc acg gct aca atc tcc gct ccg ggt cgg ggg gcc         288
Asp Ser Ser Ser Ser Thr Ala Thr Ile Ser Ala Pro Gly Arg Gly Ala
                85                  90                  95

cag cgg cgt ccc aac agt aga tgg gac gag acc ggg cga ttc ccg aac         336
Gln Arg Arg Pro Asn Ser Arg Trp Asp Glu Thr Gly Arg Phe Pro Asn
            100                 105                 110

ccg acc acc gct tcc aag acc g gtaagaagga gcggcaggga tacaagtcct         388
Pro Thr Thr Ala Ser Lys Thr
        115

ggcgggggca taagaatgcc atcatctcct gcttgcatga atgtgggggc aacatatcct      448

tcacccggcg ctacctgctc ttccaccacg gggtgaactt cccccgcaat gtcttgcatt      508

actaccgtca cctccacag cc  cct act aca gcc agc aag tcc caa cag cct       559
                     Ala Pro Thr Thr Ala Ser Lys Ser Gln Gln Pro
                                         125                 130

cgg cag aga aaa aca gca gca gcg ggg acc tcc agc aga aaa cca gca       607
Arg Gln Arg Lys Thr Ala Ala Ala Gly Thr Ser Ser Arg Lys Pro Ala
                135                 140                 145

gca gca gtt aga aag tcc agt gca gca gga gga gga ctg agg atc aca       655
Ala Ala Val Arg Lys Ser Ser Ala Ala Gly Gly Gly Leu Arg Ile Thr
            150                 155                 160

