SEQUENCE LISTING

<110> GENENTECH, INC.; SIEBEL, CHRISTIAN W.

<120> METHODS OF TREATING CANCER USING NOTCH ANTAGONISTS

<130> P4371R1 WO

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<150> 61/247,298
<151> 2009-09-30

<160> 4

<170> PatentIn version 3.5

<210> 1
<211> 2555
<212> PRT
<213> Homo sapiens

<400> 1

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Met Pro Pro Leu Leu Ala Pro Leu Leu Cys Leu Ala Leu Leu Pro Ala
1               5                  10                  15

Leu Ala Ala Arg Gly Pro Arg Cys Ser Gln Pro Gly Glu Thr Cys Leu
            20                  25                  30

Asn Gly Gly Lys Cys Glu Ala Ala Asn Gly Thr Glu Ala Cys Val Cys
        35                  40                  45

Gly Gly Ala Phe Val Gly Pro Arg Cys Gln Asp Pro Asn Pro Cys Leu
    50                  55                  60

Ser Thr Pro Cys Lys Asn Ala Gly Thr Cys His Val Val Asp Arg Arg
65                  70                  75                  80

Gly Val Ala Asp Tyr Ala Cys Ser Cys Ala Leu Gly Phe Ser Gly Pro
                85                  90                  95

Leu Cys Leu Thr Pro Leu Asp Asn Ala Cys Leu Thr Asn Pro Cys Arg
            100                 105                 110

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

Cys Pro Pro Gly Trp Ser Gly Lys Ser Cys Gln Gln Ala Asp Pro Cys
    130                 135                 140

Ala Ser Asn Pro Cys Ala Asn Gly Gly Gln Cys Leu Pro Phe Glu Ala
145                 150                 155                 160

Ser Tyr Ile Cys His Cys Pro Pro Ser Phe His Gly Pro Thr Cys Arg
                165                 170                 175
```

```
Gln Asp Val Asn Glu Cys Gly Gln Lys Pro Gly Leu Cys Arg His Gly
            180                 185                 190

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

Thr His Thr Gly Pro Asn Cys Glu Arg Pro Tyr Val Pro Cys Ser Pro
    210                 215                 220

Ser Pro Cys Gln Asn Gly Gly Thr Cys Arg Pro Thr Gly Asp Val Thr
225                 230                 235                 240

His Glu Cys Ala Cys Leu Pro Gly Phe Thr Gly Gln Asn Cys Glu Glu
                245                 250                 255

Asn Ile Asp Asp Cys Pro Gly Asn Asn Cys Lys Asn Gly Gly Ala Cys
            260                 265                 270

Val Asp Gly Val Asn Thr Tyr Asn Cys Arg Cys Pro Pro Glu Trp Thr
        275                 280                 285

Gly Gln Tyr Cys Thr Glu Asp Val Asp Glu Cys Gln Leu Met Pro Asn
    290                 295                 300

Ala Cys Gln Asn Gly Gly Thr Cys His Asn Thr His Gly Gly Tyr Asn
305                 310                 315                 320

Cys Val Cys Val Asn Gly Trp Thr Gly Glu Asp Cys Ser Glu Asn Ile
                325                 330                 335

Asp Asp Cys Ala Ser Ala Ala Cys Phe His Gly Ala Thr Cys His Asp
            340                 345                 350

Arg Val Ala Ser Phe Tyr Cys Glu Cys Pro His Gly Arg Thr Gly Leu
        355                 360                 365

Leu Cys His Leu Asn Asp Ala Cys Ile Ser Asn Pro Cys Asn Glu Gly
    370                 375                 380

Ser Asn Cys Asp Thr Asn Pro Val Asn Gly Lys Ala Ile Cys Thr Cys
385                 390                 395                 400

Pro Ser Gly Tyr Thr Gly Pro Ala Cys Ser Gln Asp Val Asp Glu Cys
                405                 410                 415

Ser Leu Gly Ala Asn Pro Cys Glu His Ala Gly Lys Cys Ile Asn Thr
            420                 425                 430

Leu Gly Ser Phe Glu Cys Gln Cys Leu Gln Gly Tyr Thr Gly Pro Arg
        435                 440                 445
```

```
Cys Glu Ile Asp Val Asn Glu Cys Val Ser Asn Pro Cys Gln Asn Asp
    450                 455                 460

Ala Thr Cys Leu Asp Gln Ile Gly Glu Phe Gln Cys Ile Cys Met Pro
465                 470                 475                 480

Gly Tyr Glu Gly Val His Cys Glu Val Asn Thr Asp Glu Cys Ala Ser
                485                 490                 495

Ser Pro Cys Leu His Asn Gly Arg Cys Leu Asp Lys Ile Asn Glu Phe
            500                 505                 510

Gln Cys Glu Cys Pro Thr Gly Phe Thr Gly His Leu Cys Gln Tyr Asp
        515                 520                 525

Val Asp Glu Cys Ala Ser Thr Pro Cys Lys Asn Gly Ala Lys Cys Leu
    530                 535                 540

Asp Gly Pro Asn Thr Tyr Thr Cys Val Cys Thr Glu Gly Tyr Thr Gly
545                 550                 555                 560

Thr His Cys Glu Val Asp Ile Asp Glu Cys Asp Pro Asp Pro Cys His
                565                 570                 575

Tyr Gly Ser Cys Lys Asp Gly Val Ala Thr Phe Thr Cys Leu Cys Arg
            580                 585                 590

Pro Gly Tyr Thr Gly His His Cys Glu Thr Asn Ile Asn Glu Cys Ser
        595                 600                 605

Ser Gln Pro Cys Arg His Gly Gly Thr Cys Gln Asp Arg Asp Asn Ala
    610                 615                 620

Tyr Leu Cys Phe Cys Leu Lys Gly Thr Thr Gly Pro Asn Cys Glu Ile
625                 630                 635                 640

Asn Leu Asp Asp Cys Ala Ser Ser Pro Cys Asp Ser Gly Thr Cys Leu
                645                 650                 655

Asp Lys Ile Asp Gly Tyr Glu Cys Ala Cys Glu Pro Gly Tyr Thr Gly
            660                 665                 670

Ser Met Cys Asn Ile Asn Ile Asp Glu Cys Ala Gly Asn Pro Cys His
        675                 680                 685

Asn Gly Gly Thr Cys Glu Asp Gly Ile Asn Gly Phe Thr Cys Arg Cys
    690                 695                 700

Pro Glu Gly Tyr His Asp Pro Thr Cys Leu Ser Glu Val Asn Glu Cys
705                 710                 715                 720
```

```
Asn Ser Asn Pro Cys Val His Gly Ala Cys Arg Asp Ser Leu Asn Gly
                725                 730                 735

Tyr Lys Cys Asp Cys Asp Pro Gly Trp Ser Gly Thr Asn Cys Asp Ile
            740                 745                 750

Asn Asn Asn Glu Cys Glu Ser Asn Pro Cys Val Asn Gly Gly Thr Cys
        755                 760                 765

Lys Asp Met Thr Ser Gly Tyr Val Cys Thr Cys Arg Glu Gly Phe Ser
    770                 775                 780

Gly Pro Asn Cys Gln Thr Asn Ile Asn Glu Cys Ala Ser Asn Pro Cys
785                 790                 795                 800

Leu Asn Gln Gly Thr Cys Ile Asp Asp Val Ala Gly Tyr Lys Cys Asn
                805                 810                 815

Cys Leu Leu Pro Tyr Thr Gly Ala Thr Cys Glu Val Val Leu Ala Pro
            820                 825                 830

Cys Ala Pro Ser Pro Cys Arg Asn Gly Gly Glu Cys Arg Gln Ser Glu
        835                 840                 845

Asp Tyr Glu Ser Phe Ser Cys Val Cys Pro Thr Gly Trp Gln Gly Gln
    850                 855                 860

Thr Cys Glu Val Asp Ile Asn Glu Cys Val Leu Ser Pro Cys Arg His
865                 870                 875                 880

Gly Ala Ser Cys Gln Asn Thr His Gly Gly Tyr Arg Cys His Cys Gln
                885                 890                 895

Ala Gly Tyr Ser Gly Arg Asn Cys Glu Thr Asp Ile Asp Asp Cys Arg
            900                 905                 910

Pro Asn Pro Cys His Asn Gly Gly Ser Cys Thr Asp Gly Ile Asn Thr
        915                 920                 925

