SEQUENCE LISTING

<110> Abbott GmbH & Co. KG

<120> Antibodies against the RGM A protein and uses thereof

<130> M/49229-PCT

<160> 68

<170> PatentIn version 3.3

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atg ggt atg ggg aga ggg gca gga cgt tca gcc ctg gga ttc tgg ccg       96
Met Gly Met Gly Arg Gly Ala Gly Arg Ser Ala Leu Gly Phe Trp Pro
            20                  25                  30

acc ctc gcc ttc ctt ctc tgc agc ttc ccc gca gcc acc tcc ccg tgc      144
Thr Leu Ala Phe Leu Leu Cys Ser Phe Pro Ala Ala Thr Ser Pro Cys
        35                  40                  45

aag atc ctc aag tgc aac tct gag ttc tgg agc gcc acg tcg ggc agc      192
Lys Ile Leu Lys Cys Asn Ser Glu Phe Trp Ser Ala Thr Ser Gly Ser
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cac gcc cca gcc tca gac gac acc ccc gag ttc tgt gca gcc ttg cgc      240
His Ala Pro Ala Ser Asp Asp Thr Pro Glu Phe Cys Ala Ala Leu Arg
65                  70                  75                  80

agc tac gcc ctg tgc acg cgg cgg acg gcc cgc acc tgc cgg ggt gac      288
Ser Tyr Ala Leu Cys Thr Arg Arg Thr Ala Arg Thr Cys Arg Gly Asp
                85                  90                  95

ctg gcc tac cac tcg gcc gtc cat ggc ata gag gac ctc atg agc cag      336
Leu Ala Tyr His Ser Ala Val His Gly Ile Glu Asp Leu Met Ser Gln
            100                 105                 110

cac aac tgc tcc aag gat ggc ccc acc tcg cag cca cgc ctg cgc acg      384
His Asn Cys Ser Lys Asp Gly Pro Thr Ser Gln Pro Arg Leu Arg Thr
        115                 120                 125

ctc cca ccg gcc gga gac agc cag gag cgc tcg gac agc ccc gag atc      432
Leu Pro Pro Ala Gly Asp Ser Gln Glu Arg Ser Asp Ser Pro Glu Ile
    130                 135                 140

tgc cat tac gag aag agc ttt cac aag cac tcg gcc acc ccc aac tac      480
Cys His Tyr Glu Lys Ser Phe His Lys His Ser Ala Thr Pro Asn Tyr
145                 150                 155                 160
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acg cac tgt ggc ctc ttc ggg gac cca cac ctc agg act ttc acc gac      528
Thr His Cys Gly Leu Phe Gly Asp Pro His Leu Arg Thr Phe Thr Asp
                165                 170                 175

cgc ttc cag acc tgc aag gtg cag ggc gcc tgg ccg ctc atc gac aat      576
Arg Phe Gln Thr Cys Lys Val Gln Gly Ala Trp Pro Leu Ile Asp Asn
            180                 185                 190

aat tac ctg aac gtg cag gcc acc aac acg cct gtg ctg ccc ggc tca      624
Asn Tyr Leu Asn Val Gln Ala Thr Asn Thr Pro Val Leu Pro Gly Ser
        195                 200                 205

gcg gcc act gcc acc agc aag ctc acc atc atc ttc aag aac ttc cag      672
Ala Ala Thr Ala Thr Ser Lys Leu Thr Ile Ile Phe Lys Asn Phe Gln
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gag tgt gtg gac cag aag gtg tac cag gct gag atg gac gag ctc ccg      720
Glu Cys Val Asp Gln Lys Val Tyr Gln Ala Glu Met Asp Glu Leu Pro
225                 230                 235                 240

gcc gcc ttc gtg gat ggc tct aag aac ggt ggg gac aag cac ggg gcc      768
Ala Ala Phe Val Asp Gly Ser Lys Asn Gly Gly Asp Lys His Gly Ala
                245                 250                 255

aac agc ctg aag atc act gag aag gtg tca ggc cag cac gtg gag atc      816
Asn Ser Leu Lys Ile Thr Glu Lys Val Ser Gly Gln His Val Glu Ile
            260                 265                 270

cag gcc aag tac atc ggc acc acc atc gtg gtg cgc cag gtg ggc cgc      864
Gln Ala Lys Tyr Ile Gly Thr Thr Ile Val Val Arg Gln Val Gly Arg
        275                 280                 285

tac ctg acc ttt gcc gtc cgc atg cca gag gaa gtg gtc aat gct gtg      912
Tyr Leu Thr Phe Ala Val Arg Met Pro Glu Glu Val Val Asn Ala Val
    290                 295                 300

gag gac tgg gac agc cag ggt ctc tac ctc tgc ctg cgg ggc tgc ccc      960
Glu Asp Trp Asp Ser Gln Gly Leu Tyr Leu Cys Leu Arg Gly Cys Pro
305                 310                 315                 320

ctc aac cag cag atc gac ttc cag gcc ttc cac acc aat gct gag ggc     1008
Leu Asn Gln Gln Ile Asp Phe Gln Ala Phe His Thr Asn Ala Glu Gly
                325                 330                 335

acc ggt gcc cgc agg ctg gca gcc gcc agc cct gca ccc aca gcc ccc     1056
Thr Gly Ala Arg Arg Leu Ala Ala Ala Ser Pro Ala Pro Thr Ala Pro
            340                 345                 350

gag acc ttc cca tac gag aca gcc gtg gcc aag tgc aag gag aag ctg     1104
Glu Thr Phe Pro Tyr Glu Thr Ala Val Ala Lys Cys Lys Glu Lys Leu
        355                 360                 365