gcg aac gag cca gcg cag acc cga gag ctg aga aac agg atc ttt cca       703
Ala Asn Glu Pro Ala Gln Thr Arg Glu Leu Arg Asn Arg Ile Phe Pro
```

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        165                 170                 175

acc ctc tat gcc atc ttc cag cag agt cgg ggg caa gag cag gaa ctg        751
Thr Leu Tyr Ala Ile Phe Gln Gln Ser Arg Gly Gln Glu Gln Glu Leu
    180                 185                 190

aaa gta aaa aac cga tct ctg cgc tcg ctc acc cga agt tgt ttg tat        799
Lys Val Lys Asn Arg Ser Leu Arg Ser Leu Thr Arg Ser Cys Leu Tyr
195                 200                 205                 210

cac aag agc gaa gac caa ctt cag cgc act ctc gag gac gcc gag gct        847
His Lys Ser Glu Asp Gln Leu Gln Arg Thr Leu Glu Asp Ala Glu Ala
                215                 220                 225

ctc ttc aac aag tac tgc gcg ctg act ctt aaa gag tagcccg                890
Leu Phe Asn Lys Tyr Cys Ala Leu Thr Leu Lys Glu
            230                 235


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<212>  PRT
<213>  Simian adenovirus 32

<400>  133

Met Ser Gln Arg Arg Gly Ser Lys Lys Leu Lys Val Gln Leu Pro Pro
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Pro Glu Asp Met Glu Glu Asp Trp Asp Ser Gln Ala Glu Glu Glu Glu
            20                  25                  30


Met Glu Asp Trp Asp Ser Gln Ala Glu Glu Ala Asp Ser Leu Glu Glu
        35                  40                  45


Asp Ser Leu Glu Glu Glu Asp Glu Glu Ala Glu Glu Val Glu Glu Ala
    50                  55                  60


Thr Ala Ala Lys Gln Leu Ser Ser Thr Ala Glu Thr Ser Arg Ala Pro
65                  70                  75                  80


Asp Ser Ser Ser Ser Thr Ala Thr Ile Ser Ala Pro Gly Arg Gly Ala
                85                  90                  95


Gln Arg Arg Pro Asn Ser Arg Trp Asp Glu Thr Gly Arg Phe Pro Asn
            100                 105                 110


Pro Thr Thr Ala Ser Lys Thr Ala Pro Thr Thr Ala Ser Lys Ser Gln
        115                 120                 125


Gln Pro Arg Gln Arg Lys Thr Ala Ala Ala Gly Thr Ser Ser Arg Lys
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    130                 135                 140

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

Ile Thr Ala Asn Glu Pro Ala Gln Thr Arg Glu Leu Arg Asn Arg Ile
                165                 170                 175

Phe Pro Thr Leu Tyr Ala Ile Phe Gln Gln Ser Arg Gly Gln Glu Gln
            180                 185                 190

Glu Leu Lys Val Lys Asn Arg Ser Leu Arg Ser Leu Thr Arg Ser Cys
        195                 200                 205

Leu Tyr His Lys Ser Glu Asp Gln Leu Gln Arg Thr Leu Glu Asp Ala
    210                 215                 220

Glu Ala Leu Phe Asn Lys Tyr Cys Ala Leu Thr Leu Lys Glu
225                 230                 235


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ggaggtgacg tgatttgtgt gggaggagtt atgttgcaag ttctcgcggt aaaagtgacg 180

caaaacgagg tgtggtttga acacggaagt agacagtttt cccgcgctta ctgacaggat 240

atgaggtagt tttgggcgga tgcaagtgaa aattctccat tttcgcgcga aaactgaatg 300

aggaagtgaa tttctgagta atttcgcgtt tatgacaggg tggagtattt gccgagggcc 360

gagtagactt tgaccgatta cgtggaggtt tcgattaccg tgtttttcac ctaaatttcc 420

gcgtacggtg tcaaagtcct gtgtttttac gtaggtgtca gctgatcgct agggtattta 480

aacctgacga gttccgtcaa gaggccactc ttgagtgcca gcgagaagag ttttctcctc 540

cgcgccgcga gtcagttctg cactttgaaa atgagacacc tgcgattcct gccacaggag 600

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gacgatccgg agccgcccgt gcagcctttc gatccaccta cgcttcacga actgtatgat 720

ttagaggtag acgggccgga ggatcccaat gaggaagctg tgaatgggtt ttttactgat 780

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gctgaaatgg acttgcgttg ttatgaagag ggttttcctc cgagtgatga tgaagatgag 960

gaaagtgagc agtccatcca gaccgcagtg aatgagggag tgaaagctgc cagtgatgtt 1020

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aataacactg gaatgaaaga actattatgc tcgctttgct atatgagaac gcactgccac 1140

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ctttgttgaa tgggggattt atgttttact tgtgattttt ttataggtcc tgtgtctgat 1260

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gcaaacgtat gcaagcccat tcctgtgaag cctaagcctg ggaaacgccc tgctgtggat     1380

aagcttgagg acttgttgga gggtggggat ggacctttgg actttagtac ccggaaactg     1440

ccaaggcaat gagtgccctg cacctgtgtt tatttaatgt gacgtcagta tttatgtgag     1500

agtgccatgt aataaaatta tgtcagctgc tgagtgtttt attgcttctt gggtggggac     1560

ttggatatat aagtaggagc agacctgtgt ggttagctca cagcagcctg ctgccatcca     1620

tggaggtttg ggctatcttg gaagacctta gacagactag gctactgcta gaaaacgcct     1680

cggacggagt ctctggcctt tggagattct ggttcggtgg tgatctagct aggctagtct     1740

ttaggataaa acaggactac agggaagaat ttgaaaagtt attggacgac agtccaggac     1800

tttttgaagc tcttaacttg ggccatcagg ctcattttaa ggagaaggtt ttatcagttt     1860

tagatttttc tactcctggt agaactgctg ctgctgtagc ctttcttact tttatattgg     1920

ataa atg gat ccg cca aac cca ctt cag caa ggg ata cgt ttt gga ttt      1969
     Met Asp Pro Pro Asn Pro Leu Gln Gln Gly Ile Arg Phe Gly Phe
     1               5                  10                  15

cat agc agc agc ttt gtg gag aac atg gaa ggc tcg cag gat gag gac      2017
His Ser Ser Ser Phe Val Glu Asn Met Glu Gly Ser Gln Asp Glu Asp
                20                  25                  30

aat ctt aga tta ctg gcc agt gca gcc tct ggg cgt agc agg gat cct      2065
Asn Leu Arg Leu Leu Ala Ser Ala Ala Ser Gly Arg Ser Arg Asp Pro
            35                  40                  45

gag aca ccc acc ggc cat gcc agc ggt tct gga gga gga gca gca gga      2113
Glu Thr Pro Thr Gly His Ala Ser Gly Ser Gly Gly Gly Ala Ala Gly
        50                  55                  60

gga caa tcc gag agc cgg cct gga ccc tcc ggt gga gga ggc gga gga      2161
Gly Gln Ser Glu Ser Arg Pro Gly Pro Ser Gly Gly Gly Gly Gly Gly
    65                  70                  75

gta gct gac ctg ttt cct gaa ctg cga cgg gtg ctt act agg tct acg      2209
Val Ala Asp Leu Phe Pro Glu Leu Arg Arg Val Leu Thr Arg Ser Thr
80                  85                  90                  95

tcc agt gga cag gac agg ggc att aag agg gag agg aat cct agt ggg      2257
Ser Ser Gly Gln Asp Arg Gly Ile Lys Arg Glu Arg Asn Pro Ser Gly
                100                 105                 110

cat aat tca aga act gag ttg gct tta agt tta atg agt cgc agg cgt      2305
His Asn Ser Arg Thr Glu Leu Ala Leu Ser Leu Met Ser Arg Arg Arg
            115                 120                 125

cct gaa act gtt tgg tgg cat gag gtt cag agc gaa ggc agg gat gaa      2353
Pro Glu Thr Val Trp Trp His Glu Val Gln Ser Glu Gly Arg Asp Glu
        130                 135                 140

gtt tca ata ttg cag gag aaa tat tcc cta gaa caa ctt aag acc tgt      2401
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Val Ser Ile Leu Gln Glu Lys Tyr Ser Leu Glu Gln Leu Lys Thr Cys
    145                 150                 155

tgg ttg gaa cct gag gat gat tgg gag gtg gcc att ggg aat tat gct       2449
Trp Leu Glu Pro Glu Asp Asp Trp Glu Val Ala Ile Gly Asn Tyr Ala
160                 165                 170                 175

aag ata tct ctg agg cct gat aaa cag tat aga att act aag aag att       2497
Lys Ile Ser Leu Arg Pro Asp Lys Gln Tyr Arg Ile Thr Lys Lys Ile
                180                 185                 190

aat atc aga aat gca tgc tac ata tca ggg aat ggg gcc gag gtt ata       2545
Asn Ile Arg Asn Ala Cys Tyr Ile Ser Gly Asn Gly Ala Glu Val Ile
            195                 200                 205

ata gat acg caa gat aaa gca gct ttt aga tgt tgt atg atg ggt atg       2593
Ile Asp Thr Gln Asp Lys Ala Ala Phe Arg Cys Cys Met Met Gly Met
        210                 215                 220

tgg cca ggg gtg gtc ggc atg gaa gca gta aca ctt atg aat att agg       2641
Trp Pro Gly Val Val Gly Met Glu Ala Val Thr Leu Met Asn Ile Arg
    225                 230                 235

ttt aga ggg gat ggg tat aat ggg att gtc ttt atg gct aac act aag       2689
Phe Arg Gly Asp Gly Tyr Asn Gly Ile Val Phe Met Ala Asn Thr Lys
240                 245                 250                 255

ctg att ctg cat ggt tgt agc ttt ttt ggg ttt aat aat act tgt gta       2737
Leu Ile Leu His Gly Cys Ser Phe Phe Gly Phe Asn Asn Thr Cys Val
                260                 265                 270

gaa gct tgg ggg caa gtc agt gta agg ggt tgt agt ttt tat gca tgc       2785
Glu Ala Trp Gly Gln Val Ser Val Arg Gly Cys Ser Phe Tyr Ala Cys
            275                 280                 285

tgg att gca aca tca ggt agg gtc aag agt cag ttg tct gtg aag aaa       2833
Trp Ile Ala Thr Ser Gly Arg Val Lys Ser Gln Leu Ser Val Lys Lys
        290                 295                 300

tgc atg ttt gag aga tgt aat ctg ggc ata ctg aat gaa ggc gaa gca       2881
Cys Met Phe Glu Arg Cys Asn Leu Gly Ile Leu Asn Glu Gly Glu Ala
    305                 310                 315

agg gtc cgc cac tgc gct gct aca gaa act ggc tgc ttc att cta ata       2929
Arg Val Arg His Cys Ala Ala Thr Glu Thr Gly Cys Phe Ile Leu Ile
320                 325                 330                 335

aag gga aat gcc agt gtg aag cat aac atg atc tgt gga cct tcg gat       2977
Lys Gly Asn Ala Ser Val Lys His Asn Met Ile Cys Gly Pro Ser Asp
                340                 345                 350

gag agg cct tat cag atg ctg acc tgc gct ggt gga cat tgc aat atg       3025
Glu Arg Pro Tyr Gln Met Leu Thr Cys Ala Gly Gly His Cys Asn Met
            355                 360                 365

ctt gct acc gtg cat atc gtt tct cat gca cgc aag aaa tgg cct gta       3073
Leu Ala Thr Val His Ile Val Ser His Ala Arg Lys Lys Trp Pro Val
        370                 375                 380
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ttc gaa cat aat gtg atg acc aag tgc acc atg cac ata ggt ggt cgc       3121
Phe Glu His Asn Val Met Thr Lys Cys Thr Met His Ile Gly Gly Arg
    385                 390                 395

agg gga atg ttt atg cct tac cag tgt aac atg aat cat gtg aag gtg       3169
Arg Gly Met Phe Met Pro Tyr Gln Cys Asn Met Asn His Val Lys Val
400                 405                 410                 415

atg ttg gaa cca gat gcc ttt tcc aga atg agc tta aca gga atc ttt       3217
Met Leu Glu Pro Asp Ala Phe Ser Arg Met Ser Leu Thr Gly Ile Phe
                420                 425                 430

gat atg aat gtg caa cta tgg aag atc ctg aga tat gat gac acc aaa       3265
Asp Met Asn Val Gln Leu Trp Lys Ile Leu Arg Tyr Asp Asp Thr Lys
            435                 440                 445

tcg agg gtg cgc gca tgc gaa tgc gga ggc aag cat gcc aga ttc cag       3313
Ser Arg Val Arg Ala Cys Glu Cys Gly Gly Lys His Ala Arg Phe Gln
        450                 455                 460

ccg gtg tgt gtg gat gtg act gaa gac ctg aga ccc gat cat ttg gtg       3361
Pro Val Cys Val Asp Val Thr Glu Asp Leu Arg Pro Asp His Leu Val
    465                 470                 475

ctt gcc tgc act gga gcg gag ttc ggt tct agt ggg gaa gaa act gac       3409
Leu Ala Cys Thr Gly Ala Glu Phe Gly Ser Ser Gly Glu Glu Thr Asp
480                 485                 490                 495

taaagtgagt agtggggcat gctgtggagg gtattccagg cgggtaaggt gggcagattg     3469

ggtaaattct gtttgtttct gtcttgcagc tacc atg agt gga agc gct tct ttt     3524
                                      Met Ser Gly Ser Ala Ser Phe
                                                          500

gag ggg gga gtc ttt agc cct tat ctg acg ggc agg ctc cca ccc tgg       3572
Glu Gly Gly Val Phe Ser Pro Tyr Leu Thr Gly Arg Leu Pro Pro Trp
        505                 510                 515

gca gga gtt cgt cag aat gtc atg gga tcc act gtg gat ggg aga ccc       3620
Ala Gly Val Arg Gln Asn Val Met Gly Ser Thr Val Asp Gly Arg Pro
    520                 525                 530

gtc cag ccc gcc aat tcc tca acg ctg acc tat gcc act ttg agc tct       3668
Val Gln Pro Ala Asn Ser Ser Thr Leu Thr Tyr Ala Thr Leu Ser Ser
535                 540                 545                 550

tca ccc ttg gat gca gct gca gcc gcc gcc gcc tct gct gcc gcc aac       3716
Ser Pro Leu Asp Ala Ala Ala Ala Ala Ala Ala Ser Ala Ala Ala Asn
                555                 560                 565

acc gtc ctt gga atg ggc tat tat gga agc atc gtt gcc aat tcc agt       3764
Thr Val Leu Gly Met Gly Tyr Tyr Gly Ser Ile Val Ala Asn Ser Ser
            570                 575                 580

tcc tct aat aac cct tcg acc ctg gct gag gac aag cta ctt gtc ctc       3812
Ser Ser Asn Asn Pro Ser Thr Leu Ala Glu Asp Lys Leu Leu Val Leu
        585                 590                 595

ttg gct cag ctt gag gcc ttg acc cag cgc cta ggc gaa ctg tct cag       3860
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Leu Ala Gln Leu Glu Ala Leu Thr Gln Arg Leu Gly Glu Leu Ser Gln
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cag gtg gcc cag ttg cgc gag caa act gag tct gct gtt gcc aca gca      3908
Gln Val Ala Gln Leu Arg Glu Gln Thr Glu Ser Ala Val Ala Thr Ala
615                 620                 625                 630

aag tct aaa taaagattcc caaatcaata ataaaggag atccttgttg              3957
Lys Ser Lys

attgtaaaac aagtgtaatg aatctttatt tgatttttcg cgcgcggtat gccctggacc    4017

accggtctcg atcattgaga actcggtgga tcttttccag gatcctgtag aggtgggatt    4077

gaatgtttag atacatgggc attaggccgt ctcgggggtg gagatagctc cattgaagag    4137

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gtctggagaa tcaatcgcca gggttgcgtt gcggtatgcc ccggttcgag cctcagcgcg    10797

gctcgtatcg gccggtttcc gcggcaagcg agggtttggc agccccgtca tttctaagac    10857

cccgccagcc gacttctcca gtttacggga gcgagccctc ttttttttgt gtttttgtc     10917

gcccag atg cat cca gtg ctg cga cag atg cgc ccc cag caa cag gcc        10965
       Met His Pro Val Leu Arg Gln Met Arg Pro Gln Gln Gln Ala
           635                 640                 645

cct tct cag caa cag cag cta cag caa cag cca caa aag gct ctt cct      11013
Pro Ser Gln Gln Gln Gln Leu Gln Gln Gln Pro Gln Lys Ala Leu Pro
        650                 655                 660

gct cct gca act act gca gct gca gcc gtg agc ggc gcg gga cag ccc      11061
Ala Pro Ala Thr Thr Ala Ala Ala Ala Val Ser Gly Ala Gly Gln Pro
    665                 670                 675

gcc tat gat ctg gac ttg gaa gag ggc gag gga ttg gcg cgc ctg ggg      11109
Ala Tyr Asp Leu Asp Leu Glu Glu Gly Glu Gly Leu Ala Arg Leu Gly
680                 685                 690                 695

gct ccc tcg ccc gag cgg cac ccg cgg gtg caa ctg aaa aag gac tct      11157
Ala Pro Ser Pro Glu Arg His Pro Arg Val Gln Leu Lys Lys Asp Ser
                700                 705                 710

cgc gag gcg tac gtg ccc cat cag aac ctg ttc agg gac agg agc ggc      11205
Arg Glu Ala Tyr Val Pro His Gln Asn Leu Phe Arg Asp Arg Ser Gly
            715                 720                 725

gag gag ccc gag gag atg cga gca tct cga ttt aac gcg ggt cgc gag      11253
Glu Glu Pro Glu Glu Met Arg Ala Ser Arg Phe Asn Ala Gly Arg Glu
        730                 735                 740

ctg cgc cac ggt ctg gat cga aga cgg gtg ctg cgg gac gag gat ttc      11301
Leu Arg His Gly Leu Asp Arg Arg Arg Val Leu Arg Asp Glu Asp Phe
    745                 750                 755

gag gtt gat gag gcg acg ggg atc agc tcc gct agg gca cat gtg gcc      11349
Glu Val Asp Glu Ala Thr Gly Ile Ser Ser Ala Arg Ala His Val Ala
760                 765                 770                 775

gcg gcc aac ctt gtc tcg gcc tac gag cag acc gtg aag gag gag cgc      11397
Ala Ala Asn Leu Val Ser Ala Tyr Glu Gln Thr Val Lys Glu Glu Arg
                780                 785                 790

aac ttc caa aaa tct ttc aac aac cat gtg cgc act ctg atc gcc cgc      11445
Asn Phe Gln Lys Ser Phe Asn Asn His Val Arg Thr Leu Ile Ala Arg
            795                 800                 805

gag gaa gtg acc ctg ggt ctg atg cac ctg tgg gac ctg atg gaa gcc      11493
Glu Glu Val Thr Leu Gly Leu Met His Leu Trp Asp Leu Met Glu Ala
        810                 815                 820

atc acc cag aac ccc act agc aaa ccc ctg aca gcc cag ctg ttt ctg      11541
Ile Thr Gln Asn Pro Thr Ser Lys Pro Leu Thr Ala Gln Leu Phe Leu
    825                 830                 835
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gta gtg caa cat agc agg gac aat gag gcg ttc agg gag gcg ctg ctg      11589
Val Val Gln His Ser Arg Asp Asn Glu Ala Phe Arg Glu Ala Leu Leu
840                 845                 850                 855

aac atc acc gag ccc gag ggg aga tgg ttg tat gat ctg atc aat atc      11637
Asn Ile Thr Glu Pro Glu Gly Arg Trp Leu Tyr Asp Leu Ile Asn Ile
                860                 865                 870

ctg caa agc att gta gtg cag gaa cgc agc ctg ggt ctg gcc gag aaa      11685
Leu Gln Ser Ile Val Val Gln Glu Arg Ser Leu Gly Leu Ala Glu Lys
            875                 880                 885

gtg gct gcc att aac tac tcg gtc ttg agt ctg ggc aag tac tac gct      11733
Val Ala Ala Ile Asn Tyr Ser Val Leu Ser Leu Gly Lys Tyr Tyr Ala
        890                 895                 900

cgc aag atc tac aag acc ccc tac gtg ccc ata gac aag gag gtg aag      11781
Arg Lys Ile Tyr Lys Thr Pro Tyr Val Pro Ile Asp Lys Glu Val Lys
    905                 910                 915

ata gat ggg ttt tac atg cgc atg act ctc aag gtg ctg act ctc agt      11829
Ile Asp Gly Phe Tyr Met Arg Met Thr Leu Lys Val Leu Thr Leu Ser
920                 925                 930                 935

gac gat ctg ggg gtg tac cgc aac gac agg atg cac cgc gcg gtg agc      11877
Asp Asp Leu Gly Val Tyr Arg Asn Asp Arg Met His Arg Ala Val Ser
                940                 945                 950

gcc agc agg agg cgc gag ctg agc gac aga gaa ctt atg cac agc ttg      11925
Ala Ser Arg Arg Arg Glu Leu Ser Asp Arg Glu Leu Met His Ser Leu
            955                 960                 965

caa aga gct ctg acg ggg gct ggg acc gag ggg gag aac tac ttt gac      11973
Gln Arg Ala Leu Thr Gly Ala Gly Thr Glu Gly Glu Asn Tyr Phe Asp
        970                 975                 980

atg gga gcg gac ttg caa tgg cag ccc agc cgc agg gcc ctg gag gct      12021
Met Gly Ala Asp Leu Gln Trp Gln Pro Ser Arg Arg Ala Leu Glu Ala
    985                 990                 995

gcg  ggg tgt gag ctt cct  tac ata gaa gag gtg  gat gaa ggc gag       12066
Ala  Gly Cys Glu Leu Pro  Tyr Ile Glu Glu Val  Asp Glu Gly Glu
1000                1005                1010

gac  gag gag ggc gag tac  ctg gaa gac tgatggcgcg acccgtattt         12113
Asp  Glu Glu Gly Glu Tyr  Leu Glu Asp
1015                1020

ttgctag atg gaa  cag cag cag gca ccg  gac ccc gca atg cgg  gcg       12159
        Met Glu  Gln Gln Gln Ala Pro  Asp Pro Ala Met Arg  Ala
            1025                1030                1035

gcg ctg cag agc  cag ccg tcc ggc att  aac tcc tcg gac gat  tgg      12204
Ala Leu Gln Ser  Gln Pro Ser Gly Ile  Asn Ser Ser Asp Asp  Trp
            1040                1045                1050

acc cag gcc atg  caa cgc atc atg gcg  ctg acg acc cgc aac  ccc      12249
Thr Gln Ala Met  Gln Arg Ile Met Ala  Leu Thr Thr Arg Asn  Pro
            1055                1060                1065
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gaa gcc ttt aga  cag caa ccc cag gcc  aac cgc ctt tcg gcc  atc       12294
Glu Ala Phe Arg  Gln Gln Pro Gln Ala  Asn Arg Leu Ser Ala  Ile
            1070                1075                1080

ctg gag gcc gta  gtt cct tcc cgc tcc  aac ccc acc cac gag  aag       12339
Leu Glu Ala Val  Val Pro Ser Arg Ser  Asn Pro Thr His Glu  Lys
            1085                1090                1095

gtc ctg gcc atc  gtg aac gcg ctg gtg  gag aac aag gcc atc  cgt       12384
Val Leu Ala Ile  Val Asn Ala Leu Val  Glu Asn Lys Ala Ile  Arg
            1100                1105                1110

ccc gat gag gcc  ggg ctg gta tac aat  gcc ctc ttg gag cgc  gtg       12429
Pro Asp Glu Ala  Gly Leu Val Tyr Asn  Ala Leu Leu Glu Arg  Val
            1115                1120                1125

gcc cgc tac aac  agc agc aac gtg cag  acc aac ctg gat cgg  atg       12474
Ala Arg Tyr Asn  Ser Ser Asn Val Gln  Thr Asn Leu Asp Arg  Met
            1130                1135                1140

gtg tcc gat gtg  cgc gag gcc gtg tct  cag cgc gag cgg ttc  cag       12519
Val Ser Asp Val  Arg Glu Ala Val Ser  Gln Arg Glu Arg Phe  Gln
            1145                1150                1155

cgc gac gcc aac  ttg ggg tcg ctg gta  gcg ctg aac gcc ttc  ctc       12564
Arg Asp Ala Asn  Leu Gly Ser Leu Val  Ala Leu Asn Ala Phe  Leu
            1160                1165                1170

agc acc cag ccc  gcc aac gtg ccc cgt  ggc cag caa gac tat  aca       12609
Ser Thr Gln Pro  Ala Asn Val Pro Arg  Gly Gln Gln Asp Tyr  Thr
            1175                1180                1185

aac ttt ttg agt  gca ttg aga ctc atg  gta gct gag gtg ccc  cag       12654
Asn Phe Leu Ser  Ala Leu Arg Leu Met  Val Ala Glu Val Pro  Gln
            1190                1195                1200

agc gag gtg tac  cag tcc ggg cca gat  tac ttc ttc cag acc  agt       12699
Ser Glu Val Tyr  Gln Ser Gly Pro Asp  Tyr Phe Phe Gln Thr  Ser
            1205                1210                1215

aga cag ggc ttg  cag aca gtg aac ctg  acc cag gct ttc aag  aac       12744
Arg Gln Gly Leu  Gln Thr Val Asn Leu  Thr Gln Ala Phe Lys  Asn
            1220                1225                1230

ctg aag ggt ctg  tgg gga gtg cac gcc  ccg gta ggg gat cgc  gcg       12789
Leu Lys Gly Leu  Trp Gly Val His Ala  Pro Val Gly Asp Arg  Ala
            1235                1240                1245

acc gtg tct agc  ttg ctg act ccc aac  tcc cgc ctg ctg ctg  ctg       12834
Thr Val Ser Ser  Leu Leu Thr Pro Asn  Ser Arg Leu Leu Leu  Leu
            1250                1255                1260

ctg gta tcc ccc  ttc act gac agc ggt  agc att gac cgc aac  tcc       12879
Leu Val Ser Pro  Phe Thr Asp Ser Gly  Ser Ile Asp Arg Asn  Ser
            1265                1270                1275

tac ttg ggc tac  ctg ctg aac ctg tat  cgc gag gcc ata ggg  cag       12924
Tyr Leu Gly Tyr  Leu Leu Asn Leu Tyr  Arg Glu Ala Ile Gly  Gln
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            1280                1285                1290

agc cag gtg gac  gag cag acc tac cag  gaa atc acc caa gtg  agc       12969
Ser Gln Val Asp  Glu Gln Thr Tyr Gln  Glu Ile Thr Gln Val  Ser
            1295                1300                1305

cgc gcc ctg ggt  cag gaa gac acg ggc  agt ttg gaa gcc acc  ctg       13014
Arg Ala Leu Gly  Gln Glu Asp Thr Gly  Ser Leu Glu Ala Thr  Leu
            1310                1315                1320

aac ttc ttg ctg  acc aac cgg tcg cag  aag atc cct cct cag  tac       13059
Asn Phe Leu Leu  Thr Asn Arg Ser Gln  Lys Ile Pro Pro Gln  Tyr
            1325                1330                1335

gcg ctt acc gcg  gag gag gag cgg atc  ctg aga tac gtg cag  cag       13104
Ala Leu Thr Ala  Glu Glu Glu Arg Ile  Leu Arg Tyr Val Gln  Gln
            1340                1345                1350

agc gtt gga ctg  ttc ctg atg cag gag  ggg gcg acc cct acc  gcc       13149
Ser Val Gly Leu  Phe Leu Met Gln Glu  Gly Ala Thr Pro Thr  Ala
            1355                1360                1365

gcg ctg gac atg  aca gct cga aac atg  gag ccc agc atg tat  gcc       13194
Ala Leu Asp Met  Thr Ala Arg Asn Met  Glu Pro Ser Met Tyr  Ala
            1370                1375                1380

agt aac cga cct  ttc atc aac aaa ctg  ctg gac tac ctg cac  agg       13239
Ser Asn Arg Pro  Phe Ile Asn Lys Leu  Leu Asp Tyr Leu His  Arg
            1385                1390                1395

gca gcc gcc atg  aac tct gat tat ttc  acc aat gct atc ttg  aac       13284
Ala Ala Ala Met  Asn Ser Asp Tyr Phe  Thr Asn Ala Ile Leu  Asn
            1400                1405                1410

ccc cac tgg ttg  ccc ccg cct ggt ttc  tac acg ggc gag tac  gac       13329
Pro His Trp Leu  Pro Pro Pro Gly Phe  Tyr Thr Gly Glu Tyr  Asp
            1415                1420                1425

atg ccc gac cca  aat gac ggg ttc ctg  tgg gac gat gtg gac  agc       13374
Met Pro Asp Pro  Asn Asp Gly Phe Leu  Trp Asp Asp Val Asp  Ser
            1430                1435                1440

agc ata ttc tcc  ccg cct ccc ggt tat  acc gtt tgg aag aag  gaa       13419
Ser Ile Phe Ser  Pro Pro Pro Gly Tyr  Thr Val Trp Lys Lys  Glu
            1445                1450                1455

ggg ggc gat aga  agg cac tct tcc gtg  tcg ctg tcc gga acg  gct       13464
Gly Gly Asp Arg  Arg His Ser Ser Val  Ser Leu Ser Gly Thr  Ala
            1460                1465                1470

ggt gct gcc gct  gcg gtg ccc gaa gct  gca agt cct ttc cct  agc       13509
Gly Ala Ala Ala  Ala Val Pro Glu Ala  Ala Ser Pro Phe Pro  Ser
            1475                1480                1485

ttg ccc ttt tca  cta aac agc gtt cgc  agc agt gaa ctg ggg  aga       13554
Leu Pro Phe Ser  Leu Asn Ser Val Arg  Ser Ser Glu Leu Gly  Arg
            1490                1495                1500

ata acc cgc ccg  cgc tta atg ggc gag  gat gag tac ttg aat  gac       13599
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Ile Thr Arg Pro  Arg Leu Met Gly Glu  Asp Glu Tyr Leu Asn  Asp
            1505                1510                1515

tct ttg ctg agg  cca gag agg gaa aag  aac ttc ccc aac aat  gga       13644
Ser Leu Leu Arg  Pro Glu Arg Glu Lys  Asn Phe Pro Asn Asn  Gly
            1520                1525                1530

ata gaa agc ctg  gtg gat aag atg agt  aga tgg aag acc tat  gcg       13689
Ile Glu Ser Leu  Val Asp Lys Met Ser  Arg Trp Lys Thr Tyr  Ala
            1535                1540                1545

cag gat cac aga  gat gag cct agg atc  ttg ggg gct aca agc  gga       13734
Gln Asp His Arg  Asp Glu Pro Arg Ile  Leu Gly Ala Thr Ser  Gly
            1550                1555                1560

gcg acc cgt aga  cgc cag cgg cat gac  agg cag agg ggt ctt  gtg       13779
Ala Thr Arg Arg  Arg Gln Arg His Asp  Arg Gln Arg Gly Leu  Val
            1565                1570                1575

tgg gac gat gag  gac tcg gcc gat gac  agc agc gtg ttg gac  ttg       13824
Trp Asp Asp Glu  Asp Ser Ala Asp Asp  Ser Ser Val Leu Asp  Leu
            1580                1585                1590

ggt ggg aga gga  gtg ggc aac ccg ttc  gct cat ctg cgt ccc  cga       13869
Gly Gly Arg Gly  Val Gly Asn Pro Phe  Ala His Leu Arg Pro  Arg
            1595                1600                1605

ttt gga cgc atg  ttg taaaagtgaa agtaaaataa aaaggcaact caccaaggcc    13924
Phe Gly Arg Met  Leu
            1610

atggcgaccg agcgtgcgtt cgttcttttc tgttatctgt gtctagt atg atg agg     13980
                                                    Met Met Arg


agg  cga gcc gtg cta ggt  gga gcg gtg gtg tat  ccg gag ggt cct       14025
Arg  Arg Ala Val Leu Gly  Gly Ala Val Val Tyr  Pro Glu Gly Pro
1615                1620                1625

cct  cct tcg tac gag agc  gtg atg cag cag cag  gcg gcg gcg gcg       14070
Pro  Pro Ser Tyr Glu Ser  Val Met Gln Gln Gln  Ala Ala Ala Ala
1630                1635                1640

atg  atg cag ccc cca ctg  gag gct ccc ttc gta  ccc ccg cgg tac       14115
Met  Met Gln Pro Pro Leu  Glu Ala Pro Phe Val  Pro Pro Arg Tyr
1645                1650                1655

ctg  gcg cct acg gag ggg  aga aac agc att cgt  tac tcg gag ctg       14160
Leu  Ala Pro Thr Glu Gly  Arg Asn Ser Ile Arg  Tyr Ser Glu Leu
1660                1665                1670

tca  ccc cag tac gat acc  acc aag ttg tat ctg  gtg gac aac aag       14205
Ser  Pro Gln Tyr Asp Thr  Thr Lys Leu Tyr Leu  Val Asp Asn Lys
1675                1680                1685

tcg  gcg gac atc gcc tcc  ctg aac tat cag aac  gac cac agc aac       14250
Ser  Ala Asp Ile Ala Ser  Leu Asn Tyr Gln Asn  Asp His Ser Asn
1690                1695                1700
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ttc  ctg acc acg gtg gtg  cag aac aat gac ttt  acc ccc acg gag       14295
Phe  Leu Thr Thr Val Val  Gln Asn Asn Asp Phe  Thr Pro Thr Glu
1705                1710                1715

gcc  agc acc cag acc atc  aac ttt gac gag cgg  tcg cgg tgg ggc       14340
Ala  Ser Thr Gln Thr Ile  Asn Phe Asp Glu Arg  Ser Arg Trp Gly
1720                1725                1730

ggt  cag ctg aag acc atc  atg cac acc aac atg  ccc aac gtg aac       14385
Gly  Gln Leu Lys Thr Ile  Met His Thr Asn Met  Pro Asn Val Asn
1735                1740                1745

gag  tac atg ttc agc aac  aag ttc aag gcg cgg  gtg atg gtg tcc       14430
Glu  Tyr Met Phe Ser Asn  Lys Phe Lys Ala Arg  Val Met Val Ser
1750                1755                1760

aga  aag gct cct gaa ggt  gtt aca gta gat gac  aaa tat gat cac       14475
Arg  Lys Ala Pro Glu Gly  Val Thr Val Asp Asp  Lys Tyr Asp His
1765                1770                1775

aag  caa gat att ctt aaa  tat gag tgg ttt gag  ttt aca ctg cca       14520
Lys  Gln Asp Ile Leu Lys  Tyr Glu Trp Phe Glu  Phe Thr Leu Pro
1780                1785                1790

gaa  ggc aac ttc tca gcc  act atg aca att gat  tta atg aac aat       14565
Glu  Gly Asn Phe Ser Ala  Thr Met Thr Ile Asp  Leu Met Asn Asn
1795                1800                1805

gcc  atc ata gac aac tac  ctg gga gtt ggt aga  cag aat gga gtc       14610
Ala  Ile Ile Asp Asn Tyr  Leu Gly Val Gly Arg  Gln Asn Gly Val
1810                1815                1820

ctg  gag agt gac att ggt  gtc aag ttt gac act  aga aac ttc agg       14655
Leu  Glu Ser Asp Ile Gly  Val Lys Phe Asp Thr  Arg Asn Phe Arg
1825                1830                1835

ctc  ggg tgg gac cca gaa  act aag tta atc atg  ccc ggg gtc tac       14700
Leu  Gly Trp Asp Pro Glu  Thr Lys Leu Ile Met  Pro Gly Val Tyr
1840                1845                1850

acc  tat gag gca ttc cat  cct gac att gta ttg  ctg cct ggt tgc       14745
Thr  Tyr Glu Ala Phe His  Pro Asp Ile Val Leu  Leu Pro Gly Cys
1855                1860                1865

ggg  gta gac ttt act gaa  agc cgc ctt agt aac  ttg ctt ggc atc       14790
Gly  Val Asp Phe Thr Glu  Ser Arg Leu Ser Asn  Leu Leu Gly Ile
1870                1875                1880

agg  aag aga cat cca ttc  cag gag ggt ttc aaa  atc atg tat gaa       14835
Arg  Lys Arg His Pro Phe  Gln Glu Gly Phe Lys  Ile Met Tyr Glu
1885                1890                1895

gat  ctt gaa ggg ggt aat  att cct gcc ctt ttg  gat gtt act gcc       14880
Asp  Leu Glu Gly Gly Asn  Ile Pro Ala Leu Leu  Asp Val Thr Ala
1900                1905                1910

tat  gag gaa agc aaa aag  gat acc act act gaa  aca ggc gaa aag       14925
Tyr  Glu Glu Ser Lys Lys  Asp Thr Thr Thr Glu  Thr Gly Glu Lys
1915                1920                1925
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gcg  gtg gtt gaa agt gaa  act gaa gcc atg act  gaa aca acc aca       14970
Ala  Val Val Glu Ser Glu  Thr Glu Ala Met Thr  Glu Thr Thr Thr
1930                1935                1940

ctg  gct gtt gca gag gaa  act agt gaa gat gat  aat ata act aga       15015
Leu  Ala Val Ala Glu Glu  Thr Ser Glu Asp Asp  Asn Ile Thr Arg
1945                1950                1955

gga  gat act tat ata act  gaa aaa caa aaa cgt  gaa gct gca gct       15060
Gly  Asp Thr Tyr Ile Thr  Glu Lys Gln Lys Arg  Glu Ala Ala Ala
1960                1965                1970

gca  gag gca gaa cta tta  ctt atg gct gaa gtt  aaa aaa gag tta       15105
Ala  Glu Ala Glu Leu Leu  Leu Met Ala Glu Val  Lys Lys Glu Leu
1975                1980                1985

aag  atc caa cct tta gaa  aaa gac agc aag agt  aga agc tat aat       15150
Lys  Ile Gln Pro Leu Glu  Lys Asp Ser Lys Ser  Arg Ser Tyr Asn
1990                1995                2000

gtc  ttg gaa gac aaa atc  aac aca gcc tac cgc  agc tgg tac ctg       15195
Val  Leu Glu Asp Lys Ile  Asn Thr Ala Tyr Arg  Ser Trp Tyr Leu
2005                2010                2015

tcc  tac aat tat ggc gac  cct gag aaa gga ata  agg tcc tgg aca       15240
Ser  Tyr Asn Tyr Gly Asp  Pro Glu Lys Gly Ile  Arg Ser Trp Thr
2020                2025                2030

ctg  ctc acc acc tcg gat  gtc acc tgc ggg gcg  gag cag gtc tac       15285
Leu  Leu Thr Thr Ser Asp  Val Thr Cys Gly Ala  Glu Gln Val Tyr
2035                2040                2045

tgg  tcg ctc cca gac atg  atg caa gac ccc gtc  acc ttc cgc tcc       15330
Trp  Ser Leu Pro Asp Met  Met Gln Asp Pro Val  Thr Phe Arg Ser
2050                2055                2060

acg  aga caa gtc aac aac  tac cca gtg gtg ggt  gca gag ctt atg       15375
Thr  Arg Gln Val Asn Asn  Tyr Pro Val Val Gly  Ala Glu Leu Met
2065                2070                2075

ccc  gtc ttc tca aag agt  ttc tac aac gag caa  gcc gtg tac tcc       15420
Pro  Val Phe Ser Lys Ser  Phe Tyr Asn Glu Gln  Ala Val Tyr Ser
2080                2085                2090

cag  cag ctc cgc cag tcc  acc tcg ctc acg cac  gtc ttc aac cgc       15465
Gln  Gln Leu Arg Gln Ser  Thr Ser Leu Thr His  Val Phe Asn Arg
2095                2100                2105

ttc  cct gag aac cag atc  ctc atc cgc ccg ccg  gcg ccc aca att       15510
Phe  Pro Glu Asn Gln Ile  Leu Ile Arg Pro Pro  Ala Pro Thr Ile
2110                2115                2120

acc  acc gtc agt gaa aac  gtt cct gct ctc aca  gat cac ggg acc       15555
Thr  Thr Val Ser Glu Asn  Val Pro Ala Leu Thr  Asp His Gly Thr
2125                2130                2135

ctg  ccg ttg cgc agc agt  atc cgg gga gtc cag  cgc gtg acc gtt       15600
Leu  Pro Leu Arg Ser Ser  Ile Arg Gly Val Gln  Arg Val Thr Val
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2140                2145                2150

act  gac gcc aga cgc cgc  acc tgt ccc tac gtt  tac aag gcc ctg       15645
Thr  Asp Ala Arg Arg Arg  Thr Cys Pro Tyr Val  Tyr Lys Ala Leu
2155                2160                2165

ggc  ata gtc gcg ccg cgc  gtc ctt tca agc cgc  act ttc taaaaaa       15691
Gly  Ile Val Ala Pro Arg  Val Leu Ser Ser Arg  Thr Phe
2170                2175                2180

atg tcc att  ctc atc tcg ccc agt  aat aat acc ggt tgg  gga ctg       15736
Met Ser Ile  Leu Ile Ser Pro Ser  Asn Asn Thr Gly Trp  Gly Leu
        2185                2190                2195

cgc gcg ccc  acc aag atg tac gga  ggc gcc cgc aaa cgc  tct acc       15781
Arg Ala Pro  Thr Lys Met Tyr Gly  Gly Ala Arg Lys Arg  Ser Thr
        2200                2205                2210

cag cac cct  gtg cgc gtg cgt ggt  cat ttc cgc gct ccc  tgg ggc       15826
Gln His Pro  Val Arg Val Arg Gly  His Phe Arg Ala Pro  Trp Gly
        2215                2220                2225

gcc ctc aag  ggc cgt acc cgc act  cgg acc acg gtc gat  gat gtg       15871
Ala Leu Lys  Gly Arg Thr Arg Thr  Arg Thr Thr Val Asp  Asp Val
        2230                2235                2240

atc gac cag  gtg gtc gcc gat gct  cgt aat tat act cct  act gcg       15916
Ile Asp Gln  Val Val Ala Asp Ala  Arg Asn Tyr Thr Pro  Thr Ala
        2245                2250                2255

cct aca tct  act gtg gat gca gtt  att gac agc gtg gtg  gca aac       15961
Pro Thr Ser  Thr Val Asp Ala Val  Ile Asp Ser Val Val  Ala Asn
        2260                2265                2270

gcc cgc gcc  tat gct cgt cgc aag  agc cga agg agg cgc  att gcc       16006
Ala Arg Ala  Tyr Ala Arg Arg Lys  Ser Arg Arg Arg Arg  Ile Ala
        2275                2280                2285

agg cgc cac  cgg gct act ccc gcc  atg cga gct gca aga  gct ctt       16051
Arg Arg His  Arg Ala Thr Pro Ala  Met Arg Ala Ala Arg  Ala Leu
        2290                2295                2300

ctg cgg agg  gcc aaa cgt gtg ggg  cga aga gcc atg ctt  aga gcg       16096
Leu Arg Arg  Ala Lys Arg Val Gly  Arg Arg Ala Met Leu  Arg Ala
        2305                2310                2315

gcc aga cgc  gcg gct tca ggt gcc  agc agc ggc agg tcc  cgc agg       16141
Ala Arg Arg  Ala Ala Ser Gly Ala  Ser Ser Gly Arg Ser  Arg Arg
        2320                2325                2330

cgt gcg gcc  acg gcg gca gca gcg  gcc att gcc aac atg  gcc caa       16186
Arg Ala Ala  Thr Ala Ala Ala Ala  Ala Ile Ala Asn Met  Ala Gln
        2335                2340                2345

ccg cga aga  ggc aat gtg tac tgg  gtg cgc gac gcc tct  ggt cag       16231
Pro Arg Arg  Gly Asn Val Tyr Trp  Val Arg Asp Ala Ser  Gly Gln
        2350                2355                2360

cgc gtg ccc  gtg cgc acc cgc ccc  cct cgc act tgaagatact             16274
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Arg Val Pro  Val Arg Thr Arg Pro  Pro Arg Thr
        2365                2370

gagcagtctc cgatgttgtg tcccagcggc gagg atg tcc  aag cgc aaa tac       16326
                                      Met Ser  Lys Arg Lys Tyr
                                          2375

aag  gaa gag atg ctc cag  gtc atc gcg cct gaa  atc tac ggt cca       16371
Lys  Glu Glu Met Leu Gln  Val Ile Ala Pro Glu  Ile Tyr Gly Pro
2380                2385                2390

ccg  gtg aag gat gaa aaa  aag ccc cgc aaa atc  aag cgg gtc aaa       16416
Pro  Val Lys Asp Glu Lys  Lys Pro Arg Lys Ile  Lys Arg Val Lys
2395                2400                2405

aag  gac aaa aag gaa gaa  gat ggc gat gat ggg  ctg gtg gag ttt       16461
Lys  Asp Lys Lys Glu Glu  Asp Gly Asp Asp Gly  Leu Val Glu Phe
2410                2415                2420

gtg  cgc gag ttc gcc cca  agg cgg cgc gtg cag  tgg cgc ggg cgc       16506
Val  Arg Glu Phe Ala Pro  Arg Arg Arg Val Gln  Trp Arg Gly Arg
2425                2430                2435

aaa  gtg cgt caa gtg ctg  aga ccc ggg acc act  gtg gtc ttc aca       16551
Lys  Val Arg Gln Val Leu  Arg Pro Gly Thr Thr  Val Val Phe Thr
2440                2445                2450

cct  ggc gag cgt tcc agc  agt act ttt aag cgg  tcc tat gat gag       16596
Pro  Gly Glu Arg Ser Ser  Ser Thr Phe Lys Arg  Ser Tyr Asp Glu
2455                2460                2465

gtg  tac ggg gat gac gat  att ctt gag cag gcg  gca gac cgc ctg       16641
Val  Tyr Gly Asp Asp Asp  Ile Leu Glu Gln Ala  Ala Asp Arg Leu
2470                2475                2480

ggc  gag ttt gct tat ggc  aag cgc act cga tcc  agt ccc aag gag       16686
Gly  Glu Phe Ala Tyr Gly  Lys Arg Thr Arg Ser  Ser Pro Lys Glu
2485                2490                2495

gag  gcg gtg tcc atc ccc  ttg gat cat gga aat  ccc acc ccc agc       16731
Glu  Ala Val Ser Ile Pro  Leu Asp His Gly Asn  Pro Thr Pro Ser
2500                2505                2510

ctc  aaa cca gtc acc ctg  cag caa gtg ctg ccc  gta cct ccg cgg       16776
Leu  Lys Pro Val Thr Leu  Gln Gln Val Leu Pro  Val Pro Pro Arg
2515                2520                2525

aga  ggc gtg aag cgc gag  ggt gag gac ctg tat  ccc acc atg cag       16821
Arg  Gly Val Lys Arg Glu  Gly Glu Asp Leu Tyr  Pro Thr Met Gln
2530                2535                2540

cta  atg gtg ccc aag cgc  cag agg cta gaa gac  gta ctg gag aaa       16866
Leu  Met Val Pro Lys Arg  Gln Arg Leu Glu Asp  Val Leu Glu Lys
2545                2550                2555

atg  aaa gtg gat ccc gat  atc cag cct gag gtc  aaa gtg aga ccc       16911
Met  Lys Val Asp Pro Asp  Ile Gln Pro Glu Val  Lys Val Arg Pro
2560                2565                2570
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atc  aag gaa gtg gcg cca  ggt ttg gga gta caa  acc gtg gac atc       16956
Ile  Lys Glu Val Ala Pro  Gly Leu Gly Val Gln  Thr Val Asp Ile
2575                2580                2585

aag  att ccc acc gag tcc  atg gaa gtg cag acc  gaa cct gca aag       17001
Lys  Ile Pro Thr Glu Ser  Met Glu Val Gln Thr  Glu Pro Ala Lys
2590                2595                2600

ccc  aca gcc acc tcc att  gag gtg cag acg gat  ccc tgg atg ccc       17046
Pro  Thr Ala Thr Ser Ile  Glu Val Gln Thr Asp  Pro Trp Met Pro
2605                2610                2615

gcg  ccc gtt gcc gcc cac  agc acc act cga aga  ccc cgg cga aag       17091
Ala  Pro Val Ala Ala His  Ser Thr Thr Arg Arg  Pro Arg Arg Lys
2620                2625                2630

tat  ggc cca gca agt ctg  cta atg ccc aac tat  gct ctg cac cca       17136
Tyr  Gly Pro Ala Ser Leu  Leu Met Pro Asn Tyr  Ala Leu His Pro
2635                2640                2645

tcc  atc att ccc act ccg  ggt tac cga ggc act  cgc tac tac cgc       17181
Ser  Ile Ile Pro Thr Pro  Gly Tyr Arg Gly Thr  Arg Tyr Tyr Arg
2650                2655                2660

agc  cgg agc agc acc tcc  cgc cgc cgc aaa aca  cct gca agt cgc       17226
Ser  Arg Ser Ser Thr Ser  Arg Arg Arg Lys Thr  Pro Ala Ser Arg
2665                2670                2675

act  cgc cgt cgc cgc cgc  cgc acc acc gcc agc  aaa ctg acg ccc       17271
Thr  Arg Arg Arg Arg Arg  Arg Thr Thr Ala Ser  Lys Leu Thr Pro
2680                2685                2690

gcc  gcc ctg gtg cgg aga  gtg tac cgc gat ggt  cgc gct gaa cct       17316
Ala  Ala Leu Val Arg Arg  Val Tyr Arg Asp Gly  Arg Ala Glu Pro
2695                2700                2705

ctg  acg ctg ccg cgc gcg  cgc tac cat ccg agc  atc acc act           17358
Leu  Thr Leu Pro Arg Ala  Arg Tyr His Pro Ser  Ile Thr Thr
2710                2715                2720

taatgactgt tgccgctgcc tccttgcaga t atg gcc  ctc act tgc cgc ctt      17410
                                  Met Ala  Leu Thr Cys Arg Leu
                                      2725                2730

cgc gtc ccc att act  ggc tac cga gga aga  aac tcg cgc cgt aga       17455
Arg Val Pro Ile Thr  Gly Tyr Arg Gly Arg  Asn Ser Arg Arg Arg
                2735                2740                2745

agg atg ttg ggg cgc  ggg atg cgt cgc cac  aga cga agg cgc gct       17500
Arg Met Leu Gly Arg  Gly Met Arg Arg His  Arg Arg Arg Arg Ala
                2750                2755                2760

atc agc aag cgg ttg  ggg ggt ggc ttt ctg  ccc gct cta att ccc       17545
Ile Ser Lys Arg Leu  Gly Gly Gly Phe Leu  Pro Ala Leu Ile Pro
                2765                2770                2775

atc atc gcc gcg gcg  atc ggg gct ata cca  ggc ata gct tcc gtg       17590
Ile Ile Ala Ala Ala  Ile Gly Ala Ile Pro  Gly Ile Ala Ser Val
                2780                2785                2790
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gcg gtt cag gcc tcg  cag cgc cac tgacattgga aaaacttata aataaaaata    17644
Ala Val Gln Ala Ser  Gln Arg His
                2795

gaatggactc tgacgctcct ggtcctgtga ctatgttttt gtagag atg gaa  gac      17699
                                                    Met Glu  Asp
                                                        2800

atc aat ttt tca  tcc ctg gct ccg cga  cac ggc acg agg ccg  tac      17744
Ile Asn Phe Ser  Ser Leu Ala Pro Arg  His Gly Thr Arg Pro  Tyr
            2805                2810                2815

atg ggc acc tgg  agc gac atc ggc acg  agc caa ctg aac ggg  ggc      17789
Met Gly Thr Trp  Ser Asp Ile Gly Thr  Ser Gln Leu Asn Gly  Gly
            2820                2825                2830

gcc ttc aat tgg  agc agt atc tgg agc  ggg ctt aaa aat ttt  ggc      17834
Ala Phe Asn Trp  Ser Ser Ile Trp Ser  Gly Leu Lys Asn Phe  Gly
            2835                2840                2845

tcg acc ata aaa  acc tat ggg aac aaa  gct tgg aac agc agc  aca      17879
Ser Thr Ile Lys  Thr Tyr Gly Asn Lys  Ala Trp Asn Ser Ser  Thr
            2850                2855                2860

ggg cag gct ctg  aga aat aag ctt aaa  gag cag aac ttc caa  cag      17924
Gly Gln Ala Leu  Arg Asn Lys Leu Lys  Glu Gln Asn Phe Gln  Gln
            2865                2870                2875

aag gtg gtt gat  ggg atc gcc tct ggt  att aat ggc gta gtg  gat      17969
Lys Val Val Asp  Gly Ile Ala Ser Gly  Ile Asn Gly Val Val  Asp
            2880                2885                2890

ctg gcc aac cag  gct gtg cag aaa cag  ata aac agc cgc ctg  gac      18014
Leu Ala Asn Gln  Ala Val Gln Lys Gln  Ile Asn Ser Arg Leu  Asp
            2895                2900                2905

ccg ccg ccc gca  gcc cct ggc gaa atg  gaa gtt gag gaa gag  ctc      18059
Pro Pro Pro Ala  Ala Pro Gly Glu Met  Glu Val Glu Glu Glu  Leu
            2910                2915                2920

cct ccg ctg gaa  aag cgg ggc gac aag  cgt ccg cgt ccc gat  ctg      18104
Pro Pro Leu Glu  Lys Arg Gly Asp Lys  Arg Pro Arg Pro Asp  Leu
            2925                2930                2935

gag gag acg ctg  gtg acg cgc gca gac  gag ccc cct tca tac  gag      18149
Glu Glu Thr Leu  Val Thr Arg Ala Asp  Glu Pro Pro Ser Tyr  Glu
            2940                2945                2950

gag gca gtg aag  ctc gga atg ccc act  acc aag cct ata gct  ccc      18194
Glu Ala Val Lys  Leu Gly Met Pro Thr  Thr Lys Pro Ile Ala  Pro
            2955                2960                2965

atg gcc acc ggg  gtg atg aaa cct tct  cag tcg cat cgg ccc  gcc      18239
Met Ala Thr Gly  Val Met Lys Pro Ser  Gln Ser His Arg Pro  Ala
            2970                2975                2980

acc ttg gac ttg  cct cct ccc cct gct  gct gca gcg cca gtt  ccc      18284
Thr Leu Asp Leu  Pro Pro Pro Pro Ala  Ala Ala Ala Pro Val  Pro
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            2985                2990                2995

aag cct gtc gct  acc aga aag ccc acc  gcc gca cag ccc gtc  gcc       18329
Lys Pro Val Ala  Thr Arg Lys Pro Thr  Ala Ala Gln Pro Val  Ala
            3000                3005                3010

gta gcc aga ccg  cga cct ggg ggc acg  ccg cgc ccg aat gca  aac       18374
Val Ala Arg Pro  Arg Pro Gly Gly Thr  Pro Arg Pro Asn Ala  Asn
            3015                3020                3025

tgg cag agt act  ctg aac agc atc gtg  ggt ctg ggc gta cag  agt       18419
Trp Gln Ser Thr  Leu Asn Ser Ile Val  Gly Leu Gly Val Gln  Ser
            3030                3035                3040

gta aag cgc cgt  cgc tgc ttt taattaaata tggagtagcg cttaacttgc       18470
Val Lys Arg Arg  Arg Cys Phe
            3045

ttgtctgtgt gtatgtatca tcaccacgcc gccgcagcag cagcagcaga ggagaaagga   18530

agaggtcgcg cgccgaggct gagttgcttt caag atg gcc  acc cca tcg atg       18582
                                      Met Ala  Thr Pro Ser Met
                                          3050

ctg  ccc cag tgg gca tac  atg cac atc gcc gga  cag gat gct tcg       18627
Leu  Pro Gln Trp Ala Tyr  Met His Ile Ala Gly  Gln Asp Ala Ser
3055                3060                3065

gag  tac ctg agt ccg ggt  ctg gtg cag ttc gcc  cgt gcc aca gac       18672
Glu  Tyr Leu Ser Pro Gly  Leu Val Gln Phe Ala  Arg Ala Thr Asp
3070                3075                3080

acc  tac ttc aat ctg ggg  aac aag ttt agg aac  ccc acc gtg gcc       18717
Thr  Tyr Phe Asn Leu Gly  Asn Lys Phe Arg Asn  Pro Thr Val Ala
3085                3090                3095

cct  acc cac gat gtg acc  acc gac cgt agc cag  cgg ctg atg ctg       18762
Pro  Thr His Asp Val Thr  Thr Asp Arg Ser Gln  Arg Leu Met Leu
3100                3105                3110

cgc  ttt gtg ccc gtt gat  cgg gag gac aat acc  tac tct tac aaa       18807
Arg  Phe Val Pro Val Asp  Arg Glu Asp Asn Thr  Tyr Ser Tyr Lys
3115                3120                3125

gtt  cgc tac aca ctg gct  gtg ggc gac aac aga  gtg ctg gac atg       18852
Val  Arg Tyr Thr Leu Ala  Val Gly Asp Asn Arg  Val Leu Asp Met
3130                3135                3140

gcc  agc acc ttc ttt gac  atc agg ggg gtg ctt  gac aga ggt ccc       18897
Ala  Ser Thr Phe Phe Asp  Ile Arg Gly Val Leu  Asp Arg Gly Pro
3145                3150                3155

agt  ttc aag cca tac tct  ggc aca gct tac aat  tcc ctg gcg cct       18942
Ser  Phe Lys Pro Tyr Ser  Gly Thr Ala Tyr Asn  Ser Leu Ala Pro
3160                3165                3170

aag  ggc gcg ccc aat aca  tgc cag tgg att gcc  aag ggg gcg cct       18987
Lys  Gly Ala Pro Asn Thr  Cys Gln Trp Ile Ala  Lys Gly Ala Pro
3175                3180                3185
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gtt  acc gat caa gac aat  gaa gaa cag gaa tta  aca gat gtt act       19032
Val  Thr Asp Gln Asp Asn  Glu Glu Gln Glu Leu  Thr Asp Val Thr
3190                 3195                 3200

tac  gct ttt ggc aat gct  cca gta caa gca gaa  gcc aaa att aca       19077
Tyr  Ala Phe Gly Asn Ala  Pro Val Gln Ala Glu  Ala Lys Ile Thr
3205                 3210                 3215

aaa  gat ggt ctg cca gta  ggt ttg gaa att aca  gaa gat gaa caa       19122
Lys  Asp Gly Leu Pro Val  Gly Leu Glu Ile Thr  Glu Asp Glu Gln
3220                 3225                 3230

aag  tca att tat gca gac  aaa ttg tat cag cca  gag ccc caa att       19167
Lys  Ser Ile Tyr Ala Asp  Lys Leu Tyr Gln Pro  Glu Pro Gln Ile
3235                 3240                 3245

ggc  gat gaa caa tgg cat  gac acc act ggc act  aat gaa caa tac       19212
Gly  Asp Glu Gln Trp His  Asp Thr Thr Gly Thr  Asn Glu Gln Tyr
3250                 3255                 3260

ggc  ggc aga gct cta aaa  ccg gcc acc aac atg  aaa cca tgt tat       19257
Gly  Gly Arg Ala Leu Lys  Pro Ala Thr Asn Met  Lys Pro Cys Tyr
3265                 3270                 3275

ggc  tca ttt gcc aga ccc  aca aat aaa aaa ggc  ggt cag gct aaa       19302