Ala Phe Cys Asp Cys Leu Pro Gly Phe Arg Gly Thr Phe Cys Glu Glu
    930                 935                 940

Asp Ile Asn Glu Cys Ala Ser Asp Pro Cys Arg Asn Gly Ala Asn Cys
945                 950                 955                 960

Thr Asp Cys Val Asp Ser Tyr Thr Cys Thr Cys Pro Ala Gly Phe Ser
                965                 970                 975

Gly Ile His Cys Glu Asn Asn Thr Pro Asp Cys Thr Glu Ser Ser Cys
            980                 985                 990
```

```
Phe Asn Gly Gly Thr Cys Val Asp  Gly Ile Asn Ser Phe  Thr Cys Leu
       995                 1000                1005

Cys Pro  Pro Gly Phe Thr Gly  Ser Tyr Cys Gln His  Asp Val Asn
    1010                1015                1020

Glu Cys  Asp Ser Gln Pro Cys  Leu His Gly Gly Thr  Cys Gln Asp
    1025                1030                1035

Gly Cys  Gly Ser Tyr Arg Cys  Thr Cys Pro Gln Gly  Tyr Thr Gly
    1040                1045                1050

Pro Asn  Cys Gln Asn Leu Val  His Trp Cys Asp Ser  Ser Pro Cys
    1055                1060                1065

Lys Asn  Gly Gly Lys Cys Trp  Gln Thr His Thr Gln  Tyr Arg Cys
    1070                1075                1080

Glu Cys  Pro Ser Gly Trp Thr  Gly Leu Tyr Cys Asp  Val Pro Ser
    1085                1090                1095

Val Ser  Cys Glu Val Ala Ala  Gln Arg Gln Gly Val  Asp Val Ala
    1100                1105                1110

Arg Leu  Cys Gln His Gly Gly  Leu Cys Val Asp Ala  Gly Asn Thr
    1115                1120                1125

His His  Cys Arg Cys Gln Ala  Gly Tyr Thr Gly Ser  Tyr Cys Glu
    1130                1135                1140

Asp Leu  Val Asp Glu Cys Ser  Pro Ser Pro Cys Gln  Asn Gly Ala
    1145                1150                1155

Thr Cys  Thr Asp Tyr Leu Gly  Gly Tyr Ser Cys Lys  Cys Val Ala
    1160                1165                1170

Gly Tyr  His Gly Val Asn Cys  Ser Glu Glu Ile Asp  Glu Cys Leu
    1175                1180                1185

Ser His  Pro Cys Gln Asn Gly  Gly Thr Cys Leu Asp  Leu Pro Asn
    1190                1195                1200

Thr Tyr  Lys Cys Ser Cys Pro  Arg Gly Thr Gln Gly  Val His Cys
    1205                1210                1215

Glu Ile  Asn Val Asp Asp Cys  Asn Pro Pro Val Asp  Pro Val Ser
    1220                1225                1230

Arg Ser  Pro Lys Cys Phe Asn  Asn Gly Thr Cys Val  Asp Gln Val
    1235                1240                1245
```

```
Gly Gly  Tyr Ser Cys Thr Cys  Pro Pro Gly Phe Val  Gly Glu Arg
    1250                 1255                 1260

Cys Glu  Gly Asp Val Asn Glu  Cys Leu Ser Asn Pro  Cys Asp Ala
    1265                 1270                 1275

Arg Gly  Thr Gln Asn Cys Val  Gln Arg Val Asn Asp  Phe His Cys
    1280                 1285                 1290

Glu Cys  Arg Ala Gly His Thr  Gly Arg Arg Cys Glu  Ser Val Ile
    1295                 1300                 1305

Asn Gly  Cys Lys Gly Lys Pro  Cys Lys Asn Gly Gly  Thr Cys Ala
    1310                 1315                 1320

Val Ala  Ser Asn Thr Ala Arg  Gly Phe Ile Cys Lys  Cys Pro Ala
    1325                 1330                 1335

Gly Phe  Glu Gly Ala Thr Cys  Glu Asn Asp Ala Arg  Thr Cys Gly
    1340                 1345                 1350

Ser Leu  Arg Cys Leu Asn Gly  Gly Thr Cys Ile Ser  Gly Pro Arg
    1355                 1360                 1365

Ser Pro  Thr Cys Leu Cys Leu  Gly Pro Phe Thr Gly  Pro Glu Cys
    1370                 1375                 1380

Gln Phe  Pro Ala Ser Ser Pro  Cys Leu Gly Gly Asn  Pro Cys Tyr
    1385                 1390                 1395

Asn Gln  Gly Thr Cys Glu Pro  Thr Ser Glu Ser Pro  Phe Tyr Arg
    1400                 1405                 1410

Cys Leu  Cys Pro Ala Lys Phe  Asn Gly Leu Leu Cys  His Ile Leu
    1415                 1420                 1425

Asp Tyr  Ser Phe Gly Gly Gly  Ala Gly Arg Asp Ile  Pro Pro Pro
    1430                 1435                 1440

Leu Ile  Glu Glu Ala Cys Glu  Leu Pro Glu Cys Gln  Glu Asp Ala
    1445                 1450                 1455

Gly Asn  Lys Val Cys Ser Leu  Gln Cys Asn Asn His  Ala Cys Gly
    1460                 1465                 1470

Trp Asp  Gly Gly Asp Cys Ser  Leu Asn Phe Asn Asp  Pro Trp Lys
    1475                 1480                 1485

Asn Cys  Thr Gln Ser Leu Gln  Cys Trp Lys Tyr Phe  Ser Asp Gly
    1490                 1495                 1500
```

```
His Cys  Asp Ser Gln Cys Asn  Ser Ala Gly Cys Leu  Phe Asp Gly
    1505                 1510                 1515

Phe Asp  Cys Gln Arg Ala Glu  Gly Gln Cys Asn Pro  Leu Tyr Asp
    1520                 1525                 1530

Gln Tyr  Cys Lys Asp His Phe  Ser Asp Gly His Cys  Asp Gln Gly
    1535                 1540                 1545

Cys Asn  Ser Ala Glu Cys Glu  Trp Asp Gly Leu Asp  Cys Ala Glu
    1550                 1555                 1560

His Val  Pro Glu Arg Leu Ala  Ala Gly Thr Leu Val  Val Val Val
    1565                 1570                 1575

Leu Met  Pro Pro Glu Gln Leu  Arg Asn Ser Ser Phe  His Phe Leu
    1580                 1585                 1590

Arg Glu  Leu Ser Arg Val Leu  His Thr Asn Val Val  Phe Lys Arg
    1595                 1600                 1605

Asp Ala  His Gly Gln Gln Met  Ile Phe Pro Tyr Tyr  Gly Arg Glu
    1610                 1615                 1620

Glu Glu  Leu Arg Lys His Pro  Ile Lys Arg Ala Ala  Glu Gly Trp
    1625                 1630                 1635

Ala Ala  Pro Asp Ala Leu Leu  Gly Gln Val Lys Ala  Ser Leu Leu
    1640                 1645                 1650

Pro Gly  Gly Ser Glu Gly Gly  Arg Arg Arg Arg Glu  Leu Asp Pro
    1655                 1660                 1665

Met Asp  Val Arg Gly Ser Ile  Val Tyr Leu Glu Ile  Asp Asn Arg
    1670                 1675                 1680

Gln Cys  Val Gln Ala Ser Ser  Gln Cys Phe Gln Ser  Ala Thr Asp
    1685                 1690                 1695

Val Ala  Ala Phe Leu Gly Ala  Leu Ala Ser Leu Gly  Ser Leu Asn
    1700                 1705                 1710

Ile Pro  Tyr Lys Ile Glu Ala  Val Gln Ser Glu Thr  Val Glu Pro
    1715                 1720                 1725

Pro Pro  Pro Ala Gln Leu His  Phe Met Tyr Val Ala  Ala Ala Ala
    1730                 1735                 1740