Gly  Ser Phe Ala Arg Pro  Thr Asn Lys Lys Gly  Gly Gln Ala Lys
3280                 3285                 3290

act  aga aaa ata gaa aag  gaa gag aat gga gtt  aaa acc gta act       19347
Thr  Arg Lys Ile Glu Lys  Glu Glu Asn Gly Val  Lys Thr Val Thr
3295                 3300                 3305

gaa  gaa gct gac att gat  atg gac ttt tat gac  tta aga tca caa       19392
Glu  Glu Ala Asp Ile Asp  Met Asp Phe Tyr Asp  Leu Arg Ser Gln
3310                 3315                 3320

aga  gca aat ttt gat cct  aaa att gtt ctt tat  tct gaa aat gta       19437
Arg  Ala Asn Phe Asp Pro  Lys Ile Val Leu Tyr  Ser Glu Asn Val
3325                 3330                 3335

aat  ttg gaa act cca gat  aca cat att gtg tat  aaa cca gga aca       19482
Asn  Leu Glu Thr Pro Asp  Thr His Ile Val Tyr  Lys Pro Gly Thr
3340                 3345                 3350

gat  gaa act agt tcc tct  gtt aac ttg gga cag  cag gca atg ccc       19527
Asp  Glu Thr Ser Ser Ser  Val Asn Leu Gly Gln  Gln Ala Met Pro
3355                 3360                 3365

aac  aga ccc aac tac att  ggt ttt agg gac aac  ttc att gga ctt       19572
Asn  Arg Pro Asn Tyr Ile  Gly Phe Arg Asp Asn  Phe Ile Gly Leu
3370                 3375                 3380

atg  ttt tac aac agt acc  ggc aac atg ggc gtg  ctg gcc ggg caa       19617
Met  Phe Tyr Asn Ser Thr  Gly Asn Met Gly Val  Leu Ala Gly Gln
3385                 3390                 3395

gct  tct cag tta aat gct  gtg gtt gac ttg cag  gac agg aac aca       19662
Ala  Ser Gln Leu Asn Ala  Val Val Asp Leu Gln  Asp Arg Asn Thr
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3400                 3405                 3410

gaa  ctg tcc tac cag ctg  ctg ctt gac tct ctg  ggt gac aga acc       19707
Glu  Leu Ser Tyr Gln Leu  Leu Leu Asp Ser Leu  Gly Asp Arg Thr
3415                 3420                 3425

aga  tac ttt agc atg tgg  aat cag gcc gtg gat  agc tat gac cca       19752
Arg  Tyr Phe Ser Met Trp  Asn Gln Ala Val Asp  Ser Tyr Asp Pro
3430                 3435                 3440

gac  gtg cgc att att gaa  aac cac ggt gtg gaa  gac gaa ctt cct       19797
Asp  Val Arg Ile Ile Glu  Asn His Gly Val Glu  Asp Glu Leu Pro
3445                 3450                 3455

aac  tat tgt ttt cca tta  gat gga gtg gga cca  att acg ggc act       19842
Asn  Tyr Cys Phe Pro Leu  Asp Gly Val Gly Pro  Ile Thr Gly Thr
3460                 3465                 3470

tat  cag ggg gtt gag cct  gat gga aac aat gga  aac tgg aag aaa       19887
Tyr  Gln Gly Val Glu Pro  Asp Gly Asn Asn Gly  Asn Trp Lys Lys
3475                 3480                 3485

aac  aca aac ata aat gga  gca aat gaa att ggc  aag gga aat aac       19932
Asn  Thr Asn Ile Asn Gly  Ala Asn Glu Ile Gly  Lys Gly Asn Asn
3490                 3495                 3500

tat  gct atg gaa att aat  cta caa gct aac ctc  tgg aga agt ttt       19977
Tyr  Ala Met Glu Ile Asn  Leu Gln Ala Asn Leu  Trp Arg Ser Phe
3505                 3510                 3515

cta  tat tcc aat gtg gct  ctg tat tta cca gac  ggt tac aaa tat       20022
Leu  Tyr Ser Asn Val Ala  Leu Tyr Leu Pro Asp  Gly Tyr Lys Tyr
3520                 3525                 3530

acc  cca gcc aat gtt aca  ctg cca gaa aac aaa  aac acc tat ggc       20067
Thr  Pro Ala Asn Val Thr  Leu Pro Glu Asn Lys  Asn Thr Tyr Gly
3535                 3540                 3545

tat  ata aac gga cga gta  gta tcc cca tct ttg  gtg gat tca tac       20112
Tyr  Ile Asn Gly Arg Val  Val Ser Pro Ser Leu  Val Asp Ser Tyr
3550                 3555                 3560

atc  aac att gga gcc aga  tgg tct ttg gat ctt  atg gac aat gta       20157
Ile  Asn Ile Gly Ala Arg  Trp Ser Leu Asp Leu  Met Asp Asn Val
3565                 3570                 3575

aac  cca ttc aat cac cac  cgc aat gca ggc ctg  cgt tac cgt tcc       20202
Asn  Pro Phe Asn His His  Arg Asn Ala Gly Leu  Arg Tyr Arg Ser
3580                 3585                 3590

atg  ctt tta gga aat ggt  cgc tat gtg cct ttc  cac atc caa gtg       20247
Met  Leu Leu Gly Asn Gly  Arg Tyr Val Pro Phe  His Ile Gln Val
3595                 3600                 3605

cct  cag aaa ttc ttt gct  gtc aag aac ctg ttg  ctt ctt ccc ggc       20292
Pro  Gln Lys Phe Phe Ala  Val Lys Asn Leu Leu  Leu Leu Pro Gly
3610                 3615                 3620

tcc  tac acc tat gag tgg  aac ttc aga aag gac  gta aac atg gtc       20337
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Ser  Tyr Thr Tyr Glu Trp  Asn Phe Arg Lys Asp  Val Asn Met Val
3625                3630                3635

ctg  caa agt tcc ctt ggt  aat gat ctc aga act  gat ggt gct agc       20382
Leu  Gln Ser Ser Leu Gly  Asn Asp Leu Arg Thr  Asp Gly Ala Ser
3640                3645                3650

atc  agt ttt acc agc atc  aat cta tat gct acc  ttt ttc ccc atg       20427
Ile  Ser Phe Thr Ser Ile  Asn Leu Tyr Ala Thr  Phe Phe Pro Met
3655                3660                3665

gcc  cac aac act gct tcc  acc ctt gaa gcc atg  ctg cgc aat gac       20472
Ala  His Asn Thr Ala Ser  Thr Leu Glu Ala Met  Leu Arg Asn Asp
3670                3675                3680

acc  aat gac cag tca ttt  aat gac tac ctt tct  gca gct aac atg       20517
Thr  Asn Asp Gln Ser Phe  Asn Asp Tyr Leu Ser  Ala Ala Asn Met
3685                3690                3695

ctc  tac cct att cca gcc  aat gca acc aac atc  ccc att tcc att       20562
Leu  Tyr Pro Ile Pro Ala  Asn Ala Thr Asn Ile  Pro Ile Ser Ile
3700                3705                3710

ccc  tct cgc aat tgg gcc  gcc ttc agg ggc tgg  tcc ttc acc aga       20607
Pro  Ser Arg Asn Trp Ala  Ala Phe Arg Gly Trp  Ser Phe Thr Arg
3715                3720                3725

ctc  aaa acc aag gag acc  cca tct ctg gga tca  ggg ttc gat ccc       20652
Leu  Lys Thr Lys Glu Thr  Pro Ser Leu Gly Ser  Gly Phe Asp Pro
3730                3735                3740

tac  ttt gtc tat tct ggt  tct att ccc tac ctt  gat ggc acc ttc       20697
Tyr  Phe Val Tyr Ser Gly  Ser Ile Pro Tyr Leu  Asp Gly Thr Phe
3745                3750                3755

tac  ctt aac cac act ttc  aag aag gtc tcc atc  atg ttt gac tcc       20742
Tyr  Leu Asn His Thr Phe  Lys Lys Val Ser Ile  Met Phe Asp Ser
3760                3765                3770

tca  gtc agc tgg cca ggc  aat gac agg ctt cta  act cca aat gag       20787
Ser  Val Ser Trp Pro Gly  Asn Asp Arg Leu Leu  Thr Pro Asn Glu
3775                3780                3785

ttt  gaa atc aaa cgc act  gtg gat ggg gaa ggg  tac aat gtg gct       20832
Phe  Glu Ile Lys Arg Thr  Val Asp Gly Glu Gly  Tyr Asn Val Ala
3790                3795                3800

caa  tgc aac atg acc aag  gac tgg ttc ctg gtt  caa atg ctc gcc       20877
Gln  Cys Asn Met Thr Lys  Asp Trp Phe Leu Val  Gln Met Leu Ala
3805                3810                3815

aac  tac aac att ggc tac  cag ggc ttc tac atc  cca gag ggg tac       20922
Asn  Tyr Asn Ile Gly Tyr  Gln Gly Phe Tyr Ile  Pro Glu Gly Tyr
3820                3825                3830

aag  gat cgc atg tac tcc  ttc ttc aga aac ttc  cag ccc atg agt       20967
Lys  Asp Arg Met Tyr Ser  Phe Phe Arg Asn Phe  Gln Pro Met Ser
3835                3840                3845
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agg  cag gtg gtt gat gag  atc aac tac aag gag  tac caa gct gtc       21012
Arg  Gln Val Val Asp Glu  Ile Asn Tyr Lys Glu  Tyr Gln Ala Val
3850                 3855                 3860

aca  ctt gct tac cag cac  aac aac tct ggc ttt  gtg ggt tac cat       21057
Thr  Leu Ala Tyr Gln His  Asn Asn Ser Gly Phe  Val Gly Tyr His
3865                 3870                 3875

gca  ccc act ctc cgt cag  ggt caa cca tac cca  gct aac tac cca       21102
Ala  Pro Thr Leu Arg Gln  Gly Gln Pro Tyr Pro  Ala Asn Tyr Pro
3880                 3885                 3890

tac  ccg ctt att gga acc  act gct gtc acc agc  gtc acc cag aaa       21147
Tyr  Pro Leu Ile Gly Thr  Thr Ala Val Thr Ser  Val Thr Gln Lys
3895                 3900                 3905

aag  ttc ttg tgc gac agg  acc atg tgg cgc atc  ccc ttc tcc agc       21192
Lys  Phe Leu Cys Asp Arg  Thr Met Trp Arg Ile  Pro Phe Ser Ser
3910                 3915                 3920

aac  ttc atg tcc atg ggt  gcc ctt acc gac ctg  ggg cag aac atg       21237
Asn  Phe Met Ser Met Gly  Ala Leu Thr Asp Leu  Gly Gln Asn Met
3925                 3930                 3935

ctt  tat gct aac tca gct  cat gcg ctg gac atg  act ttt gag gtg       21282
Leu  Tyr Ala Asn Ser Ala  His Ala Leu Asp Met  Thr Phe Glu Val
3940                 3945                 3950

gat  ccc atg gat gag ccc  aca ctg ctt tat ctt  ctt ttc gaa gtc       21327
Asp  Pro Met Asp Glu Pro  Thr Leu Leu Tyr Leu  Leu Phe Glu Val
3955                 3960                 3965

ttc  gac gtg gtc aga gtg  cac cag cca cac cgc  ggc gtc atc gag       21372
Phe  Asp Val Val Arg Val  His Gln Pro His Arg  Gly Val Ile Glu
3970                 3975                 3980

gcc  gtc tac ctg cgc aca  ccg ttc tcg gcc ggc  aac gcc acc aca       21417
Ala  Val Tyr Leu Arg Thr  Pro Phe Ser Ala Gly  Asn Ala Thr Thr
3985                 3990                 3995

taagaagcct cttgcttctt gcaagcagca gcagcagcc atg  aca tgc ggg tcc      21471
                                          Met  Thr Cys Gly Ser
                                          4000

gga  aac ggc tcc agc gag  caa gag ctc aaa gcc  atc gtc cga gac       21516
Gly  Asn Gly Ser Ser Glu  Gln Glu Leu Lys Ala  Ile Val Arg Asp
4005                 4010                 4015

ctg  ggc tgc gga ccc tat  ttc ctg gga acc ttt  gac aag cgt ttc       21561
Leu  Gly Cys Gly Pro Tyr  Phe Leu Gly Thr Phe  Asp Lys Arg Phe
4020                 4025                 4030

ccg  ggg ttc atg gcc ccc  gac aag ctc gcc tgc  gcc ata gtc aac       21606
Pro  Gly Phe Met Ala Pro  Asp Lys Leu Ala Cys  Ala Ile Val Asn
4035                 4040                 4045

act  gcc ggc cgc gag acg  ggg gga gag cac tgg  ctg gct ttt ggt       21651
Thr  Ala Gly Arg Glu Thr  Gly Gly Glu His Trp  Leu Ala Phe Gly
4050                 4055                 4060
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tgg  aac ccg cgc tcc aac  acc tgc tac ctt ttt  gat cct ttt ggg       21696
Trp  Asn Pro Arg Ser Asn  Thr Cys Tyr Leu Phe  Asp Pro Phe Gly
4065                 4070                 4075

ttc  tcg gat gag cgg ctc  aaa cag att tac cag  ttt gag tac gag       21741
Phe  Ser Asp Glu Arg Leu  Lys Gln Ile Tyr Gln  Phe Glu Tyr Glu
4080                 4085                 4090

ggg  ctc ctg cgc cgc agt  gcc ctt gct acc aaa  gac cgc tgc atc       21786
Gly  Leu Leu Arg Arg Ser  Ala Leu Ala Thr Lys  Asp Arg Cys Ile
4095                 4100                 4105

acc  ctg gaa aag tcc acc  cag acc gtg cag ggc  ccg cgc tca gcc       21831
Thr  Leu Glu Lys Ser Thr  Gln Thr Val Gln Gly  Pro Arg Ser Ala
4110                 4115                 4120

gcc  tgt gga ctt ttt tgc  tgt atg ttc ctt cat  gcc ttt gtg cac       21876
Ala  Cys Gly Leu Phe Cys  Cys Met Phe Leu His  Ala Phe Val His
4125                 4130                 4135

tgg  ccc gac cgc ccc atg  gac gga aac ccc acc  atg aag ttg ctg       21921
Trp  Pro Asp Arg Pro Met  Asp Gly Asn Pro Thr  Met Lys Leu Leu
4140                 4145                 4150

act  ggg gtg ccc aac agc  atg ctc caa tca ccc  caa gtc cag ccc       21966
Thr  Gly Val Pro Asn Ser  Met Leu Gln Ser Pro  Gln Val Gln Pro
4155                 4160                 4165

acc  ctg cgc cgc aac cag  gag gcg cta tac cgc  ttc cta aac acc       22011
Thr  Leu Arg Arg Asn Gln  Glu Ala Leu Tyr Arg  Phe Leu Asn Thr
4170                 4175                 4180

cac  tca tct tac ttt cgt  tct cac cgc gcg cgc  atc gaa agg gcc       22056
His  Ser Ser Tyr Phe Arg  Ser His Arg Ala Arg  Ile Glu Arg Ala
4185                 4190                 4195

acc  gcg ttt gac cgt atg  gat atg caa taataagtca tgtaaaaacc         22103
Thr  Ala Phe Asp Arg Met  Asp Met Gln
4200                 4205

gtgttcaata aacagcactt tatttttaca tgcactgagg ctctggtttg ctcattcatt   22163

catcattcac tcagaagtcg aatgggttct ggcgggagtc agagtgtccc gcgggcaggg   22223

atacgttgcg gaactggaac ctgttctgcc acttgaactc ggggatcacc agcttgggaa   22283

ctggaatctc ggggaaggtg tcttgccaca actttctggt cagttgcaaa gcgccaagca   22343

ggtcaggagc agagatcttg aaatcacagt tggggccggc attctggacg cgggagttgc   22403

ggtacactgg gttgcagcac tggaacacca tcaaggcggg gtgtctcacg cttgccagca   22463

cggtcgggtc actgatggta gtcacatcca agtcttcagc attggccatc ccaaagggtg   22523

tcatcttaca ggtctgcctg cccatcacgg gagcgcagcc gggcttgtgg ttgcaatcgc   22583

agtgaatggg gatcagcatc atcctggctt ggtcgggggt tatccctggg tacacggcct   22643
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tcatgaaggc ttcgtactgc ttgaaagctt cctgggcctt acttccctcg gtgtagaaca    22703

tcccacagga cttgctggaa aattgattag tagcacagtt ggcatcattc acacagcagc    22763

gggcatcgtt gttggccagc tggaccacat ttctgcccca gcggttctgg gtgatcttgg    22823

ctcggtctgg gttctccttc atagcgcgct gcccgttctc gctcgccaca tccatctcga    22883

taatgtggtc cttctggatc atgatagtgc catgcaggca tttcaccttg ccttcataat    22943

cggtgcagcc atgagcccac agagcgcatc cggtgcactc ccaattattg tgggcgatct    23003

cagaataaga atgcaccaat ccctgcatga atcttcccat catcgctgtc agggtcttca    23063

tgctggtaaa ggtcaggggg atgccacggt gctcctcgtt cacatactgg tggcagatac    23123

gcttgtactg ctcgtgctgt tctggcatca gcttgaaaga ggttctcagg tcattatcca    23183

gcctgtacct ctccattagc acagccatta cttccatgcc cttctcccag gcagaaacca    23243

ggggaaggct catggaattt ctaacagaaa tagcagctac tttagccaga gggtcatcct    23303

tgtcaatctt ctcaacactt cttttgccat ccttctcagt gatgcgcacg ggtgggtagc    23363

tgaagcccac ggccaccagc tccgcctctt ctctttcttc ttcgctgtcc tgactgatgt    23423

cttgcagagg gacatgcttg gtcttcctgg gcttcttctt gggagggatc gggggagggc    23483

tgctgctccg ctccggagac agggaggacc gcgaagtttc gctcaccagt accacctggc    23543

tctcggtaga agaaccggac cccacgcggc ggtaggtgtt cctcttcggg ggcagaggtg    23603

gaggcgactg cgatgggctg cggtccggcc tgggaggcgg atggctggca gagcctcttc    23663

cgcgttcggg ggtgtgctcc cggtggcggt cgcttgactg atttcctccg cggctggcca    23723

ttgtgttctc ctaggcagag aaacaacaga c atg gag  act cag cca tca ctg      23775
                                     Met Glu  Thr Gln Pro Ser Leu
                                         4210                4215

cca aca tcg ctg caa  gcg cca tca cac ctc  gcc ccc agc agc gac        23820
Pro Thr Ser Leu Gln  Ala Pro Ser His Leu  Ala Pro Ser Ser Asp
                4220                4225                4230

gag gag gag agc tta  acc acc cca cca ccc  agt ccc gcc acc acc        23865
Glu Glu Glu Ser Leu  Thr Thr Pro Pro Pro  Ser Pro Ala Thr Thr
                4235                4240                4245

acc tct acc ctc gaa  gat gag gag gag gtc  gac gca ccc cag gag        23910
Thr Ser Thr Leu Glu  Asp Glu Glu Glu Val  Asp Ala Pro Gln Glu
                4250                4255                4260

atg cag gcg cag gat  atg gag gat gtg aaa  gcg gaa gag att gag        23955
Met Gln Ala Gln Asp  Met Glu Asp Val Lys  Ala Glu Glu Ile Glu
                4265                4270                4275

gca gat gtc gag cag  gac ccg ggc tat gtg  aca ccg gcg gag cac        24000
Ala Asp Val Glu Gln  Asp Pro Gly Tyr Val  Thr Pro Ala Glu His
                4280                4285                4290
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gag gag gag ctg aaa  cgc ttt cta gac aga  gag gaa gtt gac agc        24045
Glu Glu Glu Leu Lys  Arg Phe Leu Asp Arg  Glu Glu Val Asp Ser
                4295                4300                4305

cgc cca gag cat caa  gca gat ggc gat cac  cag gag gct ggg ctc        24090
Arg Pro Glu His Gln  Ala Asp Gly Asp His  Gln Glu Ala Gly Leu
                4310                4315                4320

ggg gat cat gtc gcc  gac tac ctc acc ggg  ctt ggc tca gag gac        24135
Gly Asp His Val Ala  Asp Tyr Leu Thr Gly  Leu Gly Ser Glu Asp
                4325                4330                4335

gtg ctc ctc aag cat  cta gca agg cag tcc  atc ata gtc aaa gat        24180
Val Leu Leu Lys His  Leu Ala Arg Gln Ser  Ile Ile Val Lys Asp
                4340                4345                4350

gca gtg ctc gac cgc  acc gaa gtg ccc atc  agt gtg gaa gag ctc        24225
Ala Val Leu Asp Arg  Thr Glu Val Pro Ile  Ser Val Glu Glu Leu
                4355                4360                4365

agc cgc gcc tac gag  ctc aac ctc ttt tcg  cct cgg gtg ccc ccc        24270
Ser Arg Ala Tyr Glu  Leu Asn Leu Phe Ser  Pro Arg Val Pro Pro
                4370                4375                4380

aag cgg cag cca aac  ggc acc tgc gag ccc  aac cct cgc ctt aac        24315
Lys Arg Gln Pro Asn  Gly Thr Cys Glu Pro  Asn Pro Arg Leu Asn
                4385                4390                4395

ttc tat cca gct ttt  act gtc ccc gaa gtg  ctg gcc acc tac cac        24360
Phe Tyr Pro Ala Phe  Thr Val Pro Glu Val  Leu Ala Thr Tyr His
                4400                4405                4410

atc ttt ttc aag aac  caa aag att cca gtc  tcc tgc cgc gcc aac        24405
Ile Phe Phe Lys Asn  Gln Lys Ile Pro Val  Ser Cys Arg Ala Asn
                4415                4420                4425

cgc acc cgg gcc gat  gcc ctg ctt aac ttg  gga ccg ggc gct tgc        24450
Arg Thr Arg Ala Asp  Ala Leu Leu Asn Leu  Gly Pro Gly Ala Cys
                4430                4435                4440

tta cct gat ata gct  tcc ttg gaa gag gtt  cca aag atc ttc gaa        24495
Leu Pro Asp Ile Ala  Ser Leu Glu Glu Val  Pro Lys Ile Phe Glu
                4445                4450                4455

ggt ctg ggt agt gat  gag act cgg gca gca  aat gct ctg caa cag        24540
Gly Leu Gly Ser Asp  Glu Thr Arg Ala Ala  Asn Ala Leu Gln Gln
                4460                4465                4470

gga gag aat ggc atg  gat gaa cac cac agc  gct ctg gtg gag ctg        24585
Gly Glu Asn Gly Met  Asp Glu His His Ser  Ala Leu Val Glu Leu
                4475                4480                4485

gaa ggt gac aat gcc  agg ctt gca gtg ctc  aag cgc agt atc gtg        24630
Glu Gly Asp Asn Ala  Arg Leu Ala Val Leu  Lys Arg Ser Ile Val
                4490                4495                4500

gtc acc cat ttt gcc  tat ccc gct gtt aac  ctg ccc ccc aaa gtc        24675
Val Thr His Phe Ala  Tyr Pro Ala Val Asn  Leu Pro Pro Lys Val
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                4505                4510                4515

atg agc gcg gtc atg  gac cat ctg ctc atc  aaa cga gca agt ccc       24720
Met Ser Ala Val Met  Asp His Leu Leu Ile  Lys Arg Ala Ser Pro
                4520                4525                4530

ctt tca gaa gac cag  aac atg cag gat cca  gac gcc tcg gac gag       24765
Leu Ser Glu Asp Gln  Asn Met Gln Asp Pro  Asp Ala Ser Asp Glu
                4535                4540                4545

ggc aag ccg gta gtc  agt gac gag cag cta  tct cgc tgg ctg ggt       24810
Gly Lys Pro Val Val  Ser Asp Glu Gln Leu  Ser Arg Trp Leu Gly
                4550                4555                4560

acc aac tcc ccg cga  gac ttg gaa gag agg  cgc aag ctc atg atg       24855
Thr Asn Ser Pro Arg  Asp Leu Glu Glu Arg  Arg Lys Leu Met Met
                4565                4570                4575

gct gta gtg cta gtg  act gtg gag ctg gag  tgt ctg cgc cgc ttt       24900
Ala Val Val Leu Val  Thr Val Glu Leu Glu  Cys Leu Arg Arg Phe
                4580                4585                4590

ttc acc gac cct gag  acc ctg cgc aag cta  gag gag aac ctg cac       24945
Phe Thr Asp Pro Glu  Thr Leu Arg Lys Leu  Glu Glu Asn Leu His
                4595                4600                4605

tac act ttt aga cat  ggc ttc gtg cgc cag  gca tgc aag att tcc       24990
Tyr Thr Phe Arg His  Gly Phe Val Arg Gln  Ala Cys Lys Ile Ser
                4610                4615                4620

aac gtg gag ctc acc  aac ctg gtt tcc tac  atg ggc att ttg cat       25035
Asn Val Glu Leu Thr  Asn Leu Val Ser Tyr  Met Gly Ile Leu His
                4625                4630                4635

gag aac cgc ctg ggg  cag agc gtc ctg cac  acc acc ctg aag ggg       25080
Glu Asn Arg Leu Gly  Gln Ser Val Leu His  Thr Thr Leu Lys Gly
                4640                4645                4650

gag gcc cgc cgc gac  tac atc cga gac tgt  gtc tac ctc tac ctc       25125
Glu Ala Arg Arg Asp  Tyr Ile Arg Asp Cys  Val Tyr Leu Tyr Leu
                4655                4660                4665

tgc cat acc tgg cag  act ggc atg ggt gtg  tgg caa cag tgt ttg       25170
Cys His Thr Trp Gln  Thr Gly Met Gly Val  Trp Gln Gln Cys Leu
                4670                4675                4680

gaa gag cag aac cta  aaa gag ctg gac aag  ctc ttg cag aga tcc       25215
Glu Glu Gln Asn Leu  Lys Glu Leu Asp Lys  Leu Leu Gln Arg Ser
                4685                4690                4695

ctc aaa gcc ctg tgg  aca ggt ttt gac gag  cgc acc gtc gcc tcg       25260
Leu Lys Ala Leu Trp  Thr Gly Phe Asp Glu  Arg Thr Val Ala Ser
                4700                4705                4710

gac ctg gcg gac atc  atc ttc ccc gag cgt  ctc agg gtt act ctg       25305
Asp Leu Ala Asp Ile  Ile Phe Pro Glu Arg  Leu Arg Val Thr Leu
                4715                4720                4725

cgc aac ggc ctg cct  gac ttc atg agc cag  agc atg ctt aac aac       25350
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Arg Asn Gly Leu Pro  Asp Phe Met Ser Gln  Ser Met Leu Asn Asn
                4730                4735                4740

ttt cgc tct ttc atc  ctg gaa cgc tcc ggt  atc ctg ccc gcc acc        25395
Phe Arg Ser Phe Ile  Leu Glu Arg Ser Gly  Ile Leu Pro Ala Thr
                4745                4750                4755

tgc tgc gcg ctg ccc  tcc gac ttt gtg cct  ctt agc tac cga gag        25440
Cys Cys Ala Leu Pro  Ser Asp Phe Val Pro  Leu Ser Tyr Arg Glu
                4760                4765                4770

tgc ccc ccg ccg cta  tgg agc cac tgc tac  ctg ttc cgc ctg gcc        25485
Cys Pro Pro Pro Leu  Trp Ser His Cys Tyr  Leu Phe Arg Leu Ala
                4775                4780                4785

aac tac ctc tcc tac  cac tcg gat gtg atc  gag gat gtg agc gga        25530
Asn Tyr Leu Ser Tyr  His Ser Asp Val Ile  Glu Asp Val Ser Gly
                4790                4795                4800

gac ggc ctg ctg gaa  tgc cac tgc cgc tgc  aat ctc tgc aca ccc        25575
Asp Gly Leu Leu Glu  Cys His Cys Arg Cys  Asn Leu Cys Thr Pro
                4805                4810                4815

cac cgt tcc ctc gcc  tgc aac ccc cag ttg  ctg agc gag acc cag        25620
His Arg Ser Leu Ala  Cys Asn Pro Gln Leu  Leu Ser Glu Thr Gln
                4820                4825                4830

atc atc ggc acc ttc  gag ttg cag ggt ccc  agc agt gaa ggc gag        25665
Ile Ile Gly Thr Phe  Glu Leu Gln Gly Pro  Ser Ser Glu Gly Glu
                4835                4840                4845

ggg tct tct ccg ggg  cag agt ctg aaa ctg  aca ccg ggg ctg tgg        25710
Gly Ser Ser Pro Gly  Gln Ser Leu Lys Leu  Thr Pro Gly Leu Trp
                4850                4855                4860

acc tcc gcc tac ctg  cgc aag ttt cac ccc  gag gac tac cac ccc        25755
Thr Ser Ala Tyr Leu  Arg Lys Phe His Pro  Glu Asp Tyr His Pro
                4865                4870                4875

tat gag atc agg ttc  tat gag gac caa tca  cat cct ccc aaa gtc        25800
Tyr Glu Ile Arg Phe  Tyr Glu Asp Gln Ser  His Pro Pro Lys Val
                4880                4885                4890

gag ctc tca gcc tgc  gtc atc acc cag ggg  gca att ctg gcc caa        25845
Glu Leu Ser Ala Cys  Val Ile Thr Gln Gly  Ala Ile Leu Ala Gln
                4895                4900                4905

ttg caa gcc atc caa  aaa tcc cgc caa gaa  ttt ctg atg aaa aag        25890
Leu Gln Ala Ile Gln  Lys Ser Arg Gln Glu  Phe Leu Met Lys Lys
                4910                4915                4920

ggg agc ggg gtc tac  ctc gac ccc cag acc  ggt gag gag ctc aac        25935
Gly Ser Gly Val Tyr  Leu Asp Pro Gln Thr  Gly Glu Glu Leu Asn
                4925                4930                4935

aca agg ttc ccc cag  gat gtc cca gcg ccg  agg aag caa gaa gct        25980
Thr Arg Phe Pro Gln  Asp Val Pro Ala Pro  Arg Lys Gln Glu Ala
                4940                4945                4950
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gaa ggt gca gct gcc  gcc ccc aga gga tat  gga gga aga ctg gga        26025
Glu Gly Ala Ala Ala  Ala Pro Arg Gly Tyr  Gly Gly Arg Leu Gly
                4955                4960                4965

cag tca ggc aga gga  agc gga gga gat gga  aga ttg gga cag cca        26070
Gln Ser Gly Arg Gly  Ser Gly Gly Asp Gly  Arg Leu Gly Gln Pro
                4970                4975                4980

ggc aga gga ggt gga  cag cct gga gga aga  cag ttt gga gga gga        26115
Gly Arg Gly Gly Gly  Gln Pro Gly Gly Arg  Gln Phe Gly Gly Gly
                4985                4990                4995

aga cga gga ggc aga  gga ggt gga aga agc  aac cgc cgc caa aca        26160
Arg Arg Gly Gly Arg  Gly Gly Gly Arg Ser  Asn Arg Arg Gln Thr
                5000                5005                5010

gtt gtc ctc ggc ggc  gga gac aag caa gtc  ccc aga cag cag cac        26205
Val Val Leu Gly Gly  Gly Asp Lys Gln Val  Pro Arg Gln Gln His
                5015                5020                5025

ggc tac cat ctc cgc  tcc ggg tcg ggg ggc  cca gcg gcg gcc caa        26250
Gly Tyr His Leu Arg  Ser Gly Ser Gly Gly  Pro Ala Ala Ala Gln
                5030                5035                5040

cag tagatgggac gagaccgggc gcttcccgaa cccgaccacc gcttccaaga          26303
Gln


ccggtaagaa ggagcgacag ggatacaagt cctggcgggg acataaaaac gctatcatct   26363

cctgcttgca tgaatgcggg ggcaacatat ccttcacccg gcgctacctg ctcttccacc   26423

acggggtgaa cttccccccgc aatatcttgc attactaccg tcacctccac agcccctact   26483

gcagccagca agccccggca acctcggcag aaaaagacag cagcggcaac ggggaccaga   26543

aaaccagcag ttagaaaatc cacagcaagt gcagcaggag gaggactgag gatcacagcg   26603

aacgagccag cgcagaccag agagctgagg aatcggatct ttccaaccct ctatgccatc   26663

ttccagcaga gtcgggggca agagcaggaa ctgaaagtaa aaaaccgatc tctgcgctcg   26723

ctcaccagaa gttgtttgta tcacaagagc gaagaccaac ttcagcgcac tctcgaggac   26783

gccgaggctc tcttcaacaa gtactgcgcg ctgactctta aagagtagcc cttgcccgcg   26843

ctcgctcgaa aaaggcggga atcacgtcac ccttggcacc tgtcctttgc cctcgtc      26900

atg agt aaa gaa  att ccc acg cct tac  atg tgg agc tat cag  ccc      26945
Met Ser Lys Glu  Ile Pro Thr Pro Tyr  Met Trp Ser Tyr Gln  Pro
            5045                5050                5055

caa atg ggg ttg  gca gca ggc gcc tcc  cag gac tac tcc acc  cgc      26990
Gln Met Gly Leu  Ala Ala Gly Ala Ser  Gln Asp Tyr Ser Thr  Arg
            5060                5065                5070

atg aat tgg ctc  agc gcc ggg ccc tcg  atg atc tca cgg gtt  aat      27035
Met Asn Trp Leu  Ser Ala Gly Pro Ser  Met Ile Ser Arg Val  Asn
            5075                5080                5085
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gat ata cta gct  tat cga aac cag tta  ctc cta gaa cag tca  gct       27080
Asp Ile Leu Ala  Tyr Arg Asn Gln Leu  Leu Leu Glu Gln Ser  Ala
            5090                 5095                 5100

ctc acc acc aca  ccc cgc caa cac ctt  aat ccc cgg aat tgg  ccc       27125
Leu Thr Thr Thr  Pro Arg Gln His Leu  Asn Pro Arg Asn Trp  Pro
            5105                 5110                 5115

gcc gcc ctg gtg  tac cag gaa act ccc  gct ccc acc acc gta  cta       27170
Ala Ala Leu Val  Tyr Gln Glu Thr Pro  Ala Pro Thr Thr Val  Leu
            5120                 5125                 5130

ctt cct cga gac  gcc cag gcc gaa gtt  cag atg act aac gca  ggt       27215
Leu Pro Arg Asp  Ala Gln Ala Glu Val  Gln Met Thr Asn Ala  Gly
            5135                 5140                 5145

gta cag ctg gcg  ggc ggt tcc gcc ctg  tgt cgt cac cgg cct  cgg       27260
Val Gln Leu Ala  Gly Gly Ser Ala Leu  Cys Arg His Arg Pro  Arg
            5150                 5155                 5160

cag agt ata aaa  cgc ctg gtg atc aga  ggc cga ggt atc cag  ctc       27305
Gln Ser Ile Lys  Arg Leu Val Ile Arg  Gly Arg Gly Ile Gln  Leu
            5165                 5170                 5175

aac gac gag tcg  gtg agc tct tcg ctt  ggt ctg cga cca gac  gga       27350
Asn Asp Glu Ser  Val Ser Ser Ser Leu  Gly Leu Arg Pro Asp  Gly
            5180                 5185                 5190

gtc ttc cag atc  gcc ggc tgt gga aga  tct tcc ttc act cct  cgt       27395
Val Phe Gln Ile  Ala Gly Cys Gly Arg  Ser Ser Phe Thr Pro  Arg
            5195                 5200                 5205

cag gct gtg ctg  act ttg gag agt tcg  tcc tcg cag ccc cgc  tcg       27440
Gln Ala Val Leu  Thr Leu Glu Ser Ser  Ser Ser Gln Pro Arg  Ser
            5210                 5215                 5220

ggc ggc atc ggg  act ctc cag ttc gtg  gag gag ttt act ccc  tct       27485
Gly Gly Ile Gly  Thr Leu Gln Phe Val  Glu Glu Phe Thr Pro  Ser
            5225                 5230                 5235

gtg tac ttc aac  ccc ttc tcc ggc tct  cct ggc cag tac ccg  gac       27530
Val Tyr Phe Asn  Pro Phe Ser Gly Ser  Pro Gly Gln Tyr Pro  Asp
            5240                 5245                 5250

gag ttc ata ccg  aac ttc gac gca atc  agc gag tca gtg gat  ggc       27575
Glu Phe Ile Pro  Asn Phe Asp Ala Ile  Ser Glu Ser Val Asp  Gly
            5255                 5260                 5265

tat gat tg atg tct  aat ggt ggc gcg gct  gag cta gct cga ctg  cga    27622
Tyr Asp    Met Ser  Asn Gly Gly Ala Ala  Glu Leu Ala Arg Leu  Arg
               5270                 5275                 5280

cat cta gac cac  tgc cgc cgc ttt cgc  tgc ttc gcc cgg gaa  ctc       27667
His Leu Asp His  Cys Arg Arg Phe Arg  Cys Phe Ala Arg Glu  Leu
            5285                 5290                 5295

acc gag ttc atc  tac ttc gaa ctc ccc  gag gag cac cct cag  ggg       27712
Thr Glu Phe Ile  Tyr Phe Glu Leu Pro  Glu Glu His Pro Gln  Gly
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            5300                5305                5310

ccg gcc cac gga  gtg cgg att acc atc  gaa ggg gga ata gac  tct       27757
Pro Ala His Gly  Val Arg Ile Thr Ile  Glu Gly Gly Ile Asp  Ser
            5315                5320                5325

cgc ctg cat cgg  atc ttc tcc cag cga  ccc gtg ctg atc gag  cgc       27802
Arg Leu His Arg  Ile Phe Ser Gln Arg  Pro Val Leu Ile Glu  Arg
            5330                5335                5340

gac cag gga aat  aca acc atc tcc atc  tac tgc atc tgt aac  cac       27847
Asp Gln Gly Asn  Thr Thr Ile Ser Ile  Tyr Cys Ile Cys Asn  His
            5345                5350                5355

ccc gga ttg cat  gaa agc ctt tgc tgt  ctt att tgt gct gag  ttt       27892
Pro Gly Leu His  Glu Ser Leu Cys Cys  Leu Ile Cys Ala Glu  Phe
            5360                5365                5370

aat aaa aac tgagttaaga ccctcctacg gactaccgct tcttcaacca             27941
Asn Lys Asn

ggactttaca acaacaccaa ccagaccctc cgttccagcc agaagaccca gacccttcct   28001

cctctgatcc aggactctaa ctctaccttc ccagcaccat cccctactaa ccttcccgaa   28061

actaacaacc tcggagctca actgcaacac cgcctttccc gaagcctcct ttctgccaat   28121

actaccactc ccaaaaccgg aggtgagctc cgcggtctcc ccactgacga cccctgggtg   28181

gtagcgggtt ttgtaacgtt aggagtagtt gcgggtgggc ttgtgctgat cctttgctac   28241

ctatacacac cttgctgtgc atatttagtt atattgtgct gctggtttaa gaa atg       28297
                                                            Met
                                                            5375

ggg acc cta cta gtc  gtg ctt gct tta ctt  tcg ctt ttg gga ctg       28342
Gly Thr Leu Leu Val  Val Leu Ala Leu Leu  Ser Leu Leu Gly Leu
                5380                5385                5390

ggc tct gct aat ctc  att cct cct gat cac  gat cca tgt gtg aca       28387
Gly Ser Ala Asn Leu  Ile Pro Pro Asp His  Asp Pro Cys Val Thr
                5395                5400                5405

ttt gat cca gaa aac  tgc aca ctc acc ttt  gca cct gaa aca agc       28432
Phe Asp Pro Glu Asn  Cys Thr Leu Thr Phe  Ala Pro Glu Thr Ser
                5410                5415                5420

cgc tac tgc gga gta  gtt att agg tgc gga  ctg gaa tgc agg ccc       28477
Arg Tyr Cys Gly Val  Val Ile Arg Cys Gly  Leu Glu Cys Arg Pro
                5425                5430                5435

att gaa att aca cac  aat aac aaa act tgg  aac aat aca tta ttc       28522
Ile Glu Ile Thr His  Asn Asn Lys Thr Trp  Asn Asn Thr Leu Phe
                5440                5445                5450

acc aca tgg caa cca  gga tat cct cag tgg  tat act gtc tct gtc       28567
Thr Thr Trp Gln Pro  Gly Tyr Pro Gln Trp  Tyr Thr Val Ser Val
                5455                5460                5465
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cgg ggt cct gac ggt  tcc gtc cgc atg gct  aat aac act ttc att        28612
Arg Gly Pro Asp Gly  Ser Val Arg Met Ala  Asn Asn Thr Phe Ile
                5470                5475                5480

ttt gct gaa atg tgc  gat atg gtc atg ttt  atg agc aga cag tat        28657
Phe Ala Glu Met Cys  Asp Met Val Met Phe  Met Ser Arg Gln Tyr
                5485                5490                5495

gac cta tgg cct ccc  agc aaa gaa aac att  gtg gca ttc tcc att        28702
Asp Leu Trp Pro Pro  Ser Lys Glu Asn Ile  Val Ala Phe Ser Ile
                5500                5505                5510

gtt tat tgc ttg gga  aca tgc atc atc act  gct atc gtg tgt gtg        28747
Val Tyr Cys Leu Gly  Thr Cys Ile Ile Thr  Ala Ile Val Cys Val
                5515                5520                5525

tgc ata cac ttg ctt  ata gtc att cgc ccc  aga aac agc aat gag        28792
Cys Ile His Leu Leu  Ile Val Ile Arg Pro  Arg Asn Ser Asn Glu
                5530                5535                5540

gaa aaa gag aaa atg  ccc taacttttt cacaactttt tttcagccat             28840
Glu Lys Glu Lys Met  Pro
                5545

gccttcagct ttttttcttc ttactattgt tgctgttatt tccgcacaaa caatagtaga    28900

tgttccactt ggttctaact acacactaat aggtcctaca atccattcag aagttacctg    28960

gtgcaggctt aatactgaag actactataa tgtattttgt gatggggatg atgacattca    29020

agtaacctgt aacaaacaga atcttacact cattaatgtt accaaaagtt acaatggtta    29080

ctattatgga tatgatagat ctggcagtga atttaaaaat tacctggtac gaacaattcc    29140

acccattaca aacattaaaa tagagaaact ccaaatggat agtgacattt taagtaatct    29200

tacaatatcc cccaccacac catctgaaca aaacattcca agttcaatga ttgcaattat    29260

tgcggcggtg gcagtgggaa tggcaatcat aataacatgt atgattgttt atgcttgctg    29320

ctacaagaaa atcaggcgtg aaaaacaaga ttcactacta aattatgatt tttaacttct    29380

tattttaaca gaca atg att ttc att  aca gtt ctt ctt gcc  atc ttt aac    29430
                Met Ile Phe Ile  Thr Val Leu Leu Ala  Ile Phe Asn
                             5550                5555

tta cta  tca gcc tct cat ggg  cgc aca cat gtc act  cta act act       29475
Leu Leu  Ser Ala Ser His Gly  Arg Thr His Val Thr  Leu Thr Thr
    5560                5565                5570

ggt tcc  aca tac aca cta aaa  ggc cca gaa ggt cat  aat ggt gtt       29520
Gly Ser  Thr Tyr Thr Leu Lys  Gly Pro Glu Gly His  Asn Gly Val
    5575                5580                5585

att tgg  tgg aaa cta ttt gat  gat gga ggg ttt gtt  agt ccc tgc       29565
Ile Trp  Trp Lys Leu Phe Asp  Asp Gly Gly Phe Val  Ser Pro Cys
    5590                5595                5600
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agc aca  tct aat aga tat tta  tgt aat ggt aaa gac  cta act att       29610
Ser Thr  Ser Asn Arg Tyr Leu  Cys Asn Gly Lys Asp  Leu Thr Ile
    5605                 5610                 5615

att aat  gtc aca aaa cac gac  aat ggc tac tat tat  ggg acc aat       29655
Ile Asn  Val Thr Lys His Asp  Asn Gly Tyr Tyr Tyr  Gly Thr Asn
    5620                 5625                 5630

tat att  aca agt tta gat tac  acc att act gtc ata  tcg cct act       29700
Tyr Ile  Thr Ser Leu Asp Tyr  Thr Ile Thr Val Ile  Ser Pro Thr
    5635                 5640                 5645

aca cca  gca ccg cgc aaa atc  aca act ttc tct agc  agc agc gct       29745
Thr Pro  Ala Pro Arg Lys Ile  Thr Thr Phe Ser Ser  Ser Ser Ala
    5650                 5655                 5660

aaa aac  aca atc aaa att aat  aca act gct ata aaa  atg ctc caa       29790
Lys Asn  Thr Ile Lys Ile Asn  Thr Thr Ala Ile Lys  Met Leu Gln
    5665                 5670                 5675

aaa atg  gct tct aat tat acc  cca ccc gct acc aat  gcg ctt cct       29835
Lys Met  Ala Ser Asn Tyr Thr  Pro Pro Ala Thr Asn  Ala Leu Pro
    5680                 5685                 5690

aaa tca  att att gga ata att  gta gcg gcg gta gtg  ggg ctg gca       29880
Lys Ser  Ile Ile Gly Ile Ile  Val Ala Ala Val Val  Gly Leu Ala
    5695                 5700                 5705

att att  att tct tgc ata att  tat tat gcc tgc tgc  tat aga aaa       29925
Ile Ile  Ile Ser Cys Ile Ile  Tyr Tyr Ala Cys Cys  Tyr Arg Lys
    5710                 5715                 5720

ata aaa  gga gac ccc cta cta  agc ttt gat att taatttttt             29968
Ile Lys  Gly Asp Pro Leu Leu  Ser Phe Asp Ile
    5725                 5730

tcatagcacc atg  aaa ttc cta tgt gta  tta gct ttt tca gtt  ttt agc    30017
           Met  Lys Phe Leu Cys Val  Leu Ala Phe Ser Val  Phe Ser
           5735                 5740                 5745

ttt tgc aca  tcc acc ccc atc acc  att gtc aat gtg cag  act act       30062
Phe Cys Thr  Ser Thr Pro Ile Thr  Ile Val Asn Val Gln  Thr Thr
        5750                 5755                 5760

tta aat cat  gtt aat act aca aat  tac aca tct acc tcc  tat gca       30107
Leu Asn His  Val Asn Thr Thr Asn  Tyr Thr Ser Thr Ser  Tyr Ala
        5765                 5770                 5775

acc ata cat  acc cag ctt att cct  ttt tcc aca att aaa  gcc aat       30152
Thr Ile His  Thr Gln Leu Ile Pro  Phe Ser Thr Ile Lys  Ala Asn
        5780                 5785                 5790

cct cag act  aaa ttt gca cta caa  cta gaa atc act atc  cta att       30197
Pro Gln Thr  Lys Phe Ala Leu Gln  Leu Glu Ile Thr Ile  Leu Ile
        5795                 5800                 5805

gtg att gga  ata act att cta gct  gtt ctt ctt tat ttt  ata ttc       30242
Val Ile Gly  Ile Thr Ile Leu Ala  Val Leu Leu Tyr Phe  Ile Phe
        5810                 5815                 5820
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tgc cgc caa  ata ccc aat gtt cat  aaa aaa cca aaa aga  caa ccc       30287
Cys Arg Gln  Ile Pro Asn Val His  Lys Lys Pro Lys Arg  Gln Pro
        5825                5830                5835

att tat tgt  cct atg att agt aaa  cct cac ttg gcc tta  aat gaa       30332
Ile Tyr Cys  Pro Met Ile Ser Lys  Pro His Leu Ala Leu  Asn Glu
        5840                5845                5850

atc taaggtctat tcttttcttt tttacagtat ggtgatcacc aatc atg atc  cct    30388
Ile                                                   Met Ile  Pro
                                                          5855

aga aat ttc ttc  ttc acc ata ctc atc  tgt gct ttc aat gtc  tgt       30433
Arg Asn Phe Phe  Phe Thr Ile Leu Ile  Cys Ala Phe Asn Val  Cys
            5860                5865                5870

gct acc ttc acc  gca gta gcc act gca  acc cca gac tgt ata  gga       30478
Ala Thr Phe Thr  Ala Val Ala Thr Ala  Thr Pro Asp Cys Ile  Gly
            5875                5880                5885

gca ttt gct tcc  tat gta ctt ttt gcc  ttt gtt act tgc atc  tgc       30523
Ala Phe Ala Ser  Tyr Val Leu Phe Ala  Phe Val Thr Cys Ile  Cys
            5890                5895                5900

gtg tgt agc ata  gtc tgc ctg gtt att  aat ttt ttc caa ctt  gta       30568
Val Cys Ser Ile  Val Cys Leu Val Ile  Asn Phe Phe Gln Leu  Val
            5905                5910                5915

gac tgg atc ttt  gta cga att gcc tac  ctg cgt cac cat ccc  gaa       30613
Asp Trp Ile Phe  Val Arg Ile Ala Tyr  Leu Arg His His Pro  Glu
            5920                5925                5930

tac cgc aat caa  aat gtt gcg gca ctt  ctt agg ctt att taaaaccatg     30662
Tyr Arg Asn Gln  Asn Val Ala Ala Leu  Leu Arg Leu Ile
            5935                5940

caggctatgc taccagtcat tctaattctg ctgctaccct gcgttgcctt agctcccaca    30722

accactcgca ctccacctga acaacttaga aaatgcaaat ttcaacaacc atggtcattc    30782

cttgattgct accatgaaaa atctgatttt cccacatact ggatagtgat tgttggaata    30842

attaacatac tctcatgtac cttattctca ttcctaatat accccatatt tagttttggg    30902

tggaatgctc ccaatgcact gggttaccca caaattccag aggaacacat tgcactacag    30962

aacatgcaac agccactaga tctaatagat tatgaaaatg agccacagcc tccactactc    31022

cctgccatta gctacttcaa cctaaccggt ggag atg  act gat cag ctc aac       31074
                                     Met  Thr Asp Gln Leu Asn
                                     5945                5950

gcc tcc act gct gcc  gtg gat ctg ctt gac  atg gat ggc cgt acc       31119
Ala Ser Thr Ala Ala  Val Asp Leu Leu Asp  Met Asp Gly Arg Thr
                5955                5960                5965

tca gaa cag cgt ctc  gcc caa cta cgc ata  cgt cag caa cag gaa       31164
Ser Glu Gln Arg Leu  Ala Gln Leu Arg Ile  Arg Gln Gln Gln Glu
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                5970                5975                5980

cgt gcc gcc aag gag  ctc agg aat gcc atc  gag att cac cag tgt        31209
Arg Ala Ala Lys Glu  Leu Arg Asn Ala Ile  Glu Ile His Gln Cys
                5985                5990                5995

aaa aaa gga atc ttc  tgc ttg gta aaa caa  gcc aag att tcc tac        31254
Lys Lys Gly Ile Phe  Cys Leu Val Lys Gln  Ala Lys Ile Ser Tyr
                6000                6005                6010

gag atc act gct aat  gac cac cgt ctg tca  tat gag ctt gtt cag        31299
Glu Ile Thr Ala Asn  Asp His Arg Leu Ser  Tyr Glu Leu Val Gln
                6015                6020                6025

cag cga cag aaa ttc  act tgc atg gtg gga  atc aac ccc ata gta        31344
Gln Arg Gln Lys Phe  Thr Cys Met Val Gly  Ile Asn Pro Ile Val
                6030                6035                6040

atc acc cag caa tct  gga gat acc aag ggc  tgt atc cat tgt tcc        31389
Ile Thr Gln Gln Ser  Gly Asp Thr Lys Gly  Cys Ile His Cys Ser
                6045                6050                6055

tgt gac tcc acc gag  tgc atc tac acc ctg  ctg aag acc ctc tgc        31434
Cys Asp Ser Thr Glu  Cys Ile Tyr Thr Leu  Leu Lys Thr Leu Cys
                6060                6065                6070

ggc ctt cga gac ctc  cta ccc atg aac taatcaatgg cccttcccca           31481
Gly Leu Arg Asp Leu  Leu Pro Met Asn
                6075

attccaaaat agcaattaaa attatcaata aagatcactt acttgaaatc agcaataagg    31541

tttctgtcaa aattttctcc cagcagcacc tcactcccct cttcccaact ctggtactct    31601

aaacctcggc gggcggcata ctttctccac actttgaaag ggatgtcaaa ttttatttcc    31661

tcttctttgc ccacaatctt catttcttta tccccag atg  gcc aaa cgg gct        31713
                                          Met  Ala Lys Arg Ala
                                          6080

cgt  cta agc agc tcc ttc  aac ccg gtg tac ccc  tat gaa gac gag       31758
Arg  Leu Ser Ser Ser Phe  Asn Pro Val Tyr Pro  Tyr Glu Asp Glu
6085                6090                6095

agc  agc tca caa cac cca  ttt ata aac ccc ggc  ttc att tcc cct       31803
Ser  Ser Ser Gln His Pro  Phe Ile Asn Pro Gly  Phe Ile Ser Pro
6100                6105                6110

gat  ggc ttt aca caa agc  cca gac gga gtt cta  aca ctg aaa tgt       31848
Asp  Gly Phe Thr Gln Ser  Pro Asp Gly Val Leu  Thr Leu Lys Cys
6115                6120                6125

gtt  tcc cct ctt act acc  acc agt ggc gct cta  gac att aaa gtg       31893
Val  Ser Pro Leu Thr Thr  Thr Ser Gly Ala Leu  Asp Ile Lys Val
6130                6135                6140

gga  aga ggg ctt aaa gta  gat agc act gat ggt  tcc ctg gaa gaa       31938
Gly  Arg Gly Leu Lys Val  Asp Ser Thr Asp Gly  Ser Leu Glu Glu
6145                6150                6155
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aat  ata gac att aca gct  ccc ctc act aaa ttt  aac cac tca gta       31983
Asn  Ile Asp Ile Thr Ala  Pro Leu Thr Lys Phe  Asn His Ser Val
6160                6165                6170

gga  tta gca ttt ggc gac  ggt cta gaa aca aaa  gaa aac aag ctt       32028
Gly  Leu Ala Phe Gly Asp  Gly Leu Glu Thr Lys  Glu Asn Lys Leu
6175                6180                6185

tat  gta aaa ctt gga gat  gga ctt aaa ttt agc  tct ggc agt ata       32073
Tyr  Val Lys Leu Gly Asp  Gly Leu Lys Phe Ser  Ser Gly Ser Ile
6190                6195                6200

tac  att gac cat gat gtt  aac act tta tgg aca  gga gtc aat cca       32118
Tyr  Ile Asp His Asp Val  Asn Thr Leu Trp Thr  Gly Val Asn Pro
6205                6210                6215

agt  gct aac tgt ata att  aca gac aat gga gaa  acc aat gac agc       32163
Ser  Ala Asn Cys Ile Ile  Thr Asp Asn Gly Glu  Thr Asn Asp Ser
6220                6225                6230

aag  ctt acc cta ata ctt  gtt aag tca ggt gga  tta ata aat gct       32208
Lys  Leu Thr Leu Ile Leu  Val Lys Ser Gly Gly  Leu Ile Asn Ala
6235                6240                6245

tat  gtc tca tta atg ggt  gac tca gac aca gtc  aat aaa tta acc       32253
Tyr  Val Ser Leu Met Gly  Asp Ser Asp Thr Val  Asn Lys Leu Thr
6250                6255                6260

aca  gaa aaa agt gct caa  att acc gtt gac ata  tac ttt gat aat       32298
Thr  Glu Lys Ser Ala Gln  Ile Thr Val Asp Ile  Tyr Phe Asp Asn
6265                6270                6275

caa  gga aaa gtt ctt act  gaa cta tcg gcc ctt  aaa aca gat ctt       32343
Gln  Gly Lys Val Leu Thr  Glu Leu Ser Ala Leu  Lys Thr Asp Leu
6280                6285                6290

aaa  cat aaa ttt ggt caa  aac atg gct tct agc  gaa gta tca aac       32388
Lys  His Lys Phe Gly Gln  Asn Met Ala Ser Ser  Glu Val Ser Asn
6295                6300                6305

tgc  aaa ggc ttt atg cca  agc tta aat gca tac  cca ttc aga aat       32433
Cys  Lys Gly Phe Met Pro  Ser Leu Asn Ala Tyr  Pro Phe Arg Asn
6310                6315                6320

cca  act aaa cct acc aaa  gga aga gaa gac tac  att tat gga ata       32478
Pro  Thr Lys Pro Thr Lys  Gly Arg Glu Asp Tyr  Ile Tyr Gly Ile
6325                6330                6335

act  tac tat caa gcc aca  gat ggt aat ctc tat  gag cta aaa act       32523
Thr  Tyr Tyr Gln Ala Thr  Asp Gly Asn Leu Tyr  Glu Leu Lys Thr
6340                6345                6350

act  att act cta aac cac  agt gtc att agt tct  cta tgt gca tat       32568
Thr  Ile Thr Leu Asn His  Ser Val Ile Ser Ser  Leu Cys Ala Tyr
6355                6360                6365

gca  atg cac att tca tgg  tca tgg gac acc gta  aca gag cca gag       32613
Ala  Met His Ile Ser Trp  Ser Trp Asp Thr Val  Thr Glu Pro Glu
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6370                6375                6380

aca  aca ccc act act ctt  att acc tcc ccc ttc  tcc ttt tcc tat      32658
Thr  Thr Pro Thr Thr Leu  Ile Thr Ser Pro Phe  Ser Phe Ser Tyr
6385                6390                6395

atc  aga gaa gat gac tgacaacaaa aaataaagtt caaaattttt tattgaaaat    32713
Ile  Arg Glu Asp Asp
6400

cagtttacag gattcgagta gttattttgc ctccccttc ccatttcata gtatacacca    32773

atctctcccc ccgcacagct tggaacattt ggattccatt tgagatagtc atggatctag    32833

attctacatt ccacacagtt tcagagctag ctaatcttgg atcagtgata gatataaacc    32893

catcgggaaa gtccttcatg gtggtttcac agtccagttg ctgaggttgc ggctccggag    32953

tctggatcag agtcatctgg aagaagaacg atgggagtca taatccgaga acgggatcgg    33013

gcggttgtgt ctcatcaaac cccgaagcag tcgctgtctg cgccgctccg tgcgactgct    33073

gctgatggga tctgggtcca cagtctctcg aatcatgatt ttaatagccc tcagcattaa    33133

catcctggtg cgatgcgcac agcaccgcat tctaatctca cttaggtcac tgcagtaggt    33193

acagcacatc acaataatgt tgttcaacag gccataatta aaggcgctcc agccaaaact    33253

catctcaggg acaattgcta cagcgtggcc atcgtaccaa atcctgaggt aaatcaaatg    33313

gcgccccctc cagaacacac tgcccacata catgatctcc ttgggcatgt gcagattcac    33373

aatttctcgg taccatggac agcgctggtt tatcatgcag ccctgaataa ctttcctgaa    33433

ccaaatggcc agcactgctc ccccagcaat acattgaaga gaaccctgct gattacaatg    33493

acaatggaga acccacttct ctcgcccatg aaccacttgg gaataaaata tatctatatt    33553

ggcacagcac aagcatatat gcatacatct cctcatcacc cttaactctt caggggttaa    33613

aaccatatcc cagggaatag gaagctcttg caaaacagtg aaaccggcag aacaaggaag    33673

accacgaaca taacttacac tatgcatggt cagggtatta caatctggca acagcgggtg    33733

gtcctcggtc atagaagccc tggtctcatt ttcctcacag cgtggtaaag gggccctcat    33793

gcgaggatcc ctggtgtaag gttggtgcct ggcgcacgat gtcgagcgtg cacgcgacct    33853

cgttgtaatg gaggctcttc ctgacattct cgtattttgc agcgcaaaac ctggtcttag    33913

cacagcagac ttctcttcgc cttctatctc gtcgcctagc gcgttcagtg tggtaattga    33973

agtacagcca ttcccgcaga ttggtcaaaa gatcctcggc ctcagttgtc atgaaaactc    34033

catcatatct gatcgctcta ataaaatcat tcacggtaga caatgcaatt cccaaccaag    34093

caatgcaatt agcttgagtt tcgatcaggg gtgggggagg aagagatgga agaaccataa    34153

ttaattttta ttccaaacgg tcccgtagta cttcaaaatg cagatcgcgg agatggcacc    34213
```

tctcgccccc actgtgttga tgaaaaatga cagctaggtc aaacatgatg cgattttcaa 34273

ggtgctcaac ggtggcttca agcaaagcct ccactctcac atccaaaaac aaaagaatag 34333

caaaagcagg agcatgttct aattcctcaa tcatcatatt acattcctgt accattccca 34393

ggtaattttc atctttccag ccttgtatta ttcgtgttaa ttcttgttgt aaatccaatc 34453

cacacataag aaagagctcc cggagagcac cctccaccgg cattcttaaa cacaccctca 34513

tagtgaaaaa atatcgtgct cctctgtcac ctgcagcaaa ttgagaatgg caacatcaaa 34573

ctgaatgcca ttggctctaa gttcatctct aagttcaagt tgtaaatact ctttcatatc 34633

atcgccaaac tgcttggcca taggtccgcc aggaataaga gcgggggacg ctacagtgca 34693

gaacaagcga agacctcccc aattgcctcc agcaaaagtg aggttacaat aagcatactg 34753

agaacctcca gtgatatcat ccagtgtact ggaaagataa tcaggcagag cttctcgtat 34813

aaaattaata atagaaaagt tgtccagatg aacatttaaa gactgtggga tgcagatgca 34873

ataagttatc gcgctgcgtt ccagcattgt tagtatggtt agtctgtaaa aacaaaaaga 34933

gtaaaaaatt acatcacgct agcctggcga acgggtggat aaatcactct ctccaacacc 34993

aggcaggcta cagggtctcc agcgcgaccc tcgtaaaacc tgtccgtatg attaaaaagc 35053

aacaccgaaa gactttgctg atggccagca tggatgattt gtgaggaagc atacaatcca 35113

gaagtgttag tatcagttaa agaaaaaaat cggccaatat agcatctagg aacaattatg 35173

ctcaatctca aatgcagcaa agcgacacct cgtggatgca aagtaaaatc cacaggcgca 35233

taaaaataat acatattccc ctcttgcaca ggcagtgtag ctcccggccc ctccaaaaac 35293

acatacaaag cttcagcagc catagcttac cgcgcaagtc aggcagagca gacagataat 35353

gggatagctc taaactgtct gcccagcctg tgcgcaatat atagagaacc cttacactga 35413

cgtaattggg caaagtctaa aaaatcccgc caaaaaccag cacacgccca gaaactatgt 35473

cacccgctaa aaaaataatt ttcacttcct cgttccgtga gtgacgtcag ttcctctttc 35533

ccacgtgtcg tcactgccgg gtatcttgca acgtcaccac cccgcgccgg cccgcccccc 35593

ttgaccgttg aacccgtagc caatcccctt ccgccctcca ttttcaaaag ctcatttgca 35653

tgttggcacc gttccattta taaggtatat tattgatgat g 35694

<210> 135
<211> 495
<212> PRT
<213> Simian adenovirus 33

<400> 135

```
Met Asp Pro Pro Asn Pro Leu Gln Gln Gly Ile Arg Phe Gly Phe His
1               5                  10                  15

Ser Ser Ser Phe Val Glu Asn Met Glu Gly Ser Gln Asp Glu Asp Asn
            20                  25                  30

Leu Arg Leu Leu Ala Ser Ala Ala Ser Gly Arg Ser Arg Asp Pro Glu
        35                  40                  45

Thr Pro Thr Gly His Ala Ser Gly Ser Gly Gly Gly Ala Ala Gly Gly
    50                  55                  60

Gln Ser Glu Ser Arg Pro Gly Pro Ser Gly Gly Gly Gly Gly Gly Val
65                  70                  75                  80

Ala Asp Leu Phe Pro Glu Leu Arg Arg Val Leu Thr Arg Ser Thr Ser
                85                  90                  95

Ser Gly Gln Asp Arg Gly Ile Lys Arg Glu Arg Asn Pro Ser Gly His
            100                 105                 110

Asn Ser Arg Thr Glu Leu Ala Leu Ser Leu Met Ser Arg Arg Arg Pro
        115                 120                 125

Glu Thr Val Trp Trp His Glu Val Gln Ser Glu Gly Arg Asp Glu Val
    130                 135                 140

Ser Ile Leu Gln Glu Lys Tyr Ser Leu Glu Gln Leu Lys Thr Cys Trp
145                 150                 155                 160

Leu Glu Pro Glu Asp Asp Trp Glu Val Ala Ile Gly Asn Tyr Ala Lys
                165                 170                 175

Ile Ser Leu Arg Pro Asp Lys Gln Tyr Arg Ile Thr Lys Lys Ile Asn
            180                 185                 190

Ile Arg Asn Ala Cys Tyr Ile Ser Gly Asn Gly Ala Glu Val Ile Ile
        195                 200                 205

Asp Thr Gln Asp Lys Ala Ala Phe Arg Cys Cys Met Met Gly Met Trp
    210                 215                 220

Pro Gly Val Val Gly Met Glu Ala Val Thr Leu Met Asn Ile Arg Phe
225                 230                 235                 240
```

```
Arg Gly Asp Gly Tyr Asn Gly Ile Val Phe Met Ala Asn Thr Lys Leu
                245                 250                 255

Ile Leu His Gly Cys Ser Phe Phe Gly Phe Asn Asn Thr Cys Val Glu
            260                 265                 270

Ala Trp Gly Gln Val Ser Val Arg Gly Cys Ser Phe Tyr Ala Cys Trp
        275                 280                 285

Ile Ala Thr Ser Gly Arg Val Lys Ser Gln Leu Ser Val Lys Lys Cys
    290                 295                 300

Met Phe Glu Arg Cys Asn Leu Gly Ile Leu Asn Glu Gly Glu Ala Arg
305                 310                 315                 320

Val Arg His Cys Ala Ala Thr Glu Thr Gly Cys Phe Ile Leu Ile Lys
                325                 330                 335

Gly Asn Ala Ser Val Lys His Asn Met Ile Cys Gly Pro Ser Asp Glu
            340                 345                 350

Arg Pro Tyr Gln Met Leu Thr Cys Ala Gly Gly His Cys Asn Met Leu
        355                 360                 365

Ala Thr Val His Ile Val Ser His Ala Arg Lys Lys Trp Pro Val Phe
    370                 375                 380

Glu His Asn Val Met Thr Lys Cys Thr Met His Ile Gly Gly Arg Arg
385                 390                 395                 400

Gly Met Phe Met Pro Tyr Gln Cys Asn Met Asn His Val Lys Val Met
                405                 410                 415

Leu Glu Pro Asp Ala Phe Ser Arg Met Ser Leu Thr Gly Ile Phe Asp
            420                 425                 430

Met Asn Val Gln Leu Trp Lys Ile Leu Arg Tyr Asp Asp Thr Lys Ser
        435                 440                 445

Arg Val Arg Ala Cys Glu Cys Gly Gly Lys His Ala Arg Phe Gln Pro
    450                 455                 460

Val Cys Val Asp Val Thr Glu Asp Leu Arg Pro Asp His Leu Val Leu
465                 470                 475                 480
```

```
Ala Cys Thr Gly Ala Glu Phe Gly Ser Ser Gly Glu Glu Thr Asp
                485                 490                 495


<210>  136
<211>  138
<212>  PRT
<213>  Simian adenovirus 33

<400>  136

Met Ser Gly Ser Ala Ser Phe Glu Gly Gly Val Phe Ser Pro Tyr Leu
1               5                   10                  15


Thr Gly Arg Leu Pro Pro Trp Ala Gly Val Arg Gln Asn Val Met Gly
            20                  25                  30


Ser Thr Val Asp Gly Arg Pro Val Gln Pro Ala Asn Ser Ser Thr Leu
        35                  40                  45


Thr Tyr Ala Thr Leu Ser Ser Ser Pro Leu Asp Ala Ala Ala Ala Ala
    50                  55                  60


Ala Ala Ser Ala Ala Ala Asn Thr Val Leu Gly Met Gly Tyr Tyr Gly
65                  70                  75                  80


Ser Ile Val Ala Asn Ser Ser Ser Ser Asn Asn Pro Ser Thr Leu Ala
                85                  90                  95


Glu Asp Lys Leu Leu Val Leu Leu Ala Gln Leu Glu Ala Leu Thr Gln
            100                 105                 110


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


Glu Ser Ala Val Ala Thr Ala Lys Ser Lys
    130                 135


<210>  137
<211>  390
<212>  PRT
<213>  Simian adenovirus 33

<400>  137

Met His Pro Val Leu Arg Gln Met Arg Pro Gln Gln Gln Ala Pro Ser
1               5                   10                  15
```

```
Gln Gln Gln Gln Leu Gln Gln Gln Pro Gln Lys Ala Leu Pro Ala Pro
            20                  25                  30

Ala Thr Thr Ala Ala Ala Ala Val Ser Gly Ala Gly Gln Pro Ala Tyr
        35                  40                  45

Asp Leu Asp Leu Glu Glu Gly Glu Gly Leu Ala Arg Leu Gly Ala Pro
    50                  55                  60

Ser Pro Glu Arg His Pro Arg Val Gln Leu Lys Lys Asp Ser Arg Glu
65                  70                  75                  80

Ala Tyr Val Pro His Gln Asn Leu Phe Arg Asp Arg Ser Gly Glu Glu
                85                  90                  95

Pro Glu Glu Met Arg Ala Ser Arg Phe Asn Ala Gly Arg Glu Leu Arg
            100                 105                 110

His Gly Leu Asp Arg Arg Arg Val Leu Arg Asp Glu Asp Phe Glu Val
        115                 120                 125

Asp Glu Ala Thr Gly Ile Ser Ser Ala Arg Ala His Val Ala Ala Ala
    130                 135                 140

Asn Leu Val Ser Ala Tyr Glu Gln Thr Val Lys Glu Glu Arg Asn Phe
145                 150                 155                 160

Gln Lys Ser Phe Asn Asn His Val Arg Thr Leu Ile Ala Arg Glu Glu
                165                 170                 175

Val Thr Leu Gly Leu Met His Leu Trp Asp Leu Met Glu Ala Ile Thr
            180                 185                 190

Gln Asn Pro Thr Ser Lys Pro Leu Thr Ala Gln Leu Phe Leu Val Val
        195                 200                 205

Gln His Ser Arg Asp Asn Glu Ala Phe Arg Glu Ala Leu Leu Asn Ile
    210                 215                 220

Thr Glu Pro Glu Gly Arg Trp Leu Tyr Asp Leu Ile Asn Ile Leu Gln
225                 230                 235                 240

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

```
Ala Ile Asn Tyr Ser Val Leu Ser Leu Gly Lys Tyr Tyr Ala Arg Lys
            260                 265                 270

Ile Tyr Lys Thr Pro Tyr Val Pro Ile Asp Lys Glu Val Lys Ile Asp
        275                 280                 285

Gly Phe Tyr Met Arg Met Thr Leu Lys Val Leu Thr Leu Ser Asp Asp
    290                 295                 300

Leu Gly Val Tyr Arg Asn Asp Arg Met His Arg Ala Val Ser Ala Ser
305                 310                 315                 320

Arg Arg Arg Glu Leu Ser Asp Arg Glu Leu Met His Ser Leu Gln Arg
                325                 330                 335

Ala Leu Thr Gly Ala Gly Thr Glu Gly Glu Asn Tyr Phe Asp Met Gly
            340                 345                 350

Ala Asp Leu Gln Trp Gln Pro Ser Arg Arg Ala Leu Glu Ala Ala Gly
        355                 360                 365

Cys Glu Leu Pro Tyr Ile Glu Glu Val Asp Glu Gly Glu Asp Glu Glu
    370                 375                 380

Gly Glu Tyr Leu Glu Asp
385                 390


<210>  138
<211>  588
<212>  PRT
<213>  Simian adenovirus 33

<400>  138

Met Glu Gln Gln Gln Ala Pro Asp Pro Ala Met Arg Ala Ala Leu Gln
1               5                   10                  15

Ser Gln Pro Ser Gly Ile Asn Ser Ser Asp Asp Trp Thr Gln Ala Met
            20                  25                  30

Gln Arg Ile Met Ala Leu Thr Thr Arg Asn Pro Glu Ala Phe Arg Gln
        35                  40                  45

Gln Pro Gln Ala Asn Arg Leu Ser Ala Ile Leu Glu Ala Val Val Pro
    50                  55                  60
```

```
Ser Arg Ser Asn Pro Thr His Glu Lys Val Leu Ala Ile Val Asn Ala
65                  70                  75                  80

Leu Val Glu Asn Lys Ala Ile Arg Pro Asp Glu Ala Gly Leu Val Tyr
                85                  90                  95

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

Thr Asn Leu Asp Arg Met Val Ser Asp Val Arg Glu Ala Val Ser Gln
        115                 120                 125

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

Asn Ala Phe Leu Ser Thr Gln Pro Ala Asn Val Pro Arg Gly Gln Gln
145                 150                 155                 160

Asp Tyr Thr Asn Phe Leu Ser Ala Leu Arg Leu Met Val Ala Glu Val
                165                 170                 175

Pro Gln Ser Glu Val Tyr Gln Ser Gly Pro Asp Tyr Phe Phe Gln Thr
            180                 185                 190

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

Leu Lys Gly Leu Trp Gly Val His Ala Pro Val Gly Asp Arg Ala Thr
    210                 215                 220

Val Ser Ser Leu Leu Thr Pro Asn Ser Arg Leu Leu Leu Leu Leu Val
225                 230                 235                 240

Ser Pro Phe Thr Asp Ser Gly Ser Ile Asp Arg Asn Ser Tyr Leu Gly
                245                 250                 255

Tyr Leu Leu Asn Leu Tyr Arg Glu Ala Ile Gly Gln Ser Gln Val Asp
            260                 265                 270

Glu Gln Thr Tyr Gln Glu Ile Thr Gln Val Ser Arg Ala Leu Gly Gln
        275                 280                 285

Glu Asp Thr Gly Ser Leu Glu Ala Thr Leu Asn Phe Leu Leu Thr Asn
```

```
    290                 295                 300

Arg Ser Gln Lys Ile Pro Pro Gln Tyr Ala Leu Thr Ala Glu Glu Glu
305                 310                 315                 320

Arg Ile Leu Arg Tyr Val Gln Gln Ser Val Gly Leu Phe Leu Met Gln
                325                 330                 335

Glu Gly Ala Thr Pro Thr Ala Ala Leu Asp Met Thr Ala Arg Asn Met
            340                 345                 350

Glu Pro Ser Met Tyr Ala Ser Asn Arg Pro Phe Ile Asn Lys Leu Leu
        355                 360                 365

Asp Tyr Leu His Arg Ala Ala Ala Met Asn Ser Asp Tyr Phe Thr Asn
    370                 375                 380

Ala Ile Leu Asn Pro His Trp Leu Pro Pro Pro Gly Phe Tyr Thr Gly
385                 390                 395                 400

Glu Tyr Asp Met Pro Asp Pro Asn Asp Gly Phe Leu Trp Asp Asp Val
                405                 410                 415

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

Glu Gly Gly Asp Arg Arg His Ser Ser Val Ser Leu Ser Gly Thr Ala
        435                 440                 445

Gly Ala Ala Ala Ala Val Pro Glu Ala Ala Ser Pro Phe Pro Ser Leu
    450                 455                 460

Pro Phe Ser Leu Asn Ser Val Arg Ser Ser Glu Leu Gly Arg Ile Thr
465                 470                 475                 480

Arg Pro Arg Leu Met Gly Glu Asp Glu Tyr Leu Asn Asp Ser Leu Leu
                485                 490                 495

Arg Pro Glu Arg Glu Lys Asn Phe Pro Asn Asn Gly Ile Glu Ser Leu
            500                 505                 510

Val Asp Lys Met Ser Arg Trp Lys Thr Tyr Ala Gln Asp His Arg Asp
        515                 520                 525
```

```
Glu Pro Arg Ile Leu Gly Ala Thr Ser Gly Ala Thr Arg Arg Arg Gln
    530                 535                 540

Arg His Asp Arg Gln Arg Gly Leu Val Trp Asp Asp Glu Asp Ser Ala
545                 550                 555                 560

Asp Asp Ser Ser Val Leu Asp Leu Gly Gly Arg Gly Val Gly Asn Pro
                565                 570                 575

Phe Ala His Leu Arg Pro Arg Phe Gly Arg Met Leu
            580                 585
```

<210> 139
<211> 571
<212> PRT
<213> Simian adenovirus 33

<400> 139

```
Met Met Arg Arg Arg Ala Val Leu Gly Gly Ala Val Val Tyr Pro Glu
1               5                   10                  15

Gly Pro Pro Pro Ser Tyr Glu Ser Val Met Gln Gln Gln Ala Ala Ala
            20                  25                  30

Ala Met Met Gln Pro Pro Leu Glu Ala Pro Phe Val Pro Pro Arg Tyr
        35                  40                  45

Leu Ala Pro Thr Glu Gly Arg Asn Ser Ile Arg Tyr Ser Glu Leu Ser
    50                  55                  60

Pro Gln Tyr Asp Thr Thr Lys Leu Tyr Leu Val Asp Asn Lys Ser Ala
65                  70                  75                  80

Asp Ile Ala Ser Leu Asn Tyr Gln Asn Asp His Ser Asn Phe Leu Thr
                85                  90                  95

Thr Val Val Gln Asn Asn Asp Phe Thr Pro Thr Glu Ala Ser Thr Gln
            100                 105                 110

Thr Ile Asn Phe Asp Glu Arg Ser Arg Trp Gly Gly Gln Leu Lys Thr
        115                 120                 125

Ile Met His Thr Asn Met Pro Asn Val Asn Glu Tyr Met Phe Ser Asn
    130                 135                 140
```

```
Lys Phe Lys Ala Arg Val Met Val Ser Arg Lys Ala Pro Glu Gly Val
145                 150                 155                 160

Thr Val Asp Asp Lys Tyr Asp His Lys Gln Asp Ile Leu Lys Tyr Glu
                165                 170                 175

Trp Phe Glu Phe Thr Leu Pro Glu Gly Asn Phe Ser Ala Thr Met Thr
            180                 185                 190

Ile Asp Leu Met Asn Asn Ala Ile Ile Asp Asn Tyr Leu Gly Val Gly
        195                 200                 205

Arg Gln Asn Gly Val Leu Glu Ser Asp Ile Gly Val Lys Phe Asp Thr
    210                 215                 220

Arg Asn Phe Arg Leu Gly Trp Asp Pro Glu Thr Lys Leu Ile Met Pro
225                 230                 235                 240

Gly Val Tyr Thr Tyr Glu Ala Phe His Pro Asp Ile Val Leu Leu Pro
                245                 250                 255

Gly Cys Gly Val Asp Phe Thr Glu Ser Arg Leu Ser Asn Leu Leu Gly
            260                 265                 270

Ile Arg Lys Arg His Pro Phe Gln Glu Gly Phe Lys Ile Met Tyr Glu
        275                 280                 285

Asp Leu Glu Gly Gly Asn Ile Pro Ala Leu Leu Asp Val Thr Ala Tyr
    290                 295                 300

Glu Glu Ser Lys Lys Asp Thr Thr Thr Glu Thr Gly Glu Lys Ala Val
305                 310                 315                 320

Val Glu Ser Glu Thr Glu Ala Met Thr Glu Thr Thr Thr Leu Ala Val
                325                 330                 335

Ala Glu Glu Thr Ser Glu Asp Asp Asn Ile Thr Arg Gly Asp Thr Tyr
            340                 345                 350

Ile Thr Glu Lys Gln Lys Arg Glu Ala Ala Ala Ala Glu Ala Glu Leu
        355                 360                 365

Leu Leu Met Ala Glu Val Lys Lys Glu Leu Lys Ile Gln Pro Leu Glu
    370                 375                 380
```

```
Lys Asp Ser Lys Ser Arg Ser Tyr Asn Val Leu Glu Asp Lys Ile Asn
385                 390                 395                 400

Thr Ala Tyr Arg Ser Trp Tyr Leu Ser Tyr Asn Tyr Gly Asp Pro Glu
                405                 410                 415

Lys Gly Ile Arg Ser Trp Thr Leu Leu Thr Thr Ser Asp Val Thr Cys
            420                 425                 430

Gly Ala Glu Gln Val Tyr Trp Ser Leu Pro Asp Met Met Gln Asp Pro
        435                 440                 445

Val Thr Phe Arg Ser Thr Arg Gln Val Asn Asn Tyr Pro Val Val Gly
    450                 455                 460

Ala Glu Leu Met Pro Val Phe Ser Lys Ser Phe Tyr Asn Glu Gln Ala
465                 470                 475                 480

Val Tyr Ser Gln Gln Leu Arg Gln Ser Thr Ser Leu Thr His Val Phe
                485                 490                 495

Asn Arg Phe Pro Glu Asn Gln Ile Leu Ile Arg Pro Pro Ala Pro Thr
            500                 505                 510

Ile Thr Thr Val Ser Glu Asn Val Pro Ala Leu Thr Asp His Gly Thr
        515                 520                 525

Leu Pro Leu Arg Ser Ser Ile Arg Gly Val Gln Arg Val Thr Val Thr
    530                 535                 540

Asp Ala Arg Arg Arg Thr Cys Pro Tyr Val Tyr Lys Ala Leu Gly Ile
545                 550                 555                 560

Val Ala Pro Arg Val Leu Ser Ser Arg Thr Phe
                565                 570
```

<210> 140
<211> 191
<212> PRT
<213> Simian adenovirus 33

<400> 140

```
Met Ser Ile Leu Ile Ser Pro Ser Asn Asn Thr Gly Trp Gly Leu Arg
1               5                   10                  15
```

```
Ala Pro Thr Lys Met Tyr Gly Gly Ala Arg Lys Arg Ser Thr Gln His
            20                  25                  30

Pro Val Arg Val Arg Gly His Phe Arg Ala Pro Trp Gly Ala Leu Lys
        35                  40                  45

Gly Arg Thr Arg Thr Arg Thr Thr Val Asp Asp Val Ile Asp Gln Val
    50                  55                  60

Val Ala Asp Ala Arg Asn Tyr Thr Pro Thr Ala Pro Thr Ser Thr Val
65                  70                  75                  80

Asp Ala Val Ile Asp Ser Val Val Ala Asn Ala Arg Ala Tyr Ala Arg
                85                  90                  95

Arg Lys Ser Arg Arg Arg Arg Ile Ala Arg Arg His Arg Ala Thr Pro
            100                 105                 110

Ala Met Arg Ala Ala Arg Ala Leu Leu Arg Arg Ala Lys Arg Val Gly
        115                 120                 125

Arg Arg Ala Met Leu Arg Ala Ala Arg Arg Ala Ala Ser Gly Ala Ser
    130                 135                 140

Ser Gly Arg Ser Arg Arg Arg Ala Ala Thr Ala Ala Ala Ala Ala Ile
145                 150                 155                 160

Ala Asn Met Ala Gln Pro Arg Arg Gly Asn Val Tyr Trp Val Arg Asp
                165                 170                 175

Ala Ser Gly Gln Arg Val Pro Val Arg Thr Arg Pro Pro Arg Thr
            180                 185                 190
```

<210> 141
<211> 350
<212> PRT
<213> Simian adenovirus 33

<400> 141

```
Met Ser Lys Arg Lys Tyr Lys Glu Glu Met Leu Gln Val Ile Ala Pro
1               5                   10                  15

Glu Ile Tyr Gly Pro Pro Val Lys Asp Glu Lys Lys Pro Arg Lys Ile
            20                  25                  30
```

```
Lys Arg Val Lys Lys Asp Lys Lys Glu Glu Asp Gly Asp Asp Gly Leu
        35                  40                  45

Val Glu Phe Val Arg Glu Phe Ala Pro Arg Arg Arg Val Gln Trp Arg
    50                  55                  60

Gly Arg Lys Val Arg Gln Val Leu Arg Pro Gly Thr Thr Val Val Phe
65                  70                  75                  80

Thr Pro Gly Glu Arg Ser Ser Ser Thr Phe Lys Arg Ser Tyr Asp Glu
                85                  90                  95

Val Tyr Gly Asp Asp Asp Ile Leu Glu Gln Ala Ala Asp Arg Leu Gly
            100                 105                 110

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

Val Ser Ile Pro Leu Asp His Gly Asn Pro Thr Pro Ser Leu Lys Pro
    130                 135                 140

Val Thr Leu Gln Gln Val Leu Pro Val Pro Pro Arg Arg Gly Val Lys
145                 150                 155                 160

Arg Glu Gly Glu Asp Leu Tyr Pro Thr Met Gln Leu Met Val Pro Lys
                165                 170                 175

Arg Gln Arg Leu Glu Asp Val Leu Glu Lys Met Lys Val Asp Pro Asp
            180                 185                 190

Ile Gln Pro Glu Val Lys Val Arg Pro Ile Lys Glu Val Ala Pro Gly
        195                 200                 205

Leu Gly Val Gln Thr Val Asp Ile Lys Ile Pro Thr Glu Ser Met Glu
    210                 215                 220

Val Gln Thr Glu Pro Ala Lys Pro Thr Ala Thr Ser Ile Glu Val Gln
225                 230                 235                 240

Thr Asp Pro Trp Met Pro Ala Pro Val Ala Ala His Ser Thr Thr Arg
                245                 250                 255

Arg Pro Arg Arg Lys Tyr Gly Pro Ala Ser Leu Leu Met Pro Asn Tyr
            260                 265                 270
```

```
Ala Leu His Pro Ser Ile Ile Pro Thr Pro Gly Tyr Arg Gly Thr Arg
        275                 280                 285

Tyr Tyr Arg Ser Arg Ser Ser Thr Ser Arg Arg Arg Lys Thr Pro Ala
    290                 295                 300

Ser Arg Thr Arg Arg Arg Arg Arg Arg Thr Thr Ala Ser Lys Leu Thr
305                 310                 315                 320

Pro Ala Ala Leu Val Arg Arg Val Tyr Arg Asp Gly Arg Ala Glu Pro
                325                 330                 335

Leu Thr Leu Pro Arg Ala Arg Tyr His Pro Ser Ile Thr Thr
            340                 345                 350
```

<210> 142
<211> 75
<212> PRT
<213> Simian adenovirus 33

<400> 142

```
Met Ala Leu Thr Cys Arg Leu Arg Val Pro Ile Thr Gly Tyr Arg Gly
1               5                   10                  15

Arg Asn Ser Arg Arg Arg Arg Met Leu Gly Arg Gly Met Arg Arg His
            20                  25                  30

Arg Arg Arg Arg Ala Ile Ser Lys Arg Leu Gly Gly Gly Phe Leu Pro
        35                  40                  45

Ala Leu Ile Pro Ile Ile Ala Ala Ala Ile Gly Ala Ile Pro Gly Ile
    50                  55                  60

Ala Ser Val Ala Val Gln Ala Ser Gln Arg His
65                  70                  75
```

<210> 143
<211> 250
<212> PRT
<213> Simian adenovirus 33

<400> 143

```
Met Glu Asp Ile Asn Phe Ser Ser Leu Ala Pro Arg His Gly Thr Arg
1               5                   10                  15
```

```
Pro Tyr Met Gly Thr Trp Ser Asp Ile Gly Thr Ser Gln Leu Asn Gly
            20                  25                  30

Gly Ala Phe Asn Trp Ser Ser Ile Trp Ser Gly Leu Lys Asn Phe Gly
        35                  40                  45

Ser Thr Ile Lys Thr Tyr Gly Asn Lys Ala Trp Asn Ser Ser Thr Gly
    50                  55                  60

Gln Ala Leu Arg Asn Lys Leu Lys Glu Gln Asn Phe Gln Gln Lys Val
65                  70                  75                  80

Val Asp Gly Ile Ala Ser Gly Ile Asn Gly Val Val Asp Leu Ala Asn
                85                  90                  95

Gln Ala Val Gln Lys Gln Ile Asn Ser Arg Leu Asp Pro Pro Pro Ala
            100                 105                 110

Ala Pro Gly Glu Met Glu Val Glu Glu Glu Leu Pro Pro Leu Glu Lys
        115                 120                 125

Arg Gly Asp Lys Arg Pro Arg Pro Asp Leu Glu Glu Thr Leu Val Thr
    130                 135                 140

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

Pro Thr Thr Lys Pro Ile Ala Pro Met Ala Thr Gly Val Met Lys Pro
                165                 170                 175

Ser Gln Ser His Arg Pro Ala Thr Leu Asp Leu Pro Pro Pro Pro Ala
            180                 185                 190

Ala Ala Ala Pro Val Pro Lys Pro Val Ala Thr Arg Lys Pro Thr Ala
        195                 200                 205

Ala Gln Pro Val Ala Val Ala Arg Pro Arg Pro Gly Gly Thr Pro Arg
    210                 215                 220

Pro Asn Ala Asn Trp Gln Ser Thr Leu Asn Ser Ile Val Gly Leu Gly
225                 230                 235                 240

Val Gln Ser Val Lys Arg Arg Arg Cys Phe
                245                 250
```

<210> 144
<211> 951
<212> PRT
<213> Simian adenovirus 33

<400> 144

```
Met Ala Thr Pro Ser Met Leu Pro Gln Trp Ala Tyr Met His Ile Ala
1               5                  10                  15

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

Arg Ala Thr Asp Thr Tyr Phe Asn Leu Gly Asn Lys Phe Arg Asn Pro
        35                  40                  45

Thr Val Ala Pro Thr His Asp Val Thr Thr Asp Arg Ser Gln Arg Leu
    50                  55                  60

Met Leu Arg Phe Val Pro Val Asp Arg Glu Asp Asn Thr Tyr Ser Tyr
65                  70                  75                  80

Lys Val Arg Tyr Thr Leu Ala Val Gly Asp Asn Arg Val Leu Asp Met
                85                  90                  95

Ala Ser Thr Phe Phe Asp Ile Arg Gly Val Leu Asp Arg Gly Pro Ser
            100                 105                 110

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

Ala Pro Asn Thr Cys Gln Trp Ile Ala Lys Gly Ala Pro Val Thr Asp
    130                 135                 140

Gln Asp Asn Glu Glu Gln Glu Leu Thr Asp Val Thr Tyr Ala Phe Gly
145                 150                 155                 160

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

Val Gly Leu Glu Ile Thr Glu Asp Glu Gln Lys Ser Ile Tyr Ala Asp
            180                 185                 190

Lys Leu Tyr Gln Pro Glu Pro Gln Ile Gly Asp Glu Gln Trp His Asp
        195                 200                 205
```

```
Thr Thr Gly Thr Asn Glu Gln Tyr Gly Gly Arg Ala Leu Lys Pro Ala
    210                 215                 220

Thr Asn Met Lys Pro Cys Tyr Gly Ser Phe Ala Arg Pro Thr Asn Lys
225                 230                 235                 240

Lys Gly Gly Gln Ala Lys Thr Arg Lys Ile Glu Lys Glu Glu Asn Gly
                245                 250                 255

Val Lys Thr Val Thr Glu Glu Ala Asp Ile Asp Met Asp Phe Tyr Asp
            260                 265                 270

Leu Arg Ser Gln Arg Ala Asn Phe Asp Pro Lys Ile Val Leu Tyr Ser
        275                 280                 285

Glu Asn Val Asn Leu Glu Thr Pro Asp Thr His Ile Val Tyr Lys Pro
    290                 295                 300

Gly Thr Asp Glu Thr Ser Ser Ser Val Asn Leu Gly Gln Gln Ala Met
305                 310                 315                 320

Pro Asn Arg Pro Asn Tyr Ile Gly Phe Arg Asp Asn Phe Ile Gly Leu
                325                 330                 335

Met Phe Tyr Asn Ser Thr Gly Asn Met Gly Val Leu Ala Gly Gln Ala
            340                 345                 350

Ser Gln Leu Asn Ala Val Val Asp Leu Gln Asp Arg Asn Thr Glu Leu
        355                 360                 365

Ser Tyr Gln Leu Leu Leu Asp Ser Leu Gly Asp Arg Thr Arg Tyr Phe
    370                 375                 380

Ser Met Trp Asn Gln Ala Val Asp Ser Tyr Asp Pro Asp Val Arg Ile
385                 390                 395                 400

Ile Glu Asn His Gly Val Glu Asp Glu Leu Pro Asn Tyr Cys Phe Pro
                405                 410                 415

Leu Asp Gly Val Gly Pro Ile Thr Gly Thr Tyr Gln Gly Val Glu Pro
            420                 425                 430

Asp Gly Asn Asn Gly Asn Trp Lys Lys Asn Thr Asn Ile Asn Gly Ala
```

```
        435                 440                 445

Asn Glu Ile Gly Lys Gly Asn Asn Tyr Ala Met Glu Ile Asn Leu Gln
    450                 455                 460

Ala Asn Leu Trp Arg Ser Phe Leu Tyr Ser Asn Val Ala Leu Tyr Leu
465                 470                 475                 480

Pro Asp Gly Tyr Lys Tyr Thr Pro Ala Asn Val Thr Leu Pro Glu Asn
                485                 490                 495

Lys Asn Thr Tyr Gly Tyr Ile Asn Gly Arg Val Val Ser Pro Ser Leu
            500                 505                 510

Val Asp Ser Tyr Ile Asn Ile Gly Ala Arg Trp Ser Leu Asp Leu Met
        515                 520                 525

Asp Asn Val Asn Pro Phe Asn His His Arg Asn Ala Gly Leu Arg Tyr
    530                 535                 540

Arg Ser Met Leu Leu Gly Asn Gly Arg Tyr Val Pro Phe His Ile Gln
545                 550                 555                 560

Val Pro Gln Lys Phe Phe Ala Val Lys Asn Leu Leu Leu Leu Pro Gly
                565                 570                 575

Ser Tyr Thr Tyr Glu Trp Asn Phe Arg Lys Asp Val Asn Met Val Leu
            580                 585                 590

Gln Ser Ser Leu Gly Asn Asp Leu Arg Thr Asp Gly Ala Ser Ile Ser
        595                 600                 605

Phe Thr Ser Ile Asn Leu Tyr Ala Thr Phe Phe Pro Met Ala His Asn
    610                 615                 620

Thr Ala Ser Thr Leu Glu Ala Met Leu Arg Asn Asp Thr Asn Asp Gln
625                 630                 635                 640

Ser Phe Asn Asp Tyr Leu Ser Ala Ala Asn Met Leu Tyr Pro Ile Pro
                645                 650                 655

Ala Asn Ala Thr Asn Ile Pro Ile Ser Ile Pro Ser Arg Asn Trp Ala
            660                 665                 670
```

```
Ala Phe Arg Gly Trp Ser Phe Thr Arg Leu Lys Thr Lys Glu Thr Pro
        675                 680                 685

Ser Leu Gly Ser Gly Phe Asp Pro Tyr Phe Val Tyr Ser Gly Ser Ile
    690                 695                 700

Pro Tyr Leu Asp Gly Thr Phe Tyr Leu Asn His Thr Phe Lys Lys Val
705                 710                 715                 720

Ser Ile Met Phe Asp Ser Ser Val Ser Trp Pro Gly Asn Asp Arg Leu
                725                 730                 735

Leu Thr Pro Asn Glu Phe Glu Ile Lys Arg Thr Val Asp Gly Glu Gly
            740                 745                 750

Tyr Asn Val Ala Gln Cys Asn Met Thr Lys Asp Trp Phe Leu Val Gln
        755                 760                 765

Met Leu Ala Asn Tyr Asn Ile Gly Tyr Gln Gly Phe Tyr Ile Pro Glu
    770                 775                 780

Gly Tyr Lys Asp Arg Met Tyr Ser Phe Phe Arg Asn Phe Gln Pro Met
785                 790                 795                 800

Ser Arg Gln Val Val Asp Glu Ile Asn Tyr Lys Glu Tyr Gln Ala Val
                805                 810                 815

Thr Leu Ala Tyr Gln His Asn Asn Ser Gly Phe Val Gly Tyr His Ala
            820                 825                 830

Pro Thr Leu Arg Gln Gly Gln Pro Tyr Pro Ala Asn Tyr Pro Tyr Pro
        835                 840                 845

Leu Ile Gly Thr Thr Ala Val Thr Ser Val Thr Gln Lys Lys Phe Leu
    850                 855                 860

Cys Asp Arg Thr Met Trp Arg Ile Pro Phe Ser Ser Asn Phe Met Ser
865                 870                 875                 880

Met Gly Ala Leu Thr Asp Leu Gly Gln Asn Met Leu Tyr Ala Asn Ser
                885                 890                 895

Ala His Ala Leu Asp Met Thr Phe Glu Val Asp Pro Met Asp Glu Pro
            900                 905                 910
```

```
Thr Leu Leu Tyr Leu Leu Phe Glu Val Phe Asp Val Val Arg Val His
        915                 920                 925

Gln Pro His Arg Gly Val Ile Glu Ala Val Tyr Leu Arg Thr Pro Phe
    930                 935                 940

Ser Ala Gly Asn Ala Thr Thr
945                 950
```

<210> 145
<211> 209
<212> PRT
<213> Simian adenovirus 33

<400> 145

```
Met Thr Cys Gly Ser Gly Asn Gly Ser Ser Glu Gln Glu Leu Lys Ala
1               5                   10                  15

Ile Val Arg Asp Leu Gly Cys Gly Pro Tyr Phe Leu Gly Thr Phe Asp
            20                  25                  30

Lys Arg Phe Pro Gly Phe Met Ala Pro Asp Lys Leu Ala Cys Ala Ile
        35                  40                  45

Val Asn Thr Ala Gly Arg Glu Thr Gly Gly Glu His Trp Leu Ala Phe
    50                  55                  60

Gly Trp Asn Pro Arg Ser Asn Thr Cys Tyr Leu Phe Asp Pro Phe Gly
65                  70                  75                  80

Phe Ser Asp Glu Arg Leu Lys Gln Ile Tyr Gln Phe Glu Tyr Glu Gly
                85                  90                  95

Leu Leu Arg Arg Ser Ala Leu Ala Thr Lys Asp Arg Cys Ile Thr Leu
            100                 105                 110

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

Leu Phe Cys Cys Met Phe Leu His Ala Phe Val His Trp Pro Asp Arg
    130                 135                 140

Pro Met Asp Gly Asn Pro Thr Met Lys Leu Leu Thr Gly Val Pro Asn
145                 150                 155                 160
```

```
Ser Met Leu Gln Ser Pro Gln Val Gln Pro Thr Leu Arg Arg Asn Gln
                165                 170                 175

Glu Ala Leu Tyr Arg Phe Leu Asn Thr His Ser Ser Tyr Phe Arg Ser
            180                 185                 190

His Arg Ala Arg Ile Glu Arg Ala Thr Ala Phe Asp Arg Met Asp Met
        195                 200                 205

Gln
```

<210> 146
<211> 833
<212> PRT
<213> Simian adenovirus 33

<400> 146

```
Met Glu Thr Gln Pro Ser Leu Pro Thr Ser Leu Gln Ala Pro Ser His
1               5                   10                  15

Leu Ala Pro Ser Ser Asp Glu Glu Glu Ser Leu Thr Thr Pro Pro Pro
            20                  25                  30

Ser Pro Ala Thr Thr Thr Ser Thr Leu Glu Asp Glu Glu Glu Val Asp
        35                  40                  45

Ala Pro Gln Glu Met Gln Ala Gln Asp Met Glu Asp Val Lys Ala Glu
    50                  55                  60

Glu Ile Glu Ala Asp Val Glu Gln Asp Pro Gly Tyr Val Thr Pro Ala
65                  70                  75                  80

Glu His Glu Glu Glu Leu Lys Arg Phe Leu Asp Arg Glu Glu Val Asp
                85                  90                  95

Ser Arg Pro Glu His Gln Ala Asp Gly Asp His Gln Glu Ala Gly Leu
            100                 105                 110

Gly Asp His Val Ala Asp Tyr Leu Thr Gly Leu Gly Ser Glu Asp Val
        115                 120                 125

Leu Leu Lys His Leu Ala Arg Gln Ser Ile Ile Val Lys Asp Ala Val
    130                 135                 140
```

```
Leu Asp Arg Thr Glu Val Pro Ile Ser Val Glu Glu Leu Ser Arg Ala
145                 150                 155                 160

Tyr Glu Leu Asn Leu Phe Ser Pro Arg Val Pro Pro Lys Arg Gln Pro
                165                 170                 175

Asn Gly Thr Cys Glu Pro Asn Pro Arg Leu Asn Phe Tyr Pro Ala Phe
            180                 185                 190