Phe Val  Leu Leu Phe Phe Val  Gly Cys Gly Val Leu  Leu Ser Arg
    1745                 1750                 1755
```

Lys Arg Arg Arg Gln His Gly Gln Leu Trp Phe Pro Glu Gly Phe
1760 1765 1770

Lys Val Ser Glu Ala Ser Lys Lys Lys Arg Arg Glu Pro Leu Gly
1775 1780 1785

Glu Asp Ser Val Gly Leu Lys Pro Leu Lys Asn Ala Ser Asp Gly
1790 1795 1800

Ala Leu Met Asp Asp Asn Gln Asn Glu Trp Gly Asp Glu Asp Leu
1805 1810 1815

Glu Thr Lys Lys Phe Arg Phe Glu Glu Pro Val Val Leu Pro Asp
1820 1825 1830

Leu Asp Asp Gln Thr Asp His Arg Gln Trp Thr Gln Gln His Leu
1835 1840 1845

Asp Ala Ala Asp Leu Arg Met Ser Ala Met Ala Pro Thr Pro Pro
1850 1855 1860

Gln Gly Glu Val Asp Ala Asp Cys Met Asp Val Asn Val Arg Gly
1865 1870 1875

Pro Asp Gly Phe Thr Pro Leu Met Ile Ala Ser Cys Ser Gly Gly
1880 1885 1890

Gly Leu Glu Thr Gly Asn Ser Glu Glu Glu Glu Asp Ala Pro Ala
1895 1900 1905

Val Ile Ser Asp Phe Ile Tyr Gln Gly Ala Ser Leu His Asn Gln
1910 1915 1920

Thr Asp Arg Thr Gly Glu Thr Ala Leu His Leu Ala Ala Arg Tyr
1925 1930 1935

Ser Arg Ser Asp Ala Ala Lys Arg Leu Leu Glu Ala Ser Ala Asp
1940 1945 1950

Ala Asn Ile Gln Asp Asn Met Gly Arg Thr Pro Leu His Ala Ala
1955 1960 1965

Val Ser Ala Asp Ala Gln Gly Val Phe Gln Ile Leu Ile Arg Asn
1970 1975 1980

Arg Ala Thr Asp Leu Asp Ala Arg Met His Asp Gly Thr Thr Pro
1985 1990 1995

Leu Ile Leu Ala Ala Arg Leu Ala Val Glu Gly Met Leu Glu Asp
2000 2005 2010

Leu Ile Asn Ser His Ala Asp Val Asn Ala Val Asp Asp Leu Gly
2015 2020 2025

Lys Ser Ala Leu His Trp Ala Ala Ala Val Asn Asn Val Asp Ala
2030 2035 2040

Ala Val Val Leu Leu Lys Asn Gly Ala Asn Lys Asp Met Gln Asn
2045 2050 2055

Asn Arg Glu Glu Thr Pro Leu Phe Leu Ala Ala Arg Glu Gly Ser
2060 2065 2070

Tyr Glu Thr Ala Lys Val Leu Leu Asp His Phe Ala Asn Arg Asp
2075 2080 2085

Ile Thr Asp His Met Asp Arg Leu Pro Arg Asp Ile Ala Gln Glu
2090 2095 2100

Arg Met His His Asp Ile Val Arg Leu Leu Asp Glu Tyr Asn Leu
2105 2110 2115

Val Arg Ser Pro Gln Leu His Gly Ala Pro Leu Gly Gly Thr Pro
2120 2125 2130

Thr Leu Ser Pro Pro Leu Cys Ser Pro Asn Gly Tyr Leu Gly Ser
2135 2140 2145

Leu Lys Pro Gly Val Gln Gly Lys Lys Val Arg Lys Pro Ser Ser
2150 2155 2160

Lys Gly Leu Ala Cys Gly Ser Lys Glu Ala Lys Asp Leu Lys Ala
2165 2170 2175

Arg Arg Lys Lys Ser Gln Asp Gly Lys Gly Cys Leu Leu Asp Ser
2180 2185 2190

Ser Gly Met Leu Ser Pro Val Asp Ser Leu Glu Ser Pro His Gly
2195 2200 2205

Tyr Leu Ser Asp Val Ala Ser Pro Pro Leu Leu Pro Ser Pro Phe
2210 2215 2220

Gln Gln Ser Pro Ser Val Pro Leu Asn His Leu Pro Gly Met Pro
2225 2230 2235

Asp Thr His Leu Gly Ile Gly His Leu Asn Val Ala Ala Lys Pro
2240 2245 2250

Glu Met Ala Ala Leu Gly Gly Gly Gly Arg Leu Ala Phe Glu Thr
2255 2260 2265

```
Gly Pro  Pro Arg Leu Ser His  Leu Pro Val Ala Ser  Gly Thr Ser
    2270                 2275                 2280

Thr Val  Leu Gly Ser Ser Ser  Gly Gly Ala Leu Asn  Phe Thr Val
    2285                 2290                 2295

Gly Gly  Ser Thr Ser Leu Asn  Gly Gln Cys Glu Trp  Leu Ser Arg
    2300                 2305                 2310

Leu Gln  Ser Gly Met Val Pro  Asn Gln Tyr Asn Pro  Leu Arg Gly
    2315                 2320                 2325

Ser Val  Ala Pro Gly Pro Leu  Ser Thr Gln Ala Pro  Ser Leu Gln
    2330                 2335                 2340

His Gly  Met Val Gly Pro Leu  His Ser Ser Leu Ala  Ala Ser Ala
    2345                 2350                 2355

Leu Ser  Gln Met Met Ser Tyr  Gln Gly Leu Pro Ser  Thr Arg Leu
    2360                 2365                 2370

Ala Thr  Gln Pro His Leu Val  Gln Thr Gln Gln Val  Gln Pro Gln
    2375                 2380                 2385

Asn Leu  Gln Met Gln Gln Gln  Asn Leu Gln Pro Ala  Asn Ile Gln
    2390                 2395                 2400

Gln Gln  Gln Ser Leu Gln Pro  Pro Pro Pro Pro Pro  Gln Pro His
    2405                 2410                 2415

Leu Gly  Val Ser Ser Ala Ala  Ser Gly His Leu Gly  Arg Ser Phe
    2420                 2425                 2430

Leu Ser  Gly Glu Pro Ser Gln  Ala Asp Val Gln Pro  Leu Gly Pro
    2435                 2440                 2445

Ser Ser  Leu Ala Val His Thr  Ile Leu Pro Gln Glu  Ser Pro Ala
    2450                 2455                 2460

Leu Pro  Thr Ser Leu Pro Ser  Ser Leu Val Pro Pro  Val Thr Ala
    2465                 2470                 2475

Ala Gln  Phe Leu Thr Pro Pro  Ser Gln His Ser Tyr  Ser Ser Pro
    2480                 2485                 2490

Val Asp  Asn Thr Pro Ser His  Gln Leu Gln Val Pro  Glu His Pro
    2495                 2500                 2505

Phe Leu  Thr Pro Ser Pro Glu  Ser Pro Asp Gln Trp  Ser Ser Ser
    2510                 2515                 2520
```

```
Ser Pro  His Ser Asn Val Ser  Asp Trp Ser Glu Gly  Val Ser Ser
    2525                 2530                 2535

Pro Pro  Thr Ser Met Gln Ser  Gln Ile Ala Arg Ile  Pro Glu Ala
    2540                 2545                 2550

Phe Lys
    2555
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<210> 2
<211> 2531
<212> PRT
<213> Mus musculus

<400> 2

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Met Pro Arg Leu Leu Thr Pro Leu Leu Cys Leu Thr Leu Leu Pro Ala
1               5                  10                  15

Leu Ala Ala Arg Gly Leu Arg Cys Ser Gln Pro Ser Gly Thr Cys Leu
            20                  25                  30

Asn Gly Gly Arg Cys Glu Val Ala Asn Gly Thr Glu Ala Cys Val Cys
        35                  40                  45

Ser Gly Ala Phe Val Gly Gln Arg Cys Gln Asp Ser Asn Pro Cys Leu
    50                  55                  60

Ser Thr Pro Cys Lys Asn Ala Gly Thr Cys His Val Val Asp His Gly
65                  70                  75                  80

Gly Thr Val Asp Tyr Ala Cys Ser Cys Pro Leu Gly Phe Ser Gly Pro
                85                  90                  95

Leu Cys Leu Thr Pro Leu Asp Asn Ala Cys Leu Ala Asn Pro Cys Arg
            100                 105                 110

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

Cys Pro Pro Gly Trp Ser Gly Lys Ser Cys Gln Gln Ala Asp Pro Cys
    130                 135                 140

Ala Ser Asn Pro Cys Ala Asn Gly Gly Gln Cys Leu Pro Phe Glu Ser
145                 150                 155                 160

Ser Tyr Ile Cys Arg Cys Pro Pro Gly Phe His Gly Pro Thr Cys Arg
                165                 170                 175

Gln Asp Val Asn Glu Cys Ser Gln Asn Pro Gly Leu Cys Arg His Gly
            180                 185                 190