Thr Val Pro Glu Val Leu Ala Thr Tyr His Ile Phe Phe Lys Asn Gln
        195                 200                 205

Lys Ile Pro Val Ser Cys Arg Ala Asn Arg Thr Arg Ala Asp Ala Leu
    210                 215                 220

Leu Asn Leu Gly Pro Gly Ala Cys Leu Pro Asp Ile Ala Ser Leu Glu
225                 230                 235                 240

Glu Val Pro Lys Ile Phe Glu Gly Leu Gly Ser Asp Glu Thr Arg Ala
                245                 250                 255

Ala Asn Ala Leu Gln Gln Gly Glu Asn Gly Met Asp Glu His His Ser
            260                 265                 270

Ala Leu Val Glu Leu Glu Gly Asp Asn Ala Arg Leu Ala Val Leu Lys
        275                 280                 285

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

Pro Lys Val Met Ser Ala Val Met Asp His Leu Leu Ile Lys Arg Ala
305                 310                 315                 320

Ser Pro Leu Ser Glu Asp Gln Asn Met Gln Asp Pro Asp Ala Ser Asp
                325                 330                 335

Glu Gly Lys Pro Val Val Ser Asp Glu Gln Leu Ser Arg Trp Leu Gly
            340                 345                 350

Thr Asn Ser Pro Arg Asp Leu Glu Glu Arg Arg Lys Leu Met Met Ala
        355                 360                 365

Val Val Leu Val Thr Val Glu Leu Glu Cys Leu Arg Arg Phe Phe Thr
    370                 375                 380
```

```
Asp Pro Glu Thr Leu Arg Lys Leu Glu Glu Asn Leu His Tyr Thr Phe
385                 390                 395                 400

Arg His Gly Phe Val Arg Gln Ala Cys Lys Ile Ser Asn Val Glu Leu
                405                 410                 415

Thr Asn Leu Val Ser Tyr Met Gly Ile Leu His Glu Asn Arg Leu Gly
            420                 425                 430

Gln Ser Val Leu His Thr Thr Leu Lys Gly Glu Ala Arg Arg Asp Tyr
        435                 440                 445

Ile Arg Asp Cys Val Tyr Leu Tyr Leu Cys His Thr Trp Gln Thr Gly
    450                 455                 460

Met Gly Val Trp Gln Gln Cys Leu Glu Glu Gln Asn Leu Lys Glu Leu
465                 470                 475                 480

Asp Lys Leu Leu Gln Arg Ser Leu Lys Ala Leu Trp Thr Gly Phe Asp
                485                 490                 495

Glu Arg Thr Val Ala Ser Asp Leu Ala Asp Ile Ile Phe Pro Glu Arg
            500                 505                 510

Leu Arg Val Thr Leu Arg Asn Gly Leu Pro Asp Phe Met Ser Gln Ser
        515                 520                 525

Met Leu Asn Asn Phe Arg Ser Phe Ile Leu Glu Arg Ser Gly Ile Leu
    530                 535                 540

Pro Ala Thr Cys Cys Ala Leu Pro Ser Asp Phe Val Pro Leu Ser Tyr
545                 550                 555                 560

Arg Glu Cys Pro Pro Pro Leu Trp Ser His Cys Tyr Leu Phe Arg Leu
                565                 570                 575

Ala Asn Tyr Leu Ser Tyr His Ser Asp Val Ile Glu Asp Val Ser Gly
            580                 585                 590

Asp Gly Leu Leu Glu Cys His Cys Arg Cys Asn Leu Cys Thr Pro His
        595                 600                 605

Arg Ser Leu Ala Cys Asn Pro Gln Leu Leu Ser Glu Thr Gln Ile Ile
```

610 615 620

Gly Thr Phe Glu Leu Gln Gly Pro Ser Ser Glu Gly Glu Gly Ser Ser
625 630 635 640

Pro Gly Gln Ser Leu Lys Leu Thr Pro Gly Leu Trp Thr Ser Ala Tyr
645 650 655

Leu Arg Lys Phe His Pro Glu Asp Tyr His Pro Tyr Glu Ile Arg Phe
660 665 670

Tyr Glu Asp Gln Ser His Pro Pro Lys Val Glu Leu Ser Ala Cys Val
675 680 685

Ile Thr Gln Gly Ala Ile Leu Ala Gln Leu Gln Ala Ile Gln Lys Ser
690 695 700

Arg Gln Glu Phe Leu Met Lys Lys Gly Ser Gly Val Tyr Leu Asp Pro
705 710 715 720

Gln Thr Gly Glu Glu Leu Asn Thr Arg Phe Pro Gln Asp Val Pro Ala
725 730 735

Pro Arg Lys Gln Glu Ala Glu Gly Ala Ala Ala Ala Pro Arg Gly Tyr
740 745 750

Gly Gly Arg Leu Gly Gln Ser Gly Arg Gly Ser Gly Gly Asp Gly Arg
755 760 765

Leu Gly Gln Pro Gly Arg Gly Gly Gly Gln Pro Gly Gly Arg Gln Phe
770 775 780

Gly Gly Gly Arg Arg Gly Gly Arg Gly Gly Gly Arg Ser Asn Arg Arg
785 790 795 800

Gln Thr Val Val Leu Gly Gly Gly Asp Lys Gln Val Pro Arg Gln Gln
805 810 815

His Gly Tyr His Leu Arg Ser Gly Ser Gly Gly Pro Ala Ala Ala Gln
820 825 830

Gln

<210> 147
<211> 227
<212> PRT
<213> Simian adenovirus 33

<400> 147

```
Met Ser Lys Glu Ile Pro Thr Pro Tyr Met Trp Ser Tyr Gln Pro Gln
1               5                  10                  15

Met Gly Leu Ala Ala Gly Ala Ser Gln Asp Tyr Ser Thr Arg Met Asn
            20                  25                  30

Trp Leu Ser Ala Gly Pro Ser Met Ile Ser Arg Val Asn Asp Ile Leu
        35                  40                  45

Ala Tyr Arg Asn Gln Leu Leu Leu Glu Gln Ser Ala Leu Thr Thr Thr
    50                  55                  60

Pro Arg Gln His Leu Asn Pro Arg Asn Trp Pro Ala Ala Leu Val Tyr
65                  70                  75                  80

Gln Glu Thr Pro Ala Pro Thr Thr Val Leu Leu Pro Arg Asp Ala Gln
                85                  90                  95

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

Ala Leu Cys Arg His Arg Pro Arg Gln Ser Ile Lys Arg Leu Val Ile
        115                 120                 125

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

Gly Leu Arg Pro Asp Gly Val Phe Gln Ile Ala Gly Cys Gly Arg Ser
145                 150                 155                 160

Ser Phe Thr Pro Arg Gln Ala Val Leu Thr Leu Glu Ser Ser Ser Ser
                165                 170                 175

Gln Pro Arg Ser Gly Gly Ile Gly Thr Leu Gln Phe Val Glu Glu Phe
            180                 185                 190

Thr Pro Ser Val Tyr Phe Asn Pro Phe Ser Gly Ser Pro Gly Gln Tyr
        195                 200                 205
```

```
Pro Asp Glu Phe Ile Pro Asn Phe Asp Ala Ile Ser Glu Ser Val Asp
    210                 215                 220


Gly Tyr Asp
225


<210>  148
<211>  106
<212>  PRT
<213>  Simian adenovirus 33

<400>  148

Met Ser Asn Gly Gly Ala Ala Glu Leu Ala Arg Leu Arg His Leu Asp
1               5                   10                  15


His Cys Arg Arg Phe Arg Cys Phe Ala Arg Glu Leu Thr Glu Phe Ile
            20                  25                  30


Tyr Phe Glu Leu Pro Glu Glu His Pro Gln Gly Pro Ala His Gly Val
        35                  40                  45


Arg Ile Thr Ile Glu Gly Gly Ile Asp Ser Arg Leu His Arg Ile Phe
    50                  55                  60


Ser Gln Arg Pro Val Leu Ile Glu Arg Asp Gln Gly Asn Thr Thr Ile
65                  70                  75                  80


Ser Ile Tyr Cys Ile Cys Asn His Pro Gly Leu His Glu Ser Leu Cys
                85                  90                  95


Cys Leu Ile Cys Ala Glu Phe Asn Lys Asn
            100                 105


<210>  149
<211>  172
<212>  PRT
<213>  Simian adenovirus 33

<400>  149

Met Gly Thr Leu Leu Val Val Leu Ala Leu Leu Ser Leu Leu Gly Leu
1               5                   10                  15


Gly Ser Ala Asn Leu Ile Pro Pro Asp His Asp Pro Cys Val Thr Phe
            20                  25                  30


Asp Pro Glu Asn Cys Thr Leu Thr Phe Ala Pro Glu Thr Ser Arg Tyr
```

```
        35                  40                  45

Cys Gly Val Val Ile Arg Cys Gly Leu Glu Cys Arg Pro Ile Glu Ile
    50                  55                  60

Thr His Asn Asn Lys Thr Trp Asn Asn Thr Leu Phe Thr Thr Trp Gln
65                  70                  75                  80

Pro Gly Tyr Pro Gln Trp Tyr Thr Val Ser Val Arg Gly Pro Asp Gly
                85                  90                  95

Ser Val Arg Met Ala Asn Asn Thr Phe Ile Phe Ala Glu Met Cys Asp
            100                 105                 110

Met Val Met Phe Met Ser Arg Gln Tyr Asp Leu Trp Pro Pro Ser Lys
        115                 120                 125

Glu Asn Ile Val Ala Phe Ser Ile Val Tyr Cys Leu Gly Thr Cys Ile
    130                 135                 140

Ile Thr Ala Ile Val Cys Val Cys Ile His Leu Leu Ile Val Ile Arg
145                 150                 155                 160

Pro Arg Asn Ser Asn Glu Glu Lys Glu Lys Met Pro
                165                 170
```

<210> 150
<211> 188
<212> PRT
<213> Simian adenovirus 33

<400> 150

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

Ser His Gly Arg Thr His Val Thr Leu Thr Thr Gly Ser Thr Tyr Thr
            20                  25                  30

Leu Lys Gly Pro Glu Gly His Asn Gly Val Ile Trp Trp Lys Leu Phe
        35                  40                  45

Asp Asp Gly Gly Phe Val Ser Pro Cys Ser Thr Ser Asn Arg Tyr Leu
    50                  55                  60

Cys Asn Gly Lys Asp Leu Thr Ile Ile Asn Val Thr Lys His Asp Asn
```

65 70 75 80

Gly Tyr Tyr Tyr Gly Thr Asn Tyr Ile Thr Ser Leu Asp Tyr Thr Ile
85 90 95

Thr Val Ile Ser Pro Thr Thr Pro Ala Pro Arg Lys Ile Thr Thr Phe
100 105 110

Ser Ser Ser Ser Ala Lys Asn Thr Ile Lys Ile Asn Thr Thr Ala Ile
115 120 125

Lys Met Leu Gln Lys Met Ala Ser Asn Tyr Thr Pro Pro Ala Thr Asn
130 135 140

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

Leu Ala Ile Ile Ile Ser Cys Ile Ile Tyr Tyr Ala Cys Cys Tyr Arg
165 170 175

Lys Ile Lys Gly Asp Pro Leu Leu Ser Phe Asp Ile
180 185

<210> 151
<211> 119
<212> PRT
<213> Simian adenovirus 33

<400> 151

Met Lys Phe Leu Cys Val Leu Ala Phe Ser Val Phe Ser Phe Cys Thr
1 5 10 15

Ser Thr Pro Ile Thr Ile Val Asn Val Gln Thr Thr Leu Asn His Val
20 25 30

Asn Thr Thr Asn Tyr Thr Ser Thr Ser Tyr Ala Thr Ile His Thr Gln
35 40 45

Leu Ile Pro Phe Ser Thr Ile Lys Ala Asn Pro Gln Thr Lys Phe Ala
50 55 60

Leu Gln Leu Glu Ile Thr Ile Leu Ile Val Ile Gly Ile Thr Ile Leu
65 70 75 80

Ala Val Leu Leu Tyr Phe Ile Phe Cys Arg Gln Ile Pro Asn Val His

85 90 95

Lys Lys Pro Lys Arg Gln Pro Ile Tyr Cys Pro Met Ile Ser Lys Pro
100 105 110

His Leu Ala Leu Asn Glu Ile
115

<210> 152
<211> 91
<212> PRT
<213> Simian adenovirus 33

<400> 152

Met Ile Pro Arg Asn Phe Phe Phe Thr Ile Leu Ile Cys Ala Phe Asn
1 5 10 15

Val Cys Ala Thr Phe Thr Ala Val Ala Thr Ala Thr Pro Asp Cys Ile
20 25 30

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

Val Cys Ser Ile Val Cys Leu Val Ile Asn Phe Phe Gln Leu Val Asp
50 55 60

Trp Ile Phe Val Arg Ile Ala Tyr Leu Arg His His Pro Glu Tyr Arg
65 70 75 80

Asn Gln Asn Val Ala Ala Leu Leu Arg Leu Ile
85 90

<210> 153
<211> 135
<212> PRT
<213> Simian adenovirus 33

<400> 153

Met Thr Asp Gln Leu Asn Ala Ser Thr Ala Ala Val Asp Leu Leu Asp
1 5 10 15

Met Asp Gly Arg Thr Ser Glu Gln Arg Leu Ala Gln Leu Arg Ile Arg
20 25 30

Gln Gln Gln Glu Arg Ala Ala Lys Glu Leu Arg Asn Ala Ile Glu Ile
35 40 45

```
His Gln Cys Lys Lys Gly Ile Phe Cys Leu Val Lys Gln Ala Lys Ile
    50                  55                  60

Ser Tyr Glu Ile Thr Ala Asn Asp His Arg Leu Ser Tyr Glu Leu Val
65                  70                  75                  80

Gln Gln Arg Gln Lys Phe Thr Cys Met Val Gly Ile Asn Pro Ile Val
                85                  90                  95

Ile Thr Gln Gln Ser Gly Asp Thr Lys Gly Cys Ile His Cys Ser Cys
            100                 105                 110

Asp Ser Thr Glu Cys Ile Tyr Thr Leu Leu Lys Thr Leu Cys Gly Leu
        115                 120                 125

Arg Asp Leu Leu Pro Met Asn
    130                 135


<210>  154
<211>  325
<212>  PRT
<213>  Simian adenovirus 33

<400>  154

Met Ala Lys Arg Ala Arg Leu Ser Ser Ser Phe Asn Pro Val Tyr Pro
1               5                   10                  15

Tyr Glu Asp Glu Ser Ser Ser Gln His Pro Phe Ile Asn Pro Gly Phe
            20                  25                  30

Ile Ser Pro Asp Gly Phe Thr Gln Ser Pro Asp Gly Val Leu Thr Leu
        35                  40                  45

Lys Cys Val Ser Pro Leu Thr Thr Thr Ser Gly Ala Leu Asp Ile Lys
    50                  55                  60

Val Gly Arg Gly Leu Lys Val Asp Ser Thr Asp Gly Ser Leu Glu Glu
65                  70                  75                  80

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

Leu Ala Phe Gly Asp Gly Leu Glu Thr Lys Glu Asn Lys Leu Tyr Val
            100                 105                 110
```

```
Lys Leu Gly Asp Gly Leu Lys Phe Ser Ser Gly Ser Ile Tyr Ile Asp
        115                 120                 125

His Asp Val Asn Thr Leu Trp Thr Gly Val Asn Pro Ser Ala Asn Cys
    130                 135                 140

Ile Ile Thr Asp Asn Gly Glu Thr Asn Asp Ser Lys Leu Thr Leu Ile
145                 150                 155                 160

Leu Val Lys Ser Gly Gly Leu Ile Asn Ala Tyr Val Ser Leu Met Gly
                165                 170                 175

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

Thr Val Asp Ile Tyr Phe Asp Asn Gln Gly Lys Val Leu Thr Glu Leu
        195                 200                 205

Ser Ala Leu Lys Thr Asp Leu Lys His Lys Phe Gly Gln Asn Met Ala
    210                 215                 220

Ser Ser Glu Val Ser Asn Cys Lys Gly Phe Met Pro Ser Leu Asn Ala
225                 230                 235                 240

Tyr Pro Phe Arg Asn Pro Thr Lys Pro Thr Lys Gly Arg Glu Asp Tyr
                245                 250                 255

Ile Tyr Gly Ile Thr Tyr Tyr Gln Ala Thr Asp Gly Asn Leu Tyr Glu
            260                 265                 270

Leu Lys Thr Thr Ile Thr Leu Asn His Ser Val Ile Ser Ser Leu Cys
        275                 280                 285

Ala Tyr Ala Met His Ile Ser Trp Ser Trp Asp Thr Val Thr Glu Pro
    290                 295                 300

Glu Thr Thr Pro Thr Thr Leu Ile Thr Ser Pro Phe Ser Phe Ser Tyr
305                 310                 315                 320

Ile Arg Glu Asp Asp
                325
```

<210> 155

<211> 560
<212> DNA
<213> Simian adenovirus 33

<220>
<221> CDS
<222> (10)..(552)
<223> label=Elb\19K

<400> 155
ctgccatcc atg gag gtt tgg gct atc ttg gaa gac ctt aga cag act agg 51
Met Glu Val Trp Ala Ile Leu Glu Asp Leu Arg Gln Thr Arg
1 5 10

cta ctg cta gaa aac gcc tcg gac gga gtc tct ggc ctt tgg aga ttc 99
Leu Leu Leu Glu Asn Ala Ser Asp Gly Val Ser Gly Leu Trp Arg Phe
15 20 25 30

tgg ttc ggt ggt gat cta gct agg cta gtc ttt agg ata aaa cag gac 147
Trp Phe Gly Gly Asp Leu Ala Arg Leu Val Phe Arg Ile Lys Gln Asp
35 40 45

tac agg gaa gaa ttt gaa aag tta ttg gac gac agt cca gga ctt ttt 195
Tyr Arg Glu Glu Phe Glu Lys Leu Leu Asp Asp Ser Pro Gly Leu Phe
50 55 60

gaa gct ctt aac ttg ggc cat cag gct cat ttt aag gag aag gtt tta 243
Glu Ala Leu Asn Leu Gly His Gln Ala His Phe Lys Glu Lys Val Leu
65 70 75

tca gtt tta gat ttt tct act cct ggt aga act gct gct gct gta gcc 291
Ser Val Leu Asp Phe Ser Thr Pro Gly Arg Thr Ala Ala Ala Val Ala
80 85 90

ttt ctt act ttt ata ttg gat aaa tgg atc cgc caa acc cac ttc agc 339
Phe Leu Thr Phe Ile Leu Asp Lys Trp Ile Arg Gln Thr His Phe Ser
95 100 105 110

aag gga tac gtt ttg gat ttc ata gca gca gct ttg tgg aga aca tgg 387
Lys Gly Tyr Val Leu Asp Phe Ile Ala Ala Ala Leu Trp Arg Thr Trp
115 120 125

aag gct cgc agg atg agg aca atc tta gat tac tgg cca gtg cag cct 435
Lys Ala Arg Arg Met Arg Thr Ile Leu Asp Tyr Trp Pro Val Gln Pro
130 135 140

ctg ggc gta gca ggg atc ctg aga cac cca ccg gcc atg cca gcg gtt 483
Leu Gly Val Ala Gly Ile Leu Arg His Pro Pro Ala Met Pro Ala Val
145 150 155

ctg gag gag gag cag cag gag gac aat ccg aga gcc ggc ctg gac cct 531
Leu Glu Glu Glu Gln Gln Glu Asp Asn Pro Arg Ala Gly Leu Asp Pro
160 165 170

ccg gtg gag gag gcg gag gag tagctgac 560
Pro Val Glu Glu Ala Glu Glu
175 180

<210> 156
<211> 181
<212> PRT
<213> Simian adenovirus 33

<400> 156

```
Met Glu Val Trp Ala Ile Leu Glu Asp Leu Arg Gln Thr Arg Leu Leu
1               5                  10                  15


Leu Glu Asn Ala Ser Asp Gly Val Ser Gly Leu Trp Arg Phe Trp Phe
            20                  25                  30


Gly Gly Asp Leu Ala Arg Leu Val Phe Arg Ile Lys Gln Asp Tyr Arg
        35                  40                  45


Glu Glu Phe Glu Lys Leu Leu Asp Asp Ser Pro Gly Leu Phe Glu Ala
    50                  55                  60


Leu Asn Leu Gly His Gln Ala His Phe Lys Glu Lys Val Leu Ser Val
65                  70                  75                  80


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


Thr Phe Ile Leu Asp Lys Trp Ile Arg Gln Thr His Phe Ser Lys Gly
            100                 105                 110


Tyr Val Leu Asp Phe Ile Ala Ala Ala Leu Trp Arg Thr Trp Lys Ala
        115                 120                 125


Arg Arg Met Arg Thr Ile Leu Asp Tyr Trp Pro Val Gln Pro Leu Gly
    130                 135                 140


Val Ala Gly Ile Leu Arg His Pro Pro Ala Met Pro Ala Val Leu Glu
145                 150                 155                 160


Glu Glu Gln Gln Glu Asp Asn Pro Arg Ala Gly Leu Asp Pro Pro Val
                165                 170                 175


Glu Glu Ala Glu Glu
            180
```

<210> 157
<211> 5120
<212> DNA

<213> Simian adenovirus 33

<220>
<221> CDS
<222> (2)..(604)
<223> label=22K

<220>
<221> CDS
<222> (1908)..(2357)
<223> label=E3\CR1\alpha

<220>
<221> CDS
<222> (2838)..(3422)
<223> label=E3\CR1\beta

<220>
<221> CDS
<222> (4677)..(5111)
<223> label=E3\RID\beta

<400> 157

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g atg tcc cag cgc cga gga agc aag aag ctg aag gtg cag ctg ccg ccc       49
  Met Ser Gln Arg Arg Gly Ser Lys Lys Leu Lys Val Gln Leu Pro Pro
  1               5                  10                  15

cca gag gat atg gag gaa gac tgg gac agt cag gca gag gaa gcg gag         97
Pro Glu Asp Met Glu Glu Asp Trp Asp Ser Gln Ala Glu Glu Ala Glu
            20                  25                  30

gag atg gaa gat tgg gac agc cag gca gag gag gtg gac agc ctg gag        145
Glu Met Glu Asp Trp Asp Ser Gln Ala Glu Glu Val Asp Ser Leu Glu
        35                  40                  45

gaa gac agt ttg gag gag gaa gac gag gag gca gag gag gtg gaa gaa        193
Glu Asp Ser Leu Glu Glu Glu Asp Glu Glu Ala Glu Glu Val Glu Glu
    50                  55                  60

gca acc gcc gcc aaa cag ttg tcc tcg gcg gcg gag aca agc aag tcc        241
Ala Thr Ala Ala Lys Gln Leu Ser Ser Ala Ala Glu Thr Ser Lys Ser
65                  70                  75                  80

cca gac agc agc acg gct acc atc tcc gct ccg ggt cgg ggg gcc cag        289
Pro Asp Ser Ser Thr Ala Thr Ile Ser Ala Pro Gly Arg Gly Ala Gln
                85                  90                  95

cgg cgg ccc aac agt aga tgg gac gag acc ggg cgc ttc ccg aac ccg        337
Arg Arg Pro Asn Ser Arg Trp Asp Glu Thr Gly Arg Phe Pro Asn Pro
            100                 105                 110

acc acc gct tcc aag acc ggt aag aag gag cga cag gga tac aag tcc        385
Thr Thr Ala Ser Lys Thr Gly Lys Lys Glu Arg Gln Gly Tyr Lys Ser
        115                 120                 125

tgg cgg gga cat aaa aac gct atc atc tcc tgc ttg cat gaa tgc ggg        433
Trp Arg Gly His Lys Asn Ala Ile Ile Ser Cys Leu His Glu Cys Gly
    130                 135                 140
```

```
ggc aac ata tcc ttc acc cgg cgc tac ctg ctc ttc cac cac ggg gtg        481
Gly Asn Ile Ser Phe Thr Arg Arg Tyr Leu Leu Phe His His Gly Val
145                 150                 155                 160

aac ttc ccc cgc aat atc ttg cat tac tac cgt cac ctc cac agc ccc        529
Asn Phe Pro Arg Asn Ile Leu His Tyr Tyr Arg His Leu His Ser Pro
                165                 170                 175

tac tgc agc cag caa gcc ccg gca acc tcg gca gaa aaa gac agc agc        577
Tyr Cys Ser Gln Gln Ala Pro Ala Thr Ser Ala Glu Lys Asp Ser Ser
            180                 185                 190

ggc aac ggg gac cag aaa acc agc agt tagaaaatcc acagcaagtg             624
Gly Asn Gly Asp Gln Lys Thr Ser Ser
        195                 200

cagcaggagg aggactgagg atcacagcga acgagccagc gcagaccaga gagctgagga      684

atcggatctt tccaaccctc tatgccatct tccagcagag tcgggggcaa gagcaggaac      744

tgaaagtaaa aaaccgatct ctgcgctcgc tcaccagaag ttgtttgtat cacaagagcg      804

aagaccaact tcagcgcact ctcgaggacg ccgaggctct cttcaacaag tactgcgcgc      864

tgactcttaa agagtagccc ttgcccgcgc tcgctcgaaa aaggcgggaa tcacgtcacc      924

cttggcacct gtcctttgcc ctcgtcatga gtaaagaaat tcccacgcct tacatgtgga      984

gctatcagcc ccaaatgggg ttggcagcag gcgcctccca ggactactcc acccgcatga     1044

attggctcag cgccgggccc tcgatgatct cacgggttaa tgatatacta gcttatcgaa     1104

accagttact cctagaacag tcagctctca ccaccacacc ccgccaacac cttaatcccc     1164

ggaattggcc cgccgccctg gtgtaccagg aaactcccgc tcccaccacc gtactacttc     1224

ctcgagacgc ccaggccgaa gttcagatga ctaacgcagg tgtacagctg gcgggcggtt     1284

ccgccctgtg tcgtcaccgg cctcggcaga gtataaaacg cctggtgatc agaggccgag     1344

gtatccagct caacgacgag tcggtgagct cttcgcttgg tctgcgacca gacggagtct     1404

tccagatcgc cggctgtgga agatcttcct tcactcctcg tcaggctgtg ctgactttgg     1464

agagttcgtc ctcgcagccc cgctcgggcg gcatcgggac tctccagttc gtggaggagt     1524

ttactccctc tgtgtacttc aacccccttct ccggctctcc tggccagtac ccggacgagt     1584

tcataccgaa cttcgacgca atcagcgagt cagtggatgg ctatgattga tgtctaatgg     1644

tggcgcggct gagctagctc gactgcgaca tctagaccac tgccgccgct ttcgctgctt     1704

cgcccgggaa ctcaccgagt tcatctactt cgaactcccc gaggagcacc ctcaggggcc     1764

ggcccacgga gtgcggatta ccatcgaagg gggaatagac tctcgcctgc atcggatctt     1824

ctcccagcga cccgtgctga tcgagcgcga ccagggaaat acaaccatct ccatctactg     1884
```

```
catctgtaac caccccggat tgc atg aaa gcc ttt gct gtc tta ttt gtg ctg     1937
                         Met Lys Ala Phe Ala Val Leu Phe Val Leu
                                     205                 210

agt tta ata aaa act gag tta aga ccc tcc tac gga cta ccg ctt ctt      1985
Ser Leu Ile Lys Thr Glu Leu Arg Pro Ser Tyr Gly Leu Pro Leu Leu
            215                 220                 225

caa cca gga ctt tac aac aac acc aac cag acc ctc cgt tcc agc cag      2033
Gln Pro Gly Leu Tyr Asn Asn Thr Asn Gln Thr Leu Arg Ser Ser Gln
        230                 235                 240

aag acc cag acc ctt cct cct ctg atc cag gac tct aac tct acc ttc      2081
Lys Thr Gln Thr Leu Pro Pro Leu Ile Gln Asp Ser Asn Ser Thr Phe
    245                 250                 255

cca gca cca tcc cct act aac ctt ccc gaa act aac aac ctc gga gct      2129
Pro Ala Pro Ser Pro Thr Asn Leu Pro Glu Thr Asn Asn Leu Gly Ala
260                 265                 270                 275

caa ctg caa cac cgc ctt tcc cga agc ctc ctt tct gcc aat act acc      2177
Gln Leu Gln His Arg Leu Ser Arg Ser Leu Leu Ser Ala Asn Thr Thr
                280                 285                 290

act ccc aaa acc gga ggt gag ctc cgc ggt ctc ccc act gac gac ccc      2225
Thr Pro Lys Thr Gly Gly Glu Leu Arg Gly Leu Pro Thr Asp Asp Pro
            295                 300                 305

tgg gtg gta gcg ggt ttt gta acg tta gga gta gtt gcg ggt ggg ctt      2273
Trp Val Val Ala Gly Phe Val Thr Leu Gly Val Val Ala Gly Gly Leu
        310                 315                 320

gtg ctg atc ctt tgc tac cta tac aca cct tgc tgt gca tat tta gtt      2321
Val Leu Ile Leu Cys Tyr Leu Tyr Thr Pro Cys Cys Ala Tyr Leu Val
    325                 330                 335

ata ttg tgc tgc tgg ttt aag aaa tgg gga ccc tac tagtcgtgct           2367
Ile Leu Cys Cys Trp Phe Lys Lys Trp Gly Pro Tyr
340                 345                 350

tgctttactt tcgcttttgg gactgggctc tgctaatctc attcctcctg atcacgatcc    2427

atgtgtgaca tttgatccag aaaactgcac actcaccttt gcacctgaaa caagccgcta    2487

ctgcggagta gttattaggt gcggactgga atgcaggccc attgaaatta cacacaataa    2547

caaaacttgg aacaatacat tattcaccac atggcaacca ggatatcctc agtggtatac    2607

tgtctctgtc cggggtcctg acggttccgt ccgcatggct aataacactt tcatttttgc    2667

tgaaatgtgc gatatggtca tgtttatgag cagacagtat gacctatggc ctcccagcaa    2727

agaaaacatt gtggcattct ccattgttta ttgcttggga acatgcatca tcactgctat    2787

cgtgtgtgtg tgcatacact tgcttatagt cattcgcccc agaaacagca atg agg       2843
                                                          Met Arg

aaa aag aga aaa tgc cct aac ttt ttt cac aac ttt ttt tca gcc atg      2891
```

```
Lys Lys Arg Lys Cys Pro Asn Phe Phe His Asn Phe Phe Ser Ala Met
    355                 360                 365

cct tca gct ttt ttt ctt ctt act att gtt gct gtt att tcc gca caa       2939
Pro Ser Ala Phe Phe Leu Leu Thr Ile Val Ala Val Ile Ser Ala Gln
370                 375                 380                 385

aca ata gta gat gtt cca ctt ggt tct aac tac aca cta ata ggt cct       2987
Thr Ile Val Asp Val Pro Leu Gly Ser Asn Tyr Thr Leu Ile Gly Pro
                390                 395                 400

aca atc cat tca gaa gtt acc tgg tgc agg ctt aat act gaa gac tac       3035
Thr Ile His Ser Glu Val Thr Trp Cys Arg Leu Asn Thr Glu Asp Tyr
            405                 410                 415

tat aat gta ttt tgt gat ggg gat gat gac att caa gta acc tgt aac       3083
Tyr Asn Val Phe Cys Asp Gly Asp Asp Asp Ile Gln Val Thr Cys Asn
        420                 425                 430

aaa cag aat ctt aca ctc att aat gtt acc aaa agt tac aat ggt tac       3131
Lys Gln Asn Leu Thr Leu Ile Asn Val Thr Lys Ser Tyr Asn Gly Tyr
    435                 440                 445

tat tat gga tat gat aga tct ggc agt gaa ttt aaa aat tac ctg gta       3179
Tyr Tyr Gly Tyr Asp Arg Ser Gly Ser Glu Phe Lys Asn Tyr Leu Val
450                 455                 460                 465

cga aca att cca ccc att aca aac att aaa ata gag aaa ctc caa atg       3227
Arg Thr Ile Pro Pro Ile Thr Asn Ile Lys Ile Glu Lys Leu Gln Met
                470                 475                 480

gat agt gac att tta agt aat ctt aca ata tcc ccc acc aca cca tct       3275
Asp Ser Asp Ile Leu Ser Asn Leu Thr Ile Ser Pro Thr Thr Pro Ser
            485                 490                 495

gaa caa aac att cca agt tca atg att gca att att gcg gcg gtg gca       3323
Glu Gln Asn Ile Pro Ser Ser Met Ile Ala Ile Ile Ala Ala Val Ala
        500                 505                 510

gtg gga atg gca atc ata ata aca tgt atg att gtt tat gct tgc tgc       3371
Val Gly Met Ala Ile Ile Ile Thr Cys Met Ile Val Tyr Ala Cys Cys
    515                 520                 525

tac aag aaa atc agg cgt gaa aaa caa gat tca cta cta aat tat gat       3419
Tyr Lys Lys Ile Arg Arg Glu Lys Gln Asp Ser Leu Leu Asn Tyr Asp
530                 535                 540                 545

ttt taacttctta ttttaacaga caatgatttt cattacagtt cttcttgcca            3472
Phe


tctttaactt actatcagcc tctcatgggc gcacacatgt cactctaact actggttcca     3532

catacacact aaaaggccca gaaggtcata atggtgttat ttggtggaaa ctatttgatg     3592

atggagggtt tgttagtccc tgcagcacat ctaatagata tttatgtaat ggtaaagacc     3652

taactattat taatgtcaca aaacacgaca atggctacta ttatgggacc aattatatta     3712
```

```
caagtttaga ttacaccatt actgtcatat cgcctactac accagcaccg cgcaaaatca     3772

caactttctc tagcagcagc gctaaaaaca caatcaaaat taatacaact gctataaaaa     3832

tgctccaaaa aatggcttct aattataccc cacccgctac caatgcgctt cctaaatcaa     3892

ttattggaat aattgtagcg gcggtagtgg ggctggcaat tattatttct tgcataattt     3952

attatgcctg ctgctataga aaaataaaag gagacccccc actaagcttt gatatttaat     4012

ttttttttcat agcaccatga aattcctatg tgtattagct ttttcagttt ttagcttttg     4072

cacatccacc cccatcacca ttgtcaatgt gcagactact ttaaatcatg ttaatactac     4132

aaattacaca tctacctcct atgcaaccat acatacccag cttattcctt tttccacaat     4192

taaagccaat cctcagacta aatttgcact acaactagaa atcactatcc taattgtgat     4252

tggaataact attctagctg ttcttcttta ttttatattc tgccgccaaa tacccaatgt     4312

tcataaaaaa ccaaaaagac aacccattta ttgtcctatg attagtaaac ctcacttggc     4372

cttaaatgaa atctaaggtc tattcttttc ttttttacag tatggtgatc accaatcatg     4432

atccctagaa atttcttctt caccatactc atctgtgctt tcaatgtctg tgctaccttc     4492

accgcagtag ccactgcaac cccagactgt ataggagcat ttgcttccta tgtacttttt     4552

gcctttgtta cttgcatctg cgtgtgtagc atagtctgcc tggttattaa ttttttccaa     4612

cttgtagact ggatctttgt acgaattgcc tacctgcgtc accatcccga ataccgcaat     4672

caaa atg ttg cgg cac ttc tta ggc tta ttt aaa acc atg cag gct atg       4721
     Met Leu Arg His Phe Leu Gly Leu Phe Lys Thr Met Gln Ala Met
                  550                 555                 560

cta cca gtc att cta att ctg ctg cta ccc tgc gtt gcc tta gct ccc       4769
Leu Pro Val Ile Leu Ile Leu Leu Leu Pro Cys Val Ala Leu Ala Pro
            565                 570                 575

aca acc act cgc act cca cct gaa caa ctt aga aaa tgc aaa ttt caa       4817
Thr Thr Thr Arg Thr Pro Pro Glu Gln Leu Arg Lys Cys Lys Phe Gln
        580                 585                 590

caa cca tgg tca ttc ctt gat tgc tac cat gaa aaa tct gat ttt ccc       4865
Gln Pro Trp Ser Phe Leu Asp Cys Tyr His Glu Lys Ser Asp Phe Pro
    595                 600                 605

aca tac tgg ata gtg att gtt gga ata att aac ata ctc tca tgt acc       4913
Thr Tyr Trp Ile Val Ile Val Gly Ile Ile Asn Ile Leu Ser Cys Thr
610                 615                 620                 625

tta ttc tca ttc cta ata tac ccc ata ttt agt ttt ggg tgg aat gct       4961
Leu Phe Ser Phe Leu Ile Tyr Pro Ile Phe Ser Phe Gly Trp Asn Ala
                630                 635                 640

ccc aat gca ctg ggt tac cca caa att cca gag gaa cac att gca cta       5009
Pro Asn Ala Leu Gly Tyr Pro Gln Ile Pro Glu Glu His Ile Ala Leu
            645                 650                 655
```

```
cag aac atg caa cag cca cta gat cta ata gat tat gaa aat gag cca       5057
Gln Asn Met Gln Gln Pro Leu Asp Leu Ile Asp Tyr Glu Asn Glu Pro
        660                 665                 670

cag cct cca cta ctc cct gcc att agc tac ttc aac cta acc ggt gga       5105
Gln Pro Pro Leu Leu Pro Ala Ile Ser Tyr Phe Asn Leu Thr Gly Gly
    675                 680                 685

gat gac tgatcagct                                                     5120
Asp Asp
690
```

<210> 158
<211> 201
<212> PRT
<213> Simian adenovirus 33

<400> 158

```
Met Ser Gln Arg Arg Gly Ser Lys Lys Leu Lys Val Gln Leu Pro Pro
1               5                   10                  15

Pro Glu Asp Met Glu Glu Asp Trp Asp Ser Gln Ala Glu Glu Ala Glu
            20                  25                  30

Glu Met Glu Asp Trp Asp Ser Gln Ala Glu Glu Val Asp Ser Leu Glu
        35                  40                  45

Glu Asp Ser Leu Glu Glu Glu Asp Glu Glu Ala Glu Glu Val Glu Glu
    50                  55                  60

Ala Thr Ala Ala Lys Gln Leu Ser Ser Ala Ala Glu Thr Ser Lys Ser
65                  70                  75                  80

Pro Asp Ser Ser Thr Ala Thr Ile Ser Ala Pro Gly Arg Gly Ala Gln
                85                  90                  95

Arg Arg Pro Asn Ser Arg Trp Asp Glu Thr Gly Arg Phe Pro Asn Pro
            100                 105                 110

Thr Thr Ala Ser Lys Thr Gly Lys Lys Glu Arg Gln Gly Tyr Lys Ser
        115                 120                 125

Trp Arg Gly His Lys Asn Ala Ile Ile Ser Cys Leu His Glu Cys Gly
    130                 135                 140

Gly Asn Ile Ser Phe Thr Arg Arg Tyr Leu Leu Phe His His Gly Val
145                 150                 155                 160
```

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

Tyr Cys Ser Gln Gln Ala Pro Ala Thr Ser Ala Glu Lys Asp Ser Ser
            180                 185                 190

Gly Asn Gly Asp Gln Lys Thr Ser Ser
        195                 200
```

<210> 159
<211> 150
<212> PRT
<213> Simian adenovirus 33

<400> 159

```
Met Lys Ala Phe Ala Val Leu Phe Val Leu Ser Leu Ile Lys Thr Glu
1               5                   10                  15

Leu Arg Pro Ser Tyr Gly Leu Pro Leu Leu Gln Pro Gly Leu Tyr Asn
            20                  25                  30

Asn Thr Asn Gln Thr Leu Arg Ser Ser Gln Lys Thr Gln Thr Leu Pro
        35                  40                  45

Pro Leu Ile Gln Asp Ser Asn Ser Thr Phe Pro Ala Pro Ser Pro Thr
    50                  55                  60

Asn Leu Pro Glu Thr Asn Asn Leu Gly Ala Gln Leu Gln His Arg Leu
65                  70                  75                  80

Ser Arg Ser Leu Leu Ser Ala Asn Thr Thr Thr Pro Lys Thr Gly Gly
                85                  90                  95

Glu Leu Arg Gly Leu Pro Thr Asp Asp Pro Trp Val Val Ala Gly Phe
            100                 105                 110

Val Thr Leu Gly Val Val Ala Gly Gly Leu Val Leu Ile Leu Cys Tyr
        115                 120                 125

Leu Tyr Thr Pro Cys Cys Ala Tyr Leu Val Ile Leu Cys Cys Trp Phe
    130                 135                 140

Lys Lys Trp Gly Pro Tyr
145                 150
```

<210> 160
<211> 195
<212> PRT
<213> Simian adenovirus 33

<400> 160

```
Met Arg Lys Lys Arg Lys Cys Pro Asn Phe Phe His Asn Phe Phe Ser
1               5                  10                  15


Ala Met Pro Ser Ala Phe Phe Leu Leu Thr Ile Val Ala Val Ile Ser
            20                  25                  30


Ala Gln Thr Ile Val Asp Val Pro Leu Gly Ser Asn Tyr Thr Leu Ile
        35                  40                  45


Gly Pro Thr Ile His Ser Glu Val Thr Trp Cys Arg Leu Asn Thr Glu
    50                  55                  60


Asp Tyr Tyr Asn Val Phe Cys Asp Gly Asp Asp Asp Ile Gln Val Thr
65                  70                  75                  80


Cys Asn Lys Gln Asn Leu Thr Leu Ile Asn Val Thr Lys Ser Tyr Asn
                85                  90                  95


Gly Tyr Tyr Tyr Gly Tyr Asp Arg Ser Gly Ser Glu Phe Lys Asn Tyr
            100                 105                 110


Leu Val Arg Thr Ile Pro Pro Ile Thr Asn Ile Lys Ile Glu Lys Leu
        115                 120                 125


Gln Met Asp Ser Asp Ile Leu Ser Asn Leu Thr Ile Ser Pro Thr Thr
    130                 135                 140


Pro Ser Glu Gln Asn Ile Pro Ser Ser Met Ile Ala Ile Ile Ala Ala
145                 150                 155                 160


Val Ala Val Gly Met Ala Ile Ile Ile Thr Cys Met Ile Val Tyr Ala
                165                 170                 175


Cys Cys Tyr Lys Lys Ile Arg Arg Glu Lys Gln Asp Ser Leu Leu Asn
            180                 185                 190


Tyr Asp Phe
        195
```

<210> 161
<211> 145
<212> PRT
<213> Simian adenovirus 33

<400> 161

Met Leu Arg His Phe Leu Gly Leu Phe Lys Thr Met Gln Ala Met Leu
1 5 10 15

Pro Val Ile Leu Ile Leu Leu Leu Pro Cys Val Ala Leu Ala Pro Thr
20 25 30

Thr Thr Arg Thr Pro Pro Glu Gln Leu Arg Lys Cys Lys Phe Gln Gln
35 40 45

Pro Trp Ser Phe Leu Asp Cys Tyr His Glu Lys Ser Asp Phe Pro Thr
50 55 60

Tyr Trp Ile Val Ile Val Gly Ile Ile Asn Ile Leu Ser Cys Thr Leu
65 70 75 80

Phe Ser Phe Leu Ile Tyr Pro Ile Phe Ser Phe Gly Trp Asn Ala Pro
85 90 95

Asn Ala Leu Gly Tyr Pro Gln Ile Pro Glu Glu His Ile Ala Leu Gln
100 105 110

Asn Met Gln Gln Pro Leu Asp Leu Ile Asp Tyr Glu Asn Glu Pro Gln
115 120 125

Pro Pro Leu Leu Pro Ala Ile Ser Tyr Phe Asn Leu Thr Gly Gly Asp
130 135 140

Asp
145

<210> 162
<211> 880
<212> DNA
<213> Simian adenovirus 33

<220>
<221> CDS
<222> (1)..(580)
<223> label=Ela

<220>
<221> CDS
<222> (677)..(879)
<223> label=Ela

<400> 162

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atg aga cac ctg cga ttc ctg cca cag gag att atc tcc agc gag acc          48
Met Arg His Leu Arg Phe Leu Pro Gln Glu Ile Ile Ser Ser Glu Thr
1               5                   10                  15

ggg atc gaa ata ctg gag ttc gtg gta aat acc ctg atg gga gac gat          96
Gly Ile Glu Ile Leu Glu Phe Val Val Asn Thr Leu Met Gly Asp Asp
            20                  25                  30

ccg gag ccg ccc gtg cag cct ttc gat cca cct acg ctt cac gaa ctg         144
Pro Glu Pro Pro Val Gln Pro Phe Asp Pro Pro Thr Leu His Glu Leu
        35                  40                  45

tat gat tta gag gta gac ggg ccg gag gat ccc aat gag gaa gct gtg         192
Tyr Asp Leu Glu Val Asp Gly Pro Glu Asp Pro Asn Glu Glu Ala Val
    50                  55                  60

aat ggg ttt ttt act gat tct atg ctg cta gct gct gag gaa gga ttg         240
Asn Gly Phe Phe Thr Asp Ser Met Leu Leu Ala Ala Glu Glu Gly Leu
65                  70                  75                  80

gac gta aac cct cct ccg gag acc ctt gat acc cca ggg gtg gtt gtg         288
Asp Val Asn Pro Pro Pro Glu Thr Leu Asp Thr Pro Gly Val Val Val
                85                  90                  95

gaa agc ggc aga ggt ggg aaa aaa ttg cct gat ctg gga gca gct gaa         336
Glu Ser Gly Arg Gly Gly Lys Lys Leu Pro Asp Leu Gly Ala Ala Glu
            100                 105                 110

atg gac ttg cgt tgt tat gaa gag ggt ttt cct ccg agt gat gat gaa         384
Met Asp Leu Arg Cys Tyr Glu Glu Gly Phe Pro Pro Ser Asp Asp Glu
        115                 120                 125

gat gag gaa agt gag cag tcc atc cag acc gca gtg aat gag gga gtg         432
Asp Glu Glu Ser Glu Gln Ser Ile Gln Thr Ala Val Asn Glu Gly Val
    130                 135                 140

aaa gct gcc agt gat gtt ttt aag ttg gac tgt ccg gag ctg cct gga         480
Lys Ala Ala Ser Asp Val Phe Lys Leu Asp Cys Pro Glu Leu Pro Gly
145                 150                 155                 160

cat ggc tgt aag tct tgt gaa ttt cac agg aat aac act gga atg aaa         528
His Gly Cys Lys Ser Cys Glu Phe His Arg Asn Asn Thr Gly Met Lys
                165                 170                 175

gaa cta tta tgc tcg ctt tgc tat atg aga acg cac tgc cac ttt att         576
Glu Leu Leu Cys Ser Leu Cys Tyr Met Arg Thr His Cys His Phe Ile
            180                 185                 190

tac a gtaagtgtgt ttaagtgaaa tttaaaggaa cagtgaagct gttttaataa          630
Tyr
```

```
ctttgttgaa tgggggattt atgttttact tgtgattttt ttatag gt  cct gtg         684
                                                    Ser Pro Val
                                                        195

tct gat gat gat tcg cct tct cct gat tca act acc tca cct cct gaa        732
Ser Asp Asp Asp Ser Pro Ser Pro Asp Ser Thr Thr Ser Pro Pro Glu
            200                 205                 210

att cag gcg ccc gtc cct gca aac gta tgc aag ccc att cct gtg aag        780
Ile Gln Ala Pro Val Pro Ala Asn Val Cys Lys Pro Ile Pro Val Lys
        215                 220                 225

cct aag cct ggg aaa cgc cct gct gtg gat aag ctt gag gac ttg ttg        828
Pro Lys Pro Gly Lys Arg Pro Ala Val Asp Lys Leu Glu Asp Leu Leu
    230                 235                 240

gag ggt ggg gat gga cct ttg gac ttt agt acc cgg aaa ctg cca agg        876
Glu Gly Gly Asp Gly Pro Leu Asp Phe Ser Thr Arg Lys Leu Pro Arg
245                 250                 255                 260

caa t                                                                  880
Gln
```

<210> 163
<211> 261
<212> PRT
<213> Simian adenovirus 33

<400> 163

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Met Arg His Leu Arg Phe Leu Pro Gln Glu Ile Ile Ser Ser Glu Thr
1               5                   10                  15

Gly Ile Glu Ile Leu Glu Phe Val Val Asn Thr Leu Met Gly Asp Asp
            20                  25                  30

Pro Glu Pro Pro Val Gln Pro Phe Asp Pro Pro Thr Leu His Glu Leu
        35                  40                  45

Tyr Asp Leu Glu Val Asp Gly Pro Glu Asp Pro Asn Glu Glu Ala Val
    50                  55                  60

Asn Gly Phe Phe Thr Asp Ser Met Leu Leu Ala Ala Glu Glu Gly Leu
65                  70                  75                  80

Asp Val Asn Pro Pro Pro Glu Thr Leu Asp Thr Pro Gly Val Val Val
                85                  90                  95

Glu Ser Gly Arg Gly Gly Lys Lys Leu Pro Asp Leu Gly Ala Ala Glu
            100                 105                 110
```

```
Met Asp Leu Arg Cys Tyr Glu Glu Gly Phe Pro Pro Ser Asp Asp Glu
        115                 120                 125

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

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

His Gly Cys Lys Ser Cys Glu Phe His Arg Asn Asn Thr Gly Met Lys
                165                 170                 175

Glu Leu Leu Cys Ser Leu Cys Tyr Met Arg Thr His Cys His Phe Ile
            180                 185                 190

Tyr Ser Pro Val Ser Asp Asp Asp Ser Pro Ser Pro Asp Ser Thr Thr
        195                 200                 205

Ser Pro Pro Glu Ile Gln Ala Pro Val Pro Ala Asn Val Cys Lys Pro
    210                 215                 220

Ile Pro Val Lys Pro Lys Pro Gly Lys Arg Pro Ala Val Asp Lys Leu
225                 230                 235                 240

Glu Asp Leu Leu Glu Gly Gly Asp Gly Pro Leu Asp Phe Ser Thr Arg
                245                 250                 255

Lys Leu Pro Arg Gln
            260
```