Gly Thr Cys His Asn Glu Ile Gly Ser Tyr Arg Cys Ala Cys Arg Ala
        195                 200                 205
```

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

Ser Pro Cys Gln Asn Gly Gly Thr Cys Arg Pro Thr Gly Asp Thr Thr
225                 230                 235                 240

His Glu Cys Ala Cys Leu Pro Gly Phe Ala Gly Gln Asn Cys Glu Glu
                245                 250                 255

Asn Val Asp Asp Cys Pro Gly Asn Asn Cys Lys Asn Gly Gly Ala Cys
            260                 265                 270

Val Asp Gly Val Asn Thr Tyr Asn Cys Arg Cys Pro Pro Glu Trp Thr
        275                 280                 285

Gly Gln Tyr Cys Thr Glu Asp Val Asp Glu Cys Gln Leu Met Pro Asn
    290                 295                 300

Ala Cys Gln Asn Gly Gly Thr Cys His Asn Thr His Gly Gly Tyr Asn
305                 310                 315                 320

Cys Val Cys Val Asn Gly Trp Thr Gly Glu Asp Cys Ser Glu Asn Ile
                325                 330                 335

Asp Asp Cys Ala Ser Ala Ala Cys Phe Gln Gly Ala Thr Cys His Asp
            340                 345                 350

Arg Val Ala Ser Phe Tyr Cys Glu Cys Pro His Gly Arg Thr Gly Leu
        355                 360                 365

Leu Cys His Leu Asn Asp Ala Cys Ile Ser Asn Pro Cys Asn Glu Gly
    370                 375                 380

Ser Asn Cys Asp Thr Asn Pro Val Asn Gly Lys Ala Ile Cys Thr Cys
385                 390                 395                 400

Pro Ser Gly Tyr Thr Gly Pro Ala Cys Ser Gln Asp Val Asp Glu Cys
                405                 410                 415

Ala Leu Gly Ala Asn Pro Cys Glu His Ala Gly Lys Cys Leu Asn Thr
            420                 425                 430

Leu Gly Ser Phe Glu Cys Gln Cys Leu Gln Gly Tyr Thr Gly Pro Arg
        435                 440                 445

Cys Glu Ile Asp Val Asn Glu Cys Ile Ser Asn Pro Cys Gln Asn Asp
    450                 455                 460

Ala Thr Cys Leu Asp Gln Ile Gly Glu Phe Gln Cys Ile Cys Met Pro
465                 470                 475                 480
```