<210> 164
<211> 890
<212> DNA
<213> Simian adenovirus 33

<220>
<221> CDS
<222> (12)..(366)
<223> label=33K

<220>
<221> CDS
<222> (536)..(888)
<223> label=33K

<400> 164
gttcccccag g atg tcc cag cgc cga gga agc aag aag ctg aag gtg cag 50

```
                Met Ser Gln Arg Arg Gly Ser Lys Lys Leu Lys Val Gln
                1               5                   10

ctg ccg ccc cca gag gat atg gag gaa gac tgg gac agt cag gca gag          98
Leu Pro Pro Pro Glu Asp Met Glu Glu Asp Trp Asp Ser Gln Ala Glu
    15                  20                  25

gaa gcg gag gag atg gaa gat tgg gac agc cag gca gag gag gtg gac         146
Glu Ala Glu Glu Met Glu Asp Trp Asp Ser Gln Ala Glu Glu Val Asp
30                  35                  40                  45

agc ctg gag gaa gac agt ttg gag gag gaa gac gag gag gca gag gag         194
Ser Leu Glu Glu Asp Ser Leu Glu Glu Glu Asp Glu Glu Ala Glu Glu
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gtg gaa gaa gca acc gcc gcc aaa cag ttg tcc tcg gcg gcg gag aca         242
Val Glu Glu Ala Thr Ala Ala Lys Gln Leu Ser Ser Ala Ala Glu Thr
            65                  70                  75

agc aag tcc cca gac agc agc acg gct acc atc tcc gct ccg ggt cgg         290
Ser Lys Ser Pro Asp Ser Ser Thr Ala Thr Ile Ser Ala Pro Gly Arg
        80                  85                  90

ggg gcc cag cgg cgg ccc aac agt aga tgg gac gag acc ggg cgc ttc         338
Gly Ala Gln Arg Arg Pro Asn Ser Arg Trp Asp Glu Thr Gly Arg Phe
    95                  100                 105

ccg aac ccg acc acc gct tcc aag acc g gtaagaagga gcgacaggga             386
Pro Asn Pro Thr Thr Ala Ser Lys Thr
110                 115

tacaagtcct ggcggggaca taaaaacgct atcatctcct gcttgcatga atgcgggggc       446

aacatatcct tcacccggcg ctacctgctc ttccaccacg gggtgaactt cccccgcaat       506

atcttgcatt actaccgtca cctccacag cc  cct act gca gcc agc aag ccc         558
                                Ala Pro Thr Ala Ala Ser Lys Pro
                                    120                 125

cgg caa cct cgg cag aaa aag aca gca gcg gca acg ggg acc aga aaa         606
Arg Gln Pro Arg Gln Lys Lys Thr Ala Ala Ala Thr Gly Thr Arg Lys
            130                 135                 140

cca gca gtt aga aaa tcc aca gca agt gca gca gga gga gga ctg agg         654
Pro Ala Val Arg Lys Ser Thr Ala Ser Ala Ala Gly Gly Gly Leu Arg
        145                 150                 155

atc aca gcg aac gag cca gcg cag acc aga gag ctg agg aat cgg atc         702
Ile Thr Ala Asn Glu Pro Ala Gln Thr Arg Glu Leu Arg Asn Arg Ile
    160                 165                 170

ttt cca acc ctc tat gcc atc ttc cag cag agt cgg ggg caa gag cag         750
Phe Pro Thr Leu Tyr Ala Ile Phe Gln Gln Ser Arg Gly Gln Glu Gln
175                 180                 185                 190

gaa ctg aaa gta aaa aac cga tct ctg cgc tcg ctc acc aga agt tgt         798
Glu Leu Lys Val Lys Asn Arg Ser Leu Arg Ser Leu Thr Arg Ser Cys
                195                 200                 205
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ttg tat cac aag agc gaa gac caa ctt cag cgc act ctc gag gac gcc        846
Leu Tyr His Lys Ser Glu Asp Gln Leu Gln Arg Thr Leu Glu Asp Ala
            210                 215                 220

gag gct ctc ttc aac aag tac tgc gcg ctg act ctt aaa gag ta             890
Glu Ala Leu Phe Asn Lys Tyr Cys Ala Leu Thr Leu Lys Glu
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Glu Met Glu Asp Trp Asp Ser Gln Ala Glu Glu Val Asp Ser Leu Glu
        35                  40                  45

Glu Asp Ser Leu Glu Glu Glu Asp Glu Glu Ala Glu Glu Val Glu Glu
    50                  55                  60

Ala Thr Ala Ala Lys Gln Leu Ser Ser Ala Ala Glu Thr Ser Lys Ser
65                  70                  75                  80

Pro Asp Ser Ser Thr Ala Thr Ile Ser Ala Pro Gly Arg Gly Ala Gln
                85                  90                  95

Arg Arg Pro Asn Ser Arg Trp Asp Glu Thr Gly Arg Phe Pro Asn Pro
            100                 105                 110

Thr Thr Ala Ser Lys Thr Ala Pro Thr Ala Ala Ser Lys Pro Arg Gln
        115                 120                 125

Pro Arg Gln Lys Lys Thr Ala Ala Ala Thr Gly Thr Arg Lys Pro Ala
    130                 135                 140

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

Ala Asn Glu Pro Ala Gln Thr Arg Glu Leu Arg Asn Arg Ile Phe Pro
                165                 170                 175
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Thr Leu Tyr Ala Ile Phe Gln Gln Ser Arg Gly Gln Glu Gln Glu Leu
            180                 185                 190


Lys Val Lys Asn Arg Ser Leu Arg Ser Leu Thr Arg Ser Cys Leu Tyr
        195                 200                 205


His Lys Ser Glu Asp Gln Leu Gln Arg Thr Leu Glu Asp Ala Glu Ala
    210                 215                 220


Leu Phe Asn Lys Tyr Cys Ala Leu Thr Leu Lys Glu
225                 230                 235


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tgacgtatgc gtgggtgtgg ctaagatgca agctgtcgcg gtatttctga cgtaaacgag 180

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gttccgtcaa gaggccactc ttgagtgcca gcgagaagag ttttctcctc cgcgctgcga 540

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aacttgggcc accaggctca ttttaaggag aaggttttat cagttttgga tttttctacc     1860

cctggtagaa ctgctgctgc tgtagctttc cttacattca tatttgataa atg gat        1916
                                                          Met Asp
                                                          1

ccc aca gac cca ctt cag caa ggg ata cgt ttt gga ttt cat agc agc        1964
Pro Thr Asp Pro Leu Gln Gln Gly Ile Arg Phe Gly Phe His Ser Ser
        5                  10                  15

agc ttt gtg gag aac atg gaa ggc tcg cag gat gag gac aat ctt aga        2012
Ser Phe Val Glu Asn Met Glu Gly Ser Gln Asp Glu Asp Asn Leu Arg
    20                  25                  30

tta ctg gcc agt aca gcc tct ggg cgt agc agg gat cct gag aca ccc        2060
Leu Leu Ala Ser Thr Ala Ser Gly Arg Ser Arg Asp Pro Glu Thr Pro
35                  40                  45                  50

acc gac cat gcc agc ggt ttt gga gga gga gca cca aga gga caa tcc        2108
Thr Asp His Ala Ser Gly Phe Gly Gly Gly Ala Pro Arg Gly Gln Ser
                55                  60                  65

gag agt cgg cct gga ccc tcc ggt gga gga ggc gga gga gta gct gac        2156
Glu Ser Arg Pro Gly Pro Ser Gly Gly Gly Gly Gly Gly Val Ala Asp
            70                  75                  80

ttg ttt cct gaa ctg cga cgg gtg ctt act aga tct aca acc agt gga        2204
Leu Phe Pro Glu Leu Arg Arg Val Leu Thr Arg Ser Thr Thr Ser Gly
        85                  90                  95

cgg gac agg ggc att aag agg gaa agg aat cct agt gga act aat ccc        2252
Arg Asp Arg Gly Ile Lys Arg Glu Arg Asn Pro Ser Gly Thr Asn Pro
    100                 105                 110

aga tct gag ttg gct tta agt ttg atg agt cgc aga cgt cct gaa act        2300
Arg Ser Glu Leu Ala Leu Ser Leu Met Ser Arg Arg Arg Pro Glu Thr
115                 120                 125                 130

ata tgg tgg cat gag gtt cag aat gag ggc agg gat gaa gta tca ata        2348
Ile Trp Trp His Glu Val Gln Asn Glu Gly Arg Asp Glu Val Ser Ile
                135                 140                 145

ttg caa gag aaa tat tct cta gaa cag gtg aaa aca tgt tgg ttg gag        2396
Leu Gln Glu Lys Tyr Ser Leu Glu Gln Val Lys Thr Cys Trp Leu Glu
            150                 155                 160

cct gag gat gat tgg gag gtt gcc att agg aat tat gcc aag ata gct        2444
Pro Glu Asp Asp Trp Glu Val Ala Ile Arg Asn Tyr Ala Lys Ile Ala
        165                 170                 175

ttg agg cct gat aaa ttg tac aga att act aaa cgg att aat att aga        2492
Leu Arg Pro Asp Lys Leu Tyr Arg Ile Thr Lys Arg Ile Asn Ile Arg
    180                 185                 190

aat gca tgt tat ata tca ggg aat ggg gct gag gta gtg ata gac act        2540
Asn Ala Cys Tyr Ile Ser Gly Asn Gly Ala Glu Val Val Ile Asp Thr
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caa gac aga aca gtt ttt aga tgc tgc atg atg ggt atg tgg cca ggg       2588
Gln Asp Arg Thr Val Phe Arg Cys Cys Met Met Gly Met Trp Pro Gly
                215                 220                 225

gtg gtt ggc atg gag gca gta acc ctt atg aat gta aag ttt aga ggg       2636
Val Val Gly Met Glu Ala Val Thr Leu Met Asn Val Lys Phe Arg Gly
            230                 235                 240

gat ggg tat aat ggt gtg gtt ttt atg gct aat act aaa ttg att ttg       2684
Asp Gly Tyr Asn Gly Val Val Phe Met Ala Asn Thr Lys Leu Ile Leu
        245                 250                 255

cat ggt tgt agc ttt ttt ggt ttt aat aat ata tgt gtg gaa gct tgg       2732
His Gly Cys Ser Phe Phe Gly Phe Asn Asn Ile Cys Val Glu Ala Trp
    260                 265                 270

ggg cag gtg agt gta aga ggc tgt agt ttc tat gca tgc tgg att gca       2780
Gly Gln Val Ser Val Arg Gly Cys Ser Phe Tyr Ala Cys Trp Ile Ala
275                 280                 285                 290

aca tca ggc agg acc aag agt caa ttg tct gta aag aaa tgt atg ttt       2828
Thr Ser Gly Arg Thr Lys Ser Gln Leu Ser Val Lys Lys Cys Met Phe
                295                 300                 305

gag aga tgt aac ctg ggc ata ctg aat gaa gga gaa gcc aga gtc agc       2876
Glu Arg Cys Asn Leu Gly Ile Leu Asn Glu Gly Glu Ala Arg Val Ser
            310                 315                 320

cac tgt gct tct tcc gaa act ggc tgt ttc ata ttg ata aag gga aat       2924
His Cys Ala Ser Ser Glu Thr Gly Cys Phe Ile Leu Ile Lys Gly Asn
        325                 330                 335

gcc aat gtg aaa cat aat atg atc tgt gga ccc tca gat gag agg cct       2972
Ala Asn Val Lys His Asn Met Ile Cys Gly Pro Ser Asp Glu Arg Pro
    340                 345                 350

tat cag atg ctg aca tgt gct ggc gga cat tgc aat atg ctg gct acc       3020
Tyr Gln Met Leu Thr Cys Ala Gly Gly His Cys Asn Met Leu Ala Thr
355                 360                 365                 370

gtg cat att gtt tct cac cca cgc aag aaa tgg cct gtt ttg gaa cat       3068
Val His Ile Val Ser His Pro Arg Lys Lys Trp Pro Val Leu Glu His
                375                 380                 385

aat gtg atg acc aaa tgc act atg cac gta ggt ggt cgc aga gga atg       3116
Asn Val Met Thr Lys Cys Thr Met His Val Gly Gly Arg Arg Gly Met
            390                 395                 400

tta atg cca tac cag tgt aac atg aat aat gtg aaa gtg atg ttg gag       3164
Leu Met Pro Tyr Gln Cys Asn Met Asn Asn Val Lys Val Met Leu Glu
        405                 410                 415

cca gat gca ttt tcc aga atg agt tta aca gga atc ttt gac atg aat       3212
Pro Asp Ala Phe Ser Arg Met Ser Leu Thr Gly Ile Phe Asp Met Asn
    420                 425                 430

ctg caa ata tgg aag atc ctg aga tat gat gac acg aag tcg agg gta       3260
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Leu Gln Ile Trp Lys Ile Leu Arg Tyr Asp Asp Thr Lys Ser Arg Val
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cgc gca tgc gag tgc ggg ggc aaa cat gcc agg ttc cag ccg gtg tgt       3308
Arg Ala Cys Glu Cys Gly Gly Lys His Ala Arg Phe Gln Pro Val Cys
                455                 460                 465

gtg gat gtg act gaa gaa cta agg cca gat cat ttg gtg att gcc tgc       3356
Val Asp Val Thr Glu Glu Leu Arg Pro Asp His Leu Val Ile Ala Cys
            470                 475                 480

act gga gcg gag ttc ggt tct agt ggt gaa gaa act gac taaagtgagt        3405
Thr Gly Ala Glu Phe Gly Ser Ser Gly Glu Glu Thr Asp
        485                 490                 495

agtagtggga tggtttggat ggactctaat gtgaataaga tggacagatt gggtaaattt     3465

ttgttttttc tgtcttgcag ctgtc atg agt gga agc gct tct ttt gag ggg       3517
                          Met Ser Gly Ser Ala Ser Phe Glu Gly
                                              500

gga gtc ttt agc cct tat ctg acg ggc cgt ctc cca cca tgg gca gga       3565
Gly Val Phe Ser Pro Tyr Leu Thr Gly Arg Leu Pro Pro Trp Ala Gly
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gta cgt cag aat gtc atg gga tct act gtg gat ggg aga cca gtc cag       3613
Val Arg Gln Asn Val Met Gly Ser Thr Val Asp Gly Arg Pro Val Gln
                525                 530                 535

ccc gcc aat tca tca aca ctg acc tat gcc act ttg agc tct tca ccc       3661
Pro Ala Asn Ser Ser Thr Leu Thr Tyr Ala Thr Leu Ser Ser Ser Pro
            540                 545                 550

ttg gat gca gct gca gct gct gcc gcc tct gct gcc gcc aac acc gtc       3709
Leu Asp Ala Ala Ala Ala Ala Ala Ala Ser Ala Ala Ala Asn Thr Val
        555                 560                 565

ctt gga att ggc tat tat gga agc atc gtt gcc aat acc agt tcc tca       3757
Leu Gly Ile Gly Tyr Tyr Gly Ser Ile Val Ala Asn Thr Ser Ser Ser
    570                 575                 580

aat aac cct tcg acc ctg gct gag gac aag cta ctt gtt ctt ttg gcg       3805
Asn Asn Pro Ser Thr Leu Ala Glu Asp Lys Leu Leu Val Leu Leu Ala
585                 590                 595                 600

cag ctt gag gcg ttg acc cag cgc ctg ggt gaa ctg tct cag cag gtg       3853
Gln Leu Glu Ala Leu Thr Gln Arg Leu Gly Glu Leu Ser Gln Gln Val
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gcc cag ctg cgc gag caa act gag tct gct gtt gcc aca gca aag tct       3901
Ala Gln Leu Arg Glu Gln Thr Glu Ser Ala Val Ala Thr Ala Lys Ser
            620                 625                 630

aaa taaagattaa tcaataaata aaggagatac ttgttgattt taaactgtaa           3954
Lys


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atggtggcgc gcacttcgcg ctcgaaggcc cccgggattt cttcctcctc ttctaactct 9234

tcttccacta acatctcttc ttcctcttca ggcgggggcg gaggaggagg aggggtacg 9294

cggcgacgcc ggcggcgcac gggcaaacgg tcgatgaatc tttcaatgac ctctccgcgg 9354

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cggcggcgca tggtctcggt gacggcacgg ccgttctccc tgggtctcaa agtgaaaacg     9414

cctccgcgca tctccctgaa gtggtgactt gggggctctc cgttgggcag tgaaagggcg     9474

ctgattatgc actttatcaa ttgtcctgta gggactccgc gcaaggacct gatcgtctca     9534

agatccacgg gatctgaaaa tctttcaacg aaagcgtcta accagtcgca atcgcaaggt     9594

aggctgagca ctgtttcttg ctggcggggg tggctacacg ctgggtcggg gttctctctt     9654

tcttctcctt cctcctcttg ggagggtgag acgatgctgc tggtgatgaa attaaaatag     9714

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atgtaatcgt tacaggtgcg caccaggtac tggtagccga tgagaaagtg cggcggcggc    10194

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gggtttggca gccccgtcat ttctaagacc ccgccagccg acttctccag tttacgggag    10854

cgagccctct ttttttttt ttgttgccca g atg cat ccc gtg ctg cga cag        10906
                                  Met His Pro Val Leu Arg Gln
                                      635                 640

atg cgc ccc cag caa cag ccc cct tct cag cag cag cta cag caa cag      10954
Met Arg Pro Gln Gln Gln Pro Pro Ser Gln Gln Gln Leu Gln Gln Gln
                645                 650                 655
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cca caa aag gct ctt cct gct cct gta act act gcg gct gca gcc gtc      11002
Pro Gln Lys Ala Leu Pro Ala Pro Val Thr Thr Ala Ala Ala Ala Val
            660                 665                 670

agc ggc gcg gga cag ccc gcc tat gat ctg gac ttg gaa gag ggc gag      11050
Ser Gly Ala Gly Gln Pro Ala Tyr Asp Leu Asp Leu Glu Glu Gly Glu
        675                 680                 685

gga ctg gcg cgc ctg ggt gca cca tcg ccc gag cgg cac ccg cgg gtg      11098
Gly Leu Ala Arg Leu Gly Ala Pro Ser Pro Glu Arg His Pro Arg Val
    690                 695                 700

caa ctg aaa aag gac tct cgc gag gcg tac gtg ccc cag cag aac ctg      11146
Gln Leu Lys Lys Asp Ser Arg Glu Ala Tyr Val Pro Gln Gln Asn Leu
705                 710                 715                 720

ttc agg gac agg agc ggc gag gag cct gag gaa atg cga gct tcc cgc      11194
Phe Arg Asp Arg Ser Gly Glu Glu Pro Glu Glu Met Arg Ala Ser Arg
                725                 730                 735

ttt aac gcg ggt cgc gaa ctg cgt cac ggt ctg gac cga aga cgg gtg      11242
Phe Asn Ala Gly Arg Glu Leu Arg His Gly Leu Asp Arg Arg Arg Val
            740                 745                 750

ctg cgt gat gat gat ttt gaa gtc gat gaa gtg aca gga ata agt cct      11290
Leu Arg Asp Asp Asp Phe Glu Val Asp Glu Val Thr Gly Ile Ser Pro
        755                 760                 765

gct agg gca cat gtg gcc gcg gcc aac cta gta tca gct tac gag cag      11338
Ala Arg Ala His Val Ala Ala Ala Asn Leu Val Ser Ala Tyr Glu Gln
    770                 775                 780

acc gtg aag gag gag cgc aac ttt caa aaa tct ttc aac aac cat gtg      11386
Thr Val Lys Glu Glu Arg Asn Phe Gln Lys Ser Phe Asn Asn His Val
785                 790                 795                 800

cgc acc ctg att gcc cgc gag gaa gtg aca ctg ggt ctg atg cac ctg      11434
Arg Thr Leu Ile Ala Arg Glu Glu Val Thr Leu Gly Leu Met His Leu
                805                 810                 815

tgg gac ctg atg gaa gct att acc cag aac ccc acc agc aaa cct ctg      11482
Trp Asp Leu Met Glu Ala Ile Thr Gln Asn Pro Thr Ser Lys Pro Leu
            820                 825                 830

acc gct cag ctg ttt ctg gtg gtg caa cat agt aga gac aat gag gca      11530
Thr Ala Gln Leu Phe Leu Val Val Gln His Ser Arg Asp Asn Glu Ala
        835                 840                 845

ttt agg gag gcg ctg ttg aac att act gag ccc gag ggg aga tgg ttg      11578
Phe Arg Glu Ala Leu Leu Asn Ile Thr Glu Pro Glu Gly Arg Trp Leu
    850                 855                 860

tat gat ctt atc aat att ctg caa agt ata ata gtg caa gaa cgt agc      11626
Tyr Asp Leu Ile Asn Ile Leu Gln Ser Ile Ile Val Gln Glu Arg Ser
865                 870                 875                 880

ctg ggt cta gct gag aag gtg gct gct att aac tac tcg gtc ttg agc      11674
Leu Gly Leu Ala Glu Lys Val Ala Ala Ile Asn Tyr Ser Val Leu Ser
                885                 890                 895
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ctg ggc aag cac tac gct cgc aag atc tac aaa acc cca tac gta cct      11722
Leu Gly Lys His Tyr Ala Arg Lys Ile Tyr Lys Thr Pro Tyr Val Pro
            900                 905                 910

ata gac aag gag gtg aag ata gat ggg ttt tat atg cgc atg act ctc      11770
Ile Asp Lys Glu Val Lys Ile Asp Gly Phe Tyr Met Arg Met Thr Leu
        915                 920                 925

aag gtg ctg acc tta agt gac gat ctg gga gtg tac cgc aac gac agg      11818
Lys Val Leu Thr Leu Ser Asp Asp Leu Gly Val Tyr Arg Asn Asp Arg
    930                 935                 940

atg cac cgc gca gtg agc gcc agc aga agg cgt gag ctg agc gac aga      11866
Met His Arg Ala Val Ser Ala Ser Arg Arg Arg Glu Leu Ser Asp Arg
945                 950                 955                 960

gaa ctt atg cac agc ttg caa aga gct ctg acg ggg gct gga acc gag      11914
Glu Leu Met His Ser Leu Gln Arg Ala Leu Thr Gly Ala Gly Thr Glu
                965                 970                 975

ggg gag acc tac ttt gac atg gga gcg gac ttg cag tgg cag ccc agt      11962
Gly Glu Thr Tyr Phe Asp Met Gly Ala Asp Leu Gln Trp Gln Pro Ser
            980                 985                 990

cgc agg gcc ctg gac gca gca ggg  tat gag ctt cct tac  ata gaa gag    12010
Arg Arg Ala Leu Asp Ala Ala Gly  Tyr Glu Leu Pro Tyr  Ile Glu Glu
        995                 1000                1005

gtg gat  gca ggc cag gat gag  gag ggc gag tac ctg  gaa gac          12052
Val Asp  Ala Gly Gln Asp Glu  Glu Gly Glu Tyr Leu  Glu Asp
    1010                1015                1020

tgatggcgcg accatccata tttttgctag atg gaa cag  cag gca ccg gac       12103
                                 Met Glu Gln  Gln Ala Pro Asp
                                         1025

ccc  gca ata cgg gcg gcg  cta cag agc cag ccg  tcc ggc att aac      12148
Pro  Ala Ile Arg Ala Ala  Leu Gln Ser Gln Pro  Ser Gly Ile Asn
1030                1035                1040

tcc  tcg gac gat tgg agc  cag gcc atg caa cgc  atc atg gcg ctg      12193
Ser  Ser Asp Asp Trp Ser  Gln Ala Met Gln Arg  Ile Met Ala Leu
1045                1050                1055

acg  acc cgc aac ccc gaa  gcc ttt aga cag caa  ccc cag gcc aac      12238
Thr  Thr Arg Asn Pro Glu  Ala Phe Arg Gln Gln  Pro Gln Ala Asn
1060                1065                1070

cgc  ctt tct gcc atc ctg  gag gcc gta gtg ccc  tcc cgc tcc aac      12283
Arg  Leu Ser Ala Ile Leu  Glu Ala Val Val Pro  Ser Arg Ser Asn
1075                1080                1085

ccc  aca cac gag aag gtc  ctg gcc atc gtg aac  gcg ctg gtg gag      12328
Pro  Thr His Glu Lys Val  Leu Ala Ile Val Asn  Ala Leu Val Glu
1090                1095                1100

aac  aaa gcc ata cgt ccc  gat gag gct ggg ctg  gta tac aat gcc      12373
Asn  Lys Ala Ile Arg Pro  Asp Glu Ala Gly Leu  Val Tyr Asn Ala
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1105                1110                1115

cta  ttg gag cgc gta gcc  cgt tac aac agc agc  aac gtg cag acc       12418
Leu  Leu Glu Arg Val Ala  Arg Tyr Asn Ser Ser  Asn Val Gln Thr
1120                1125                1130

aac  ctg gac cgg atg gtg  acc gat gtg cgc gag  gcc gtg tcc cag       12463
Asn  Leu Asp Arg Met Val  Thr Asp Val Arg Glu  Ala Val Ser Gln
1135                1140                1145

cgc  gag cgg ttc cag cga  gac gcc aat tta ggg  tcg ctg gtg gct       12508
Arg  Glu Arg Phe Gln Arg  Asp Ala Asn Leu Gly  Ser Leu Val Ala
1150                1155                1160

ttg  aac gcc ttc ctc agc  act cag cct gcc aac  gtg cct cgc ggt       12553
Leu  Asn Ala Phe Leu Ser  Thr Gln Pro Ala Asn  Val Pro Arg Gly
1165                1170                1175

cag  caa gac tac aca aac  ttt cta agt gca tta  aga ctc atg gtg       12598
Gln  Gln Asp Tyr Thr Asn  Phe Leu Ser Ala Leu  Arg Leu Met Val
1180                1185                1190

gcc  gaa gtc cct caa agc  gaa gtg tac cag tcc  ggg cca gac tac       12643
Ala  Glu Val Pro Gln Ser  Glu Val Tyr Gln Ser  Gly Pro Asp Tyr
1195                1200                1205

ttt  ttc cag acc agc aga  cag ggc ttg cag aca  gtg aac ctg agt       12688
Phe  Phe Gln Thr Ser Arg  Gln Gly Leu Gln Thr  Val Asn Leu Ser
1210                1215                1220

cag  gct ttt aag aac ctg  aat ggt ctg tgg gga  gtg cgc gcc cca       12733
Gln  Ala Phe Lys Asn Leu  Asn Gly Leu Trp Gly  Val Arg Ala Pro
1225                1230                1235

gtg  gga gat cgg gcg acc  gtg tct agc ttg ctg  acc ccc aac tcc       12778
Val  Gly Asp Arg Ala Thr  Val Ser Ser Leu Leu  Thr Pro Asn Ser
1240                1245                1250

cgc  cta cta ctt ctc ttg  gta gcc cca ttc act  gac agc ggt agc       12823
Arg  Leu Leu Leu Leu Leu  Val Ala Pro Phe Thr  Asp Ser Gly Ser
1255                1260                1265

atc  gac cgt aat tct tac  ttg ggc tat ctg ttg  aac ctg tat cgc       12868
Ile  Asp Arg Asn Ser Tyr  Leu Gly Tyr Leu Leu  Asn Leu Tyr Arg
1270                1275                1280

gag  gcc ata ggg caa act  cag gta gat gag caa  acc tat caa gaa       12913
Glu  Ala Ile Gly Gln Thr  Gln Val Asp Glu Gln  Thr Tyr Gln Glu
1285                1290                1295

att  acc caa gtg agc cgc  gct ctg ggt cag gag  gac act ggc agc       12958
Ile  Thr Gln Val Ser Arg  Ala Leu Gly Gln Glu  Asp Thr Gly Ser
1300                1305                1310

ttg  gaa gcc acc tta aac  ttc ttg ctg acc aac  cgg tcg cag aag       13003
Leu  Glu Ala Thr Leu Asn  Phe Leu Leu Thr Asn  Arg Ser Gln Lys
1315                1320                1325

atc  cct cct cag tat gcg  ctt acc gcg gag gag  gaa cgg atc ctg       13048
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Ile  Pro Pro Gln Tyr Ala  Leu Thr Ala Glu Glu  Glu Arg Ile Leu
1330                1335                1340

aga  tac gtg cag cag agc  gtg gga ctg ttc cta  atg cag gag ggg       13093
Arg  Tyr Val Gln Gln Ser  Val Gly Leu Phe Leu  Met Gln Glu Gly
1345                1350                1355

gcg  act cct act gct gcg  ctc gat atg aca gcc  cga aac atg gag       13138
Ala  Thr Pro Thr Ala Ala  Leu Asp Met Thr Ala  Arg Asn Met Glu
1360                1365                1370

ccc  agc atg tat gcc agt  aac cgg cct ttt atc  aat aaa ctg cta       13183
Pro  Ser Met Tyr Ala Ser  Asn Arg Pro Phe Ile  Asn Lys Leu Leu
1375                1380                1385

gac  tac tta cac agg gcg  gct gct atg aac tct  gat tat ttc acc       13228
Asp  Tyr Leu His Arg Ala  Ala Ala Met Asn Ser  Asp Tyr Phe Thr
1390                1395                1400

aat  gct atc ctg aac ccc  cat tgg ctg ccc cca  cct ggg ttc tat       13273
Asn  Ala Ile Leu Asn Pro  His Trp Leu Pro Pro  Pro Gly Phe Tyr
1405                1410                1415

acg  ggc gag tat gac atg  ccc gac ccc aat gac  ggg ttt tta tgg       13318
Thr  Gly Glu Tyr Asp Met  Pro Asp Pro Asn Asp  Gly Phe Leu Trp
1420                1425                1430

gac  gat gtg gac agt agt  gtt ttc tcc ccg cct  cct ggt tat aac       13363
Asp  Asp Val Asp Ser Ser  Val Phe Ser Pro Pro  Pro Gly Tyr Asn
1435                1440                1445

act  tgg aag aag gaa ggt  ggc gat aga agg cac  tct tcc gtg tca       13408
Thr  Trp Lys Lys Glu Gly  Gly Asp Arg Arg His  Ser Ser Val Ser
1450                1455                1460

ctg  tcc ggg gca acg ggt  gct gcc gca gcg gtt  ccc gag gct gca       13453
Leu  Ser Gly Ala Thr Gly  Ala Ala Ala Ala Val  Pro Glu Ala Ala
1465                1470                1475

agt  cct ttc cct agt ttg  cca ttt tcg cta aac  agt gta cgc agc       13498
Ser  Pro Phe Pro Ser Leu  Pro Phe Ser Leu Asn  Ser Val Arg Ser
1480                1485                1490

agt  gag ctg gga aga ata  acc cgt cct cgc ttg  atc ggc gag gag       13543
Ser  Glu Leu Gly Arg Ile  Thr Arg Pro Arg Leu  Ile Gly Glu Glu
1495                1500                1505

gag  tat ttg aac gac tcc  ctg ttg aga ccc gag  agg gag aag aat       13588
Glu  Tyr Leu Asn Asp Ser  Leu Leu Arg Pro Glu  Arg Glu Lys Asn
1510                1515                1520

ttc  ccc aac aac ggg ata  gaa agc ttg gtt gac  aaa atg aac cgc       13633
Phe  Pro Asn Asn Gly Ile  Glu Ser Leu Val Asp  Lys Met Asn Arg
1525                1530                1535

tgg  aag acg tac gcg cac  gat cac agg gac gat  ccc cgg gcg ctg       13678
Trp  Lys Thr Tyr Ala His  Asp His Arg Asp Asp  Pro Arg Ala Leu
1540                1545                1550
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ggg  gat agc cgg ggc agc  gct acc cgt aaa cgc  cag tgg cac gac       13723
Gly  Asp Ser Arg Gly Ser  Ala Thr Arg Lys Arg  Gln Trp His Asp
1555                1560                1565

agg  cag cgg ggc ctg gtg  tgg gcc gat gag gat  tcc gcc gac gac       13768
Arg  Gln Arg Gly Leu Val  Trp Ala Asp Glu Asp  Ser Ala Asp Asp
1570                1575                1580

agc  agc gtg ttg gac ttg  ggt ggg agt ggt ggt  aac ccg ttc gct       13813
Ser  Ser Val Leu Asp Leu  Gly Gly Ser Gly Gly  Asn Pro Phe Ala
1585                1590                1595

cac  ctg cgc ccc cgc gtc  ggg cgc ctg atg taagaaaccg aaaataaata      13863
His  Leu Arg Pro Arg Val  Gly Arg Leu Met
1600                1605

ctcaccaagg ccatggcgac cagcgtgcgt tcgtttcttc tctgttatat ctagt atg     13921
                                                            Met
                                                            1610

atg agg cga acc gtg  cta ggc gga gcg gtg  gtg tat ccg gag ggt       13966
Met Arg Arg Thr Val  Leu Gly Gly Ala Val  Val Tyr Pro Glu Gly
                1615                1620                1625

cct cct cct tcg tac  gag agc gtg atg cag  cag gcg gcg gcg gcg       14011
Pro Pro Pro Ser Tyr  Glu Ser Val Met Gln  Gln Ala Ala Ala Ala
                1630                1635                1640

gcg atg cag cca cca  ctg gag gct ccc ttt  gta ccc cct cgg tac       14056
Ala Met Gln Pro Pro  Leu Glu Ala Pro Phe  Val Pro Pro Arg Tyr
                1645                1650                1655

ctg gca cct acg gag  ggg aga aac agc att  cgt tac tcg gag ctg       14101
Leu Ala Pro Thr Glu  Gly Arg Asn Ser Ile  Arg Tyr Ser Glu Leu
                1660                1665                1670

gca cca ttg tat gat  acc acc cgg ttg tat  ttg gtg gac aac aag       14146
Ala Pro Leu Tyr Asp  Thr Thr Arg Leu Tyr  Leu Val Asp Asn Lys
                1675                1680                1685

tcc gcg gac atc gcc  tca ctg aac tat cag  aac gac cac agc aac       14191
Ser Ala Asp Ile Ala  Ser Leu Asn Tyr Gln  Asn Asp His Ser Asn
                1690                1695                1700

ttc ctc acc acg gtg  gtg caa aac aat gac  ttt acc ccc acg gag       14236
Phe Leu Thr Thr Val  Val Gln Asn Asn Asp  Phe Thr Pro Thr Glu
                1705                1710                1715

gcc agc acc cag acc  atc aac ttt gac gag  cgg tcg cga tgg ggc       14281
Ala Ser Thr Gln Thr  Ile Asn Phe Asp Glu  Arg Ser Arg Trp Gly
                1720                1725                1730

ggt cag ctg aag act  atc atg cac acc aac  atg ccc aac gtg aac       14326
Gly Gln Leu Lys Thr  Ile Met His Thr Asn  Met Pro Asn Val Asn
                1735                1740                1745

gag tac atg ttt agc  aac aag ttc aaa gct  cgg gtg atg gtg tct       14371
Glu Tyr Met Phe Ser  Asn Lys Phe Lys Ala  Arg Val Met Val Ser
                1750                1755                1760
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aga aag gct cct gaa  ggt gtc aca gta gat  gac aat tat gat cac        14416
Arg Lys Ala Pro Glu  Gly Val Thr Val Asp  Asp Asn Tyr Asp His
                1765                1770                1775

aag cag gat att ttg  gaa tat gag tgg ttt  gag ttt act cta ccg        14461
Lys Gln Asp Ile Leu  Glu Tyr Glu Trp Phe  Glu Phe Thr Leu Pro
                1780                1785                1790

gaa ggg aac ttc tca  gcc aca atg acc att  gac cta atg aac aat        14506
Glu Gly Asn Phe Ser  Ala Thr Met Thr Ile  Asp Leu Met Asn Asn
                1795                1800                1805

gcc atc att gat aat  tac ctt gaa gtg ggc  aga cag aat gga gtg        14551
Ala Ile Ile Asp Asn  Tyr Leu Glu Val Gly  Arg Gln Asn Gly Val
                1810                1815                1820

ttg gag agt gac att  ggt gtt aaa ttt gac  acc agg aac ttt aga        14596
Leu Glu Ser Asp Ile  Gly Val Lys Phe Asp  Thr Arg Asn Phe Arg
                1825                1830                1835

ctg ggt tgg gat ccg  gaa act aag ttg att  atg cct ggg gtt tac        14641
Leu Gly Trp Asp Pro  Glu Thr Lys Leu Ile  Met Pro Gly Val Tyr
                1840                1845                1850

acc tat gag gca ttc  cat cct gac att gta  ttg ttg cct ggt tgc        14686
Thr Tyr Glu Ala Phe  His Pro Asp Ile Val  Leu Leu Pro Gly Cys
                1855                1860                1865

gga gtt gac ttt act  gaa agt cgc ctt agt  aac ttg ctt ggt atc        14731
Gly Val Asp Phe Thr  Glu Ser Arg Leu Ser  Asn Leu Leu Gly Ile
                1870                1875                1880

agg aaa aga cac cca  ttc cag gag ggt ttt  aag atc ttg tat gag        14776
Arg Lys Arg His Pro  Phe Gln Glu Gly Phe  Lys Ile Leu Tyr Glu
                1885                1890                1895

gat ctt gaa ggg ggt  aat atc ccg gcc ctg  ttg gat gta gaa gcc        14821
Asp Leu Glu Gly Gly  Asn Ile Pro Ala Leu  Leu Asp Val Glu Ala
                1900                1905                1910

tat gag aac agt aag  aaa gaa caa gaa gcc  aaa aca gaa gcc gct        14866
Tyr Glu Asn Ser Lys  Lys Glu Gln Glu Ala  Lys Thr Glu Ala Ala
                1915                1920                1925

aaa gct gct gct att  gct aaa gcc aac ata  gtt gtc agc gac cct        14911
Lys Ala Ala Ala Ile  Ala Lys Ala Asn Ile  Val Val Ser Asp Pro
                1930                1935                1940

gta agg gtg gct aat  gcc gaa gaa gtc aga  gga gac aac tat aca        14956
Val Arg Val Ala Asn  Ala Glu Glu Val Arg  Gly Asp Asn Tyr Thr
                1945                1950                1955

gct tca tct gtt gca  act gaa gaa tcg cta  ttg gct gct gtg gcc        15001
Ala Ser Ser Val Ala  Thr Glu Glu Ser Leu  Leu Ala Ala Val Ala
                1960                1965                1970

gaa acc gaa act aca  gag aca aaa ctc act  att aaa cct gta gaa        15046
Glu Thr Glu Thr Thr  Glu Thr Lys Leu Thr  Ile Lys Pro Val Glu
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                1975                1980                1985

aaa gac agc aag agt  aga agt tac aat gtc  ttg gaa gat aaa gtc       15091
Lys Asp Ser Lys Ser  Arg Ser Tyr Asn Val  Leu Glu Asp Lys Val
                1990                1995                2000

aat aca gcc tac cgc  agc tgg tac ctg tcc  tac aac tat ggt gac       15136
Asn Thr Ala Tyr Arg  Ser Trp Tyr Leu Ser  Tyr Asn Tyr Gly Asp
                2005                2010                2015

cct gaa aaa gga gtc  cgt tcc tgg aca ctg  ctc acc acc tcg gat       15181
Pro Glu Lys Gly Val  Arg Ser Trp Thr Leu  Leu Thr Thr Ser Asp
                2020                2025                2030

gtc acc tgt gga gca  gag cag gtg tac tgg  tcg ctc cca gac atg       15226
Val Thr Cys Gly Ala  Glu Gln Val Tyr Trp  Ser Leu Pro Asp Met
                2035                2040                2045

atg cag gac cct gtc  aca ttc cgt tcc acg  aga caa gtc agc aac       15271
Met Gln Asp Pro Val  Thr Phe Arg Ser Thr  Arg Gln Val Ser Asn
                2050                2055                2060

tat cca gtg gta ggt  gca gag ctc atg ccg  gtc ttc tca aag agt       15316
Tyr Pro Val Val Gly  Ala Glu Leu Met Pro  Val Phe Ser Lys Ser
                2065                2070                2075

ttc tac aac gag caa  gcc gtg tac tcc cag  cag ctt cgc cag tcc       15361
Phe Tyr Asn Glu Gln  Ala Val Tyr Ser Gln  Gln Leu Arg Gln Ser
                2080                2085                2090

acc tcg ctc acg cac  gtc ttc aac cgc ttc  cct gag aac cag atc       15406
Thr Ser Leu Thr His  Val Phe Asn Arg Phe  Pro Glu Asn Gln Ile
                2095                2100                2105

ctc atc cgc ccg cca  gcg ccc acc att acc  acc gtc agt gaa aac       15451
Leu Ile Arg Pro Pro  Ala Pro Thr Ile Thr  Thr Val Ser Glu Asn
                2110                2115                2120

gtt cct gct ctc aca  gat cac ggg acc ctg  ccg ttg cgc agc agt       15496
Val Pro Ala Leu Thr  Asp His Gly Thr Leu  Pro Leu Arg Ser Ser
                2125                2130                2135

atc cgg gga gtc cag  cgc gtg acc gtt act  gac gcc aga cgc cgc       15541
Ile Arg Gly Val Gln  Arg Val Thr Val Thr  Asp Ala Arg Arg Arg
                2140                2145                2150

acc tgc ccc tac gtc  tac aag gcc ctg ggc  ata gtc gcg ccg cgc       15586
Thr Cys Pro Tyr Val  Tyr Lys Ala Leu Gly  Ile Val Ala Pro Arg
                2155                2160                2165

gtc ctt tca agc cgc  act ttc taaaaaaaaa aaa atg tcc att  ctt atc     15635
Val Leu Ser Ser Arg  Thr Phe                Met Ser Ile  Leu Ile
                2170                                    2175

tca cct agt  aat aac acc ggt tgg  ggc ctg cgc gcg cca  agc aag       15680
Ser Pro Ser  Asn Asn Thr Gly Trp  Gly Leu Arg Ala Pro  Ser Lys
        2180                2185                2190

atg tac gga  ggt gct cgc aaa cgc  tct aca cag cac cct  gtg cgc       15725
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Met Tyr Gly  Gly Ala Arg Lys Arg  Ser Thr Gln His Pro  Val Arg
        2195                 2200                 2205

gtg cgc ggg  cac ttc cgc gct cca  tgg ggc gcc ctc aag  ggt cgt       15770
Val Arg Gly  His Phe Arg Ala Pro  Trp Gly Ala Leu Lys  Gly Arg
        2210                 2215                 2220

acc cgc act  aga acc acc gtc gat  gat gtg atc gac cag  gtg gtg       15815
Thr Arg Thr  Arg Thr Thr Val Asp  Asp Val Ile Asp Gln  Val Val
        2225                 2230                 2235

gcc gat gct  cgt aat tat act cct  act gca cct aca tct  act gtg       15860
Ala Asp Ala  Arg Asn Tyr Thr Pro  Thr Ala Pro Thr Ser  Thr Val
        2240                 2245                 2250

gat gca gtt  att gac agc gta gtg  gct gac gcc cgc gcc  tat gct       15905
Asp Ala Val  Ile Asp Ser Val Val  Ala Asp Ala Arg Ala  Tyr Ala
        2255                 2260                 2265

cgc cgg aag  agc agg cgg aga cgc  atc gcc agg cgc cac  cgg gct       15950
Arg Arg Lys  Ser Arg Arg Arg Arg  Ile Ala Arg Arg His  Arg Ala
        2270                 2275                 2280

act ccc gct  atg cga gcg gca aga  gct ctg cta cgg agg  gcc aaa       15995
Thr Pro Ala  Met Arg Ala Ala Arg  Ala Leu Leu Arg Arg  Ala Lys
        2285                 2290                 2295

cgc gtg ggg  cga aga gct atg ctt  aga gcg gcc aga cgc  gcg gct       16040
Arg Val Gly  Arg Arg Ala Met Leu  Arg Ala Ala Arg Arg  Ala Ala
        2300                 2305                 2310

tca ggt gcc  agt gcc ggc agg tcc  cgc agg cgc gca gcc  acg gcg       16085
Ser Gly Ala  Ser Ala Gly Arg Ser  Arg Arg Arg Ala Ala  Thr Ala
        2315                 2320                 2325

gca gca gcg  gcc att gcc aac atg  gcc caa ccg cga aga  ggc aat       16130
Ala Ala Ala  Ala Ile Ala Asn Met  Ala Gln Pro Arg Arg  Gly Asn
        2330                 2335                 2340

gtg tac tgg  gtg cgc gac gcc acc  acc ggc cag cgc gtg  ccc gtg       16175
Val Tyr Trp  Val Arg Asp Ala Thr  Thr Gly Gln Arg Val  Pro Val
        2345                 2350                 2355

cgc acc cgc  ccc cct cgc tct tagaagatac tgagcagtct ccgatgttgt       16226
Arg Thr Arg  Pro Pro Arg Ser
        2360

gtcccagcga gg atg  tcc aag cgc aaa tac  aag gaa gag atg ctc  cag     16274
               Met  Ser Lys Arg Lys Tyr  Lys Glu Glu Met Leu  Gln
               2365                 2370                 2375

gtc atc gcg cct  gaa atc tac ggt ccg  ccg gtg aag gat gaa  aaa       16319
Val Ile Ala Pro  Glu Ile Tyr Gly Pro  Pro Val Lys Asp Glu  Lys
            2380                 2385                 2390

aag ccc cgc aaa  atc aag cgg gtc aaa  aag gac aaa aag gaa  gaa       16364
Lys Pro Arg Lys  Ile Lys Arg Val Lys  Lys Asp Lys Lys Glu  Glu
            2395                 2400                 2405
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gat ggc aat gat  ggt ctg gtg gag ttt  gta cgc gag ttc gcc  cca       16409
Asp Gly Asn Asp  Gly Leu Val Glu Phe  Val Arg Glu Phe Ala  Pro
            2410                 2415                 2420

agg cgg cgt gtg  cag tgg cgt gga cgc  aaa gtg cgg cct gtg  ctg       16454
Arg Arg Arg Val  Gln Trp Arg Gly Arg  Lys Val Arg Pro Val  Leu
            2425                 2430                 2435

aga cct gga acc  acg gtg gtc ttt acg  ccc ggc gag cgc acc  agc       16499
Arg Pro Gly Thr  Thr Val Val Phe Thr  Pro Gly Glu Arg Thr  Ser
            2440                 2445                 2450

act gct ttt aag  cga tcc tat gat gag  gtg tat ggg gat gat  gat       16544
Thr Ala Phe Lys  Arg Ser Tyr Asp Glu  Val Tyr Gly Asp Asp  Asp
            2455                 2460                 2465

att ctg gag cag  gcg gcc gac cgc ctg  ggc gag ttt gct tat  ggc       16589
Ile Leu Glu Gln  Ala Ala Asp Arg Leu  Gly Glu Phe Ala Tyr  Gly
            2470                 2475                 2480

aag cgc tcc cgc  tcc agc ccc aag gag  gag gcg gtg tcc att  ccc       16634
Lys Arg Ser Arg  Ser Ser Pro Lys Glu  Glu Ala Val Ser Ile  Pro
            2485                 2490                 2495

ttg gac aat ggg  aat ccc acc cct agc  ctc aag cca gtc acc  ctg       16679
Leu Asp Asn Gly  Asn Pro Thr Pro Ser  Leu Lys Pro Val Thr  Leu
            2500                 2505                 2510

cag caa gtg ctg  ccc gtg cct cca cgc  aga ggc aac aag cga  gag       16724
Gln Gln Val Leu  Pro Val Pro Pro Arg  Arg Gly Asn Lys Arg  Glu
            2515                 2520                 2525

ggt gag gat ctg  tat ccc acg atg caa  ttg atg gtg ccc aag  cgc       16769
Gly Glu Asp Leu  Tyr Pro Thr Met Gln  Leu Met Val Pro Lys  Arg
            2530                 2535                 2540

cag cgg ctg gag  gac gtg ctg gag aaa  atg aaa gtg gat ccc  gat       16814
Gln Arg Leu Glu  Asp Val Leu Glu Lys  Met Lys Val Asp Pro  Asp
            2545                 2550                 2555

ata caa cct gag  gtc aaa gtg aga ccc  atc aag cag gtg gcg  cca       16859
Ile Gln Pro Glu  Val Lys Val Arg Pro  Ile Lys Gln Val Ala  Pro
            2560                 2565                 2570

ggt ttg gga gta  caa acc gta gac atc  aag att ccc acc gag  tcc       16904
Gly Leu Gly Val  Gln Thr Val Asp Ile  Lys Ile Pro Thr Glu  Ser
            2575                 2580                 2585

atg gaa gtc caa  acc gaa cct gca aag  ccc aca acc acc tcc  att       16949
Met Glu Val Gln  Thr Glu Pro Ala Lys  Pro Thr Thr Thr Ser  Ile
            2590                 2595                 2600

gag gtg caa acg  gat ccc tgg atg tcc  gca ccc gtt aca gct  caa       16994
Glu Val Gln Thr  Asp Pro Trp Met Ser  Ala Pro Val Thr Ala  Gln
            2605                 2610                 2615

gct gct gtc aac  acc act cga aga tcc  cgg cga aag tac ggt  cca       17039
Ala Ala Val Asn  Thr Thr Arg Arg Ser  Arg Arg Lys Tyr Gly  Pro
            2620                 2625                 2630
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gca agt ttg ctg  atg cca aat tat gct  ctg cac cca tct att  att       17084
Ala Ser Leu Leu  Met Pro Asn Tyr Ala  Leu His Pro Ser Ile  Ile
            2635                 2640                 2645

cca act ccg ggt  tac cga ggc act cgc  tac tac cgc agc cgg  agc       17129
Pro Thr Pro Gly  Tyr Arg Gly Thr Arg  Tyr Tyr Arg Ser Arg  Ser
            2650                 2655                 2660

agc act tcc cgc  cgt cgc cgc aaa aca  cct gca agt cgt agt  cac       17174
Ser Thr Ser Arg  Arg Arg Arg Lys Thr  Pro Ala Ser Arg Ser  His
            2665                 2670                 2675

cgt cgt cgt cgc  cgc ccc gcc agc aat  ctg acc ccc gct gct  ctg       17219
Arg Arg Arg Arg  Arg Pro Ala Ser Asn  Leu Thr Pro Ala Ala  Leu
            2680                 2685                 2690

gtg cgg aga gtg  tat cgc gat ggc cgc  gca gat ccc ctg acg  ttg       17264
Val Arg Arg Val  Tyr Arg Asp Gly Arg  Ala Asp Pro Leu Thr  Leu
            2695                 2700                 2705

cca cgc gta cgc  tac cat cca agc atc  aca act taacgactgt             17307
Pro Arg Val Arg  Tyr His Pro Ser Ile  Thr Thr
            2710                 2715

tgccgctgcc tccttgcaga t atg gcc ctc  act tgc cgc ctt cgt  gtc ccc    17358
                        Met Ala Leu  Thr Cys Arg Leu Arg  Val Pro
                                2720                 2725

att act ggc  tac cga gga aga aac  tcg cgc cgt aga aga  ggg atg       17403
Ile Thr Gly  Tyr Arg Gly Arg Asn  Ser Arg Arg Arg Arg  Gly Met
        2730                 2735                 2740

ttg ggg cgc  ggg atg cga cgc cac  agg cgg cgg cgc gct  atc agc       17448
Leu Gly Arg  Gly Met Arg Arg His  Arg Arg Arg Arg Ala  Ile Ser
        2745                 2750                 2755

aaa agg ctg  ggg ggt ggc ttt ctg  cct gct ctg atc ccc  atc ata       17493
Lys Arg Leu  Gly Gly Gly Phe Leu  Pro Ala Leu Ile Pro  Ile Ile
        2760                 2765                 2770

gcc gcg gcg  atc ggg gcg ata cca  ggc ata gct tcc gtg  gcg gtt       17538
Ala Ala Ala  Ile Gly Ala Ile Pro  Gly Ile Ala Ser Val  Ala Val
        2775                 2780                 2785

cag gcc tcg  cag cgc cac tgacattgga aaaacttata aataaaatag           17586
Gln Ala Ser  Gln Arg His
        2790

aatggactct gatgctcctg gtcctgtgac tatgtttttg tagag atg gaa  gac       17640
                                                 Met Glu  Asp
                                                     2795

atc aat ttt tca  tcc ctg gct ccg cga  cac ggc acg agg ccg  tac       17685
Ile Asn Phe Ser  Ser Leu Ala Pro Arg  His Gly Thr Arg Pro  Tyr
            2800                 2805                 2810

atg ggc acc tgg  agc gac atc ggc acc  agc caa ctg aac ggg  ggc       17730
Met Gly Thr Trp  Ser Asp Ile Gly Thr  Ser Gln Leu Asn Gly  Gly
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            2815                2820                2825

gcc ttc aat tgg  agc agt atc tgg agc  ggg ctt aaa aat ttt  ggc       17775
Ala Phe Asn Trp  Ser Ser Ile Trp Ser  Gly Leu Lys Asn Phe  Gly
            2830                2835                2840

tct acc ata aaa  acc tat ggg aac aaa  gct tgg aac agc agc  aca       17820
Ser Thr Ile Lys  Thr Tyr Gly Asn Lys  Ala Trp Asn Ser Ser  Thr
            2845                2850                2855

ggg cag gca ctg  aga aat aag ctt aaa  gag caa aac ttc caa  cag       17865
Gly Gln Ala Leu  Arg Asn Lys Leu Lys  Glu Gln Asn Phe Gln  Gln
            2860                2865                2870

aag gtg gtt gat  ggg atc gcc tct ggt  atc aat ggg gtg gtg  gat       17910
Lys Val Val Asp  Gly Ile Ala Ser Gly  Ile Asn Gly Val Val  Asp
            2875                2880                2885

ctg gcc aac cag  gcc gtg cag aaa cag  ata aac agc cgc ctg  gac       17955
Leu Ala Asn Gln  Ala Val Gln Lys Gln  Ile Asn Ser Arg Leu  Asp
            2890                2895                2900

ccg ccg ccg tca  gcc ccg ggt gaa atg  gaa gtg gag gaa gat  ctc       18000
Pro Pro Pro Ser  Ala Pro Gly Glu Met  Glu Val Glu Glu Asp  Leu
            2905                2910                2915

cct ccc ctt gaa  aag cgg ggc gac aag  cgt ccg cgc ccc gat  ctg       18045
Pro Pro Leu Glu  Lys Arg Gly Asp Lys  Arg Pro Arg Pro Asp  Leu
            2920                2925                2930

gag gag aca cta  gtc aca cgc tca gac  gac ccg ccc tcc tac  gag       18090
Glu Glu Thr Leu  Val Thr Arg Ser Asp  Asp Pro Pro Ser Tyr  Glu
            2935                2940                2945

gag gca gtg aag  ctt gga atg ccc acc  acc aga cct gta gcc  ccc       18135
Glu Ala Val Lys  Leu Gly Met Pro Thr  Thr Arg Pro Val Ala  Pro
            2950                2955                2960

atg gct acc ggg  gta atg aaa cct tct  cag tca cac cga ccc  gct       18180
Met Ala Thr Gly  Val Met Lys Pro Ser  Gln Ser His Arg Pro  Ala
            2965                2970                2975

acc ttg gac ttg  cct cct ccc cct act  gct gca gcg cct gct  cgc       18225
Thr Leu Asp Leu  Pro Pro Pro Pro Thr  Ala Ala Ala Pro Ala  Arg
            2980                2985                2990

aag cct gtc gct  acc ccg aag ccc acc  acc gta cag ccc gtc  gcc       18270
Lys Pro Val Ala  Thr Pro Lys Pro Thr  Thr Val Gln Pro Val  Ala
            2995                3000                3005

gta gcc agg ccg  cgt cct ggg ggc act  cca cgt cca aat gca  aac       18315
Val Ala Arg Pro  Arg Pro Gly Gly Thr  Pro Arg Pro Asn Ala  Asn
            3010                3015                3020

tgg cag agt act  ctg aac agc atc gtg  ggt ctg ggc gtg caa  agt       18360
Trp Gln Ser Thr  Leu Asn Ser Ile Val  Gly Leu Gly Val Gln  Ser
            3025                3030                3035

gta aag cgc cgt  cgc tgc ttt taaattaaat atggagtagc gcttaacttg       18411
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Val Lys Arg Arg  Arg Cys Phe
            3040

cctgtctgtg tgtgtatgtg tcatcatcac gccgccgccg cagcaacagc agaggagaaa    18471

aggaagaggt cgcgcgccga ggctgagttg ctttcaag atg gcc  acc cca tcg       18524
                                          Met Ala  Thr Pro Ser
                                              3045

atg ctg  ccc cag tgg gca tac  atg cac atc gcc gga  cag gat gct       18569
Met Leu  Pro Gln Trp Ala Tyr  Met His Ile Ala Gly  Gln Asp Ala
    3050                 3055                 3060

tcg gag  tac ctg agt ccg ggt  ctg gtg cag ttc gcc  cgc gcc aca       18614
Ser Glu  Tyr Leu Ser Pro Gly  Leu Val Gln Phe Ala  Arg Ala Thr
    3065                 3070                 3075

gac acc  tac ttc aat ctg ggg  aac aag ttt agg aac  cct acc gtg       18659
Asp Thr  Tyr Phe Asn Leu Gly  Asn Lys Phe Arg Asn  Pro Thr Val
    3080                 3085                 3090

gcg ccc  acc cat gat gtg acc  acc gac cgc agt caa  cgg ctg atg       18704
Ala Pro  Thr His Asp Val Thr  Thr Asp Arg Ser Gln  Arg Leu Met
    3095                 3100                 3105

ctc cgc  ttt gtg ccc gtt gac  cgg gag gac aat acc  tac tca tac       18749
Leu Arg  Phe Val Pro Val Asp  Arg Glu Asp Asn Thr  Tyr Ser Tyr
    3110                 3115                 3120

aaa gtt  cga tac acc ttg gct  gtg ggc gac aac aga  gtg ctg gat       18794
Lys Val  Arg Tyr Thr Leu Ala  Val Gly Asp Asn Arg  Val Leu Asp
    3125                 3130                 3135

atg gcc  agt act ttc ttt gac  att cgg ggt gtg ttg  gat aga ggc       18839
Met Ala  Ser Thr Phe Phe Asp  Ile Arg Gly Val Leu  Asp Arg Gly
    3140                 3145                 3150

cct agc  ttc aag cca tat tct  ggc act gct tac aac  tca ttg gcc       18884
Pro Ser  Phe Lys Pro Tyr Ser  Gly Thr Ala Tyr Asn  Ser Leu Ala
    3155                 3160                 3165

cct aag  ggc gct ccc aat aca  tct cag tgg att gct  gaa ggc gta       18929
Pro Lys  Gly Ala Pro Asn Thr  Ser Gln Trp Ile Ala  Glu Gly Val
    3170                 3175                 3180

aaa aaa  gaa aat ggg gaa gct  gac aat gaa gca gct  gtc gaa gag       18974
Lys Lys  Glu Asn Gly Glu Ala  Asp Asn Glu Ala Ala  Val Glu Glu
    3185                 3190                 3195

gaa gag  gaa gag aaa aat ctt  acc act tac act ttt  gga aat gcc       19019
Glu Glu  Glu Glu Lys Asn Leu  Thr Thr Tyr Thr Phe  Gly Asn Ala
    3200                 3205                 3210

cca gtg  aaa gca gaa ggt ggt  gat atc act aaa gac  aaa ggt ctt       19064
Pro Val  Lys Ala Glu Gly Gly  Asp Ile Thr Lys Asp  Lys Gly Leu
    3215                 3220                 3225

cca att  ggt tca gaa att aca  gac ggc aaa gcc aaa  cca att tat       19109
Pro Ile  Gly Ser Glu Ile Thr  Asp Gly Lys Ala Lys  Pro Ile Tyr
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    3230                3235                3240

gca gat  aaa cta tac caa cca  gaa cct cag gtg gga  gag gaa act       19154
Ala Asp  Lys Leu Tyr Gln Pro  Glu Pro Gln Val Gly  Glu Glu Thr
    3245                3250                3255

tgg act  gac aca gat gga aca  act gag aag tat ggt  ggt aga gct       19199
Trp Thr  Asp Thr Asp Gly Thr  Thr Glu Lys Tyr Gly  Gly Arg Ala
    3260                3265                3270

cta aag  cca gaa act aaa atg  aaa ccc tgc tat ggg  tct ttt gct       19244
Leu Lys  Pro Glu Thr Lys Met  Lys Pro Cys Tyr Gly  Ser Phe Ala
    3275                3280                3285

aaa ccc  act aac gtc aaa ggc  gga cag gca aaa caa  aaa act act       19289
Lys Pro  Thr Asn Val Lys Gly  Gly Gln Ala Lys Gln  Lys Thr Thr
    3290                3295                3300

gaa caa  ctg caa aac cag cag  gtt gaa tat gat att  gac atg aac       19334
Glu Gln  Leu Gln Asn Gln Gln  Val Glu Tyr Asp Ile  Asp Met Asn
    3305                3310                3315

ttt ttt  gat caa gcg tca cag  aaa gca aac ttc agt  cca aaa att       19379
Phe Phe  Asp Gln Ala Ser Gln  Lys Ala Asn Phe Ser  Pro Lys Ile
    3320                3325                3330

gtg atg  tat gca gaa aat gta  gac ttg gaa acc cca  gac act cac       19424
Val Met  Tyr Ala Glu Asn Val  Asp Leu Glu Thr Pro  Asp Thr His
    3335                3340                3345

gtg gtg  tac aaa cct ggt act  tca gaa gaa agt tct  cat gct aat       19469
Val Val  Tyr Lys Pro Gly Thr  Ser Glu Glu Ser Ser  His Ala Asn
    3350                3355                3360

ctc ggt  caa caa tct atg ccc  aac aga ccc aac tac  att ggc ttt       19514
Leu Gly  Gln Gln Ser Met Pro  Asn Arg Pro Asn Tyr  Ile Gly Phe
    3365                3370                3375

aga gat  aac ttt att gga ctt  atg tac tac aac agt  act ggc aac       19559
Arg Asp  Asn Phe Ile Gly Leu  Met Tyr Tyr Asn Ser  Thr Gly Asn
    3380                3385                3390

atg gga  gtg ctg gca ggt caa  gca tcc caa ttg aat  gcg gtg gtt       19604
Met Gly  Val Leu Ala Gly Gln  Ala Ser Gln Leu Asn  Ala Val Val
    3395                3400                3405

gac ttg  cag gac aga aac aca  gaa cta tca tat caa  cta ctg ctt       19649
Asp Leu  Gln Asp Arg Asn Thr  Glu Leu Ser Tyr Gln  Leu Leu Leu
    3410                3415                3420

gat tct  ctg ggt gac aga acc  aga tac ttc agc atg  tgg aat caa       19694
Asp Ser  Leu Gly Asp Arg Thr  Arg Tyr Phe Ser Met  Trp Asn Gln
    3425                3430                3435

gca gtc  gat agc tat gat cct  gat gtg cgc att att  gaa aat cat       19739
Ala Val  Asp Ser Tyr Asp Pro  Asp Val Arg Ile Ile  Glu Asn His
    3440                3445                3450

ggg gtg  gaa gat gag ctt ccc  aac tac tgc ttt cca  ttg gat gga       19784
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Gly Val  Glu Asp Glu Leu Pro  Asn Tyr Cys Phe Pro  Leu Asp Gly
    3455                 3460                 3465

gta ggg  gta cca aca act agt  tac aaa ata att gaa  cca aat gga       19829
Val Gly  Val Pro Thr Thr Ser  Tyr Lys Ile Ile Glu  Pro Asn Gly
    3470                 3475                 3480

gag ggt  gca gat tgg aaa gag  cct gac ata aat gga  aca agt gaa       19874
Glu Gly  Ala Asp Trp Lys Glu  Pro Asp Ile Asn Gly  Thr Ser Glu
    3485                 3490                 3495

att gga  caa gga aat ctc ttt  gcc atg gaa att aac  ctc caa gct       19919
Ile Gly  Gln Gly Asn Leu Phe  Ala Met Glu Ile Asn  Leu Gln Ala
    3500                 3505                 3510

aat ctc  tgg aga agt ttt ctt  tat tcc aat gtg gct  ctg tat ctc       19964
Asn Leu  Trp Arg Ser Phe Leu  Tyr Ser Asn Val Ala  Leu Tyr Leu
    3515                 3520                 3525

cca gac  tcc tac aaa tac acc  cca gcc aat gtc act  ctt cca act       20009
Pro Asp  Ser Tyr Lys Tyr Thr  Pro Ala Asn Val Thr  Leu Pro Thr
    3530                 3535                 3540

aac acc  aac act tat gac tac  atg aat ggg cgg gtg  gtt ccc cca       20054
Asn Thr  Asn Thr Tyr Asp Tyr  Met Asn Gly Arg Val  Val Pro Pro
    3545                 3550                 3555

tcc cta  gtg gat acc tac gta  aac att ggc gcc aga  tgg tct ttg       20099
Ser Leu  Val Asp Thr Tyr Val  Asn Ile Gly Ala Arg  Trp Ser Leu
    3560                 3565                 3570

gat gcc  atg gac aat gtc aac  ccc ttt aac cat cac  cgc aac gct       20144
Asp Ala  Met Asp Asn Val Asn  Pro Phe Asn His His  Arg Asn Ala
    3575                 3580                 3585

ggc ctg  cga tac cgg tcc atg  ctt ttg ggc aat ggt  cgc tac gtg       20189
Gly Leu  Arg Tyr Arg Ser Met  Leu Leu Gly Asn Gly  Arg Tyr Val
    3590                 3595                 3600

cct ttc  cac att caa gtg cct  cag aaa ttc ttt gct  gtg aag aac       20234
Pro Phe  His Ile Gln Val Pro  Gln Lys Phe Phe Ala  Val Lys Asn
    3605                 3610                 3615

ctg ctg  ctt cta ccc ggt tct  tac acc tac gag tgg  aac ttc aga       20279
Leu Leu  Leu Leu Pro Gly Ser  Tyr Thr Tyr Glu Trp  Asn Phe Arg
    3620                 3625                 3630

aag gat  gtg aac atg gtc ctg  cag agt tcc ctt ggt  aat gat ctc       20324
Lys Asp  Val Asn Met Val Leu  Gln Ser Ser Leu Gly  Asn Asp Leu
    3635                 3640                 3645

cgg gtc  gat ggt gcc agc atc  agt ttt acc agc atc  aat ctc tat       20369
Arg Val  Asp Gly Ala Ser Ile  Ser Phe Thr Ser Ile  Asn Leu Tyr
    3650                 3655                 3660

gcc acc  ttc ttc ccc atg gcc  cac aac act gcc tcc  acc ctt gaa       20414
Ala Thr  Phe Phe Pro Met Ala  His Asn Thr Ala Ser  Thr Leu Glu
    3665                 3670                 3675
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gcc atg  ctg cgc aat gac acc  aat gat caa tca ttc  aat gac tac       20459
Ala Met  Leu Arg Asn Asp Thr  Asn Asp Gln Ser Phe  Asn Asp Tyr
    3680                 3685                 3690

ctt tct  gca gcc aac atg ctc  tac ccc atc ccg gcc  aac gct acc       20504
Leu Ser  Ala Ala Asn Met Leu  Tyr Pro Ile Pro Ala  Asn Ala Thr
    3695                 3700                 3705

aac gtt  ccc atc tcc att ccc  tct cgt aac tgg gcc  gcc ttc aga       20549
Asn Val  Pro Ile Ser Ile Pro  Ser Arg Asn Trp Ala  Ala Phe Arg
    3710                 3715                 3720

ggc tgg  tcc ttc acc aga ctc  aaa acc aaa gag act  ccc tct ttg       20594
Gly Trp  Ser Phe Thr Arg Leu  Lys Thr Lys Glu Thr  Pro Ser Leu
    3725                 3730                 3735

gga tca  ggg ttc gat ccc tac  ttt gtt tac tct ggt  tct ata cct       20639
Gly Ser  Gly Phe Asp Pro Tyr  Phe Val Tyr Ser Gly  Ser Ile Pro
    3740                 3745                 3750

tac ctg  gat ggt acc ttc tac  ctt aac cac act ttt  aag aaa gtc       20684
Tyr Leu  Asp Gly Thr Phe Tyr  Leu Asn His Thr Phe  Lys Lys Val
    3755                 3760                 3765

tct atc  atg ttt gac tct tca  gtc agc tgg cct ggt  aat gac aga       20729
Ser Ile  Met Phe Asp Ser Ser  Val Ser Trp Pro Gly  Asn Asp Arg
    3770                 3775                 3780

ttg cta  act cca aat gag ttc  gaa atc aag cgc aca  gtt gat ggg       20774
Leu Leu  Thr Pro Asn Glu Phe  Glu Ile Lys Arg Thr  Val Asp Gly
    3785                 3790                 3795

gaa ggc  tac aat gtg gcc caa  tgt aac atg acc aaa  gac tgg ttc       20819
Glu Gly  Tyr Asn Val Ala Gln  Cys Asn Met Thr Lys  Asp Trp Phe
    3800                 3805                 3810

ctg gtc  cag atg ctt gcc aac  tac aac att gga tac  cag ggc ttc       20864
Leu Val  Gln Met Leu Ala Asn  Tyr Asn Ile Gly Tyr  Gln Gly Phe
    3815                 3820                 3825

tac gtt  cct gag ggt tac aag  gat cgc atg tac tcc  ttc ttc aga       20909
Tyr Val  Pro Glu Gly Tyr Lys  Asp Arg Met Tyr Ser  Phe Phe Arg
    3830                 3835                 3840

aac ttc  cag ccc atg agt aga  cag gtg gtt gat gag  att aac tac       20954
Asn Phe  Gln Pro Met Ser Arg  Gln Val Val Asp Glu  Ile Asn Tyr
    3845                 3850                 3855

aaa gac  tat aaa gct gtc gcc  gta ccc tac cag cat  aat aac tct       20999
Lys Asp  Tyr Lys Ala Val Ala  Val Pro Tyr Gln His  Asn Asn Ser
    3860                 3865                 3870

ggc ttt  gtg ggt tac atg gct  cct acc atg cgt cag  ggt caa gcg       21044
Gly Phe  Val Gly Tyr Met Ala  Pro Thr Met Arg Gln  Gly Gln Ala
    3875                 3880                 3885

tac cct  gct aac tac cca tac  ccc cta att gga acc  act gca gta       21089
Tyr Pro  Ala Asn Tyr Pro Tyr  Pro Leu Ile Gly Thr  Thr Ala Val
    3890                 3895                 3900
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acc agt  gtc acc cag aaa aaa  ttc ctg tgc gac agg  acc atg tgg       21134
Thr Ser  Val Thr Gln Lys Lys  Phe Leu Cys Asp Arg  Thr Met Trp
    3905                 3910                 3915

cgc atc  cca ttc tct agc aac  ttc atg tcc atg ggt  gcc ctt aca       21179
Arg Ile  Pro Phe Ser Ser Asn  Phe Met Ser Met Gly  Ala Leu Thr
    3920                 3925                 3930

gac ctg  gga cag aac ttg ctg  tat gcc aac tca gcc  cat gcg ctg       21224
Asp Leu  Gly Gln Asn Leu Leu  Tyr Ala Asn Ser Ala  His Ala Leu
    3935                 3940                 3945

gac atg  act ttt gag gtg gat  ccc atg gat gag ccc  acc ctg ctt       21269
Asp Met  Thr Phe Glu Val Asp  Pro Met Asp Glu Pro  Thr Leu Leu
    3950                 3955                 3960

tat ctt  ctt ttt gaa gta ttc  gac gtg gtc aga gtg  cac caa cca       21314
Tyr Leu  Leu Phe Glu Val Phe  Asp Val Val Arg Val  His Gln Pro
    3965                 3970                 3975

cac cgc  ggc gtc atc gag gcc  gtc tac ctg cgc aca  ccg ttc tcg       21359
His Arg  Gly Val Ile Glu Ala  Val Tyr Leu Arg Thr  Pro Phe Ser
    3980                 3985                 3990

gct ggt  aac gcc acc aca taagaaacct gcttcttgca aggtgcagcc           21407
Ala Gly  Asn Ala Thr Thr
    3995

atggcctgcg ggtccggaaa cggctccagc gagcaagagc tcagagccat cgtccgagac   21467

cttggctgtg gaccctactt cctgggaacc tttgacaaac gcttcccggg gtttatggct   21527

ccaaacaagc tggcctgcgc cattgtcaac acagccggtc gcgagacggg gggagagcac   21587

tggttggctt ttggttggaa cccgcgctcc aacacatgct acctttttga tccgtttgga   21647

ttctcggatg accgtctcaa gcagatctac cagtttgaat acgaggggtt actgcgccgc   21707

agcgcccttg ctactaagga tcgctgcatt accttggaaa agtccaccca aaccgtgcag   21767

ggtccgcgct ccgccgcttg tggacttttt tgctgcatgt ttctccatgc ctttgtacac   21827

tggccagacc gccccatgga cggtaacccc accatgaagt tgcttacggg agtgcccaac   21887

agcatgctcc agtcacccca agtccagccc accctgcgca ggaaccagga ggcgctctac   21947

catttcctca acacacattc atcttacttt cgttctcacc gcgcacgtat cgaaagggct   22007

actgcgttcg atcgtatggg atattaataa gtcatgtaaa accgtgttca ataaacagaa   22067

ctttattttt tacatgcact ggtggtttct cattcattta ttcactcaga agtcgaaggg   22127

gttttggcgg gaatcagagt gacccgcggg cagggatacg ttgcggaact ggaactgagc   22187

ctgccacttg aattcgggga tcaccagctt gggaactggc aggtcaggca ggatgtcgct   22247

ccacagcttc ctggtcagtt gcagggctcc caacaggtca ggagctgaaa tcttgaaatc   22307
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gcaattggga cccgtgctct gagcgcggga gttgcgatac acagggttgc aacactggaa    22367

caccatcagc gacgggtatt tcacactcgc cagcacagtg ggatcggtga taattcccac    22427

atccaggtct tcggcattgg ccatgctaaa gggggtcatc ttgcatgtct gtctgcccat    22487

agccggtacc cagcctggct tgtggttgca atcgcagcgc agagggatca gcatcatctt    22547

ggcctggtcg gatctcatac cgggatacac agctttcatg aaagcttcat attgcttgaa    22607

agcctgttgg gccttgctac cctcagtgta gaacatccca caagacttgc tagagaactg    22667

gttagcagca catccggcat cattcacaca acagcgagcg tcgttgttgg ctatttgcac    22727

cacactcctg ccccagcggt tctgggtgat cttggttcgc tcagggttct ccttcagcgc    22787

ccgttgaccg ttttcgcttg ccacatccat ttctatgata tgttccttct gaatcatgat    22847

gttgccatgc aaacacttca gcttgccttc ataatcatta catccatgtg accacagcgc    22907

gcatcccgta cactcccagt tattgtgagc gatctcagaa taggaatgca ccaacccctg    22967

caggaatctt cccatcatgg ttgagagggt cttgttactg gtgaaagtca gcgggacgcc    23027

tcgatgctcc tcgttcacat actggtggca aattcgcttg tactgttcat gctgctctgg    23087

cataagcttg aaagaggttc ttaggtcatt ctccagcctg tacttctcca tcagcacagc    23147

cattacttcc atgccctttt cccaggcaga aaccaggggt aggctcatgg aatttctaac    23207

agaaatagca gctactttag ccagagggtc atccttgtca atcttctcaa cacttctttt    23267

gccatccttc tcagtgatgc gcacgggtgg gtagctgaag cccacggcca ccagctccgc    23327

ctcttctctt tcttcttcgc tgtcctgact gatgtcttgt aaagggacat gcttggtctt    23387

cctgggcttc tttttggggg gtattggcgg agggctgctg ctccgctccg gagacatgga    23447

ggaccgcgaa gtttcgctca ccagtaccac ctggctctcg gtagaagaac cggaccccac    23507

acggcggtag gtgttcctct tcgggggcag aggtggaggt gactgcgatg ggctgcggtc    23567

cggcctggga ggcggatgac tggcagagcc ccttccgcgt tcgggggtgt gctcccggtg    23627

gcggtcgctt gactgatttc ctccgcggct ggccattgtg ttctcctagg cagagaaaca    23687

acagac atg  gag act cag cca tcg  ctg cca aca ccg ctg  caa gca cca    23735
       Met  Glu Thr Gln Pro Ser  Leu Pro Thr Pro Leu  Gln Ala Pro
       4000                4005                4010

tca cac  ctc gcc tcc agc gat  gag gag gag gaa caa  agc tta acc      23780
Ser His  Leu Ala Ser Ser Asp  Glu Glu Glu Glu Gln  Ser Leu Thr
    4015                4020                4025

gcc cca  cca ccc agt ccc gcc  acc acc acc tct acc  ctc gag gat      23825
Ala Pro  Pro Pro Ser Pro Ala  Thr Thr Thr Ser Thr  Leu Glu Asp
    4030                4035                4040

gag gag  gtc gac gca ccc cag  gag ata cgg acg cag  gat atg gag      23870
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Glu Glu  Val Asp Ala Pro Gln  Glu Ile Arg Thr Gln  Asp Met Glu
    4045                 4050                 4055

gat gag  aaa gcg gaa gag att  gag gca gat atc gag  cag gac cca       23915
Asp Glu  Lys Ala Glu Glu Ile  Glu Ala Asp Ile Glu  Gln Asp Pro
    4060                 4065                 4070

ggc tat  gtg aca ccg gcc gag  cac gag gaa gag ctg  aga cgc ttt       23960
Gly Tyr  Val Thr Pro Ala Glu  His Glu Glu Glu Leu  Arg Arg Phe
    4075                 4080                 4085

cta gag  aaa gat gat gac aac  cgt cca gaa cag caa  gca gat ggc       24005
Leu Glu  Lys Asp Asp Asp Asn  Arg Pro Glu Gln Gln  Ala Asp Gly
    4090                 4095                 4100

gat cag  cag aat gtt ggg ctc  ggg gat cat gtt gtc  gac tac ctc       24050
Asp Gln  Gln Asn Val Gly Leu  Gly Asp His Val Val  Asp Tyr Leu
    4105                 4110                 4115

acc ggc  ctt ggt ggg gag gac  gtg ctc ctc aaa cac  cta gca agg       24095
Thr Gly  Leu Gly Gly Glu Asp  Val Leu Leu Lys His  Leu Ala Arg
    4120                 4125                 4130

cag tcg  atc ata atc aaa gat  gca ctg ctt gat cgc  agc gaa gtg       24140
Gln Ser  Ile Ile Ile Lys Asp  Ala Leu Leu Asp Arg  Ser Glu Val
    4135                 4140                 4145

ccc atc  agt gtg gaa gag ctc  agc cgc gcc tac gag  ctc aac ctg       24185
Pro Ile  Ser Val Glu Glu Leu  Ser Arg Ala Tyr Glu  Leu Asn Leu
    4150                 4155                 4160

ttc tcg  cct cgg gta ccc ccc  aag cgt cag cca aac  ggc acc tgc       24230
Phe Ser  Pro Arg Val Pro Pro  Lys Arg Gln Pro Asn  Gly Thr Cys
    4165                 4170                 4175

gag ccc  aac cct cgc ctc aac  ttc tat ccc gca ttc  acc gtc ccc       24275
Glu Pro  Asn Pro Arg Leu Asn  Phe Tyr Pro Ala Phe  Thr Val Pro
    4180                 4185                 4190

gag gtg  ctg gct acc tac cac  ata ttt ttc aaa aac  caa aaa att       24320
Glu Val  Leu Ala Thr Tyr His  Ile Phe Phe Lys Asn  Gln Lys Ile
    4195                 4200                 4205

cca att  tcc tgc cgc gcc aac  cga act cgc gcc gat  gcc ctg ctc       24365
Pro Ile  Ser Cys Arg Ala Asn  Arg Thr Arg Ala Asp  Ala Leu Leu
    4210                 4215                 4220

aac ttg  gga cct ggc gct tgc  tta cct gat ata act  tcc ttg gaa       24410
Asn Leu  Gly Pro Gly Ala Cys  Leu Pro Asp Ile Thr  Ser Leu Glu
    4225                 4230                 4235

gag gtc  cca aag atc ttc gaa  ggt ctg ggc agt gat  gag act cgg       24455
Glu Val  Pro Lys Ile Phe Glu  Gly Leu Gly Ser Asp  Glu Thr Arg
    4240                 4245                 4250

gcc gca  aat gct ctg caa cag  gga gag aat ggc atc  gat gaa cat       24500
Ala Ala  Asn Ala Leu Gln Gln  Gly Glu Asn Gly Ile  Asp Glu His
    4255                 4260                 4265
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cac agc  gct ctg gtg gag ttg  gag ggc gat aat gcc  cga cta gca       24545
His Ser  Ala Leu Val Glu Leu  Glu Gly Asp Asn Ala  Arg Leu Ala
    4270                 4275                 4280

gta ctc  aag cgc agt atc gag  gtg acc cat ttt gca  tac ccc gct       24590
Val Leu  Lys Arg Ser Ile Glu  Val Thr His Phe Ala  Tyr Pro Ala
    4285                 4290                 4295

gtc aac  ctg cct ccc aaa gtc  atg agc gct gtc atg  gat cag ata       24635
Val Asn  Leu Pro Pro Lys Val  Met Ser Ala Val Met  Asp Gln Ile
    4300                 4305                 4310

ctc att  aaa cgc gca agt ccc  ctt tca gaa aac atg  cag gat cca       24680
Leu Ile  Lys Arg Ala Ser Pro  Leu Ser Glu Asn Met  Gln Asp Pro
    4315                 4320                 4325

gac gcc  tcg gat gag ggc aag  cca gtg gtc agt gat  gaa cag cta       24725
Asp Ala  Ser Asp Glu Gly Lys  Pro Val Val Ser Asp  Glu Gln Leu
    4330                 4335                 4340

tct cgc  tgg ctg ggc acc aac  tcc cca cga gac ttg  gaa gag cgg       24770
Ser Arg  Trp Leu Gly Thr Asn  Ser Pro Arg Asp Leu  Glu Glu Arg
    4345                 4350                 4355

cgc aag  ctc atg atg gcc gtg  gtg cta gtt act gtg  gaa atg gag       24815
Arg Lys  Leu Met Met Ala Val  Val Leu Val Thr Val  Glu Met Glu
    4360                 4365                 4370

tgt ctt  cgc cgc ttc ttc act  gac ccc gag aca ctg  cgc aag ctc       24860
Cys Leu  Arg Arg Phe Phe Thr  Asp Pro Glu Thr Leu  Arg Lys Leu
    4375                 4380                 4385

gag gag  aac cta cac tac act  ttt aga cat gga ttt  gtg aga cag       24905
Glu Glu  Asn Leu His Tyr Thr  Phe Arg His Gly Phe  Val Arg Gln
    4390                 4395                 4400

gca tgc  aag atc tcc aac gtg  gag ctt acc aac ctg  gtt tcc tac       24950
Ala Cys  Lys Ile Ser Asn Val  Glu Leu Thr Asn Leu  Val Ser Tyr
    4405                 4410                 4415

atg ggc  att ttg cat gaa aac  aga ctc gga cag agc  gtg ctg cac       24995
Met Gly  Ile Leu His Glu Asn  Arg Leu Gly Gln Ser  Val Leu His
    4420                 4425                 4430

acc acc  ctg aag ggg gaa gcc  cgt cgc gac tac atc  cgc gac act       25040
Thr Thr  Leu Lys Gly Glu Ala  Arg Arg Asp Tyr Ile  Arg Asp Thr
    4435                 4440                 4445

gtc tac  ctc tac ctc tgc cat  acc tgg cag act ggt  atg ggt gtg       25085
Val Tyr  Leu Tyr Leu Cys His  Thr Trp Gln Thr Gly  Met Gly Val
    4450                 4455                 4460

tgg cag  cag tgt ttg gaa gaa  caa aac ctg aaa gaa  cta gac aag       25130
Trp Gln  Gln Cys Leu Glu Glu  Gln Asn Leu Lys Glu  Leu Asp Lys
    4465                 4470                 4475

ctc tta  cag aga tcc ctc aaa  acc ttg tgg acg ggt  ttt gac gag       25175
Leu Leu  Gln Arg Ser Leu Lys  Thr Leu Trp Thr Gly  Phe Asp Glu
    4480                 4485                 4490
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cgc aca  gtc gcc tct gat ctg  gca gat ctc atc ttc  cca gag cgt       25220
Arg Thr  Val Ala Ser Asp Leu  Ala Asp Leu Ile Phe  Pro Glu Arg
    4495                 4500                 4505

ctc agg  act act ctg cgc aac  ggg ctg cct gac ttc  atg aac cag       25265
Leu Arg  Thr Thr Leu Arg Asn  Gly Leu Pro Asp Phe  Met Asn Gln
    4510                 4515                 4520

agc atg  att aac aac ttt cgc  tct ttc atc ctg gaa  cgc tcc ggt       25310
Ser Met  Ile Asn Asn Phe Arg  Ser Phe Ile Leu Glu  Arg Ser Gly
    4525                 4530                 4535

atc ctg  ccc gcc acc tgc tgt  gcg cta cca tcc gac  ttt gtg cct       25355
Ile Leu  Pro Ala Thr Cys Cys  Ala Leu Pro Ser Asp  Phe Val Pro
    4540                 4545                 4550

ctg acc  tac cgc gag tgc ccc  cca ccg cta tgg agc  cac tgc tac       25400
Leu Thr  Tyr Arg Glu Cys Pro  Pro Pro Leu Trp Ser  His Cys Tyr
    4555                 4560                 4565

ctg ttc  cgc ctg gcc aac tac  cta tca tac cac tcg  gat gtg atc       25445
Leu Phe  Arg Leu Ala Asn Tyr  Leu Ser Tyr His Ser  Asp Val Ile
    4570                 4575                 4580

gag gat  gtg agc gga gat ggc  ctg ctt gag tgc cac  tgc cgc tgt       25490
Glu Asp  Val Ser Gly Asp Gly  Leu Leu Glu Cys His  Cys Arg Cys
    4585                 4590                 4595

aat ctc  tgc tca cca cat cgc  tcc ctc gtc tgt aac  ccc cag ttg       25535
Asn Leu  Cys Ser Pro His Arg  Ser Leu Val Cys Asn  Pro Gln Leu
    4600                 4605                 4610

ctt agc  gaa acc caa att ata  ggc acc ttc gaa ttg  cag ggt ccc       25580
Leu Ser  Glu Thr Gln Ile Ile  Gly Thr Phe Glu Leu  Gln Gly Pro
    4615                 4620                 4625

agc agc  gaa ggc gag ggg tct  tct cct ggg caa agt  ttg aaa ctg       25625
Ser Ser  Glu Gly Glu Gly Ser  Ser Pro Gly Gln Ser  Leu Lys Leu
    4630                 4635                 4640

acc ccg  gga ctg tgg acc tcc  gcc tac ctg cgc aag  ttc tcc ccc       25670
Thr Pro  Gly Leu Trp Thr Ser  Ala Tyr Leu Arg Lys  Phe Ser Pro
    4645                 4650                 4655

gag gac  tac cac ccc tat gag  atc agg ttc tat gaa  gac caa tca       25715
Glu Asp  Tyr His Pro Tyr Glu  Ile Arg Phe Tyr Glu  Asp Gln Ser
    4660                 4665                 4670

cag ccg  ccc aaa gct gag ctc  tca gcg tgc gtc atc  acc cag ggg       25760
Gln Pro  Pro Lys Ala Glu Leu  Ser Ala Cys Val Ile  Thr Gln Gly
    4675                 4680                 4685

gca att  ttg gcc caa ttg caa  gcc atc caa aaa tcc  cgc caa gaa       25805
Ala Ile  Leu Ala Gln Leu Gln  Ala Ile Gln Lys Ser  Arg Gln Glu
    4690                 4695                 4700

ttt ttg  ctg aaa aag ggt aac  gga gtc tac ctc gac  ccc cag act       25850
Phe Leu  Leu Lys Lys Gly Asn  Gly Val Tyr Leu Asp  Pro Gln Thr
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    4705                4710                4715

ggt gag  gag ctc aac aca agg  ttc tct cag gat gtc  tca gcg ccg       25895
Gly Glu  Glu Leu Asn Thr Arg  Phe Ser Gln Asp Val  Ser Ala Pro
    4720                4725                4730

agg aaa  caa gaa gtt gaa agt  gca gct gcc gcc ccc  aga gga tat       25940
Arg Lys  Gln Glu Val Glu Ser  Ala Ala Ala Ala Pro  Arg Gly Tyr
    4735                4740                4745

gga gga  aga ctg gga cag tca  gac aga gga gat gga  aga ttg gga       25985
Gly Gly  Arg Leu Gly Gln Ser  Asp Arg Gly Asp Gly  Arg Leu Gly
    4750                4755                4760

cag cca  ggc aga gga gga gga  gga cag cct gga gga  aga cag ttt       26030
Gln Pro  Gly Arg Gly Gly Gly  Gly Gln Pro Gly Gly  Arg Gln Phe
    4765                4770                4775

gga gga  gga aga cga gga ggc  aga gga ggt gga aga  agc aac cgc       26075
Gly Gly  Gly Arg Arg Gly Gly  Arg Gly Gly Gly Arg  Ser Asn Arg
    4780                4785                4790

cgc caa  aca gtt gtc ctc ggc  ggc gga gac aag caa  ggc cac aga       26120
Arg Gln  Thr Val Val Leu Gly  Gly Gly Asp Lys Gln  Gly His Arg
    4795                4800                4805

caa cac  cac agc tac cat ctc  cgt tcc ggg tcg ggg  ggt cca gca       26165
Gln His  His Ser Tyr His Leu  Arg Ser Gly Ser Gly  Gly Pro Ala
    4810                4815                4820

ccg tcc  caa cag tagatgggat gagaccgggc gactcccgaa tgcgaccacc       26217
Pro Ser  Gln Gln
    4825

gcttctaaga ctggtaagaa ggagcggcag ggatacaagt cctggcgggg gcataagaac  26277

gctatcatat cctgcttgca tgaatgcggg ggcaacatat ccttcacccg ccgctacctg  26337

ctcttccacc acggggtgaa cttcccccgc aatgtcttgc attactaccg tcacctccac  26397

agcccctact acagccagca agcctcggca gaaaaagaca acagcagcaa gaacctccag  26457

cagaaaacca gcagcagtta gaacacccac agcaggtgca acaggaggag gactgagaat  26517

cacagcgaac gagccagcgc agacccgaga gctgagaaac cggatttttc caaccctcta  26577

tgccatcttc caacagagtc gggggcaaga gcaggaactg aaagtaaaaa accgatcttt  26637

gcgctcgctc acccgaagtt gtttgtatca caagagcgaa gaccaacttc agcgcactct  26697

cgaggacgcc gaggctctct tcaacaagta ctgcgcgctc actcttaaag agtagcccgc  26757

gcccgcgcta gctcgaaaaa aggcgggaat tacgtcaccc attggcgcct gtcctttgcc  26817

ctcgtc atg agt aaa  gaa att ccc acg cct  tac atg tgg agt tat  caa    26865
       Met Ser Lys  Glu Ile Pro Thr Pro  Tyr Met Trp Ser Tyr  Gln
                4830                4835                4840

ccc caa atg gga  ctg gca gca ggc gcc  tcc cag gac tac tcc  acc       26910
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Pro Gln Met Gly  Leu Ala Ala Gly Ala  Ser Gln Asp Tyr Ser  Thr
            4845                 4850                 4855

cgt atg aat tgg  ctc agc gcc ggt ccc  tcg atg atc tca cgg  gtt       26955
Arg Met Asn Trp  Leu Ser Ala Gly Pro  Ser Met Ile Ser Arg  Val
            4860                 4865                 4870

aat gat ata cga  gct tat cga aac caa  tta ctc cta gaa cag  tca       27000
Asn Asp Ile Arg  Ala Tyr Arg Asn Gln  Leu Leu Leu Glu Gln  Ser
            4875                 4880                 4885

gca ctt acc gcc  aca ccc aga caa cac  ctt aat ccc cgg aat  tgg       27045
Ala Leu Thr Ala  Thr Pro Arg Gln His  Leu Asn Pro Arg Asn  Trp
            4890                 4895                 4900

ccc gcc gcc ctg  gtg tac cag gaa acc  ccc gct ccc acc acc  gtc       27090
Pro Ala Ala Leu  Val Tyr Gln Glu Thr  Pro Ala Pro Thr Thr  Val
            4905                 4910                 4915

cta ctt cct cga  gac gcc cag gcc gaa  gtt cag atg act aac  gca       27135
Leu Leu Pro Arg  Asp Ala Gln Ala Glu  Val Gln Met Thr Asn  Ala
            4920                 4925                 4930

ggt gta cag ctg  gct ggc ggt tcc gcc  ctg tgt cgt cac cgg  cct       27180
Gly Val Gln Leu  Ala Gly Gly Ser Ala  Leu Cys Arg His Arg  Pro
            4935                 4940                 4945

caa cag agt ata  aaa cgc ctg gtg atc  aga ggc cga ggt atc  cag       27225
Gln Gln Ser Ile  Lys Arg Leu Val Ile  Arg Gly Arg Gly Ile  Gln
            4950                 4955                 4960

ctc aac gac gag  tcg gtg agc tct tcg  ctt ggt cta cga cca  gac       27270
Leu Asn Asp Glu  Ser Val Ser Ser Ser  Leu Gly Leu Arg Pro  Asp
            4965                 4970                 4975

gga gtc ttc caa  att gcc ggc tgc ggg  aga tct tcc ttc act  cct       27315
Gly Val Phe Gln  Ile Ala Gly Cys Gly  Arg Ser Ser Phe Thr  Pro
            4980                 4985                 4990

cgt cag gct gta  ctg act ttg gag agt  tcg tca tcg cag ccc  cgc       27360
Arg Gln Ala Val  Leu Thr Leu Glu Ser  Ser Ser Ser Gln Pro  Arg
            4995                 5000                 5005

tcg ggt ggc atc  ggg act ctc caa ttt  gtg gag gag ttt act  ccc       27405
Ser Gly Gly Ile  Gly Thr Leu Gln Phe  Val Glu Glu Phe Thr  Pro
            5010                 5015                 5020

tct gtc tac ttc  aac ccc ttc tcc ggc  tct cct ggg cat tat  ccg       27450
Ser Val Tyr Phe  Asn Pro Phe Ser Gly  Ser Pro Gly His Tyr  Pro
            5025                 5030                 5035

gac gag ttc ata  cca aac ttc gac gca  atc agc gag tca gtg  gat       27495
Asp Glu Phe Ile  Pro Asn Phe Asp Ala  Ile Ser Glu Ser Val  Asp
            5040                 5045                 5050

ggc tat gat tg atg  tct aat ggt ggc gcg  gct gag cta gct cga  ctg    27542
Gly Tyr Asp    Met  Ser Asn Gly Gly Ala  Ala Glu Leu Ala Arg  Leu
               5055                 5060                 5065
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cga cat cta gac  cac tgc cgc cgc ttt  cgc tgc ttt gcc cga  gaa       27587
Arg His Leu Asp  His Cys Arg Arg Phe  Arg Cys Phe Ala Arg  Glu
            5070                 5075                 5080

ctc acc gag ttc  atc tac ttc gaa ata  ccc gag gag cac cct  caa       27632
Leu Thr Glu Phe  Ile Tyr Phe Glu Ile  Pro Glu Glu His Pro  Gln
            5085                 5090                 5095

gga ccg gcc cac  gga gtg cgt att acc  atc gaa ggg ggg ata  gac       27677
Gly Pro Ala His  Gly Val Arg Ile Thr  Ile Glu Gly Gly Ile  Asp
            5100                 5105                 5110

tct cgc ctg cat  cgg atc ttc tgc cag  cga ccc gtg cta atc  gag       27722
Ser Arg Leu His  Arg Ile Phe Cys Gln  Arg Pro Val Leu Ile  Glu
            5115                 5120                 5125

cgc gac cag gga  aac acc aca gtc tcc  atc tac tgc atc tgt  aac       27767
Arg Asp Gln Gly  Asn Thr Thr Val Ser  Ile Tyr Cys Ile Cys  Asn
            5130                 5135                 5140

cac ccc gga ttg  cat gaa agc ctt tgc  tgt ctt att tgt gct  gag       27812
His Pro Gly Leu  His Glu Ser Leu Cys  Cys Leu Ile Cys Ala  Glu
            5145                 5150                 5155

ttt aat aaa aac  tgagttaaga ctctcctacg gactaccaat tcttcaactc        27864
Phe Asn Lys Asn
            5160

ggactttata acaatcagac cctccgttca agtcagaaga ccccaaccct tcctctgatc   27924

caggaatcta attctacctc cccagcacca cactttacta gccttcccga aactaacaac   27984

ctcggagctc aactgcacca cttttccaga agccttctct ctgccaatac taccactccc   28044

agaaccggag gtgagctccg tggtcttcct aataacaacc cctgggtggt aactgggttt   28104

gtaacgctag gtgtagttgc gggtgggctt gtgcttgtcc tttgctacct atacacacct   28164

tgctgtgctt atttagtaat cttgtgttgc tggtttaaga a atg ggg gcc cta       28217
                                              Met Gly Ala Leu


cta  gtc gcg ctt gct tta  ctt tca ctt ttg gat  ctg ggc tct act       28262
Leu  Val Ala Leu Ala Leu  Leu Ser Leu Leu Asp  Leu Gly Ser Thr
5165                 5170                 5175

atg  cta gtt cag cct gta  cta ttt gat cca tgc  ctc aat ttt gat       28307
Met  Leu Val Gln Pro Val  Leu Phe Asp Pro Cys  Leu Asn Phe Asp
5180                 5185                 5190

cca  gac aac tgc aca ctc  act ttt gct cca gag  gct ggc cgc tgt       28352
Pro  Asp Asn Cys Thr Leu  Thr Phe Ala Pro Glu  Ala Gly Arg Cys
5195                 5200                 5205

gga  gtt ctt att agg tgc  gga cgg gaa tgc agt  ccc att gaa ata       28397
Gly  Val Leu Ile Arg Cys  Gly Arg Glu Cys Ser  Pro Ile Glu Ile
5210                 5215                 5220

cac  cac aat aac aaa att  tgg aac aat acc tta  ttc acc aca tgg       28442
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His  His Asn Asn Lys Ile  Trp Asn Asn Thr Leu  Phe Thr Thr Trp
5225                5230                5235

cag  cca gga gac cct gag  tgg tat act gtc tct  gtc cgt ggt cct      28487
Gln  Pro Gly Asp Pro Glu  Trp Tyr Thr Val Ser  Val Arg Gly Pro
5240                5245                5250

gac  ggt tcc atc cgc act  gct aat aac act ttt  att ttt gct gag      28532
Asp  Gly Ser Ile Arg Thr  Ala Asn Asn Thr Phe  Ile Phe Ala Glu
5255                5260                5265

atg  tgc gat ctg acc atg  ttc atg agc aaa cag  tat aac cta tgg      28577
Met  Cys Asp Leu Thr Met  Phe Met Ser Lys Gln  Tyr Asn Leu Trp
5270                5275                5280

cct  cca agc aag gag aac  att gtg gca ttc tcc  att gct tat ttc      28622
Pro  Pro Ser Lys Glu Asn  Ile Val Ala Phe Ser  Ile Ala Tyr Phe
5285                5290                5295

ttg  tgt acg tgt ctc att  act gct att cta tgt  atc tgc ata cac      28667
Leu  Cys Thr Cys Leu Ile  Thr Ala Ile Leu Cys  Ile Cys Ile His
5300                5305                5310

ttg  ctt att tgc cac cgc  cac aga aac agc aat  gag gaa aaa gag      28712
Leu  Leu Ile Cys His Arg  His Arg Asn Ser Asn  Glu Glu Lys Glu
5315                5320                5325

aaa  atg cct tgagcttttt ctcatttttg ttttttttt gtttacagcc            28761
Lys  Met Pro
5330

atggcttcag ttatagctct aattattgcc agcattctca ctgccgcaca gggacaaaca   28821

attgtctata ttaccttagg tcataaccac actcttatag gaccccaaat tagttcacag   28881

gttatatgga ccaaacttgg aagtgttgat tattttgaca taatctgcaa cagaactaaa   28941

ccaatatttg taacctgtaa caaacaaaat ctcaccttaa ttaatgttag cgaaatttac   29001

agcggttact attatggtta tgacagacac agcagtgaat ataaaaatta cctagttcgc   29061

ataactcaac ccaaaaccac aaaaatgcca aataaggcaa aaattcaaat ggttagcgca   29121

ttagaacatc ttacatatcc caccacaccc gatgagagaa acattccaaa ttcaatgatt   29181

gccattattg cggcggtggc agtgggaatg gcactaataa taatttgtat gttcctatat   29241

gcttgttact gtagaaagtt tcatcacaaa caggattccc tactaaattt ttgacattta   29301

atttttata cagctatggt ttccactaca gccttttttg ttattagtag ccttgcagct   29361

gtcacttatg gtcgctcaca cctcactgta actgttggct caacttgtac actacaagga   29421

ccccaagaag ggc atg tca gtt  ggt gga gaa tat gat  agt gga tgg ttc     29470
              Met Ser Val  Gly Gly Glu Tyr Asp  Ser Gly Trp Phe
                      5335                5340

att  agg cca tgt gac cag  cct ggt aac aaa ttt  ttc tgc aac ggg      29515
Ile  Arg Pro Cys Asp Gln  Pro Gly Asn Lys Phe  Phe Cys Asn Gly
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5345                5350                5355

aga  gac ttg acc att att  aac atc aca gta aat  gac cag ggc ttc       29560
Arg  Asp Leu Thr Ile Ile  Asn Ile Thr Val Asn  Asp Gln Gly Phe
5360                5365                5370

tat  tat gga act aac tat  aaa aat aac tta gat  tac aac att atc       29605
Tyr  Tyr Gly Thr Asn Tyr  Lys Asn Asn Leu Asp  Tyr Asn Ile Ile
5375                5380                5385

gta  gtg cca gcc acc act  cca gct ccc cgc aaa  acc act ttc ttt       29650
Val  Val Pro Ala Thr Thr  Pro Ala Pro Arg Lys  Thr Thr Phe Phe
5390                5395                5400

agc  agc agt gcc agt att  tct aaa aca gct tct  gca agc ttc aaa       29695
Ser  Ser Ser Ala Ser Ile  Ser Lys Thr Ala Ser  Ala Ser Phe Lys
5405                5410                5415

aaa  ttc gct tta cgt aat  tcc aca acc tct tcc  act tcc aat atg       29740
Lys  Phe Ala Leu Arg Asn  Ser Thr Thr Ser Ser  Thr Ser Asn Met
5420                5425                5430

tct  aaa tca gta atc ggc  atc gct gct gcc gcg  ata gtg gga tta       29785
Ser  Lys Ser Val Ile Gly  Ile Ala Ala Ala Ala  Ile Val Gly Leu
5435                5440                5445

atg  att ata att ttg tgc  ata atc tac tac gcc  tgc tgc tat aga       29830
Met  Ile Ile Ile Leu Cys  Ile Ile Tyr Tyr Ala  Cys Cys Tyr Arg
5450                5455                5460

aaa  cat gaa caa aaa agc  gat ccc ttg ctg aat  ttt gat att           29872
Lys  His Glu Gln Lys Ser  Asp Pro Leu Leu Asn  Phe Asp Ile
5465                5470                5475

taatttttt atagcatc atg aaa  aaa cta agt atc cta  gct ttt att ttg    29923
                    Met Lys  Lys Leu Ser Ile Leu  Ala Phe Ile Leu
                        5480                5485

ttt  gaa aca ttt acc aat  gtg cag act act tta  agt cat gat ata       29968
Phe  Glu Thr Phe Thr Asn  Val Gln Thr Thr Leu  Ser His Asp Ile
5490                5495                5500

gag  aac cac act acc tct  tat gtg ccc aca aac  att act acc cat       30013
Glu  Asn His Thr Thr Ser  Tyr Val Pro Thr Asn  Ile Thr Thr His
5505                5510                5515

ccc  aaa cat gct atg caa  cta gaa atc acc atg  cta att gta gtt       30058
Pro  Lys His Ala Met Gln  Leu Glu Ile Thr Met  Leu Ile Val Val
5520                5525                5530

gta  ata ctt att cta gct  atc att ttc tat ttt  aca cta tgc cgc       30103
Val  Ile Leu Ile Leu Ala  Ile Ile Phe Tyr Phe  Thr Leu Cys Arg
5535                5540                5545

caa  ata cct aat att cat  aaa aat tct aaa aga  cgt ccc atc tat       30148
Gln  Ile Pro Asn Ile His  Lys Asn Ser Lys Arg  Arg Pro Ile Tyr
5550                5555                5560

tgc  cct gtg att agt cga  ccc cat atg act cta  aat gaa atc           30190
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Cys  Pro Val Ile Ser Arg  Pro His Met Thr Leu  Asn Glu Ile
5565                5570                5575

taagatcatc tatttctctt ttacagtatg gtgaacacca atc atg att  cct aga     30245
                                              Met Ile  Pro Arg
                                                  5580

aat ttc ttc  ttc acc ata ctc atc  tgt gct ttt aat gtc  tgt gcc       30290
Asn Phe Phe  Phe Thr Ile Leu Ile  Cys Ala Phe Asn Val  Cys Ala
        5585                5590                5595

acc ttc aca  gca gta gcc act gca  acc cca gac tgt ata  gga cca       30335
Thr Phe Thr  Ala Val Ala Thr Ala  Thr Pro Asp Cys Ile  Gly Pro
        5600                5605                5610

ttt gct tca  tat aca ctt ttc gct  ttt gtc gct tgc acc  tgc gtg       30380
Phe Ala Ser  Tyr Thr Leu Phe Ala  Phe Val Ala Cys Thr  Cys Val
        5615                5620                5625

tgt agc gta  gtc tgc ctg gtt att  aat ttt ttc caa ctt  gta gac       30425
Cys Ser Val  Val Cys Leu Val Ile  Asn Phe Phe Gln Leu  Val Asp
        5630                5635                5640

tgg atc ttt  gta cga ctt gcc tac  ctg cgt cac cat ccc  gaa tac       30470
Trp Ile Phe  Val Arg Leu Ala Tyr  Leu Arg His His Pro  Glu Tyr
        5645                5650                5655

cgc aat caa  cat gtt gcg gca ctt  ctc aga ctt att taaaaccatg         30516
Arg Asn Gln  His Val Ala Ala Leu  Leu Arg Leu Ile
        5660                5665

caggctatac taccagtcat tctgcttctg ttgctcccct gcgatacctt aacccccgtc    30576

gctaatcgta ccccacctga acaacttaga aaatgcaaat tccaacaacc atggacattc    30636

cttgattgct accgagaaaa atctgatttc cctacatact ggattatgat cattggaatt    30696

gtcaatctag tttcttgcac actattctct ttccttgttt atcatttttt tgattttgga    30756

tggaatgccc ccaatgcact cacttaccca caagaaccag aggaacatat cccactacag    30816

aacatgcaac agccaatagc tataatagat tatgacaatg agccacagcc ctcgctgctt    30876

cctgctatta gttacttcaa cctaaccggt ggag atg  act gac cca ctc gcc       30928
                                      Met  Thr Asp Pro Leu Ala
                                      5670                5675

gcc tcc act gct gcc  gag gaa cta ctt gat  atg gac ggc cgc gcc       30973
Ala Ser Thr Ala Ala  Glu Glu Leu Leu Asp  Met Asp Gly Arg Ala
                5680                5685                5690

tca gaa cag cga ctc  gcc cga cta cgc ata  cgc cag cag cag gaa       31018
Ser Glu Gln Arg Leu  Ala Arg Leu Arg Ile  Arg Gln Gln Gln Glu
                5695                5700                5705

cgt gcc gcc aag gag  ctc agg gat gct att  gaa att cac cag tgc       31063
Arg Ala Ala Lys Glu  Leu Arg Asp Ala Ile  Glu Ile His Gln Cys
                5710                5715                5720
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aaa aaa ggc ata ttc  tgt ctg gtg aaa caa  gcc aag att tcc tac        31108
Lys Lys Gly Ile Phe  Cys Leu Val Lys Gln  Ala Lys Ile Ser Tyr
                5725                5730                5735

gag att acc aat act  gac cat cgc ctc tca  tac gag ctc gga ccg        31153
Glu Ile Thr Asn Thr  Asp His Arg Leu Ser  Tyr Glu Leu Gly Pro
                5740                5745                5750

cag cgg caa aaa ttc  act tgt atg gtg gga  atc aac ccc ata atc        31198
Gln Arg Gln Lys Phe  Thr Cys Met Val Gly  Ile Asn Pro Ile Ile
                5755                5760                5765

atc acc cag caa gct  gga gat acc aag ggt  tgc atc cac tgt tcc        31243
Ile Thr Gln Gln Ala  Gly Asp Thr Lys Gly  Cys Ile His Cys Ser
                5770                5775                5780

tgc agt tcc acc gag  tgc atc tac acc cta  ctg aag acc ctc tgc        31288
Cys Ser Ser Thr Glu  Cys Ile Tyr Thr Leu  Leu Lys Thr Leu Cys
                5785                5790                5795

ggc ctt cga gac ctc  ata ccc atg aac taatcaaccc agcccctcac           31335
Gly Leu Arg Asp Leu  Ile Pro Met Asn
                5800

ttaccaatta cataaagcca attaataaaa atcacttact tgaaatcaga aataaggttt    31395

ctgtctacgt tgtttccaag cagcacctca cttccctctt cccaactctg gtactctaag    31455

cctcggcggg tggcatactt cctccacact ttgaaaggga tgtcaaattt tagttcctct    31515

tctttgccca caatcttcat ttctttatcc ccag atg  gcc aaa cgg gct cgg       31567
                                      Met  Ala Lys Arg Ala Arg
                                      5805                5810

cta agc agc tca ttc  aat ccg gtc tac cca  tat gaa gat gaa agc        31612
Leu Ser Ser Ser Phe  Asn Pro Val Tyr Pro  Tyr Glu Asp Glu Ser
                5815                5820                5825

agc tca caa cac ccc  ttt ata aac cct ggt  ttc att tcc tca aat        31657
Ser Ser Gln His Pro  Phe Ile Asn Pro Gly  Phe Ile Ser Ser Asn
                5830                5835                5840

ggt ttt aca caa agc  cca gat gga gtt cta  act ctt aaa tgt gtt        31702
Gly Phe Thr Gln Ser  Pro Asp Gly Val Leu  Thr Leu Lys Cys Val
                5845                5850                5855

aat ccg ctc act acc  gcc agc gga ccc ctc  caa ctt aaa gtt gga        31747
Asn Pro Leu Thr Thr  Ala Ser Gly Pro Leu  Gln Leu Lys Val Gly
                5860                5865                5870

agc agt ctt aca gta  gat act atc gat ggg  tct ttg gag gaa aat        31792
Ser Ser Leu Thr Val  Asp Thr Ile Asp Gly  Ser Leu Glu Glu Asn
                5875                5880                5885

ata act gcc gca gcg  cca ctc act aaa act  aac cac tcc ata ggt        31837
Ile Thr Ala Ala Ala  Pro Leu Thr Lys Thr  Asn His Ser Ile Gly
                5890                5895                5900

tta tca ata gga tct  ggc ttg caa aca aag  gat gat aaa ctt tgt        31882
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Leu Ser Ile Gly Ser  Gly Leu Gln Thr Lys  Asp Asp Lys Leu Cys
                5905                5910                5915

tta tcg ctg gga gat  ggg ttg gta aca aag  gat gat aaa cta tgt        31927
Leu Ser Leu Gly Asp  Gly Leu Val Thr Lys  Asp Asp Lys Leu Cys
                5920                5925                5930

tta tcg ctg gga gat  ggg tta ata aca aaa  gat gat aca cta tgt        31972
Leu Ser Leu Gly Asp  Gly Leu Ile Thr Lys  Asp Asp Thr Leu Cys
                5935                5940                5945

gcc aaa cta gga cat  ggc ctt gtg ttt gac  tct tcc aat gct atc        32017
Ala Lys Leu Gly His  Gly Leu Val Phe Asp  Ser Ser Asn Ala Ile
                5950                5955                5960

acc ata gaa aac aac  acc ttg tgg aca ggt  gca aaa cca agc gcc        32062
Thr Ile Glu Asn Asn  Thr Leu Trp Thr Gly  Ala Lys Pro Ser Ala
                5965                5970                5975

aac tgt gta att aaa  gag gga gaa gat tcc  cca gac tgt aag ctc        32107
Asn Cys Val Ile Lys  Glu Gly Glu Asp Ser  Pro Asp Cys Lys Leu
                5980                5985                5990

act tta gtt cta gtg  aag aat gga gga ctg  ata aat gga tac ata        32152
Thr Leu Val Leu Val  Lys Asn Gly Gly Leu  Ile Asn Gly Tyr Ile
                5995                6000                6005

aca tta atg gga gac  tca gaa tat act aac  acc ttg ttt aaa aac        32197
Thr Leu Met Gly Asp  Ser Glu Tyr Thr Asn  Thr Leu Phe Lys Asn
                6010                6015                6020

aaa caa gtt aca atc  gat gta aac ctc gca  ttt gat aat acc ggc        32242
Lys Gln Val Thr Ile  Asp Val Asn Leu Ala  Phe Asp Asn Thr Gly
                6025                6030                6035

caa att atc act tac  cta tca tct ctt aaa  agt aac ctg aac ttc        32287
Gln Ile Ile Thr Tyr  Leu Ser Ser Leu Lys  Ser Asn Leu Asn Phe
                6040                6045                6050

aaa gac aac caa aac  atg gct act gga acc  ata acc agt gcc aaa        32332
Lys Asp Asn Gln Asn  Met Ala Thr Gly Thr  Ile Thr Ser Ala Lys
                6055                6060                6065

ggc ttc atg cca agc  acc act gcc tat cca  ttt ata aca tac gcc        32377
Gly Phe Met Pro Ser  Thr Thr Ala Tyr Pro  Phe Ile Thr Tyr Ala
                6070                6075                6080

act cag tcc cta aat  gaa gat tac att tat  gga gag tgt tac tac        32422
Thr Gln Ser Leu Asn  Glu Asp Tyr Ile Tyr  Gly Glu Cys Tyr Tyr
                6085                6090                6095

aaa tct acc aat gga  act ctc ttt cca cta  aaa gtt act gtc aca        32467
Lys Ser Thr Asn Gly  Thr Leu Phe Pro Leu  Lys Val Thr Val Thr
                6100                6105                6110

cta aac aga cgt atg  tca gct tct gga atg  gcc tat gct atg aat        32512
Leu Asn Arg Arg Met  Ser Ala Ser Gly Met  Ala Tyr Ala Met Asn
                6115                6120                6125
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ttt tca tgg tct cta  aat gca gag gaa gcc  ccg gaa act acc gaa       32557
Phe Ser Trp Ser Leu  Asn Ala Glu Glu Ala  Pro Glu Thr Thr Glu
                6130                6135                6140

gtc act ctc att acc  tcc ccc ttc ttt ttt  tct tac atc aga gaa       32602
Val Thr Leu Ile Thr  Ser Pro Phe Phe Phe  Ser Tyr Ile Arg Glu
                6145                6150                6155

gat gac tgacaacaaa aataaagatc aacttttta ttgaaaatca gtttacaaga       32658
Asp Asp

ttcgagtagt tattttgccc ccctcttccc attttataga atacacaatt ctctccccac   32718

gcacagcttt gaacatttga attccattag agatagacat agttttagat tccacattcc   32778

acacagtttc agagcgggcc aatcttggat cagtgataga tataaagcca tcggaacagt   32838

ctttcaaggt ggtttcacag tccaactgct gcggctgcgg ttccggagtt tggattagag   32898

tcatctggaa gaagaacgat gggagtcata atccgagaac ggtatcgggc ggttgtgtct   32958

caaacctcga agcagtcgct gtctgcgccg ctccgtgcga ctgctgctga tgggatcagg   33018

atccacagtc tctcgaagca tgattttaat agccctcaac attaacatcc tggtgcgatg   33078

tgcacaacaa cgcattctaa tctcacttag ctcactacag taggtacaac acattaccac   33138

aatgttgttt aacaggccat aattaaaggt gctccagcca aaactcatct cagggataat   33198

catacccgcg tgaccatcgt accagatctt aatgtaaatc aaatggcgcc ccctccagaa   33258

cacactgccc acatacataa tctccttggg catatgcatg ttcacaatct ctctatacca   33318

tggacagcgc tggttaatca tacagcccat aataaccttc cggaaccaaa tagccagcaa   33378

tgctccccca gcaatacatt gaagagaacc aggctgttta cagtgacaat gaagaaccca   33438

cttctctcgc ccatggatca cttgagaatg aaatatatct atagtagcac aacacaaaca   33498

taaatgcatg catcttttca taactcttaa ctcttcgggg gttagaaaca tatcccaggg   33558

aatgggaagc tcttgcaaaa cagtaaagct ggcagaacaa ggaagaccgc gaacataact   33618

tacactgtgc atggtcaggg tattacaatc tggtaacagc ggatggtctt cagtcataga   33678

agctctggtt tcattttcct cacagcgtgg taaaggggcc ctcaaatgag ggtccatgat   33738

gtacggatga tgtctgtgac atgacgtcga tcgtgcacgc gacctcgttg taatggagct   33798

gcttcctgac attctcgtat tttgcatgac agaacctagc cttagcacaa cacacttctc   33858

ttcgccttct atcacgccgc ctagcgcgtt cagtgtggta attgaagtac agccattccc   33918

gtagatttgt caaaagttcc tcagcttcag ttgttatgaa aactccatca tatctgatcg   33978

ctctgataaa atcattcact gtagaatggg caatgcccaa ccatgcaata caattagctt   34038

gagtttcaac caaaggaggg ggaggaagac atggaagaac cataattaat tttttatgcc   34098
```

agacgatctc gcagtatttc taaatgaaga tcacgaagat ggcacctctc gcccccactg 34158

tgttgatgaa aaataacagc taagtcaaac acgatgcgat tttcaagatg ctcaatggtg 34218

gcttcaagca aagcctccac acgcacatcc aaaaacaaaa gaacagcaaa agaaggagca 34278

tgttctaatt cctcaatcat catattacat tcctgtacca ttcccagata attttcatct 34338

ttccagcctt gaattaatcg tgtcatttct tcttgtaaat ccaatccaca catgagaaag 34398

agctctcgga gggcaccctc caccaccatc cttaagcaca ccctcataat gacaaaatat 34458

cttgctcctg tgtcacctgc agcaaattga gaatggcaac atcaaacgac atgccattgg 34518

ctctaagctc ttctctaagt tcaagttgta aaaactcctt caaatcatcg ccaaactgct 34578

tggccatagg tccgccagga ataagagcgg gggacgctac tgtacagaac aagcggagac 34638

ctccccagtg agatccagca aaagtgaggt tacaataagc atactgagaa cctccagtga 34698

tatcatccaa tgtgctggaa acataatcag gcagagtttc tcgtataaaa ttaataaaag 34758

aaaattctgc cagatgaaca tttaaaagtt ctggaataca gatgcaataa gttaccgcgc 34818

tgcgctccaa cattgttagt acgattagtc tgtaaaaaaa gcacaaaaaa attacatcat 34878

gctagcctgg cgaacggatg gataaatcac tctctccaac accaggcagg ctacagggtc 34938

cccaacgcga ccctcgtaaa acctgtcagt atgattaaaa agcatcaccg aaagaggctg 34998

ttgatgagca gcgaatatta tttgcgatga agcatacaat ccagaagtgt tagtatcagt 35058

taaagaaaaa aaacgtccaa tatagcatct gggaacaatt atgctcaatc tcaaatgcag 35118

caaagcgaca cctctcggat gcaaagtaaa atccacagga gcataaaaaa tgtaattatt 35178

cccctcttgc acaggcagcc tagctcccgg cccctccaaa atcacataca aaacttcagc 35238

agccatagct taccgcacaa atcaggcaca gcagtcagga aaactataaa ctgactgccg 35298

cctgtgcgca atatatagag aacctataca ctgacgtaat cgaacaaagt ctaaaaaaaa 35358

atcccgccaa aaccagcaca cgcccaaaaa ctgtgtcatc cactaaaaaa aatctcactt 35418

cctcattccg taaaatcgtc acgtcctctt tcccacgaaa cgtcacttcc ggccatcttg 35478

taacgtcacc ttcccgcgcc gccccgtgac cgttgaaccc caagccaatc cccttccgct 35538

ctccattttc aaaccacctc atttacatat tggcaccatt ccatctataa ggtatattat 35598

tgatgatg 35606

<210> 167
<211> 495
<212> PRT
<213> Simian adenovirus 35

<400> 167

```
Met Asp Pro Thr Asp Pro Leu Gln Gln Gly Ile Arg Phe Gly Phe His
1               5                  10                  15

Ser Ser Ser Phe Val Glu Asn Met Glu Gly Ser Gln Asp Glu Asp Asn
            20                  25                  30

Leu Arg Leu Leu Ala Ser Thr Ala Ser Gly Arg Ser Arg Asp Pro Glu
        35                  40                  45

Thr Pro Thr Asp His Ala Ser Gly Phe Gly Gly Gly Ala Pro Arg Gly
    50                  55                  60

Gln Ser Glu Ser Arg Pro Gly Pro Ser Gly Gly Gly Gly Gly Gly Val
65                  70                  75                  80

Ala Asp Leu Phe Pro Glu Leu Arg Arg Val Leu Thr Arg Ser Thr Thr
                85                  90                  95

Ser Gly Arg Asp Arg Gly Ile Lys Arg Glu Arg Asn Pro Ser Gly Thr
            100                 105                 110

Asn Pro Arg Ser Glu Leu Ala Leu Ser Leu Met Ser Arg Arg Arg Pro
        115                 120                 125

Glu Thr Ile Trp Trp His Glu Val Gln Asn Glu Gly Arg Asp Glu Val
    130                 135                 140

Ser Ile Leu Gln Glu Lys Tyr Ser Leu Glu Gln Val Lys Thr Cys Trp
145                 150                 155                 160

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

Ile Ala Leu Arg Pro Asp Lys Leu Tyr Arg Ile Thr Lys Arg Ile Asn
            180                 185                 190

Ile Arg Asn Ala Cys Tyr Ile Ser Gly Asn Gly Ala Glu Val Val Ile
        195                 200                 205

Asp Thr Gln Asp Arg Thr Val Phe Arg Cys Cys Met Met Gly Met Trp
    210                 215                 220

Pro Gly Val Val Gly Met Glu Ala Val Thr Leu Met Asn Val Lys Phe
```

```
225                 230                 235                 240

Arg Gly Asp Gly Tyr Asn Gly Val Val Phe Met Ala Asn Thr Lys Leu
                245                 250                 255

Ile Leu His Gly Cys Ser Phe Phe Gly Phe Asn Asn Ile Cys Val Glu
            260                 265                 270

Ala Trp Gly Gln Val Ser Val Arg Gly Cys Ser Phe Tyr Ala Cys Trp
        275                 280                 285

Ile Ala Thr Ser Gly Arg Thr Lys Ser Gln Leu Ser Val Lys Lys Cys
    290                 295                 300

Met Phe Glu Arg Cys Asn Leu Gly Ile Leu Asn Glu Gly Glu Ala Arg
305                 310                 315                 320

Val Ser His Cys Ala Ser Ser Glu Thr Gly Cys Phe Ile Leu Ile Lys
                325                 330                 335

Gly Asn Ala Asn Val Lys His Asn Met Ile Cys Gly Pro Ser Asp Glu
            340                 345                 350

Arg Pro Tyr Gln Met Leu Thr Cys Ala Gly Gly His Cys Asn Met Leu
        355                 360                 365

Ala Thr Val His Ile Val Ser His Pro Arg Lys Lys Trp Pro Val Leu
    370                 375                 380

Glu His Asn Val Met Thr Lys Cys Thr Met His Val Gly Gly Arg Arg
385                 390                 395                 400

Gly Met Leu Met Pro Tyr Gln Cys Asn Met Asn Asn Val Lys Val Met
                405                 410                 415

Leu Glu Pro Asp Ala Phe Ser Arg Met Ser Leu Thr Gly Ile Phe Asp
            420                 425                 430

Met Asn Leu Gln Ile Trp Lys Ile Leu Arg Tyr Asp Asp Thr Lys Ser
        435                 440                 445

Arg Val Arg Ala Cys Glu Cys Gly Gly Lys His Ala Arg Phe Gln Pro
    450                 455                 460
```

```
Val Cys Val Asp Val Thr Glu Glu Leu Arg Pro Asp His Leu Val Ile
465                 470                 475                 480


Ala Cys Thr Gly Ala Glu Phe Gly Ser Ser Gly Glu Glu Thr Asp
                485                 490                 495


<210>  168
<211>  138
<212>  PRT
<213>  Simian adenovirus 35

<400>  168

Met Ser Gly Ser Ala Ser Phe Glu Gly Gly Val Phe Ser Pro Tyr Leu
1               5                   10                  15


Thr Gly Arg Leu Pro Pro Trp Ala Gly Val Arg Gln Asn Val Met Gly
            20                  25                  30


Ser Thr Val Asp Gly Arg Pro Val Gln Pro Ala Asn Ser Ser Thr Leu
        35                  40                  45


Thr Tyr Ala Thr Leu Ser Ser Ser Pro Leu Asp Ala Ala Ala Ala Ala
    50                  55                  60


Ala Ala Ser Ala Ala Ala Asn Thr Val Leu Gly Ile Gly Tyr Tyr Gly
65                  70                  75                  80


Ser Ile Val Ala Asn Thr Ser Ser Ser Asn Asn Pro Ser Thr Leu Ala
                85                  90                  95


Glu Asp Lys Leu Leu Val Leu Leu Ala Gln Leu Glu Ala Leu Thr Gln
            100                 105                 110


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


Glu Ser Ala Val Ala Thr Ala Lys Ser Lys
    130                 135


<210>  169
<211>  389
<212>  PRT
<213>  Simian adenovirus 35

<400>  169

Met His Pro Val Leu Arg Gln Met Arg Pro Gln Gln Gln Pro Pro Ser
```

```
1               5                   10                  15

Gln Gln Gln Leu Gln Gln Gln Pro Gln Lys Ala Leu Pro Ala Pro Val
            20                  25                  30

Thr Thr Ala Ala Ala Ala Val Ser Gly Ala Gly Gln Pro Ala Tyr Asp
        35                  40                  45

Leu Asp Leu Glu Glu Gly Glu Gly Leu Ala Arg Leu Gly Ala Pro Ser
    50                  55                  60

Pro Glu Arg His Pro Arg Val Gln Leu Lys Lys Asp Ser Arg Glu Ala
65                  70                  75                  80

Tyr Val Pro Gln Gln Asn Leu Phe Arg Asp Arg Ser Gly Glu Glu Pro
                85                  90                  95

Glu Glu Met Arg Ala Ser Arg Phe Asn Ala Gly Arg Glu Leu Arg His
            100                 105                 110

Gly Leu Asp Arg Arg Arg Val Leu Arg Asp Asp Asp Phe Glu Val Asp
        115                 120                 125

Glu Val Thr Gly Ile Ser Pro Ala Arg Ala His Val Ala Ala Ala Asn
    130                 135                 140

Leu Val Ser Ala Tyr Glu Gln Thr Val Lys Glu Glu Arg Asn Phe Gln
145                 150                 155                 160

Lys Ser Phe Asn Asn His Val Arg Thr Leu Ile Ala Arg Glu Glu Val
                165                 170                 175

Thr Leu Gly Leu Met His Leu Trp Asp Leu Met Glu Ala Ile Thr Gln
            180                 185                 190

Asn Pro Thr Ser Lys Pro Leu Thr Ala Gln Leu Phe Leu Val Val Gln
        195                 200                 205

His Ser Arg Asp Asn Glu Ala Phe Arg Glu Ala Leu Leu Asn Ile Thr
    210                 215                 220

Glu Pro Glu Gly Arg Trp Leu Tyr Asp Leu Ile Asn Ile Leu Gln Ser
225                 230                 235                 240
```

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

Ile Asn Tyr Ser Val Leu Ser Leu Gly Lys His Tyr Ala Arg Lys Ile
            260                 265                 270

Tyr Lys Thr Pro Tyr Val Pro Ile Asp Lys Glu Val Lys Ile Asp Gly
        275                 280                 285

Phe Tyr Met Arg Met Thr Leu Lys Val Leu Thr Leu Ser Asp Asp Leu
    290                 295                 300

Gly Val Tyr Arg Asn Asp Arg Met His Arg Ala Val Ser Ala Ser Arg
305                 310                 315                 320

Arg Arg Glu Leu Ser Asp Arg Glu Leu Met His Ser Leu Gln Arg Ala
                325                 330                 335

Leu Thr Gly Ala Gly Thr Glu Gly Glu Thr Tyr Phe Asp Met Gly Ala
            340                 345                 350

Asp Leu Gln Trp Gln Pro Ser Arg Arg Ala Leu Asp Ala Ala Gly Tyr
        355                 360                 365

Glu Leu Pro Tyr Ile Glu Glu Val Asp Ala Gly Gln Asp Glu Glu Gly
    370                 375                 380

Glu Tyr Leu Glu Asp
385
```

<210> 170
<211> 587
<212> PRT
<213> Simian adenovirus 35

<400> 170

```
Met Glu Gln Gln Ala Pro Asp Pro Ala Ile Arg Ala Ala Leu Gln Ser
1               5                   10                  15

Gln Pro Ser Gly Ile Asn Ser Ser Asp Asp Trp Ser Gln Ala Met Gln
            20                  25                  30

Arg Ile Met Ala Leu Thr Thr Arg Asn Pro Glu Ala Phe Arg Gln Gln
        35                  40                  45
```

```
Pro Gln Ala Asn Arg Leu Ser Ala Ile Leu Glu Ala Val Val Pro Ser
    50                  55                  60

Arg Ser Asn Pro Thr His Glu Lys Val Leu Ala Ile Val Asn Ala Leu
65                  70                  75                  80

Val Glu Asn Lys Ala Ile Arg Pro Asp Glu Ala Gly Leu Val Tyr Asn
                85                  90                  95

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

Asn Leu Asp Arg Met Val Thr Asp Val Arg Glu Ala Val Ser Gln Arg
        115                 120                 125

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

Ala Phe Leu Ser Thr Gln Pro Ala Asn Val Pro Arg Gly Gln Gln Asp
145                 150                 155                 160

Tyr Thr Asn Phe Leu Ser Ala Leu Arg Leu Met Val Ala Glu Val Pro
                165                 170                 175

Gln Ser Glu Val Tyr Gln Ser Gly Pro Asp Tyr Phe Phe Gln Thr Ser
            180                 185                 190

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

Asn Gly Leu Trp Gly Val Arg Ala Pro Val Gly Asp Arg Ala Thr Val
    210                 215                 220

Ser Ser Leu Leu Thr Pro Asn Ser Arg Leu Leu Leu Leu Leu Val Ala
225                 230                 235                 240

Pro Phe Thr Asp Ser Gly Ser Ile Asp Arg Asn Ser Tyr Leu Gly Tyr
                245                 250                 255

Leu Leu Asn Leu Tyr Arg Glu Ala Ile Gly Gln Thr Gln Val Asp Glu
            260                 265                 270

Gln Thr Tyr Gln Glu Ile Thr Gln Val Ser Arg Ala Leu Gly Gln Glu
        275                 280                 285
```

```
Asp Thr Gly Ser Leu Glu Ala Thr Leu Asn Phe Leu Leu Thr Asn Arg
    290                 295                 300

Ser Gln Lys Ile Pro Pro Gln Tyr Ala Leu Thr Ala Glu Glu Glu Arg
305                 310                 315                 320

Ile Leu Arg Tyr Val Gln Gln Ser Val Gly Leu Phe Leu Met Gln Glu
                325                 330                 335

Gly Ala Thr Pro Thr Ala Ala Leu Asp Met Thr Ala Arg Asn Met Glu
            340                 345                 350

Pro Ser Met Tyr Ala Ser Asn Arg Pro Phe Ile Asn Lys Leu Leu Asp
        355                 360                 365

Tyr Leu His Arg Ala Ala Ala Met Asn Ser Asp Tyr Phe Thr Asn Ala
    370                 375                 380

Ile Leu Asn Pro His Trp Leu Pro Pro Pro Gly Phe Tyr Thr Gly Glu
385                 390                 395                 400

Tyr Asp Met Pro Asp Pro Asn Asp Gly Phe Leu Trp Asp Asp Val Asp
                405                 410                 415

Ser Ser Val Phe Ser Pro Pro Pro Gly Tyr Asn Thr Trp Lys Lys Glu
            420                 425                 430

Gly Gly Asp Arg Arg His Ser Ser Val Ser Leu Ser Gly Ala Thr Gly
        435                 440                 445

Ala Ala Ala Ala Val Pro Glu Ala Ala Ser Pro Phe Pro Ser Leu Pro
    450                 455                 460

Phe Ser Leu Asn Ser Val Arg Ser Ser Glu Leu Gly Arg Ile Thr Arg
465                 470                 475                 480

Pro Arg Leu Ile Gly Glu Glu Glu Tyr Leu Asn Asp Ser Leu Leu Arg
                485                 490                 495

Pro Glu Arg Glu Lys Asn Phe Pro Asn Asn Gly Ile Glu Ser Leu Val
            500                 505                 510

Asp Lys Met Asn Arg Trp Lys Thr Tyr Ala His Asp His Arg Asp Asp
        515                 520                 525
```

```
Pro Arg Ala Leu Gly Asp Ser Arg Gly Ser Ala Thr Arg Lys Arg Gln
    530                 535                 540

Trp His Asp Arg Gln Arg Gly Leu Val Trp Ala Asp Glu Asp Ser Ala
545                 550                 555                 560

Asp Asp Ser Ser Val Leu Asp Leu Gly Gly Ser Gly Gly Asn Pro Phe
                565                 570                 575

Ala His Leu Arg Pro Arg Val Gly Arg Leu Met
            580                 585
```

<210> 171
<211> 563
<212> PRT
<213> Simian adenovirus 35

<400> 171

```
Met Met Arg Arg Thr Val Leu Gly Gly Ala Val Val Tyr Pro Glu Gly
1               5                   10                  15

Pro Pro Pro Ser Tyr Glu Ser Val Met Gln Gln Ala Ala Ala Ala Ala
            20                  25                  30

Met Gln Pro Pro Leu Glu Ala Pro Phe Val Pro Pro Arg Tyr Leu Ala
        35                  40                  45

Pro Thr Glu Gly Arg Asn Ser Ile Arg Tyr Ser Glu Leu Ala Pro Leu
    50                  55                  60

Tyr Asp Thr Thr Arg Leu Tyr Leu Val Asp Asn Lys Ser Ala Asp Ile
65                  70                  75                  80

Ala Ser Leu Asn Tyr Gln Asn Asp His Ser Asn Phe Leu Thr Thr Val
                85                  90                  95

Val Gln Asn Asn Asp Phe Thr Pro Thr Glu Ala Ser Thr Gln Thr Ile
            100                 105                 110

Asn Phe Asp Glu Arg Ser Arg Trp Gly Gly Gln Leu Lys Thr Ile Met
        115                 120                 125

His Thr Asn Met Pro Asn Val Asn Glu Tyr Met Phe Ser Asn Lys Phe
    130                 135                 140
```

```
Lys Ala Arg Val Met Val Ser Arg Lys Ala Pro Glu Gly Val Thr Val
145                 150                 155                 160

Asp Asp Asn Tyr Asp His Lys Gln Asp Ile Leu Glu Tyr Glu Trp Phe
                165                 170                 175

Glu Phe Thr Leu Pro Glu Gly Asn Phe Ser Ala Thr Met Thr Ile Asp
            180                 185                 190

Leu Met Asn Asn Ala Ile Ile Asp Asn Tyr Leu Glu Val Gly Arg Gln
        195                 200                 205

Asn Gly Val Leu Glu Ser Asp Ile Gly Val Lys Phe Asp Thr Arg Asn
    210                 215                 220

Phe Arg Leu Gly Trp Asp Pro Glu Thr Lys Leu Ile Met Pro Gly Val
225                 230                 235                 240

Tyr Thr Tyr Glu Ala Phe His Pro Asp Ile Val Leu Leu Pro Gly Cys
                245                 250                 255

Gly Val Asp Phe Thr Glu Ser Arg Leu Ser Asn Leu Leu Gly Ile Arg
            260                 265                 270

Lys Arg His Pro Phe Gln Glu Gly Phe Lys Ile Leu Tyr Glu Asp Leu
        275                 280                 285

Glu Gly Gly Asn Ile Pro Ala Leu Leu Asp Val Glu Ala Tyr Glu Asn
    290                 295                 300

Ser Lys Lys Glu Gln Glu Ala Lys Thr Glu Ala Ala Lys Ala Ala Ala
305                 310                 315                 320

Ile Ala Lys Ala Asn Ile Val Val Ser Asp Pro Val Arg Val Ala Asn
                325                 330                 335

Ala Glu Glu Val Arg Gly Asp Asn Tyr Thr Ala Ser Ser Val Ala Thr
            340                 345                 350

Glu Glu Ser Leu Leu Ala Ala Val Ala Glu Thr Glu Thr Thr Glu Thr
        355                 360                 365

Lys Leu Thr Ile Lys Pro Val Glu Lys Asp Ser Lys Ser Arg Ser Tyr
```

```
    370                 375                 380

Asn Val Leu Glu Asp Lys Val Asn Thr Ala Tyr Arg Ser Trp Tyr Leu
385                 390                 395                 400

Ser Tyr Asn Tyr Gly Asp Pro Glu Lys Gly Val Arg Ser Trp Thr Leu
                405                 410                 415

Leu Thr Thr Ser Asp Val Thr Cys Gly Ala Glu Gln Val Tyr Trp Ser
            420                 425                 430

Leu Pro Asp Met Met Gln Asp Pro Val Thr Phe Arg Ser Thr Arg Gln
        435                 440                 445

Val Ser Asn Tyr Pro Val Val Gly Ala Glu Leu Met Pro Val Phe Ser
    450                 455                 460

Lys Ser Phe Tyr Asn Glu Gln Ala Val Tyr Ser Gln Gln Leu Arg Gln
465                 470                 475                 480

Ser Thr Ser Leu Thr His Val Phe Asn Arg Phe Pro Glu Asn Gln Ile
                485                 490                 495

Leu Ile Arg Pro Pro Ala Pro Thr Ile Thr Thr Val Ser Glu Asn Val
            500                 505                 510

Pro Ala Leu Thr Asp His Gly Thr Leu Pro Leu Arg Ser Ser Ile Arg
        515                 520                 525

Gly Val Gln Arg Val Thr Val Thr Asp Ala Arg Arg Arg Thr Cys Pro
    530                 535                 540

Tyr Val Tyr Lys Ala Leu Gly Ile Val Ala Pro Arg Val Leu Ser Ser
545                 550                 555                 560

Arg Thr Phe
```

<210> 172
<211> 192
<212> PRT
<213> Simian adenovirus 35

<400> 172

```
Met Ser Ile Leu Ile Ser Pro Ser Asn Asn Thr Gly Trp Gly Leu Arg
```

1 5 10 15

Ala Pro Ser Lys Met Tyr Gly Gly Ala Arg Lys Arg Ser Thr Gln His
20 25 30

Pro Val Arg Val Arg Gly His Phe Arg Ala Pro Trp Gly Ala Leu Lys
35 40 45

Gly Arg Thr Arg Thr Arg Thr Thr Val Asp Asp Val Ile Asp Gln Val
50 55 60

Val Ala Asp Ala Arg Asn Tyr Thr Pro Thr Ala Pro Thr Ser Thr Val
65 70 75 80

Asp Ala Val Ile Asp Ser Val Val Ala Asp Ala Arg Ala Tyr Ala Arg
85 90 95

Arg Lys Ser Arg Arg Arg Arg Ile Ala Arg Arg His Arg Ala Thr Pro
100 105 110

Ala Met Arg Ala Ala Arg Ala Leu Leu Arg Arg Ala Lys Arg Val Gly
115 120 125

Arg Arg Ala Met Leu Arg Ala Ala Arg Arg Ala Ala Ser Gly Ala Ser
130 135 140

Ala Gly Arg Ser Arg Arg Arg Ala Ala Thr Ala Ala Ala Ala Ala Ile
145 150 155 160

Ala Asn Met Ala Gln Pro Arg Arg Gly Asn Val Tyr Trp Val Arg Asp
165 170 175

Ala Thr Thr Gly Gln Arg Val Pro Val Arg Thr Arg Pro Pro Arg Ser
180 185 190

<210> 173
<211> 353
<212> PRT
<213> Simian adenovirus 35

<400> 173

Met Ser Lys Arg Lys Tyr Lys Glu Glu Met Leu Gln Val Ile Ala Pro
1 5 10 15

Glu Ile Tyr Gly Pro Pro Val Lys Asp Glu Lys Lys Pro Arg Lys Ile

```
            20                  25                  30

Lys Arg Val Lys Lys Asp Lys Lys Glu Glu Asp Gly Asn Asp Gly Leu
        35                  40                  45

Val Glu Phe Val Arg Glu Phe Ala Pro Arg Arg Arg Val Gln Trp Arg
    50                  55                  60

Gly Arg Lys Val Arg Pro Val Leu Arg Pro Gly Thr Thr Val Val Phe
65                  70                  75                  80

Thr Pro Gly Glu Arg Thr Ser Thr Ala Phe Lys Arg Ser Tyr Asp Glu
                85                  90                  95

Val Tyr Gly Asp Asp Asp Ile Leu Glu Gln Ala Ala Asp Arg Leu Gly
            100                 105                 110

Glu Phe Ala Tyr Gly Lys Arg Ser Arg Ser Ser Pro Lys Glu Glu Ala
        115                 120                 125

Val Ser Ile Pro Leu Asp Asn Gly Asn Pro Thr Pro Ser Leu Lys Pro
    130                 135                 140

Val Thr Leu Gln Gln Val Leu Pro Val Pro Pro Arg Arg Gly Asn Lys
145                 150                 155                 160

Arg Glu Gly Glu Asp Leu Tyr Pro Thr Met Gln Leu Met Val Pro Lys
                165                 170                 175

Arg Gln Arg Leu Glu Asp Val Leu Glu Lys Met Lys Val Asp Pro Asp
            180                 185                 190

Ile Gln Pro Glu Val Lys Val Arg Pro Ile Lys Gln Val Ala Pro Gly
        195                 200                 205

Leu Gly Val Gln Thr Val Asp Ile Lys Ile Pro Thr Glu Ser Met Glu
    210                 215                 220

Val Gln Thr Glu Pro Ala Lys Pro Thr Thr Thr Ser Ile Glu Val Gln
225                 230                 235                 240

Thr Asp Pro Trp Met Ser Ala Pro Val Thr Ala Gln Ala Ala Val Asn
                245                 250                 255
```

```
Thr Thr Arg Arg Ser Arg Arg Lys Tyr Gly Pro Ala Ser Leu Leu Met
            260                 265                 270

Pro Asn Tyr Ala Leu His Pro Ser Ile Ile Pro Thr Pro Gly Tyr Arg
        275                 280                 285

Gly Thr Arg Tyr Tyr Arg Ser Arg Ser Ser Thr Ser Arg Arg Arg Arg
    290                 295                 300

Lys Thr Pro Ala Ser Arg Ser His Arg Arg Arg Arg Arg Pro Ala Ser
305                 310                 315                 320

Asn Leu Thr Pro Ala Ala Leu Val Arg Arg Val Tyr Arg Asp Gly Arg
                325                 330                 335

Ala Asp Pro Leu Thr Leu Pro Arg Val Arg Tyr His Pro Ser Ile Thr
            340                 345                 350

Thr
```

<210> 174
<211> 76
<212> PRT
<213> Simian adenovirus 35

<400> 174

```
Met Ala Leu Thr Cys Arg Leu Arg Val Pro Ile Thr Gly Tyr Arg Gly
1               5                   10                  15

Arg Asn Ser Arg Arg Arg Arg Gly Met Leu Gly Arg Gly Met Arg Arg
            20                  25                  30

His Arg Arg Arg Arg Ala Ile Ser Lys Arg Leu Gly Gly Gly Phe Leu
        35                  40                  45

Pro Ala Leu Ile Pro Ile Ile Ala Ala Ala Ile Gly Ala Ile Pro Gly
    50                  55                  60

Ile Ala Ser Val Ala Val Gln Ala Ser Gln Arg His
65                  70                  75
```

<210> 175
<211> 250
<212> PRT
<213> Simian adenovirus 35

<400> 175

```
Met Glu Asp Ile Asn Phe Ser Ser Leu Ala Pro Arg His Gly Thr Arg
1               5                  10                  15

Pro Tyr Met Gly Thr Trp Ser Asp Ile Gly Thr Ser Gln Leu Asn Gly
            20                  25                  30

Gly Ala Phe Asn Trp Ser Ser Ile Trp Ser Gly Leu Lys Asn Phe Gly
        35                  40                  45

Ser Thr Ile Lys Thr Tyr Gly Asn Lys Ala Trp Asn Ser Ser Thr Gly
    50                  55                  60

Gln Ala Leu Arg Asn Lys Leu Lys Glu Gln Asn Phe Gln Gln Lys Val
65                  70                  75                  80

Val Asp Gly Ile Ala Ser Gly Ile Asn Gly Val Val Asp Leu Ala Asn
                85                  90                  95

Gln Ala Val Gln Lys Gln Ile Asn Ser Arg Leu Asp Pro Pro Pro Ser
            100                 105                 110

Ala Pro Gly Glu Met Glu Val Glu Glu Asp Leu Pro Pro Leu Glu Lys
        115                 120                 125

Arg Gly Asp Lys Arg Pro Arg Pro Asp Leu Glu Glu Thr Leu Val Thr
    130                 135                 140

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

Pro Thr Thr Arg Pro Val Ala Pro Met Ala Thr Gly Val Met Lys Pro
                165                 170                 175

Ser Gln Ser His Arg Pro Ala Thr Leu Asp Leu Pro Pro Pro Pro Thr
            180                 185                 190

Ala Ala Ala Pro Ala Arg Lys Pro Val Ala Thr Pro Lys Pro Thr Thr
        195                 200                 205

Val Gln Pro Val Ala Val Ala Arg Pro Arg Pro Gly Gly Thr Pro Arg
    210                 215                 220
```

```
Pro Asn Ala Asn Trp Gln Ser Thr Leu Asn Ser Ile Val Gly Leu Gly
225                 230                 235                 240


Val Gln Ser Val Lys Arg Arg Arg Cys Phe
                245                 250


<210>  176
<211>  956
<212>  PRT
<213>  Simian adenovirus 35

<400>  176

Met Ala Thr Pro Ser Met Leu Pro Gln Trp Ala Tyr Met His Ile Ala
1               5                   10                  15


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


Arg Ala Thr Asp Thr Tyr Phe Asn Leu Gly Asn Lys Phe Arg Asn Pro
        35                  40                  45


Thr Val Ala Pro Thr His Asp Val Thr Thr Asp Arg Ser Gln Arg Leu
    50                  55                  60


Met Leu Arg Phe Val Pro Val Asp Arg Glu Asp Asn Thr Tyr Ser Tyr
65                  70                  75                  80


Lys Val Arg Tyr Thr Leu Ala Val Gly Asp Asn Arg Val Leu Asp Met
                85                  90                  95


Ala Ser Thr Phe Phe Asp Ile Arg Gly Val Leu Asp Arg Gly Pro Ser
            100                 105                 110


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


Ala Pro Asn Thr Ser Gln Trp Ile Ala Glu Gly Val Lys Lys Glu Asn
    130                 135                 140


Gly Glu Ala Asp Asn Glu Ala Ala Val Glu Glu Glu Glu Glu Glu Lys
145                 150                 155                 160


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

```
Gly Asp Ile Thr Lys Asp Lys Gly Leu Pro Ile Gly Ser Glu Ile Thr
            180                 185                 190

Asp Gly Lys Ala Lys Pro Ile Tyr Ala Asp Lys Leu Tyr Gln Pro Glu
        195                 200                 205

Pro Gln Val Gly Glu Glu Thr Trp Thr Asp Thr Asp Gly Thr Thr Glu
    210                 215                 220

Lys Tyr Gly Gly Arg Ala Leu Lys Pro Glu Thr Lys Met Lys Pro Cys
225                 230                 235                 240

Tyr Gly Ser Phe Ala Lys Pro Thr Asn Val Lys Gly Gly Gln Ala Lys
                245                 250                 255

Gln Lys Thr Thr Glu Gln Leu Gln Asn Gln Gln Val Glu Tyr Asp Ile
            260                 265                 270

Asp Met Asn Phe Phe Asp Gln Ala Ser Gln Lys Ala Asn Phe Ser Pro
        275                 280                 285

Lys Ile Val Met Tyr Ala Glu Asn Val Asp Leu Glu Thr Pro Asp Thr
    290                 295                 300

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

Leu Gly Gln Gln Ser Met Pro Asn Arg Pro Asn Tyr Ile Gly Phe Arg
                325                 330                 335

Asp Asn Phe Ile Gly Leu Met Tyr Tyr Asn Ser Thr Gly Asn Met Gly
            340                 345                 350

Val Leu Ala Gly Gln Ala Ser Gln Leu Asn Ala Val Val Asp Leu Gln
        355                 360                 365

Asp Arg Asn Thr Glu Leu Ser Tyr Gln Leu Leu Leu Asp Ser Leu Gly
    370                 375                 380

Asp Arg Thr Arg Tyr Phe Ser Met Trp Asn Gln Ala Val Asp Ser Tyr
385                 390                 395                 400

Asp Pro Asp Val Arg Ile Ile Glu Asn His Gly Val Glu Asp Glu Leu
                405                 410                 415
```

```
Pro Asn Tyr Cys Phe Pro Leu Asp Gly Val Gly Val Pro Thr Thr Ser
            420                 425                 430

Tyr Lys Ile Ile Glu Pro Asn Gly Glu Gly Ala Asp Trp Lys Glu Pro
        435                 440                 445

Asp Ile Asn Gly Thr Ser Glu Ile Gly Gln Gly Asn Leu Phe Ala Met
    450                 455                 460

Glu Ile Asn Leu Gln Ala Asn Leu Trp Arg Ser Phe Leu Tyr Ser Asn
465                 470                 475                 480

Val Ala Leu Tyr Leu Pro Asp Ser Tyr Lys Tyr Thr Pro Ala Asn Val
                485                 490                 495

Thr Leu Pro Thr Asn Thr Asn Thr Tyr Asp Tyr Met Asn Gly Arg Val
            500                 505                 510

Val Pro Pro Ser Leu Val Asp Thr Tyr Val Asn Ile Gly Ala Arg Trp
        515                 520                 525

Ser Leu Asp Ala Met Asp Asn Val Asn Pro Phe Asn His His Arg Asn
    530                 535                 540

Ala Gly Leu Arg Tyr Arg Ser Met Leu Leu Gly Asn Gly Arg Tyr Val
545                 550                 555                 560

Pro Phe His Ile Gln Val Pro Gln Lys Phe Phe Ala Val Lys Asn Leu
                565                 570                 575

Leu Leu Leu Pro Gly Ser Tyr Thr Tyr Glu Trp Asn Phe Arg Lys Asp
            580                 585                 590

Val Asn Met Val Leu Gln Ser Ser Leu Gly Asn Asp Leu Arg Val Asp
        595                 600                 605

Gly Ala Ser Ile Ser Phe Thr Ser Ile Asn Leu Tyr Ala Thr Phe Phe
    610                 615                 620

Pro Met Ala His Asn Thr Ala Ser Thr Leu Glu Ala Met Leu Arg Asn
625                 630                 635                 640

Asp Thr Asn Asp Gln Ser Phe Asn Asp Tyr Leu Ser Ala Ala Asn Met
                645                 650                 655
```

```
Leu Tyr Pro Ile Pro Ala Asn Ala Thr Asn Val Pro Ile Ser Ile Pro
            660                 665                 670

Ser Arg Asn Trp Ala Ala Phe Arg Gly Trp Ser Phe Thr Arg Leu Lys
        675                 680                 685

Thr Lys Glu Thr Pro Ser Leu Gly Ser Gly Phe Asp Pro Tyr Phe Val
    690                 695                 700

Tyr Ser Gly Ser Ile Pro Tyr Leu Asp Gly Thr Phe Tyr Leu Asn His
705                 710                 715                 720

Thr Phe Lys Lys Val Ser Ile Met Phe Asp Ser Ser Val Ser Trp Pro
                725                 730                 735

Gly Asn Asp Arg Leu Leu Thr Pro Asn Glu Phe Glu Ile Lys Arg Thr
            740                 745                 750

Val Asp Gly Glu Gly Tyr Asn Val Ala Gln Cys Asn Met Thr Lys Asp
        755                 760                 765

Trp Phe Leu Val Gln Met Leu Ala Asn Tyr Asn Ile Gly Tyr Gln Gly
    770                 775                 780

Phe Tyr Val Pro Glu Gly Tyr Lys Asp Arg Met Tyr Ser Phe Phe Arg
785                 790                 795                 800

Asn Phe Gln Pro Met Ser Arg Gln Val Val Asp Glu Ile Asn Tyr Lys
                805                 810                 815

Asp Tyr Lys Ala Val Ala Val Pro Tyr Gln His Asn Asn Ser Gly Phe
            820                 825                 830

Val Gly Tyr Met Ala Pro Thr Met Arg Gln Gly Gln Ala Tyr Pro Ala
        835                 840                 845

Asn Tyr Pro Tyr Pro Leu Ile Gly Thr Thr Ala Val Thr Ser Val Thr
    850                 855                 860

Gln Lys Lys Phe Leu Cys Asp Arg Thr Met Trp Arg Ile Pro Phe Ser
865                 870                 875                 880

Ser Asn Phe Met Ser Met Gly Ala Leu Thr Asp Leu Gly Gln Asn Leu
```

885 890 895

Leu Tyr Ala Asn Ser Ala His Ala Leu Asp Met Thr Phe Glu Val Asp
900 905 910

Pro Met Asp Glu Pro Thr Leu Leu Tyr Leu Leu Phe Glu Val Phe Asp
915 920 925

Val Val Arg Val His Gln Pro His Arg Gly Val Ile Glu Ala Val Tyr
930 935 940

Leu Arg Thr Pro Phe Ser Ala Gly Asn Ala Thr Thr
945 950 955

<210> 177
<211> 828
<212> PRT
<213> Simian adenovirus 35

<400> 177

Met Glu Thr Gln Pro Ser Leu Pro Thr Pro Leu Gln Ala Pro Ser His
1 5 10 15

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

Pro Ser Pro Ala Thr Thr Thr Ser Thr Leu Glu Asp Glu Glu Val Asp
35 40 45

Ala Pro Gln Glu Ile Arg Thr Gln Asp Met Glu Asp Glu Lys Ala Glu
50 55 60

Glu Ile Glu Ala Asp Ile Glu Gln Asp Pro Gly Tyr Val Thr Pro Ala
65 70 75 80

Glu His Glu Glu Glu Leu Arg Arg Phe Leu Glu Lys Asp Asp Asp Asn
85 90 95

Arg Pro Glu Gln Gln Ala Asp Gly Asp Gln Gln Asn Val Gly Leu Gly
100 105 110

Asp His Val Val Asp Tyr Leu Thr Gly Leu Gly Gly Glu Asp Val Leu
115 120 125

Leu Lys His Leu Ala Arg Gln Ser Ile Ile Ile Lys Asp Ala Leu Leu

```
    130                 135                 140

Asp Arg Ser Glu Val Pro Ile Ser Val Glu Glu Leu Ser Arg Ala Tyr
145                 150                 155                 160

Glu Leu Asn Leu Phe Ser Pro Arg Val Pro Pro Lys Arg Gln Pro Asn
                165                 170                 175

Gly Thr Cys Glu Pro Asn Pro Arg Leu Asn Phe Tyr Pro Ala Phe Thr
            180                 185                 190

Val Pro Glu Val Leu Ala Thr Tyr His Ile Phe Phe Lys Asn Gln Lys
        195                 200                 205

Ile Pro Ile Ser Cys Arg Ala Asn Arg Thr Arg Ala Asp Ala Leu Leu
    210                 215                 220

Asn Leu Gly Pro Gly Ala Cys Leu Pro Asp Ile Thr Ser Leu Glu Glu
225                 230                 235                 240

Val Pro Lys Ile Phe Glu Gly Leu Gly Ser Asp Glu Thr Arg Ala Ala
                245                 250                 255

Asn Ala Leu Gln Gln Gly Glu Asn Gly Ile Asp Glu His His Ser Ala
            260                 265                 270

Leu Val Glu Leu Glu Gly Asp Asn Ala Arg Leu Ala Val Leu Lys Arg
        275                 280                 285

Ser Ile Glu Val Thr His Phe Ala Tyr Pro Ala Val Asn Leu Pro Pro
    290                 295                 300

Lys Val Met Ser Ala Val Met Asp Gln Ile Leu Ile Lys Arg Ala Ser
305                 310                 315                 320

Pro Leu Ser Glu Asn Met Gln Asp Pro Asp Ala Ser Asp Glu Gly Lys
                325                 330                 335

Pro Val Val Ser Asp Glu Gln Leu Ser Arg Trp Leu Gly Thr Asn Ser
            340                 345                 350

Pro Arg Asp Leu Glu Glu Arg Arg Lys Leu Met Met Ala Val Val Leu
        355                 360                 365
```

```
Val Thr Val Glu Met Glu Cys Leu Arg Arg Phe Phe Thr Asp Pro Glu
    370                 375                 380

Thr Leu Arg Lys Leu Glu Glu Asn Leu His Tyr Thr Phe Arg His Gly
385                 390                 395                 400

Phe Val Arg Gln Ala Cys Lys Ile Ser Asn Val Glu Leu Thr Asn Leu
                405                 410                 415

Val Ser Tyr Met Gly Ile Leu His Glu Asn Arg Leu Gly Gln Ser Val
            420                 425                 430

Leu His Thr Thr Leu Lys Gly Glu Ala Arg Arg Asp Tyr Ile Arg Asp
        435                 440                 445

Thr Val Tyr Leu Tyr Leu Cys His Thr Trp Gln Thr Gly Met Gly Val
    450                 455                 460

Trp Gln Gln Cys Leu Glu Glu Gln Asn Leu Lys Glu Leu Asp Lys Leu
465                 470                 475                 480

Leu Gln Arg Ser Leu Lys Thr Leu Trp Thr Gly Phe Asp Glu Arg Thr
                485                 490                 495

Val Ala Ser Asp Leu Ala Asp Leu Ile Phe Pro Glu Arg Leu Arg Thr
            500                 505                 510

Thr Leu Arg Asn Gly Leu Pro Asp Phe Met Asn Gln Ser Met Ile Asn
        515                 520                 525

Asn Phe Arg Ser Phe Ile Leu Glu Arg Ser Gly Ile Leu Pro Ala Thr
    530                 535                 540

Cys Cys Ala Leu Pro Ser Asp Phe Val Pro Leu Thr Tyr Arg Glu Cys
545                 550                 555                 560

Pro Pro Pro Leu Trp Ser His Cys Tyr Leu Phe Arg Leu Ala Asn Tyr
                565                 570                 575

Leu Ser Tyr His Ser Asp Val Ile Glu Asp Val Ser Gly Asp Gly Leu
            580                 585                 590

Leu Glu Cys His Cys Arg Cys Asn Leu Cys Ser Pro His Arg Ser Leu
        595                 600                 605
```

```
Val Cys Asn Pro Gln Leu Leu Ser Glu Thr Gln Ile Ile Gly Thr Phe
    610                 615                 620

Glu Leu Gln Gly Pro Ser Ser Glu Gly Glu Gly Ser Ser Pro Gly Gln
625                 630                 635                 640

Ser Leu Lys Leu Thr Pro Gly Leu Trp Thr Ser Ala Tyr Leu Arg Lys
                645                 650                 655

Phe Ser Pro Glu Asp Tyr His Pro Tyr Glu Ile Arg Phe Tyr Glu Asp
            660                 665                 670

Gln Ser Gln Pro Pro Lys Ala Glu Leu Ser Ala Cys Val Ile Thr Gln
        675                 680                 685

Gly Ala Ile Leu Ala Gln Leu Gln Ala Ile Gln Lys Ser Arg Gln Glu
    690                 695                 700

Phe Leu Leu Lys Lys Gly Asn Gly Val Tyr Leu Asp Pro Gln Thr Gly
705                 710                 715                 720

Glu Glu Leu Asn Thr Arg Phe Ser Gln Asp Val Ser Ala Pro Arg Lys
                725                 730                 735

Gln Glu Val Glu Ser Ala Ala Ala Ala Pro Arg Gly Tyr Gly Gly Arg
            740                 745                 750

Leu Gly Gln Ser Asp Arg Gly Asp Gly Arg Leu Gly Gln Pro Gly Arg
        755                 760                 765

Gly Gly Gly Gly Gln Pro Gly Gly Arg Gln Phe Gly Gly Gly Arg Arg
    770                 775                 780

Gly Gly Arg Gly Gly Gly Arg Ser Asn Arg Arg Gln Thr Val Val Leu
785                 790                 795                 800

Gly Gly Gly Asp Lys Gln Gly His Arg Gln His His Ser Tyr His Leu
                805                 810                 815

Arg Ser Gly Ser Gly Gly Pro Ala Pro Ser Gln Gln
            820                 825
```

<210> 178
<211> 227

<212> PRT
<213> Simian adenovirus 35

<400> 178

```
Met Ser Lys Glu Ile Pro Thr Pro Tyr Met Trp Ser Tyr Gln Pro Gln
1               5                  10                  15

Met Gly Leu Ala Ala Gly Ala Ser Gln Asp Tyr Ser Thr Arg Met Asn
            20                  25                  30

Trp Leu Ser Ala Gly Pro Ser Met Ile Ser Arg Val Asn Asp Ile Arg
        35                  40                  45

Ala Tyr Arg Asn Gln Leu Leu Leu Glu Gln Ser Ala Leu Thr Ala Thr
    50                  55                  60

Pro Arg Gln His Leu Asn Pro Arg Asn Trp Pro Ala Ala Leu Val Tyr
65                  70                  75                  80

Gln Glu Thr Pro Ala Pro Thr Thr Val Leu Leu Pro Arg Asp Ala Gln
                85                  90                  95

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

Ala Leu Cys Arg His Arg Pro Gln Gln Ser Ile Lys Arg Leu Val Ile
        115                 120                 125

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

Gly Leu Arg Pro Asp Gly Val Phe Gln Ile Ala Gly Cys Gly Arg Ser
145                 150                 155                 160

Ser Phe Thr Pro Arg Gln Ala Val Leu Thr Leu Glu Ser Ser Ser Ser
                165                 170                 175

Gln Pro Arg Ser Gly Gly Ile Gly Thr Leu Gln Phe Val Glu Glu Phe
            180                 185                 190

Thr Pro Ser Val Tyr Phe Asn Pro Phe Ser Gly Ser Pro Gly His Tyr
        195                 200                 205

Pro Asp Glu Phe Ile Pro Asn Phe Asp Ala Ile Ser Glu Ser Val Asp
    210                 215                 220
```

Gly Tyr Asp
225

<210> 179
<211> 106
<212> PRT
<213> Simian adenovirus 35

<400> 179

Met Ser Asn Gly Gly Ala Ala Glu Leu Ala Arg Leu Arg His Leu Asp
1 5 10 15

His Cys Arg Arg Phe Arg Cys Phe Ala Arg Glu Leu Thr Glu Phe Ile
20 25 30

Tyr Phe Glu Ile Pro Glu Glu His Pro Gln Gly Pro Ala His Gly Val
35 40 45

Arg Ile Thr Ile Glu Gly Gly Ile Asp Ser Arg Leu His Arg Ile Phe
50 55 60

Cys Gln Arg Pro Val Leu Ile Glu Arg Asp Gln Gly Asn Thr Thr Val
65 70 75 80

Ser Ile Tyr Cys Ile Cys Asn His Pro Gly Leu His Glu Ser Leu Cys
85 90 95

Cys Leu Ile Cys Ala Glu Phe Asn Lys Asn
100 105

<210> 180
<211> 172
<212> PRT
<213> Simian adenovirus 35

<400> 180

Met Gly Ala Leu Leu Val Ala Leu Ala Leu Leu Ser Leu Leu Asp Leu
1 5 10 15

Gly Ser Thr Met Leu Val Gln Pro Val Leu Phe Asp Pro Cys Leu Asn
20 25 30

Phe Asp Pro Asp Asn Cys Thr Leu Thr Phe Ala Pro Glu Ala Gly Arg
35 40 45

```
Cys Gly Val Leu Ile Arg Cys Gly Arg Glu Cys Ser Pro Ile Glu Ile
    50                  55                  60

His His Asn Asn Lys Ile Trp Asn Asn Thr Leu Phe Thr Thr Trp Gln
65                  70                  75                  80

Pro Gly Asp Pro Glu Trp Tyr Thr Val Ser Val Arg Gly Pro Asp Gly
                85                  90                  95

Ser Ile Arg Thr Ala Asn Asn Thr Phe Ile Phe Ala Glu Met Cys Asp
            100                 105                 110

Leu Thr Met Phe Met Ser Lys Gln Tyr Asn Leu Trp Pro Pro Ser Lys
        115                 120                 125

Glu Asn Ile Val Ala Phe Ser Ile Ala Tyr Phe Leu Cys Thr Cys Leu
    130                 135                 140

Ile Thr Ala Ile Leu Cys Ile Cys Ile His Leu Leu Ile Cys His Arg
145                 150                 155                 160

His Arg Asn Ser Asn Glu Glu Lys Glu Lys Met Pro
                165                 170
```