Gly Tyr Glu Gly Val Tyr Cys Glu Ile Asn Thr Asp Glu Cys Ala Ser
485 490 495

Ser Pro Cys Leu His Asn Gly His Cys Met Asp Lys Ile Asn Glu Phe
500 505 510

Gln Cys Gln Cys Pro Lys Gly Phe Asn Gly His Leu Cys Gln Tyr Asp
515 520 525

Val Asp Glu Cys Ala Ser Thr Pro Cys Lys Asn Gly Ala Lys Cys Leu
530 535 540

Asp Gly Pro Asn Thr Tyr Thr Cys Val Cys Thr Glu Gly Tyr Thr Gly
545 550 555 560

Thr His Cys Glu Val Asp Ile Asp Glu Cys Asp Pro Asp Pro Cys His
565 570 575

Tyr Gly Ser Cys Lys Asp Gly Val Ala Thr Phe Thr Cys Leu Cys Gln
580 585 590

Pro Gly Tyr Thr Gly His His Cys Glu Thr Asn Ile Asn Glu Cys His
595 600 605

Ser Gln Pro Cys Arg His Gly Gly Thr Cys Gln Asp Arg Asp Asn Ser
610 615 620

Tyr Leu Cys Leu Cys Leu Lys Gly Thr Thr Gly Pro Asn Cys Glu Ile
625 630 635 640

Asn Leu Asp Asp Cys Ala Ser Asn Pro Cys Asp Ser Gly Thr Cys Leu
645 650 655

Asp Lys Ile Asp Gly Tyr Glu Cys Ala Cys Glu Pro Gly Tyr Thr Gly
660 665 670

Ser Met Cys Asn Val Asn Ile Asp Glu Cys Ala Gly Ser Pro Cys His
675 680 685

Asn Gly Gly Thr Cys Glu Asp Gly Ile Ala Gly Phe Thr Cys Arg Cys
690 695 700

Pro Glu Gly Tyr His Asp Pro Thr Cys Leu Ser Glu Val Asn Glu Cys
705 710 715 720

Asn Ser Asn Pro Cys Ile His Gly Ala Cys Arg Asp Gly Leu Asn Gly
725 730 735

Tyr Lys Cys Asp Cys Ala Pro Gly Trp Ser Gly Thr Asn Cys Asp Ile
740 745 750

```
Asn Asn Asn Glu Cys Glu Ser Asn Pro Cys Val Asn Gly Gly Thr Cys
        755                 760                 765

Lys Asp Met Thr Ser Gly Tyr Val Cys Thr Cys Arg Glu Gly Phe Ser
    770                 775                 780

Gly Pro Asn Cys Gln Thr Asn Ile Asn Glu Cys Ala Ser Asn Pro Cys
785                 790                 795                 800

Leu Asn Gln Gly Thr Cys Ile Asp Asp Val Ala Gly Tyr Lys Cys Asn
                805                 810                 815

Cys Pro Leu Pro Tyr Thr Gly Ala Thr Cys Glu Val Val Leu Ala Pro
            820                 825                 830

Cys Ala Thr Ser Pro Cys Lys Asn Ser Gly Val Cys Lys Glu Ser Glu
        835                 840                 845

Asp Tyr Glu Ser Phe Ser Cys Val Cys Pro Thr Gly Trp Gln Gly Gln
    850                 855                 860

Thr Cys Glu Val Asp Ile Asn Glu Cys Val Lys Ser Pro Cys Arg His
865                 870                 875                 880

Gly Ala Ser Cys Gln Asn Thr Asn Gly Ser Tyr Arg Cys Leu Cys Gln
                885                 890                 895

Ala Gly Tyr Thr Gly Arg Asn Cys Glu Ser Asp Ile Asp Asp Cys Arg
            900                 905                 910

Pro Asn Pro Cys His Asn Gly Gly Ser Cys Thr Asp Gly Ile Asn Thr
        915                 920                 925

Ala Phe Cys Asp Cys Leu Pro Gly Phe Gln Gly Ala Phe Cys Glu Glu
    930                 935                 940

Asp Ile Asn Glu Cys Ala Ser Asn Pro Cys Gln Asn Gly Ala Asn Cys
945                 950                 955                 960

Thr Asp Cys Val Asp Ser Tyr Thr Cys Thr Cys Pro Val Gly Phe Asn
                965                 970                 975

Gly Ile His Cys Glu Asn Asn Thr Pro Asp Cys Thr Glu Ser Ser Cys
            980                 985                 990

Phe Asn Gly Gly Thr Cys Val Asp  Gly Ile Asn Ser Phe  Thr Cys Leu
        995                 1000                1005

Cys Pro  Pro Gly Phe Thr Gly  Ser Tyr Cys Gln Tyr  Asp Val Asn
    1010                1015                1020
```

```
Glu Cys Asp Ser Arg Pro Cys Leu His Gly Gly Thr Cys Gln Asp
    1025                1030                1035

Ser Tyr Gly Thr Tyr Lys Cys Thr Cys Pro Gln Gly Tyr Thr Gly
    1040                1045                1050

Leu Asn Cys Gln Asn Leu Val Arg Trp Cys Asp Ser Ala Pro Cys
    1055                1060                1065

Lys Asn Gly Gly Arg Cys Trp Gln Thr Asn Thr Gln Tyr His Cys
    1070                1075                1080

Glu Cys Arg Ser Gly Trp Thr Gly Val Asn Cys Asp Val Leu Ser
    1085                1090                1095

Val Ser Cys Glu Val Ala Ala Gln Lys Arg Gly Ile Asp Val Thr
    1100                1105                1110

Leu Leu Cys Gln His Gly Gly Leu Cys Val Asp Glu Gly Asp Lys
    1115                1120                1125

His Tyr Cys His Cys Gln Ala Gly Tyr Thr Gly Ser Tyr Cys Glu
    1130                1135                1140

Asp Glu Val Asp Glu Cys Ser Pro Asn Pro Cys Gln Asn Gly Ala
    1145                1150                1155

Thr Cys Thr Asp Tyr Leu Gly Gly Phe Ser Cys Lys Cys Val Ala
    1160                1165                1170

Gly Tyr His Gly Ser Asn Cys Ser Glu Glu Ile Asn Glu Cys Leu
    1175                1180                1185

Ser Gln Pro Cys Gln Asn Gly Gly Thr Cys Ile Asp Leu Thr Asn
    1190                1195                1200

Ser Tyr Lys Cys Ser Cys Pro Arg Gly Thr Gln Gly Val His Cys
    1205                1210                1215

Glu Ile Asn Val Asp Asp Cys His Pro Pro Leu Asp Pro Ala Ser
    1220                1225                1230

Arg Ser Pro Lys Cys Phe Asn Asn Gly Thr Cys Val Asp Gln Val
    1235                1240                1245

Gly Gly Tyr Thr Cys Thr Cys Pro Pro Gly Phe Val Gly Glu Arg
    1250                1255                1260

Cys Glu Gly Asp Val Asn Glu Cys Leu Ser Asn Pro Cys Asp Pro
    1265                1270                1275
```

```
Arg Gly  Thr Gln Asn Cys Val  Gln Arg Val Asn Asp  Phe His Cys
    1280                 1285                 1290

Glu Cys  Arg Ala Gly His Thr  Gly Arg Arg Cys Glu  Ser Val Ile
    1295                 1300                 1305

Asn Gly  Cys Arg Gly Lys Pro  Cys Lys Asn Gly Gly  Val Cys Ala
    1310                 1315                 1320

Val Ala  Ser Asn Thr Ala Arg  Gly Phe Ile Cys Arg  Cys Pro Ala
    1325                 1330                 1335

Gly Phe  Glu Gly Ala Thr Cys  Glu Asn Asp Ala Arg  Thr Cys Gly
    1340                 1345                 1350

Ser Leu  Arg Cys Leu Asn Gly  Gly Thr Cys Ile Ser  Gly Pro Arg
    1355                 1360                 1365

Ser Pro  Thr Cys Leu Cys Leu  Gly Ser Phe Thr Gly  Pro Glu Cys
    1370                 1375                 1380

Gln Phe  Pro Ala Ser Ser Pro  Cys Val Gly Ser Asn  Pro Cys Tyr
    1385                 1390                 1395

Asn Gln  Gly Thr Cys Glu Pro  Thr Ser Glu Asn Pro  Phe Tyr Arg
    1400                 1405                 1410

Cys Leu  Cys Pro Ala Lys Phe  Asn Gly Leu Leu Cys  His Ile Leu
    1415                 1420                 1425

Asp Tyr  Ser Phe Thr Gly Gly  Ala Gly Arg Asp Ile  Pro Pro Pro
    1430                 1435                 1440

Gln Ile  Glu Glu Ala Cys Glu  Leu Pro Glu Cys Gln  Val Asp Ala
    1445                 1450                 1455

Gly Asn  Lys Val Cys Asn Leu  Gln Cys Asn Asn His  Ala Cys Gly
    1460                 1465                 1470

Trp Asp  Gly Gly Asp Cys Ser  Leu Asn Phe Asn Asp  Pro Trp Lys
    1475                 1480                 1485

Asn Cys  Thr Gln Ser Leu Gln  Cys Trp Lys Tyr Phe  Ser Asp Gly
    1490                 1495                 1500

His Cys  Asp Ser Gln Cys Asn  Ser Ala Gly Cys Leu  Phe Asp Gly
    1505                 1510                 1515

Phe Asp  Cys Gln Leu Thr Glu  Gly Gln Cys Asn Pro  Leu Tyr Asp
    1520                 1525                 1530
```

```
Gln Tyr  Cys Lys Asp His Phe  Ser Asp Gly His Cys  Asp Gln Gly
    1535                 1540                 1545

Cys Asn  Ser Ala Glu Cys Glu  Trp Asp Gly Leu Asp  Cys Ala Glu
    1550                 1555                 1560

His Val  Pro Glu Arg Leu Ala  Ala Gly Thr Leu Val  Leu Val Val
    1565                 1570                 1575

Leu Leu  Pro Pro Asp Gln Leu  Arg Asn Asn Ser Phe  His Phe Leu
    1580                 1585                 1590

Arg Glu  Leu Ser His Val Leu  His Thr Asn Val Val  Phe Lys Arg
    1595                 1600                 1605

Asp Ala  Gln Gly Gln Gln Met  Ile Phe Pro Tyr Tyr  Gly His Glu
    1610                 1615                 1620

Glu Glu  Leu Arg Lys His Pro  Ile Lys Arg Ser Thr  Val Gly Trp
    1625                 1630                 1635

Ala Thr  Ser Ser Leu Leu Pro  Gly Thr Ser Gly Gly  Arg Gln Arg
    1640                 1645                 1650

Arg Glu  Leu Asp Pro Met Asp  Ile Arg Gly Ser Ile  Val Tyr Leu
    1655                 1660                 1665

Glu Ile  Asp Asn Arg Gln Cys  Val Gln Ser Ser Ser  Gln Cys Phe
    1670                 1675                 1680

Gln Ser  Ala Thr Asp Val Ala  Ala Phe Leu Gly Ala  Leu Ala Ser
    1685                 1690                 1695

Leu Gly  Ser Leu Asn Ile Pro  Tyr Lys Ile Glu Ala  Val Lys Ser
    1700                 1705                 1710

Glu Pro  Val Glu Pro Pro Leu  Pro Ser Gln Leu His  Leu Met Tyr
    1715                 1720                 1725

Val Ala  Ala Ala Ala Phe Val  Leu Leu Phe Phe Val  Gly Cys Gly
    1730                 1735                 1740

Val Leu  Leu Ser Arg Lys Arg  Arg Arg Gln His Gly  Gln Leu Trp
    1745                 1750                 1755

Phe Pro  Glu Gly Phe Lys Val  Ser Glu Ala Ser Lys  Lys Lys Arg
    1760                 1765                 1770

Arg Glu  Pro Leu Gly Glu Asp  Ser Val Gly Leu Lys  Pro Leu Lys
    1775                 1780                 1785
```

```
Asn Ala  Ser Asp Gly Ala Leu  Met Asp Asp Asn Gln  Asn Glu Trp
    1790                 1795                 1800

Gly Asp  Glu Asp Leu Glu Thr  Lys Lys Phe Arg Phe  Glu Glu Pro
    1805                 1810                 1815

Val Val  Leu Pro Asp Leu Ser  Asp Gln Thr Asp His  Arg Gln Trp
    1820                 1825                 1830

Thr Gln  Gln His Leu Asp Ala  Ala Asp Leu Arg Met  Ser Ala Met
    1835                 1840                 1845

Ala Pro  Thr Pro Pro Gln Gly  Glu Val Asp Ala Asp  Cys Met Asp
    1850                 1855                 1860

Val Asn  Val Arg Gly Pro Asp  Gly Phe Thr Pro Leu  Met Ile Ala
    1865                 1870                 1875

Ser Cys  Ser Gly Gly Gly Leu  Glu Thr Gly Asn Ser  Glu Glu Glu
    1880                 1885                 1890

Glu Asp  Ala Pro Ala Val Ile  Ser Asp Phe Ile Tyr  Gln Gly Ala
    1895                 1900                 1905

Ser Leu  His Asn Gln Thr Asp  Arg Thr Gly Glu Thr  Ala Leu His
    1910                 1915                 1920

Leu Ala  Ala Arg Tyr Ser Arg  Ser Asp Ala Ala Lys  Arg Leu Leu
    1925                 1930                 1935

Glu Ala  Ser Ala Asp Ala Asn  Ile Gln Asp Asn Met  Gly Arg Thr
    1940                 1945                 1950

Pro Leu  His Ala Ala Val Ser  Ala Asp Ala Gln Gly  Val Phe Gln
    1955                 1960                 1965

Ile Leu  Leu Arg Asn Arg Ala  Thr Asp Leu Asp Ala  Arg Met His
    1970                 1975                 1980

Asp Gly  Thr Thr Pro Leu Ile  Leu Ala Ala Arg Leu  Ala Val Glu
    1985                 1990                 1995

Gly Met  Leu Glu Asp Leu Ile  Asn Ser His Ala Asp  Val Asn Ala
    2000                 2005                 2010

Val Asp  Asp Leu Gly Lys Ser  Ala Leu His Trp Ala  Ala Ala Val
    2015                 2020                 2025

Asn Asn  Val Asp Ala Ala Val  Val Leu Leu Lys Asn  Gly Ala Asn
    2030                 2035                 2040
```

```
Lys Asp Met Gln Asn Asn Lys Glu Glu Thr Pro Leu Phe Leu Ala
2045                2050                2055

Ala Arg Glu Gly Ser Tyr Glu Thr Ala Lys Val Leu Leu Asp His
2060                2065                2070

Phe Ala Asn Arg Asp Ile Thr Asp His Met Asp Arg Leu Pro Arg
2075                2080                2085

Asp Ile Ala Gln Glu Arg Met His His Asp Ile Val Arg Leu Leu
2090                2095                2100

Asp Glu Tyr Asn Leu Val Arg Ser Pro Gln Leu His Gly Thr Ala
2105                2110                2115

Leu Gly Gly Thr Pro Thr Leu Ser Pro Thr Leu Cys Ser Pro Asn
2120                2125                2130

Gly Tyr Leu Gly Asn Leu Lys Ser Ala Thr Gln Gly Lys Lys Ala
2135                2140                2145

Arg Lys Pro Ser Thr Lys Gly Leu Ala Cys Gly Ser Lys Glu Ala
2150                2155                2160

Lys Asp Leu Lys Ala Arg Arg Lys Lys Ser Gln Asp Gly Lys Gly
2165                2170                2175

Cys Leu Leu Asp Ser Ser Ser Met Leu Ser Pro Val Asp Ser Leu
2180                2185                2190

Glu Ser Pro His Gly Tyr Leu Ser Asp Val Ala Ser Pro Pro Leu
2195                2200                2205

Leu Pro Ser Pro Phe Gln Gln Ser Pro Ser Met Pro Leu Ser His
2210                2215                2220

Leu Pro Gly Met Pro Asp Thr His Leu Gly Ile Ser His Leu Asn
2225                2230                2235

Val Ala Ala Lys Pro Glu Met Ala Ala Leu Ala Gly Gly Ser Arg
2240                2245                2250

Leu Ala Phe Glu Pro Pro Pro Pro Arg Leu Ser His Leu Pro Val
2255                2260                2265

Ala Ser Ser Ala Ser Thr Val Leu Ser Thr Asn Gly Thr Gly Ala
2270                2275                2280

Met Asn Phe Thr Val Gly Ala Pro Ala Ser Leu Asn Gly Gln Cys
2285                2290                2295
```

```
Glu Trp  Leu Pro Arg Leu Gln  Asn Gly Met Val Pro  Ser Gln Tyr
    2300                 2305                 2310

Asn Pro  Leu Arg Pro Gly Val  Thr Pro Gly Thr Leu  Ser Thr Gln
    2315                 2320                 2325

Ala Ala  Gly Leu Gln His Ser  Met Met Gly Pro Leu  His Ser Ser
    2330                 2335                 2340

Leu Ser  Thr Asn Thr Leu Ser  Pro Ile Ile Tyr Gln  Gly Leu Pro
    2345                 2350                 2355

Asn Thr  Arg Leu Ala Thr Gln  Pro His Leu Val Gln  Thr Gln Gln
    2360                 2365                 2370

Val Gln  Pro Gln Asn Leu Gln  Leu Gln Pro Gln Asn  Leu Gln Pro
    2375                 2380                 2385

Pro Ser  Gln Pro His Leu Ser  Val Ser Ser Ala Ala  Asn Gly His
    2390                 2395                 2400

Leu Gly  Arg Ser Phe Leu Ser  Gly Glu Pro Ser Gln  Ala Asp Val
    2405                 2410                 2415

Gln Pro  Leu Gly Pro Ser Ser  Leu Pro Val His Thr  Ile Leu Pro
    2420                 2425                 2430

Gln Glu  Ser Gln Ala Leu Pro  Thr Ser Leu Pro Ser  Ser Met Val
    2435                 2440                 2445

Pro Pro  Met Thr Thr Thr Gln  Phe Leu Thr Pro Pro  Ser Gln His
    2450                 2455                 2460

Ser Tyr  Ser Ser Ser Pro Val  Asp Asn Thr Pro Ser  His Gln Leu
    2465                 2470                 2475

Gln Val  Pro Glu His Pro Phe  Leu Thr Pro Ser Pro  Glu Ser Pro
    2480                 2485                 2490

Asp Gln  Trp Ser Ser Ser Ser  Pro His Ser Asn Ile  Ser Asp Trp
    2495                 2500                 2505

Ser Glu  Gly Ile Ser Ser Pro  Pro Thr Thr Met Pro  Ser Gln Ile
    2510                 2515                 2520

Thr His  Ile Pro Glu Ala Phe  Lys
    2525                 2530
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<210> 3
<211> 2321

<212> PRT
<213> Homo sapiens

<400> 3

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Met Gly Pro Gly Ala Arg Gly Arg Arg Arg Arg Arg Pro Met Ser
1               5                  10                  15

Pro Pro Pro Pro Pro Pro Pro Val Arg Ala Leu Pro Leu Leu Leu Leu
            20                  25                  30

Leu Ala Gly Pro Gly Ala Ala Ala Pro Pro Cys Leu Asp Gly Ser Pro
        35                  40                  45

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

Cys Leu Cys Pro Pro Gly Trp Val Gly Glu Arg Cys Gln Leu Glu Asp
65                  70                  75                  80

Pro Cys His Ser Gly Pro Cys Ala Gly Arg Gly Val Cys Gln Ser Ser
                85                  90                  95

Val Val Ala Gly Thr Ala Arg Phe Ser Cys Arg Cys Pro Arg Gly Phe
            100                 105                 110

Arg Gly Pro Asp Cys Ser Leu Pro Asp Pro Cys Leu Ser Ser Pro Cys
        115                 120                 125

Ala His Gly Ala Arg Cys Ser Val Gly Pro Asp Gly Arg Phe Leu Cys
    130                 135                 140

Ser Cys Pro Pro Gly Tyr Gln Gly Arg Ser Cys Arg Ser Asp Val Asp
145                 150                 155                 160

Glu Cys Arg Val Gly Glu Pro Cys Arg His Gly Gly Thr Cys Leu Asn
                165                 170                 175

Thr Pro Gly Ser Phe Arg Cys Gln Cys Pro Ala Gly Tyr Thr Gly Pro
            180                 185                 190

Leu Cys Glu Asn Pro Ala Val Pro Cys Ala Pro Ser Pro Cys Arg Asn
        195                 200                 205

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

Leu Pro Gly Phe Glu Gly Gln Asn Cys Glu Val Asn Val Asp Asp Cys
225                 230                 235                 240

Pro Gly His Arg Cys Leu Asn Gly Gly Thr Cys Val Asp Gly Val Asn
                245                 250                 255
```