<210> 181
<211> 146
<212> PRT
<213> Simian adenovirus 35

<400> 181

```
Met Ser Val Gly Gly Glu Tyr Asp Ser Gly Trp Phe Ile Arg Pro Cys
1               5                   10                  15

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

Ile Asn Ile Thr Val Asn Asp Gln Gly Phe Tyr Tyr Gly Thr Asn Tyr
        35                  40                  45

Lys Asn Asn Leu Asp Tyr Asn Ile Ile Val Val Pro Ala Thr Thr Pro
    50                  55                  60

Ala Pro Arg Lys Thr Thr Phe Phe Ser Ser Ser Ala Ser Ile Ser Lys
65                  70                  75                  80
```

```
Thr Ala Ser Ala Ser Phe Lys Lys Phe Ala Leu Arg Asn Ser Thr Thr
                85                  90                  95

Ser Ser Thr Ser Asn Met Ser Lys Ser Val Ile Gly Ile Ala Ala Ala
            100                 105                 110

Ala Ile Val Gly Leu Met Ile Ile Ile Leu Cys Ile Ile Tyr Tyr Ala
        115                 120                 125

Cys Cys Tyr Arg Lys His Glu Gln Lys Ser Asp Pro Leu Leu Asn Phe
    130                 135                 140

Asp Ile
145
```

<210> 182
<211> 100
<212> PRT
<213> Simian adenovirus 35

<400> 182

```
Met Lys Lys Leu Ser Ile Leu Ala Phe Ile Leu Phe Glu Thr Phe Thr
1               5                   10                  15

Asn Val Gln Thr Thr Leu Ser His Asp Ile Glu Asn His Thr Thr Ser
            20                  25                  30

Tyr Val Pro Thr Asn Ile Thr Thr His Pro Lys His Ala Met Gln Leu
        35                  40                  45

Glu Ile Thr Met Leu Ile Val Val Val Ile Leu Ile Leu Ala Ile Ile
    50                  55                  60

Phe Tyr Phe Thr Leu Cys Arg Gln Ile Pro Asn Ile His Lys Asn Ser
65                  70                  75                  80

Lys Arg Arg Pro Ile Tyr Cys Pro Val Ile Ser Arg Pro His Met Thr
                85                  90                  95

Leu Asn Glu Ile
            100
```

<210> 183
<211> 91
<212> PRT

<213> Simian adenovirus 35

<400> 183

```
Met Ile Pro Arg Asn Phe Phe Phe Thr Ile Leu Ile Cys Ala Phe Asn
1               5                  10                  15

Val Cys Ala Thr Phe Thr Ala Val Ala Thr Ala Thr Pro Asp Cys Ile
            20                  25                  30

Gly Pro Phe Ala Ser Tyr Thr Leu Phe Ala Phe Val Ala Cys Thr Cys
        35                  40                  45

Val Cys Ser Val Val Cys Leu Val Ile Asn Phe Phe Gln Leu Val Asp
    50                  55                  60

Trp Ile Phe Val Arg Leu Ala Tyr Leu Arg His His Pro Glu Tyr Arg
65                  70                  75                  80

Asn Gln His Val Ala Ala Leu Leu Arg Leu Ile
                85                  90
```

<210> 184
<211> 135
<212> PRT
<213> Simian adenovirus 35

<400> 184

```
Met Thr Asp Pro Leu Ala Ala Ser Thr Ala Ala Glu Glu Leu Leu Asp
1               5                  10                  15

Met Asp Gly Arg Ala Ser Glu Gln Arg Leu Ala Arg Leu Arg Ile Arg
            20                  25                  30

Gln Gln Gln Glu Arg Ala Ala Lys Glu Leu Arg Asp Ala Ile Glu Ile
        35                  40                  45

His Gln Cys Lys Lys Gly Ile Phe Cys Leu Val Lys Gln Ala Lys Ile
    50                  55                  60

Ser Tyr Glu Ile Thr Asn Thr Asp His Arg Leu Ser Tyr Glu Leu Gly
65                  70                  75                  80

Pro Gln Arg Gln Lys Phe Thr Cys Met Val Gly Ile Asn Pro Ile Ile
                85                  90                  95
```

```
Ile Thr Gln Gln Ala Gly Asp Thr Lys Gly Cys Ile His Cys Ser Cys
            100                 105                 110


Ser Ser Thr Glu Cys Ile Tyr Thr Leu Leu Lys Thr Leu Cys Gly Leu
        115                 120                 125


Arg Asp Leu Ile Pro Met Asn
    130                 135


<210>  185
<211>  353
<212>  PRT
<213>  Simian adenovirus 35

<400>  185

Met Ala Lys Arg Ala Arg Leu Ser Ser Ser Phe Asn Pro Val Tyr Pro
1               5                   10                  15


Tyr Glu Asp Glu Ser Ser Ser Gln His Pro Phe Ile Asn Pro Gly Phe
            20                  25                  30


Ile Ser Ser Asn Gly Phe Thr Gln Ser Pro Asp Gly Val Leu Thr Leu
        35                  40                  45


Lys Cys Val Asn Pro Leu Thr Thr Ala Ser Gly Pro Leu Gln Leu Lys
    50                  55                  60


Val Gly Ser Ser Leu Thr Val Asp Thr Ile Asp Gly Ser Leu Glu Glu
65                  70                  75                  80


Asn Ile Thr Ala Ala Ala Pro Leu Thr Lys Thr Asn His Ser Ile Gly
                85                  90                  95


Leu Ser Ile Gly Ser Gly Leu Gln Thr Lys Asp Asp Lys Leu Cys Leu
            100                 105                 110


Ser Leu Gly Asp Gly Leu Val Thr Lys Asp Asp Lys Leu Cys Leu Ser
        115                 120                 125


Leu Gly Asp Gly Leu Ile Thr Lys Asp Asp Thr Leu Cys Ala Lys Leu
    130                 135                 140


Gly His Gly Leu Val Phe Asp Ser Ser Asn Ala Ile Thr Ile Glu Asn
145                 150                 155                 160
```

```
Asn Thr Leu Trp Thr Gly Ala Lys Pro Ser Ala Asn Cys Val Ile Lys
                165                 170                 175

Glu Gly Glu Asp Ser Pro Asp Cys Lys Leu Thr Leu Val Leu Val Lys
            180                 185                 190

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

Tyr Thr Asn Thr Leu Phe Lys Asn Lys Gln Val Thr Ile Asp Val Asn
    210                 215                 220

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

Lys Ser Asn Leu Asn Phe Lys Asp Asn Gln Asn Met Ala Thr Gly Thr
                245                 250                 255

Ile Thr Ser Ala Lys Gly Phe Met Pro Ser Thr Thr Ala Tyr Pro Phe
            260                 265                 270

Ile Thr Tyr Ala Thr Gln Ser Leu Asn Glu Asp Tyr Ile Tyr Gly Glu
        275                 280                 285

Cys Tyr Tyr Lys Ser Thr Asn Gly Thr Leu Phe Pro Leu Lys Val Thr
    290                 295                 300

Val Thr Leu Asn Arg Arg Met Ser Ala Ser Gly Met Ala Tyr Ala Met
305                 310                 315                 320

Asn Phe Ser Trp Ser Leu Asn Ala Glu Glu Ala Pro Glu Thr Thr Glu
                325                 330                 335

Val Thr Leu Ile Thr Ser Pro Phe Phe Phe Ser Tyr Ile Arg Glu Asp
            340                 345                 350

Asp
```

<210> 186
<211> 550
<212> DNA
<213> Simian adenovirus 35

<220>

<221> CDS
<222> (6)..(548)
<223> label=E1b\19K

<400> 186
catcc atg gag gtt tgg gcc atc ttg gaa gat ctt agg cag act agg caa 50
Met Glu Val Trp Ala Ile Leu Glu Asp Leu Arg Gln Thr Arg Gln
1 5 10 15

ctg cta gaa aac gcc tcg gac gga gtc tct ggt ctt tgg aga ttc tgg 98
Leu Leu Glu Asn Ala Ser Asp Gly Val Ser Gly Leu Trp Arg Phe Trp
20 25 30

ttc ggt ggt gat ctg gct aga cta gtc ttt aga ata aaa cag gat tac 146
Phe Gly Gly Asp Leu Ala Arg Leu Val Phe Arg Ile Lys Gln Asp Tyr
35 40 45

agg caa gaa ttt gaa aag tta ttg gac gac tgt tca gga ctt ttt gaa 194
Arg Gln Glu Phe Glu Lys Leu Leu Asp Asp Cys Ser Gly Leu Phe Glu
50 55 60

gct ctt aac ttg ggc cac cag gct cat ttt aag gag aag gtt tta tca 242
Ala Leu Asn Leu Gly His Gln Ala His Phe Lys Glu Lys Val Leu Ser
65 70 75

gtt ttg gat ttt tct acc cct ggt aga act gct gct gct gta gct ttc 290
Val Leu Asp Phe Ser Thr Pro Gly Arg Thr Ala Ala Ala Val Ala Phe
80 85 90 95

ctt aca ttc ata ttt gat aaa tgg atc cca cag acc cac ttc agc aag 338
Leu Thr Phe Ile Phe Asp Lys Trp Ile Pro Gln Thr His Phe Ser Lys
100 105 110

gga tac gtt ttg gat ttc ata gca gca gct ttg tgg aga aca tgg aag 386
Gly Tyr Val Leu Asp Phe Ile Ala Ala Ala Leu Trp Arg Thr Trp Lys
115 120 125

gct cgc agg atg agg aca atc tta gat tac tgg cca gta cag cct ctg 434
Ala Arg Arg Met Arg Thr Ile Leu Asp Tyr Trp Pro Val Gln Pro Leu
130 135 140

ggc gta gca ggg atc ctg aga cac cca ccg acc atg cca gcg gtt ttg 482
Gly Val Ala Gly Ile Leu Arg His Pro Pro Thr Met Pro Ala Val Leu
145 150 155

gag gag gag cac caa gag gac aat ccg aga gtc ggc ctg gac cct ccg 530
Glu Glu Glu His Gln Glu Asp Asn Pro Arg Val Gly Leu Asp Pro Pro
160 165 170 175

gtg gag gag gcg gag gag ta 550
Val Glu Glu Ala Glu Glu
180

<210> 187
<211> 181
<212> PRT
<213> Simian adenovirus 35

<400> 187

```
Met Glu Val Trp Ala Ile Leu Glu Asp Leu Arg Gln Thr Arg Gln Leu
1               5                  10                  15

Leu Glu Asn Ala Ser Asp Gly Val Ser Gly Leu Trp Arg Phe Trp Phe
            20                  25                  30

Gly Gly Asp Leu Ala Arg Leu Val Phe Arg Ile Lys Gln Asp Tyr Arg
        35                  40                  45

Gln Glu Phe Glu Lys Leu Leu Asp Asp Cys Ser Gly Leu Phe Glu Ala
    50                  55                  60

Leu Asn Leu Gly His Gln Ala His Phe Lys Glu Lys Val Leu Ser Val
65                  70                  75                  80

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

Thr Phe Ile Phe Asp Lys Trp Ile Pro Gln Thr His Phe Ser Lys Gly
            100                 105                 110

Tyr Val Leu Asp Phe Ile Ala Ala Ala Leu Trp Arg Thr Trp Lys Ala
        115                 120                 125

Arg Arg Met Arg Thr Ile Leu Asp Tyr Trp Pro Val Gln Pro Leu Gly
    130                 135                 140

Val Ala Gly Ile Leu Arg His Pro Pro Thr Met Pro Ala Val Leu Glu
145                 150                 155                 160

Glu Glu His Gln Glu Asp Asn Pro Arg Val Gly Leu Asp Pro Pro Val
                165                 170                 175

Glu Glu Ala Glu Glu
            180
```

<210> 188
<211> 9670
<212> DNA
<213> Simian adenovirus 35

<220>
<221> CDS
<222> (3)..(611)

<223> label=protease

<220>
<221> CDS
<222> (4632)..(5225)
<223> label=22K

<220>
<221> CDS
<222> (6531)..(6968)
<223> label=E3\CR1\alpha

<220>
<221> CDS
<222> (7449)..(8042)
<223> label=E3\CR1\beta

<220>
<221> CDS
<222> (9231)..(9665)
<223> label=E3\RID\beta

<400> 188

```
gg atg agc cca ccc tgc ttt atc ttc ttt ttg aag tat tcg acg tgg          47
   Met Ser Pro Pro Cys Phe Ile Phe Phe Leu Lys Tyr Ser Thr Trp
   1               5                  10                  15

tca gag tgc acc aac cac acc gcg gcg tca tcg agg ccg tct acc tgc         95
Ser Glu Cys Thr Asn His Thr Ala Ala Ser Ser Arg Pro Ser Thr Cys
                20                  25                  30

gca cac cgt tct cgg ctg gta acg cca cca cat aag aaa cct gct tct        143
Ala His Arg Ser Arg Leu Val Thr Pro Pro His Lys Lys Pro Ala Ser
            35                  40                  45

tgc aag gtg cag cca tgg cct gcg ggt ccg gaa acg gct cca gcg agc        191
Cys Lys Val Gln Pro Trp Pro Ala Gly Pro Glu Thr Ala Pro Ala Ser
        50                  55                  60

aag agc tca gag cca tcg tcc gag acc ttg gct gtg gac cct act tcc        239
Lys Ser Ser Glu Pro Ser Ser Glu Thr Leu Ala Val Asp Pro Thr Ser
    65                  70                  75

tgg gaa cct ttg aca aac gct tcc cgg ggt tta tgg ctc caa aca agc        287
Trp Glu Pro Leu Thr Asn Ala Ser Arg Gly Leu Trp Leu Gln Thr Ser
80                  85                  90                  95

tgg cct gcg cca ttg tca aca cag ccg gtc gcg aga cgg ggg gag agc        335
Trp Pro Ala Pro Leu Ser Thr Gln Pro Val Ala Arg Arg Gly Glu Ser
                100                 105                 110

act ggt tgg ctt ttg gtt gga acc cgc gct cca aca cat gct acc ttt        383
Thr Gly Trp Leu Leu Val Gly Thr Arg Ala Pro Thr His Ala Thr Phe
            115                 120                 125

ttg atc cgt ttg gat tct cgg atg acc gtc tca agc aga tct acc agt        431
Leu Ile Arg Leu Asp Ser Arg Met Thr Val Ser Ser Arg Ser Thr Ser
        130                 135                 140
```

```
ttg aat acg agg ggt tac tgc gcc gca gcg ccc ttg cta cta agg atc        479
Leu Asn Thr Arg Gly Tyr Cys Ala Ala Ala Pro Leu Leu Leu Arg Ile
    145                 150                 155

gct gca tta cct tgg aaa agt cca ccc aaa ccg tgc agg gtc cgc gct        527
Ala Ala Leu Pro Trp Lys Ser Pro Pro Lys Pro Cys Arg Val Arg Ala
160                 165                 170                 175

ccg ccg ctt gtg gac ttt ttt gct gca tgt ttc tcc atg cct ttg tac        575
Pro Pro Leu Val Asp Phe Phe Ala Ala Cys Phe Ser Met Pro Leu Tyr
                180                 185                 190

act ggc cag acc gcc cca tgg acg gta acc cca cca tgaagttgct             621
Thr Gly Gln Thr Ala Pro Trp Thr Val Thr Pro Pro
            195                 200

tacgggagtg cccaacagca tgctccagtc accccaagtc cagcccaccc tgcgcaggaa      681

ccaggaggcg ctctaccatt tcctcaacac acattcatct tactttcgtt ctcaccgcgc      741

acgtatcgaa agggctactg cgttcgatcg tatgggatat taataagtca tgtaaaaccg      801

tgttcaataa acagaacttt atttttaca tgcactggtg gtttctcatt catttattca      861

ctcagaagtc gaaggggttt tggcgggaat cagagtgacc cgcgggcagg gatacgttgc      921

ggaactggaa ctgagcctgc cacttgaatt cggggatcac cagcttggga actggcaggt      981

caggcaggat gtcgctccac agcttcctgg tcagttgcag ggctcccaac aggtcaggag     1041

ctgaaatctt gaaatcgcaa ttgggacccg tgctctgagc gcgggagttg cgatacacag     1101

ggttgcaaca ctggaacacc atcagcgacg ggtatttcac actcgccagc acagtgggat     1161

cggtgataat tcccacatcc aggtcttcgg cattggccat gctaaagggg gtcatcttgc     1221

atgtctgtct gcccatagcc ggtacccagc ctggcttgtg gttgcaatcg cagcgcagag     1281

ggatcagcat catcttggcc tggtcggatc tcataccggg atacacagct ttcatgaaag     1341

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acttgctaga gaactggtta gcagcacatc cggcatcatt cacacaacag cgagcgtcgt     1461

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ccttctgaat catgatgttg ccatgcaaac acttcagctt gccttcataa tcattacatc     1641

catgtgacca cagcgcgcat cccgtacact cccagttatt gtgagcgatc tcagaatagg     1701

aatgcaccaa cccctgcagg aatcttccca tcatggttga gagggtcttg ttactggtga     1761

aagtcagcgg gacgcctcga tgctcctcgt tcacatactg gtggcaaatt cgcttgtact     1821

gttcatgctg ctctggcata agcttgaaag aggttcttag gtcattctcc agcctgtact     1881

tctccatcag cacagccatt acttccatgc ccttttccca ggcagaaacc aggggtaggc     1941
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acactacact tttagacatg gatttgtgag acaggcatgc aagatctcca acgtggagct 3681

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gcacaccacc ctgaaggggg aagcccgtcg cgactacatc cgcgacactg tctacctcta     3801

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cctgaaagaa ctagacaagc tcttacagag atccctcaaa accttgtgga cgggttttga     3921

cgagcgcaca gtcgcctctg atctggcaga tctcatcttc ccagagcgtc tcaggactac     3981

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cgaggggtct tctcctgggc aaagtttgaa actgaccccg ggactgtgga cctccgccta     4401

cctgcgcaag ttctcccccg aggactacca cccctatgag atcaggttct atgaagacca     4461

atcacagccg cccaaagctg agctctcagc gtgcgtcatc acccaggggg caattttggc     4521

ccaattgcaa gccatccaaa aatcccgcca agaatttttg ctgaaaaagg gtaacggagt     4581

ctacctcgac ccccagactg gtgaggagct caacacaagg ttctctcagg atg tct        4637
                                                        Met Ser
                                                            205

cag cgc cga gga aac aag aag ttg aaa gtg cag ctg ccg ccc cca gag        4685
Gln Arg Arg Gly Asn Lys Lys Leu Lys Val Gln Leu Pro Pro Pro Glu
                210                 215                 220

gat atg gag gaa gac tgg gac agt cag aca gag gag atg gaa gat tgg        4733
Asp Met Glu Glu Asp Trp Asp Ser Gln Thr Glu Glu Met Glu Asp Trp
            225                 230                 235

gac agc cag gca gag gag gag gag gac agc ctg gag gaa gac agt ttg        4781
Asp Ser Gln Ala Glu Glu Glu Glu Asp Ser Leu Glu Glu Asp Ser Leu
        240                 245                 250

gag gag gaa gac gag gag gca gag gag gtg gaa gaa gca acc gcc gcc        4829
Glu Glu Glu Asp Glu Glu Ala Glu Glu Val Glu Glu Ala Thr Ala Ala
    255                 260                 265

aaa cag ttg tcc tcg gcg gcg gag aca agc aag gcc aca gac aac acc        4877
Lys Gln Leu Ser Ser Ala Ala Glu Thr Ser Lys Ala Thr Asp Asn Thr
270                 275                 280                 285

aca gct acc atc tcc gtt ccg ggt cgg ggg gtc cag cac cgt ccc aac        4925
Thr Ala Thr Ile Ser Val Pro Gly Arg Gly Val Gln His Arg Pro Asn
                290                 295                 300

agt aga tgg gat gag acc ggg cga ctc ccg aat gcg acc acc gct tct        4973
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Ser Arg Trp Asp Glu Thr Gly Arg Leu Pro Asn Ala Thr Thr Ala Ser
            305                 310                 315

aag act ggt aag aag gag cgg cag gga tac aag tcc tgg cgg ggg cat       5021
Lys Thr Gly Lys Lys Glu Arg Gln Gly Tyr Lys Ser Trp Arg Gly His
        320                 325                 330

aag aac gct atc ata tcc tgc ttg cat gaa tgc ggg ggc aac ata tcc       5069
Lys Asn Ala Ile Ile Ser Cys Leu His Glu Cys Gly Gly Asn Ile Ser
    335                 340                 345

ttc acc cgc cgc tac ctg ctc ttc cac cac ggg gtg aac ttc ccc cgc       5117
Phe Thr Arg Arg Tyr Leu Leu Phe His His Gly Val Asn Phe Pro Arg
350                 355                 360                 365

aat gtc ttg cat tac tac cgt cac ctc cac agc ccc tac tac agc cag       5165
Asn Val Leu His Tyr Tyr Arg His Leu His Ser Pro Tyr Tyr Ser Gln
                370                 375                 380

caa gcc tcg gca gaa aaa gac aac agc agc aag aac ctc cag cag aaa       5213
Gln Ala Ser Ala Glu Lys Asp Asn Ser Ser Lys Asn Leu Gln Gln Lys
            385                 390                 395

acc agc agc agt tagaacaccc acagcaggtg caacaggagg aggactgaga          5265
Thr Ser Ser Ser
        400

atcacagcga acgagccagc gcagacccga gagctgagaa accggatttt tccaaccctc     5325

tatgccatct tccaacagag tcgggggcaa gagcaggaac tgaaagtaaa aaaccgatct     5385

ttgcgctcgc tcacccgaag ttgtttgtat cacaagagcg aagaccaact tcagcgcact     5445

ctcgaggacg ccgaggctct cttcaacaag tactgcgcgc tcactcttaa agagtagccc     5505

gcgcccgcgc tagctcgaaa aaaggcggga attacgtcac ccattggcgc ctgtcctttg     5565

ccctcgtcat gagtaaagaa attcccacgc cttacatgtg gagttatcaa ccccaaatgg     5625

gactggcagc aggcgcctcc caggactact ccacccgtat gaattggctc agcgccggtc     5685

cctcgatgat ctcacgggtt aatgatatac gagcttatcg aaaccaatta ctcctagaac     5745

agtcagcact taccgccaca cccagacaac accttaatcc ccggaattgg cccgccgccc     5805

tggtgtacca ggaaaccccc gctcccacca ccgtcctact tcctcgagac gcccaggccg     5865

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cccgctcggg tggcatcggg actctccaat ttgtggagga gtttactccc tctgtctact     6165

tcaacccctt ctccggctct cctgggcatt atccggacga gttcatacca aacttcgacg     6225
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caatcagcga gtcagtggat ggctatgatt gatgtctaat ggtggcgcgg ctgagctagc     6285

tcgactgcga catctagacc actgccgccg ctttcgctgc tttgcccgag aactcaccga     6345

gttcatctac ttcgaaatac ccgaggagca ccctcaagga ccggcccacg gagtgcgtat     6405

taccatcgaa ggggggatag actctcgcct gcatcggatc ttctgccagc gacccgtgct     6465

aatcgagcgc gaccagggaa acaccacagt ctccatctac tgcatctgta accaccccgg     6525

attgc atg aaa gcc ttt gct gtc tta ttt gtg ctg agt tta ata aaa act     6575
      Met Lys Ala Phe Ala Val Leu Phe Val Leu Ser Leu Ile Lys Thr
                  405                 410                 415

gag tta aga ctc tcc tac gga cta cca att ctt caa ctc gga ctt tat      6623
Glu Leu Arg Leu Ser Tyr Gly Leu Pro Ile Leu Gln Leu Gly Leu Tyr
            420                 425                 430

aac aat cag acc ctc cgt tca agt cag aag acc cca acc ctt cct ctg      6671
Asn Asn Gln Thr Leu Arg Ser Ser Gln Lys Thr Pro Thr Leu Pro Leu
        435                 440                 445

atc cag gaa tct aat tct acc tcc cca gca cca cac ttt act agc ctt      6719
Ile Gln Glu Ser Asn Ser Thr Ser Pro Ala Pro His Phe Thr Ser Leu
    450                 455                 460

ccc gaa act aac aac ctc gga gct caa ctg cac cac ttt tcc aga agc      6767
Pro Glu Thr Asn Asn Leu Gly Ala Gln Leu His His Phe Ser Arg Ser
465                 470                 475                 480

ctt ctc tct gcc aat act acc act ccc aga acc gga ggt gag ctc cgt      6815
Leu Leu Ser Ala Asn Thr Thr Thr Pro Arg Thr Gly Gly Glu Leu Arg
                485                 490                 495

ggt ctt cct aat aac aac ccc tgg gtg gta act ggg ttt gta acg cta      6863
Gly Leu Pro Asn Asn Asn Pro Trp Val Val Thr Gly Phe Val Thr Leu
            500                 505                 510

ggt gta gtt gcg ggt ggg ctt gtg ctt gtc ctt tgc tac cta tac aca      6911
Gly Val Val Ala Gly Gly Leu Val Leu Val Leu Cys Tyr Leu Tyr Thr
        515                 520                 525

cct tgc tgt gct tat tta gta atc ttg tgt tgc tgg ttt aag aaa tgg      6959
Pro Cys Cys Ala Tyr Leu Val Ile Leu Cys Cys Trp Phe Lys Lys Trp
    530                 535                 540

ggg ccc tac tagtcgcgct tgctttactt tcacttttgg atctgggctc              7008
Gly Pro Tyr
545

tactatgcta gttcagcctg tactatttga tccatgcctc aattttgatc cagacaactg     7068

cacactcact tttgctccag aggctggccg ctgtggagtt cttattaggt gcggacggga     7128

atgcagtccc attgaaatac accacaataa caaaatttgg aacaatacct tattcaccac     7188

atggcagcca ggagaccctg agtggtatac tgtctctgtc cgtggtcctg acggttccat     7248

ccgcactgct aataacactt ttatttttgc tgagatgtgc gatctgacca tgttcatgag     7308
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caaacagtat aacctatggc ctccaagcaa ggagaacatt gtggcattct ccattgctta     7368

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ccaccgccac agaaacagca atg agg aaa aag aga aaa tgc ctt gag ctt ttt     7481
                       Met Arg Lys Lys Arg Lys Cys Leu Glu Leu Phe
                                550                 555

ctc att ttt gtt ttt ttt ttg ttt aca gcc atg gct tca gtt ata gct       7529
Leu Ile Phe Val Phe Phe Leu Phe Thr Ala Met Ala Ser Val Ile Ala
    560                 565                 570

cta att att gcc agc att ctc act gcc gca cag gga caa aca att gtc       7577
Leu Ile Ile Ala Ser Ile Leu Thr Ala Ala Gln Gly Gln Thr Ile Val
575                 580                 585                 590

tat att acc tta ggt cat aac cac act ctt ata gga ccc caa att agt       7625
Tyr Ile Thr Leu Gly His Asn His Thr Leu Ile Gly Pro Gln Ile Ser
                595                 600                 605

tca cag gtt ata tgg acc aaa ctt gga agt gtt gat tat ttt gac ata       7673
Ser Gln Val Ile Trp Thr Lys Leu Gly Ser Val Asp Tyr Phe Asp Ile
            610                 615                 620

atc tgc aac aga act aaa cca ata ttt gta acc tgt aac aaa caa aat       7721
Ile Cys Asn Arg Thr Lys Pro Ile Phe Val Thr Cys Asn Lys Gln Asn
        625                 630                 635

ctc acc tta att aat gtt agc gaa att tac agc ggt tac tat tat ggt       7769
Leu Thr Leu Ile Asn Val Ser Glu Ile Tyr Ser Gly Tyr Tyr Tyr Gly
    640                 645                 650

tat gac aga cac agc agt gaa tat aaa aat tac cta gtt cgc ata act       7817
Tyr Asp Arg His Ser Ser Glu Tyr Lys Asn Tyr Leu Val Arg Ile Thr
655                 660                 665                 670

caa ccc aaa acc aca aaa atg cca aat aag gca aaa att caa atg gtt       7865
Gln Pro Lys Thr Thr Lys Met Pro Asn Lys Ala Lys Ile Gln Met Val
                675                 680                 685

agc gca tta gaa cat ctt aca tat ccc acc aca ccc gat gag aga aac       7913
Ser Ala Leu Glu His Leu Thr Tyr Pro Thr Thr Pro Asp Glu Arg Asn
            690                 695                 700

att cca aat tca atg att gcc att att gcg gcg gtg gca gtg gga atg       7961
Ile Pro Asn Ser Met Ile Ala Ile Ile Ala Ala Val Ala Val Gly Met
        705                 710                 715

gca cta ata ata att tgt atg ttc cta tat gct tgt tac tgt aga aag       8009
Ala Leu Ile Ile Ile Cys Met Phe Leu Tyr Ala Cys Tyr Cys Arg Lys
    720                 725                 730

ttt cat cac aaa cag gat tcc cta cta aat ttt tgacatttaa ttttttatac     8062
Phe His His Lys Gln Asp Ser Leu Leu Asn Phe
735                 740                 745

agctatggtt tccactacag ccttttttgt tattagtagc cttgcagctg tcacttatgg     8122
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tcgctcacac ctcactgtaa ctgttggctc aacttgtaca ctacaaggac cccaagaagg     8182

gcatgtcagt tggtggagaa tatgatagtg gatggttcat taggccatgt gaccagcctg     8242

gtaacaaatt tttctgcaac gggagagact tgaccattat taacatcaca gtaaatgacc     8302

agggcttcta ttatggaact aactataaaa ataacttaga ttacaacatt atcgtagtgc     8362

cagccaccac tccagctccc cgcaaaacca ctttctttag cagcagtgcc agtatttcta     8422

aaacagcttc tgcaagcttc aaaaaattcg ctttacgtaa ttccacaacc tcttccactt     8482

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cactatgccg ccaaatacct aatattcata aaaattctaa aagacgtccc atctattgcc     8902

ctgtgattag tcgaccccat atgactctaa atgaaatcta agatcatcta tttctctttt     8962

acagtatggt gaacaccaat catgattcct agaaatttct tcttcaccat actcatctgt     9022

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tgcctggtta ttaatttttt ccaacttgta gactggatct ttgtacgact tgcctacctg     9202

cgtcaccatc ccgaataccg caatcaac atg ttg cgg cac ttc tca gac tta         9254
                               Met Leu Arg His Phe Ser Asp Leu
                                                   750

ttt aaa acc atg cag gct ata cta cca gtc att ctg ctt ctg ttg ctc       9302
Phe Lys Thr Met Gln Ala Ile Leu Pro Val Ile Leu Leu Leu Leu Leu
    755                 760                 765

ccc tgc gat acc tta acc ccc gtc gct aat cgt acc cca cct gaa caa       9350
Pro Cys Asp Thr Leu Thr Pro Val Ala Asn Arg Thr Pro Pro Glu Gln
770                 775                 780                 785

ctt aga aaa tgc aaa ttc caa caa cca tgg aca ttc ctt gat tgc tac       9398
Leu Arg Lys Cys Lys Phe Gln Gln Pro Trp Thr Phe Leu Asp Cys Tyr
                790                 795                 800

cga gaa aaa tct gat ttc cct aca tac tgg att atg atc att gga att       9446
Arg Glu Lys Ser Asp Phe Pro Thr Tyr Trp Ile Met Ile Ile Gly Ile
            805                 810                 815

gtc aat cta gtt tct tgc aca cta ttc tct ttc ctt gtt tat cat ttt       9494
Val Asn Leu Val Ser Cys Thr Leu Phe Ser Phe Leu Val Tyr His Phe
        820                 825                 830
```

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ttt gat ttt gga tgg aat gcc ccc aat gca ctc act tac cca caa gaa       9542
Phe Asp Phe Gly Trp Asn Ala Pro Asn Ala Leu Thr Tyr Pro Gln Glu
    835                 840                 845

cca gag gaa cat atc cca cta cag aac atg caa cag cca ata gct ata       9590
Pro Glu Glu His Ile Pro Leu Gln Asn Met Gln Gln Pro Ile Ala Ile
850                 855                 860                 865

ata gat tat gac aat gag cca cag ccc tcg ctg ctt cct gct att agt       9638
Ile Asp Tyr Asp Asn Glu Pro Gln Pro Ser Leu Leu Pro Ala Ile Ser
                870                 875                 880

tac ttc aac cta acc ggt gga gat gac tgacc                            9670
Tyr Phe Asn Leu Thr Gly Gly Asp Asp
            885                 890
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<210> 189
<211> 203
<212> PRT
<213> Simian adenovirus 35

<400> 189

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Met Ser Pro Pro Cys Phe Ile Phe Phe Leu Lys Tyr Ser Thr Trp Ser
1               5                   10                  15

Glu Cys Thr Asn His Thr Ala Ala Ser Ser Arg Pro Ser Thr Cys Ala
            20                  25                  30

His Arg Ser Arg Leu Val Thr Pro Pro His Lys Lys Pro Ala Ser Cys
        35                  40                  45

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

Ser Ser Glu Pro Ser Ser Glu Thr Leu Ala Val Asp Pro Thr Ser Trp
65                  70                  75                  80

Glu Pro Leu Thr Asn Ala Ser Arg Gly Leu Trp Leu Gln Thr Ser Trp
                85                  90                  95

Pro Ala Pro Leu Ser Thr Gln Pro Val Ala Arg Arg Gly Glu Ser Thr
            100                 105                 110

Gly Trp Leu Leu Val Gly Thr Arg Ala Pro Thr His Ala Thr Phe Leu
        115                 120                 125

Ile Arg Leu Asp Ser Arg Met Thr Val Ser Ser Arg Ser Thr Ser Leu
    130                 135                 140
```

```
Asn Thr Arg Gly Tyr Cys Ala Ala Ala Pro Leu Leu Leu Arg Ile Ala
145                 150                 155                 160

Ala Leu Pro Trp Lys Ser Pro Pro Lys Pro Cys Arg Val Arg Ala Pro
                165                 170                 175

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

Gly Gln Thr Ala Pro Trp Thr Val Thr Pro Pro
        195                 200
```

<210> 190
<211> 198
<212> PRT
<213> Simian adenovirus 35

<400> 190

```
Met Ser Gln Arg Arg Gly Asn Lys Lys Leu Lys Val Gln Leu Pro Pro
1               5                   10                  15

Pro Glu Asp Met Glu Glu Asp Trp Asp Ser Gln Thr Glu Glu Met Glu
            20                  25                  30

Asp Trp Asp Ser Gln Ala Glu Glu Glu Glu Asp Ser Leu Glu Glu Asp
        35                  40                  45

Ser Leu Glu Glu Glu Asp Glu Glu Ala Glu Glu Val Glu Glu Ala Thr
    50                  55                  60

Ala Ala Lys Gln Leu Ser Ser Ala Ala Glu Thr Ser Lys Ala Thr Asp
65                  70                  75                  80

Asn Thr Thr Ala Thr Ile Ser Val Pro Gly Arg Gly Val Gln His Arg
                85                  90                  95

Pro Asn Ser Arg Trp Asp Glu Thr Gly Arg Leu Pro Asn Ala Thr Thr
            100                 105                 110

Ala Ser Lys Thr Gly Lys Lys Glu Arg Gln Gly Tyr Lys Ser Trp Arg
        115                 120                 125

Gly His Lys Asn Ala Ile Ile Ser Cys Leu His Glu Cys Gly Gly Asn
    130                 135                 140
```

```
Ile Ser Phe Thr Arg Arg Tyr Leu Leu Phe His His Gly Val Asn Phe
145                 150                 155                 160

Pro Arg Asn Val Leu His Tyr Tyr Arg His Leu His Ser Pro Tyr Tyr
                165                 170                 175

Ser Gln Gln Ala Ser Ala Glu Lys Asp Asn Ser Ser Lys Asn Leu Gln
            180                 185                 190

Gln Lys Thr Ser Ser Ser
        195
```

<210> 191
<211> 146
<212> PRT
<213> Simian adenovirus 35

<400> 191

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Met Lys Ala Phe Ala Val Leu Phe Val Leu Ser Leu Ile Lys Thr Glu
1               5                   10                  15

Leu Arg Leu Ser Tyr Gly Leu Pro Ile Leu Gln Leu Gly Leu Tyr Asn
            20                  25                  30

Asn Gln Thr Leu Arg Ser Ser Gln Lys Thr Pro Thr Leu Pro Leu Ile
        35                  40                  45

Gln Glu Ser Asn Ser Thr Ser Pro Ala Pro His Phe Thr Ser Leu Pro
    50                  55                  60

Glu Thr Asn Asn Leu Gly Ala Gln Leu His His Phe Ser Arg Ser Leu
65                  70                  75                  80

Leu Ser Ala Asn Thr Thr Thr Pro Arg Thr Gly Gly Glu Leu Arg Gly
                85                  90                  95

Leu Pro Asn Asn Asn Pro Trp Val Val Thr Gly Phe Val Thr Leu Gly
            100                 105                 110

Val Val Ala Gly Gly Leu Val Leu Val Leu Cys Tyr Leu Tyr Thr Pro
        115                 120                 125

Cys Cys Ala Tyr Leu Val Ile Leu Cys Cys Trp Phe Lys Lys Trp Gly
    130                 135                 140
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Pro Tyr
145

<210> 192
<211> 198
<212> PRT
<213> Simian adenovirus 35

<400> 192

Met Arg Lys Lys Arg Lys Cys Leu Glu Leu Phe Leu Ile Phe Val Phe
1 5 10 15

Phe Leu Phe Thr Ala Met Ala Ser Val Ile Ala Leu Ile Ile Ala Ser
20 25 30

Ile Leu Thr Ala Ala Gln Gly Gln Thr Ile Val Tyr Ile Thr Leu Gly
35 40 45

His Asn His Thr Leu Ile Gly Pro Gln Ile Ser Ser Gln Val Ile Trp
50 55 60

Thr Lys Leu Gly Ser Val Asp Tyr Phe Asp Ile Ile Cys Asn Arg Thr
65 70 75 80

Lys Pro Ile Phe Val Thr Cys Asn Lys Gln Asn Leu Thr Leu Ile Asn
85 90 95

Val Ser Glu Ile Tyr Ser Gly Tyr Tyr Tyr Gly Tyr Asp Arg His Ser
100 105 110

Ser Glu Tyr Lys Asn Tyr Leu Val Arg Ile Thr Gln Pro Lys Thr Thr
115 120 125

Lys Met Pro Asn Lys Ala Lys Ile Gln Met Val Ser Ala Leu Glu His
130 135 140

Leu Thr Tyr Pro Thr Thr Pro Asp Glu Arg Asn Ile Pro Asn Ser Met
145 150 155 160

Ile Ala Ile Ile Ala Ala Val Ala Val Gly Met Ala Leu Ile Ile Ile
165 170 175

Cys Met Phe Leu Tyr Ala Cys Tyr Cys Arg Lys Phe His His Lys Gln
180 185 190

Asp Ser Leu Leu Asn Phe
195

<210> 193
<211> 145
<212> PRT
<213> Simian adenovirus 35

<400> 193

Met Leu Arg His Phe Ser Asp Leu Phe Lys Thr Met Gln Ala Ile Leu
1 5 10 15

Pro Val Ile Leu Leu Leu Leu Leu Pro Cys Asp Thr Leu Thr Pro Val
20 25 30

Ala Asn Arg Thr Pro Pro Glu Gln Leu Arg Lys Cys Lys Phe Gln Gln
35 40 45

Pro Trp Thr Phe Leu Asp Cys Tyr Arg Glu Lys Ser Asp Phe Pro Thr
50 55 60

Tyr Trp Ile Met Ile Ile Gly Ile Val Asn Leu Val Ser Cys Thr Leu
65 70 75 80

Phe Ser Phe Leu Val Tyr His Phe Phe Asp Phe Gly Trp Asn Ala Pro
85 90 95

Asn Ala Leu Thr Tyr Pro Gln Glu Pro Glu Glu His Ile Pro Leu Gln
100 105 110

Asn Met Gln Gln Pro Ile Ala Ile Ile Asp Tyr Asp Asn Glu Pro Gln
115 120 125

Pro Ser Leu Leu Pro Ala Ile Ser Tyr Phe Asn Leu Thr Gly Gly Asp
130 135 140

Asp
145

<210> 194
<211> 880
<212> DNA
<213> Simian adenovirus 35

<220>
<221> CDS
<222> (1)..(580)
<223> label=Ela

<220>
<221> CDS
<222> (672)..(877)
<223> label=Ela

<400> 194

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atg aga cac ctg cgt ttc ctg tcc cag gag ata gtc tcc act gaa act          48
Met Arg His Leu Arg Phe Leu Ser Gln Glu Ile Val Ser Thr Glu Thr
1               5                   10                  15

ggg aat gaa ata ctg cag ttt gtg gta aat act ctg atg gga gac gat          96
Gly Asn Glu Ile Leu Gln Phe Val Val Asn Thr Leu Met Gly Asp Asp
            20                  25                  30

cca gag ccg cct gag cca tct ttt gat cct cct acg ctt cat gaa tta         144
Pro Glu Pro Pro Glu Pro Ser Phe Asp Pro Pro Thr Leu His Glu Leu
        35                  40                  45

tat gat tta gag gta gac gga ccg gag gac cct aat gag gac gac gtg         192
Tyr Asp Leu Glu Val Asp Gly Pro Glu Asp Pro Asn Glu Asp Asp Val
    50                  55                  60

aat ggg ttt ttt act gat tct atg tta tta gct gct aat gag gga gtg         240
Asn Gly Phe Phe Thr Asp Ser Met Leu Leu Ala Ala Asn Glu Gly Val
65                  70                  75                  80

gat tta gac cca cct tct gga act ctt gat act cca ggg gtg att gtg         288
Asp Leu Asp Pro Pro Ser Gly Thr Leu Asp Thr Pro Gly Val Ile Val
                85                  90                  95

gaa agc gac ata aat ggg aaa aat tta cct gat ttg ggt gct gct gaa         336
Glu Ser Asp Ile Asn Gly Lys Asn Leu Pro Asp Leu Gly Ala Ala Glu
            100                 105                 110

ttg gac ttg cac tgc tat gaa gag ggt ttt cct ccg agt gat gat gaa         384
Leu Asp Leu His Cys Tyr Glu Glu Gly Phe Pro Pro Ser Asp Asp Glu
        115                 120                 125

gat gtg gag aat gag cag tca att cag acc gca gcg ggt gag gga gtg         432
Asp Val Glu Asn Glu Gln Ser Ile Gln Thr Ala Ala Gly Glu Gly Val
    130                 135                 140

aaa gca gcc agt gat ggt ttt aag ttg gac tgc ccg atg ctg cct gga         480
Lys Ala Ala Ser Asp Gly Phe Lys Leu Asp Cys Pro Met Leu Pro Gly
145                 150                 155                 160

cat ggc tgt aag tct tgt gaa ttt cac agg aaa aat act gga gta aaa         528
His Gly Cys Lys Ser Cys Glu Phe His Arg Lys Asn Thr Gly Val Lys
                165                 170                 175

gaa ata tta tgc tcg ctt tgt tat atg aga gcg cat tgc cac ttt att         576
Glu Ile Leu Cys Ser Leu Cys Tyr Met Arg Ala His Cys His Phe Ile
            180                 185                 190
```

```
tac a gtaagtgtgt ttaagttaaa tttaaaggaa cagtagctgt ttttataact          630
Tyr


cttggatggg tgatttatgt tttgcttgtg atttttttata g gt  cct gtg tct gat     685
                                               Ser Pro Val Ser Asp
                                                   195

gct gat gaa tcg cct tct cct gat tca act acc tca cct cct gaa att        733
Ala Asp Glu Ser Pro Ser Pro Asp Ser Thr Thr Ser Pro Pro Glu Ile
    200                 205                 210

cag gca ccc gtc cct gca aat gta tgc aag ccc att cct gtg aag ctt        781
Gln Ala Pro Val Pro Ala Asn Val Cys Lys Pro Ile Pro Val Lys Leu
215                 220                 225                 230

aag cct ggg aaa cgc cct gct gtg gat aaa ctt gag gat ttg ctg gag        829
Lys Pro Gly Lys Arg Pro Ala Val Asp Lys Leu Glu Asp Leu Leu Glu
                235                 240                 245

ggt gtg gat gaa cct ttg gac ttg tgt acc cgg aaa ata cca agg caa        877
Gly Val Asp Glu Pro Leu Asp Leu Cys Thr Arg Lys Ile Pro Arg Gln
            250                 255                 260

tga                                                                   880


<210>  195
<211>  262
<212>  PRT
<213>  Simian adenovirus 35

<400>  195

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


Gly Asn Glu Ile Leu Gln Phe Val Val Asn Thr Leu Met Gly Asp Asp
            20                  25                  30


Pro Glu Pro Pro Glu Pro Ser Phe Asp Pro Pro Thr Leu His Glu Leu
        35                  40                  45


Tyr Asp Leu Glu Val Asp Gly Pro Glu Asp Pro Asn Glu Asp Asp Val
    50                  55                  60


Asn Gly Phe Phe Thr Asp Ser Met Leu Leu Ala Ala Asn Glu Gly Val
65                  70                  75                  80


Asp Leu Asp Pro Pro Ser Gly Thr Leu Asp Thr Pro Gly Val Ile Val
                85                  90                  95


Glu Ser Asp Ile Asn Gly Lys Asn Leu Pro Asp Leu Gly Ala Ala Glu
```

```
            100                 105                 110

Leu Asp Leu His Cys Tyr Glu Glu Gly Phe Pro Pro Ser Asp Asp Glu
        115                 120                 125

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

Lys Ala Ala Ser Asp Gly Phe Lys Leu Asp Cys Pro Met Leu Pro Gly
145                 150                 155                 160

His Gly Cys Lys Ser Cys Glu Phe His Arg Lys Asn Thr Gly Val Lys
                165                 170                 175

Glu Ile Leu Cys Ser Leu Cys Tyr Met Arg Ala His Cys His Phe Ile
            180                 185                 190

Tyr Ser Pro Val Ser Asp Ala Asp Glu Ser Pro Ser Pro Asp Ser Thr
        195                 200                 205

Thr Ser Pro Pro Glu Ile Gln Ala Pro Val Pro Ala Asn Val Cys Lys
    210                 215                 220

Pro Ile Pro Val Lys Leu Lys Pro Gly Lys Arg Pro Ala Val Asp Lys
225                 230                 235                 240

Leu Glu Asp Leu Leu Glu Gly Val Asp Glu Pro Leu Asp Leu Cys Thr
                245                 250                 255

Arg Lys Ile Pro Arg Gln
            260


<210>  196
<211>  880
<212>  DNA
<213>  Simian adenovirus 35


<220>
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<222>  (12)..(360)
<223>  label=33K

<220>
<221>  CDS
<222>  (530)..(879)
<223>  label=33K
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<400> 196
gttctctcag g atg tct cag cgc cga gga aac aag aag ttg aaa gtg cag 50
Met Ser Gln Arg Arg Gly Asn Lys Lys Leu Lys Val Gln
1 5 10

ctg ccg ccc cca gag gat atg gag gaa gac tgg gac agt cag aca gag 98
Leu Pro Pro Pro Glu Asp Met Glu Glu Asp Trp Asp Ser Gln Thr Glu
15 20 25

gag atg gaa gat tgg gac agc cag gca gag gag gag gag gac agc ctg 146
Glu Met Glu Asp Trp Asp Ser Gln Ala Glu Glu Glu Glu Asp Ser Leu
30 35 40 45

gag gaa gac agt ttg gag gag gaa gac gag gag gca gag gag gtg gaa 194
Glu Glu Asp Ser Leu Glu Glu Glu Asp Glu Glu Ala Glu Glu Val Glu
50 55 60

gaa gca acc gcc gcc aaa cag ttg tcc tcg gcg gcg gag aca agc aag 242
Glu Ala Thr Ala Ala Lys Gln Leu Ser Ser Ala Ala Glu Thr Ser Lys
65 70 75

gcc aca gac aac acc aca gct acc atc tcc gtt ccg ggt cgg ggg gtc 290
Ala Thr Asp Asn Thr Thr Ala Thr Ile Ser Val Pro Gly Arg Gly Val
80 85 90

cag cac cgt ccc aac agt aga tgg gat gag acc ggg cga ctc ccg aat 338
Gln His Arg Pro Asn Ser Arg Trp Asp Glu Thr Gly Arg Leu Pro Asn
95 100 105

gcg acc acc gct tct aag act g gtaagaagga gcggcaggga tacaagtcct 390
Ala Thr Thr Ala Ser Lys Thr
110 115

ggcgggggca taagaacgct atcatatcct gcttgcatga atgcgggggc aacatatcct 450

tcacccgccg ctacctgctc ttccaccacg gggtgaactt cccccgcaat gtcttgcatt 510

actaccgtca cctccacag cc cct act aca gcc agc aag cct cgg cag aaa 561
Ala Pro Thr Thr Ala Ser Lys Pro Arg Gln Lys
120 125

aag aca aca gca gca aga acc tcc agc aga aaa cca gca gca gtt aga 609
Lys Thr Thr Ala Ala Arg Thr Ser Ser Arg Lys Pro Ala Ala Val Arg
130 135 140

aca ccc aca gca ggt gca aca gga gga gga ctg aga atc aca gcg aac 657
Thr Pro Thr Ala Gly Ala Thr Gly Gly Gly Leu Arg Ile Thr Ala Asn
145 150 155

gag cca gcg cag acc cga gag ctg aga aac cgg att ttt cca acc ctc 705
Glu Pro Ala Gln Thr Arg Glu Leu Arg Asn Arg Ile Phe Pro Thr Leu
160 165 170 175

tat gcc atc ttc caa cag agt cgg ggg caa gag cag gaa ctg aaa gta 753
Tyr Ala Ile Phe Gln Gln Ser Arg Gly Gln Glu Gln Glu Leu Lys Val
180 185 190

aaa aac cga tct ttg cgc tcg ctc acc cga agt tgt ttg tat cac aag 801
Lys Asn Arg Ser Leu Arg Ser Leu Thr Arg Ser Cys Leu Tyr His Lys

```
            195                 200                 205

agc gaa gac caa ctt cag cgc act ctc gag gac gcc gag gct ctc ttc        849
Ser Glu Asp Gln Leu Gln Arg Thr Leu Glu Asp Ala Glu Ala Leu Phe
        210                 215                 220

aac aag tac tgc gcg ctc act ctt aaa gag t                              880
Asn Lys Tyr Cys Ala Leu Thr Leu Lys Glu
    225                 230
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<210> 197
<211> 233
<212> PRT
<213> Simian adenovirus 35

<400> 197

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Met Ser Gln Arg Arg Gly Asn Lys Lys Leu Lys Val Gln Leu Pro Pro
1               5                   10                  15

Pro Glu Asp Met Glu Glu Asp Trp Asp Ser Gln Thr Glu Glu Met Glu
            20                  25                  30

Asp Trp Asp Ser Gln Ala Glu Glu Glu Glu Asp Ser Leu Glu Glu Asp
        35                  40                  45

Ser Leu Glu Glu Glu Asp Glu Glu Ala Glu Glu Val Glu Glu Ala Thr
    50                  55                  60

Ala Ala Lys Gln Leu Ser Ser Ala Ala Glu Thr Ser Lys Ala Thr Asp
65                  70                  75                  80

Asn Thr Thr Ala Thr Ile Ser Val Pro Gly Arg Gly Val Gln His Arg
                85                  90                  95

Pro Asn Ser Arg Trp Asp Glu Thr Gly Arg Leu Pro Asn Ala Thr Thr
            100                 105                 110

Ala Ser Lys Thr Ala Pro Thr Thr Ala Ser Lys Pro Arg Gln Lys Lys
        115                 120                 125

Thr Thr Ala Ala Arg Thr Ser Ser Arg Lys Pro Ala Ala Val Arg Thr
    130                 135                 140

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

Pro Ala Gln Thr Arg Glu Leu Arg Asn Arg Ile Phe Pro Thr Leu Tyr
```

```
                165                 170                 175

Ala Ile Phe Gln Gln Ser Arg Gly Gln Glu Gln Glu Leu Lys Val Lys
            180                 185                 190

Asn Arg Ser Leu Arg Ser Leu Thr Arg Ser Cys Leu Tyr His Lys Ser
        195                 200                 205

Glu Asp Gln Leu Gln Arg Thr Leu Glu Asp Ala Glu Ala Leu Phe Asn
    210                 215                 220

Lys Tyr Cys Ala Leu Thr Leu Lys Glu
225                 230
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<210> 198
<211> 51
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 198
cgcgccgagc attcatgctt gtacgtaccc acgcacagct ttaaacattt g 51

<210> 199
<211> 51
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 199
aattcaaatg tttaaagctg tgcgtgggta cgtacaagca tgaatgctcg g 51

<210> 200
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 200
taccaccagc ggcgcgccag acatcaag 28

<210> 201
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 201
aaatggaatt caaatgttta aagctgtg 28

<210> 202
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 202
ttgtagcata gtttgcctgg 20