Thr Tyr Asn Cys Gln Cys Pro Pro Glu Trp Thr Gly Gln Phe Cys Thr
260 265 270

Glu Asp Val Asp Glu Cys Gln Leu Gln Pro Asn Ala Cys His Asn Gly
275 280 285

Gly Thr Cys Phe Asn Thr Leu Gly Gly His Ser Cys Val Cys Val Asn
290 295 300

Gly Trp Thr Gly Glu Ser Cys Ser Gln Asn Ile Asp Asp Cys Ala Thr
305 310 315 320

Ala Val Cys Phe His Gly Ala Thr Cys His Asp Arg Val Ala Ser Phe
325 330 335

Tyr Cys Ala Cys Pro Met Gly Lys Thr Gly Leu Leu Cys His Leu Asp
340 345 350

Asp Ala Cys Val Ser Asn Pro Cys His Glu Asp Ala Ile Cys Asp Thr
355 360 365

Asn Pro Val Asn Gly Arg Ala Ile Cys Thr Cys Pro Pro Gly Phe Thr
370 375 380

Gly Gly Ala Cys Asp Gln Asp Val Asp Glu Cys Ser Ile Gly Ala Asn
385 390 395 400

Pro Cys Glu His Leu Gly Arg Cys Val Asn Thr Gln Gly Ser Phe Leu
405 410 415

Cys Gln Cys Gly Arg Gly Tyr Thr Gly Pro Arg Cys Glu Thr Asp Val
420 425 430

Asn Glu Cys Leu Ser Gly Pro Cys Arg Asn Gln Ala Thr Cys Leu Asp
435 440 445

Arg Ile Gly Gln Phe Thr Cys Ile Cys Met Ala Gly Phe Thr Gly Thr
450 455 460

Tyr Cys Glu Val Asp Ile Asp Glu Cys Gln Ser Ser Pro Cys Val Asn
465 470 475 480

Gly Gly Val Cys Lys Asp Arg Val Asn Gly Phe Ser Cys Thr Cys Pro
485 490 495

Ser Gly Phe Ser Gly Ser Thr Cys Gln Leu Asp Val Asp Glu Cys Ala
500 505 510

Ser Thr Pro Cys Arg Asn Gly Ala Lys Cys Val Asp Gln Pro Asp Gly
515 520 525

```
Tyr Glu Cys Arg Cys Ala Glu Gly Phe Glu Gly Thr Leu Cys Asp Arg
    530                 535                 540

Asn Val Asp Asp Cys Ser Pro Asp Pro Cys His His Gly Arg Cys Val
545                 550                 555                 560

Asp Gly Ile Ala Ser Phe Ser Cys Ala Cys Ala Pro Gly Tyr Thr Gly
                565                 570                 575

Thr Arg Cys Glu Ser Gln Val Asp Glu Cys Arg Ser Gln Pro Cys Arg
            580                 585                 590

His Gly Gly Lys Cys Leu Asp Leu Val Asp Lys Tyr Leu Cys Arg Cys
        595                 600                 605

Pro Ser Gly Thr Thr Gly Val Asn Cys Glu Val Asn Ile Asp Asp Cys
    610                 615                 620

Ala Ser Asn Pro Cys Thr Phe Gly Val Cys Arg Asp Gly Ile Asn Arg
625                 630                 635                 640

Tyr Asp Cys Val Cys Gln Pro Gly Phe Thr Gly Pro Leu Cys Asn Val
                645                 650                 655

Glu Ile Asn Glu Cys Ala Ser Ser Pro Cys Gly Glu Gly Gly Ser Cys
            660                 665                 670

Val Asp Gly Glu Asn Gly Phe Arg Cys Leu Cys Pro Pro Gly Ser Leu
        675                 680                 685

Pro Pro Leu Cys Leu Pro Pro Ser His Pro Cys Ala His Glu Pro Cys
    690                 695                 700

Ser His Gly Ile Cys Tyr Asp Ala Pro Gly Gly Phe Arg Cys Val Cys
705                 710                 715                 720

Glu Pro Gly Trp Ser Gly Pro Arg Cys Ser Gln Ser Leu Ala Arg Asp
                725                 730                 735

Ala Cys Glu Ser Gln Pro Cys Arg Ala Gly Gly Thr Cys Ser Ser Asp
            740                 745                 750

Gly Met Gly Phe His Cys Thr Cys Pro Pro Gly Val Gln Gly Arg Gln
        755                 760                 765

Cys Glu Leu Leu Ser Pro Cys Thr Pro Asn Pro Cys Glu His Gly Gly
    770                 775                 780

Arg Cys Glu Ser Ala Pro Gly Gln Leu Pro Val Cys Ser Cys Pro Gln
785                 790                 795                 800
```

```
Gly Trp Gln Gly Pro Arg Cys Gln Gln Asp Val Asp Glu Cys Ala Gly
                805                 810                 815

Pro Ala Pro Cys Gly Pro His Gly Ile Cys Thr Asn Leu Ala Gly Ser
            820                 825                 830

Phe Ser Cys Thr Cys His Gly Gly Tyr Thr Gly Pro Ser Cys Asp Gln
        835                 840                 845

Asp Ile Asn Asp Cys Asp Pro Asn Pro Cys Leu Asn Gly Gly Ser Cys
    850                 855                 860

Gln Asp Gly Val Gly Ser Phe Ser Cys Ser Cys Leu Pro Gly Phe Ala
865                 870                 875                 880

Gly Pro Arg Cys Ala Arg Asp Val Asp Glu Cys Leu Ser Asn Pro Cys
                885                 890                 895

Gly Pro Gly Thr Cys Thr Asp His Val Ala Ser Phe Thr Cys Thr Cys
            900                 905                 910

Pro Pro Gly Tyr Gly Gly Phe His Cys Glu Gln Asp Leu Pro Asp Cys
        915                 920                 925

Ser Pro Ser Ser Cys Phe Asn Gly Gly Thr Cys Val Asp Gly Val Asn
    930                 935                 940

Ser Phe Ser Cys Leu Cys Arg Pro Gly Tyr Thr Gly Ala His Cys Gln
945                 950                 955                 960

His Glu Ala Asp Pro Cys Leu Ser Arg Pro Cys Leu His Gly Gly Val
                965                 970                 975

Cys Ser Ala Ala His Pro Gly Phe Arg Cys Thr Cys Leu Glu Ser Phe
            980                 985                 990

Thr Gly Pro Gln Cys Gln Thr Leu  Val Asp Trp Cys Ser  Arg Gln Pro
        995                 1000                1005

Cys Gln  Asn Gly Gly Arg Cys  Val Gln Thr Gly Ala  Tyr Cys Leu
    1010                1015                1020

Cys Pro  Pro Gly Trp Ser Gly  Arg Leu Cys Asp Ile  Arg Ser Leu
    1025                1030                1035

Pro Cys  Arg Glu Ala Ala Ala  Gln Ile Gly Val Arg  Leu Glu Gln
    1040                1045                1050

Leu Cys  Gln Ala Gly Gly Gln  Cys Val Asp Glu Asp  Ser Ser His
    1055                1060                1065
```

```
Tyr Cys  Val Cys Pro Glu Gly  Arg Thr Gly Ser His  Cys Glu Gln
    1070                1075                1080

Glu Val  Asp Pro Cys Leu Ala  Gln Pro Cys Gln His  Gly Gly Thr
    1085                1090                1095

Cys Arg  Gly Tyr Met Gly Gly  Tyr Met Cys Glu Cys  Leu Pro Gly
    1100                1105                1110

Tyr Asn  Gly Asp Asn Cys Glu  Asp Asp Val Asp Glu  Cys Ala Ser
    1115                1120                1125

Gln Pro  Cys Gln His Gly Gly  Ser Cys Ile Asp Leu  Val Ala Arg
    1130                1135                1140

Tyr Leu  Cys Ser Cys Pro Pro  Gly Thr Leu Gly Val  Leu Cys Glu
    1145                1150                1155

Ile Asn  Glu Asp Asp Cys Gly  Pro Gly Pro Pro Leu  Asp Ser Gly
    1160                1165                1170

Pro Arg  Cys Leu His Asn Gly  Thr Cys Val Asp Leu  Val Gly Gly
    1175                1180                1185

Phe Arg  Cys Thr Cys Pro Pro  Gly Tyr Thr Gly Leu  Arg Cys Glu
    1190                1195                1200

Ala Asp  Ile Asn Glu Cys Arg  Ser Gly Ala Cys His  Ala Ala His
    1205                1210                1215

Thr Arg  Asp Cys Leu Gln Asp  Pro Gly Gly Gly Phe  Arg Cys Leu
    1220                1225                1230

Cys His  Ala Gly Phe Ser Gly  Pro Arg Cys Gln Thr  Val Leu Ser
    1235                1240                1245

Pro Cys  Glu Ser Gln Pro Cys  Gln His Gly Gly Gln  Cys Arg Pro
    1250                1255                1260

Ser Pro  Gly Pro Gly Gly Gly  Leu Thr Phe Thr Cys  His Cys Ala
    1265                1270                1275

Gln Pro  Phe Trp Gly Pro Arg  Cys Glu Arg Val Ala  Arg Ser Cys
    1280                1285                1290

Arg Glu  Leu Gln Cys Pro Val  Gly Val Pro Cys Gln  Gln Thr Pro
    1295                1300                1305

Arg Gly  Pro Arg Cys Ala Cys  Pro Pro Gly Leu Ser  Gly Pro Ser
    1310                1315                1320
```

```
Cys Arg Ser Phe Pro Gly Ser Pro Pro Gly Ala Ser Asn Ala Ser
1325                1330                1335

Cys Ala Ala Ala Pro Cys Leu His Gly Gly Ser Cys Arg Pro Ala
1340                1345                1350

Pro Leu Ala Pro Phe Phe Arg Cys Ala Cys Ala Gln Gly Trp Thr
1355                1360                1365

Gly Pro Arg Cys Glu Ala Pro Ala Ala Ala Pro Glu Val Ser Glu
1370                1375                1380

Glu Pro Arg Cys Pro Arg Ala Ala Cys Gln Ala Lys Arg Gly Asp
1385                1390                1395

Gln Arg Cys Asp Arg Glu Cys Asn Ser Pro Gly Cys Gly Trp Asp
1400                1405                1410

Gly Gly Asp Cys Ser Leu Ser Val Gly Asp Pro Trp Arg Gln Cys
1415                1420                1425

Glu Ala Leu Gln Cys Trp Arg Leu Phe Asn Asn Ser Arg Cys Asp
1430                1435                1440

Pro Ala Cys Ser Ser Pro Ala Cys Leu Tyr Asp Asn Phe Asp Cys
1445                1450                1455

His Ala Gly Gly Arg Glu Arg Thr Cys Asn Pro Val Tyr Glu Lys
1460                1465                1470

Tyr Cys Ala Asp His Phe Ala Asp Gly Arg Cys Asp Gln Gly Cys
1475                1480                1485

Asn Thr Glu Glu Cys Gly Trp Asp Gly Leu Asp Cys Ala Ser Glu
1490                1495                1500

Val Pro Ala Leu Leu Ala Arg Gly Val Leu Val Leu Thr Val Leu
1505                1510                1515

Leu Pro Pro Glu Glu Leu Leu Arg Ser Ser Ala Asp Phe Leu Gln
1520                1525                1530

Arg Leu Ser Ala Ile Leu Arg Thr Ser Leu Arg Phe Arg Leu Asp
1535                1540                1545

Ala His Gly Gln Ala Met Val Phe Pro Tyr His Arg Pro Ser Pro
1550                1555                1560

Gly Ser Glu Pro Arg Ala Arg Arg Glu Leu Ala Pro Glu Val Ile
1565                1570                1575
```

```
Gly Ser  Val Val Met Leu Glu  Ile Asp Asn Arg Leu  Cys Leu Gln
    1580                 1585                 1590

Ser Pro  Glu Asn Asp His Cys  Phe Pro Asp Ala Gln  Ser Ala Ala
    1595                 1600                 1605

Asp Tyr  Leu Gly Ala Leu Ser  Ala Val Glu Arg Leu  Asp Phe Pro
    1610                 1615                 1620

Tyr Pro  Leu Arg Asp Val Arg  Gly Glu Pro Leu Glu  Pro Pro Glu
    1625                 1630                 1635

Pro Ser  Val Pro Leu Leu Pro  Leu Leu Val Ala Gly  Ala Val Leu
    1640                 1645                 1650

Leu Leu  Val Ile Leu Val Leu  Gly Val Met Val Ala  Arg Arg Lys
    1655                 1660                 1665

Arg Glu  His Ser Thr Leu Trp  Phe Pro Glu Gly Phe  Ser Leu His
    1670                 1675                 1680

Lys Asp  Val Ala Ser Gly His  Lys Gly Arg Arg Glu  Pro Val Gly
    1685                 1690                 1695

Gln Asp  Ala Leu Gly Met Lys  Asn Met Ala Lys Gly  Glu Ser Leu
    1700                 1705                 1710

Met Gly  Glu Val Ala Thr Asp  Trp Met Asp Thr Glu  Cys Pro Glu
    1715                 1720                 1725

Ala Lys  Arg Leu Lys Val Glu  Glu Pro Gly Met Gly  Ala Glu Glu
    1730                 1735                 1740

Ala Val  Asp Cys Arg Gln Trp  Thr Gln His His Leu  Val Ala Ala
    1745                 1750                 1755

Asp Ile  Arg Val Ala Pro Ala  Met Ala Leu Thr Pro  Pro Gln Gly
    1760                 1765                 1770

Asp Ala  Asp Ala Asp Gly Met  Asp Val Asn Val Arg  Gly Pro Asp
    1775                 1780                 1785

Gly Phe  Thr Pro Leu Met Leu  Ala Ser Phe Cys Gly  Gly Ala Leu
    1790                 1795                 1800

Glu Pro  Met Pro Thr Glu Glu  Asp Glu Ala Asp Asp  Thr Ser Ala
    1805                 1810                 1815

Ser Ile  Ile Ser Asp Leu Ile  Cys Gln Gly Ala Gln  Leu Gly Ala
    1820                 1825                 1830
```

Arg Thr Asp Arg Thr Gly Glu Thr Ala Leu His Leu Ala Ala Arg
1835 1840 1845

Tyr Ala Arg Ala Asp Ala Ala Lys Arg Leu Leu Asp Ala Gly Ala
1850 1855 1860

Asp Thr Asn Ala Gln Asp His Ser Gly Arg Thr Pro Leu His Thr
1865 1870 1875

Ala Val Thr Ala Asp Ala Gln Gly Val Phe Gln Ile Leu Ile Arg
1880 1885 1890

Asn Arg Ser Thr Asp Leu Asp Ala Arg Met Ala Asp Gly Ser Thr
1895 1900 1905

Ala Leu Ile Leu Ala Ala Arg Leu Ala Val Glu Gly Met Val Glu
1910 1915 1920

Glu Leu Ile Ala Ser His Ala Asp Val Asn Ala Val Asp Glu Leu
1925 1930 1935

Gly Lys Ser Ala Leu His Trp Ala Ala Ala Val Asn Asn Val Glu
1940 1945 1950

Ala Thr Leu Ala Leu Leu Lys Asn Gly Ala Asn Lys Asp Met Gln
1955 1960 1965

Asp Ser Lys Glu Glu Thr Pro Leu Phe Leu Ala Ala Arg Glu Gly
1970 1975 1980

Ser Tyr Glu Ala Ala Lys Leu Leu Leu Asp His Phe Ala Asn Arg
1985 1990 1995

Glu Ile Thr Asp His Leu Asp Arg Leu Pro Arg Asp Val Ala Gln
2000 2005 2010

Glu Arg Leu His Gln Asp Ile Val Arg Leu Leu Asp Gln Pro Ser
2015 2020 2025

Gly Pro Arg Ser Pro Pro Gly Pro His Gly Leu Gly Pro Leu Leu
2030 2035 2040

Cys Pro Pro Gly Ala Phe Leu Pro Gly Leu Lys Ala Ala Gln Ser
2045 2050 2055

Gly Ser Lys Lys Ser Arg Arg Pro Pro Gly Lys Ala Gly Leu Gly
2060 2065 2070

Pro Gln Gly Pro Arg Gly Arg Gly Lys Lys Leu Thr Leu Ala Cys
2075 2080 2085

Pro Gly Pro Leu Ala Asp Ser Ser Val Thr Leu Ser Pro Val Asp
2090 2095 2100

Ser Leu Asp Ser Pro Arg Pro Phe Gly Gly Pro Pro Ala Ser Pro
2105 2110 2115

Gly Gly Phe Pro Leu Glu Gly Pro Tyr Ala Ala Ala Thr Ala Thr
2120 2125 2130

Ala Val Ser Leu Ala Gln Leu Gly Gly Pro Gly Arg Ala Gly Leu
2135 2140 2145

Gly Arg Gln Pro Pro Gly Gly Cys Val Leu Ser Leu Gly Leu Leu
2150 2155 2160

Asn Pro Val Ala Val Pro Leu Asp Trp Ala Arg Leu Pro Pro Pro
2165 2170 2175

Ala Pro Pro Gly Pro Ser Phe Leu Leu Pro Leu Ala Pro Gly Pro
2180 2185 2190

Gln Leu Leu Asn Pro Gly Thr Pro Val Ser Pro Gln Glu Arg Pro
2195 2200 2205

Pro Pro Tyr Leu Ala Val Pro Gly His Gly Glu Glu Tyr Pro Val
2210 2215 2220

Ala Gly Ala His Ser Ser Pro Pro Lys Ala Arg Phe Leu Arg Val
2225 2230 2235

Pro Ser Glu His Pro Tyr Leu Thr Pro Ser Pro Glu Ser Pro Glu
2240 2245 2250

His Trp Ala Ser Pro Ser Pro Pro Ser Leu Ser Asp Trp Ser Glu
2255 2260 2265

Ser Thr Pro Ser Pro Ala Thr Ala Thr Gly Ala Met Ala Thr Thr
2270 2275 2280

Thr Gly Ala Leu Pro Ala Gln Pro Leu Pro Leu Ser Val Pro Ser
2285 2290 2295

Ser Leu Ala Gln Ala Gln Thr Gln Leu Gly Pro Gln Pro Glu Val
2300 2305 2310

Thr Pro Lys Arg Gln Val Leu Ala
2315 2320

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<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

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Val Met Val Ala Arg Arg Lys Arg Glu His Ser Thr Leu Trp
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