ccg gtg gag gac ctg tac tac cag gcc tgc gtc ttc gac ctc ctc acc     1152
Pro Val Glu Asp Leu Tyr Tyr Gln Ala Cys Val Phe Asp Leu Leu Thr
    370                 375                 380

acg ggc gac gtg aac ttc aca ctg gcc gcc tac tac gcg ttg gag gat     1200
Thr Gly Asp Val Asn Phe Thr Leu Ala Ala Tyr Tyr Ala Leu Glu Asp
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gtc aag atg ctc cac tcc aac aaa gac aaa ctg cac ctg tat gag agg     1248
Val Lys Met Leu His Ser Asn Lys Asp Lys Leu His Leu Tyr Glu Arg
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act cgg gac ctg cca ggc agg gcg gct gcg ggg ctg ccc ctg gcc ccc     1296
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cgg ccc ctc ctg ggc gcc ctc gtc ccg ctc ctg gcc ctg ctc cct gtg     1344
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ttc tgc tag                                                        1353
Phe Cys
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Thr Leu Ala Phe Leu Leu Cys Ser Phe Pro Ala Ala Thr Ser Pro Cys
        35                  40                  45

Lys Ile Leu Lys Cys Asn Ser Glu Phe Trp Ser Ala Thr Ser Gly Ser
    50                  55                  60

His Ala Pro Ala Ser Asp Asp Thr Pro Glu Phe Cys Ala Ala Leu Arg
65                  70                  75                  80

Ser Tyr Ala Leu Cys Thr Arg Arg Thr Ala Arg Thr Cys Arg Gly Asp
                85                  90                  95

Leu Ala Tyr His Ser Ala Val His Gly Ile Glu Asp Leu Met Ser Gln
            100                 105                 110

His Asn Cys Ser Lys Asp Gly Pro Thr Ser Gln Pro Arg Leu Arg Thr
        115                 120                 125

Leu Pro Pro Ala Gly Asp Ser Gln Glu Arg Ser Asp Ser Pro Glu Ile
    130                 135                 140

Cys His Tyr Glu Lys Ser Phe His Lys His Ser Ala Thr Pro Asn Tyr
145                 150                 155                 160

Thr His Cys Gly Leu Phe Gly Asp Pro His Leu Arg Thr Phe Thr Asp
                165                 170                 175
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Arg Phe Gln Thr Cys Lys Val Gln Gly Ala Trp Pro Leu Ile Asp Asn
            180                 185                 190

Asn Tyr Leu Asn Val Gln Ala Thr Asn Thr Pro Val Leu Pro Gly Ser
        195                 200                 205

Ala Ala Thr Ala Thr Ser Lys Leu Thr Ile Ile Phe Lys Asn Phe Gln
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Glu Cys Val Asp Gln Lys Val Tyr Gln Ala Glu Met Asp Glu Leu Pro
225                 230                 235                 240

Ala Ala Phe Val Asp Gly Ser Lys Asn Gly Gly Asp Lys His Gly Ala
                245                 250                 255

Asn Ser Leu Lys Ile Thr Glu Lys Val Ser Gly Gln His Val Glu Ile
            260                 265                 270

Gln Ala Lys Tyr Ile Gly Thr Thr Ile Val Val Arg Gln Val Gly Arg
        275                 280                 285

Tyr Leu Thr Phe Ala Val Arg Met Pro Glu Glu Val Val Asn Ala Val
    290                 295                 300

Glu Asp Trp Asp Ser Gln Gly Leu Tyr Leu Cys Leu Arg Gly Cys Pro
305                 310                 315                 320

Leu Asn Gln Gln Ile Asp Phe Gln Ala Phe His Thr Asn Ala Glu Gly
                325                 330                 335

Thr Gly Ala Arg Arg Leu Ala Ala Ala Ser Pro Ala Pro Thr Ala Pro
            340                 345                 350

Glu Thr Phe Pro Tyr Glu Thr Ala Val Ala Lys Cys Lys Glu Lys Leu
        355                 360                 365

Pro Val Glu Asp Leu Tyr Tyr Gln Ala Cys Val Phe Asp Leu Leu Thr
    370                 375                 380

Thr Gly Asp Val Asn Phe Thr Leu Ala Ala Tyr Tyr Ala Leu Glu Asp
385                 390                 395                 400

Val Lys Met Leu His Ser Asn Lys Asp Lys Leu His Leu Tyr Glu Arg
                405                 410                 415

Thr Arg Asp Leu Pro Gly Arg Ala Ala Ala Gly Leu Pro Leu Ala Pro
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            420                 425                 430

Arg Pro Leu Leu Gly Ala Leu Val Pro Leu Leu Ala Leu Leu Pro Val
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Phe Cys
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1               5                   10                  15

ggt tcc act ggt gac gcg gcc cag ccg gcc agg cgc gcg cgc cgt acg       96
Gly Ser Thr Gly Asp Ala Ala Gln Pro Ala Arg Arg Ala Arg Arg Thr
            20                  25                  30

aag ctt ccg tgc aag atc ctc aag tgc aac tct gag ttc tgg agc gcc      144
Lys Leu Pro Cys Lys Ile Leu Lys Cys Asn Ser Glu Phe Trp Ser Ala
        35                  40                  45

acg tcg ggc agc cac gcc cca gcc tca gac gac acc ccc gag ttc tgt      192
Thr Ser Gly Ser His Ala Pro Ala Ser Asp Asp Thr Pro Glu Phe Cys
    50                  55                  60

gca gcc ttg cgc agc tac gcc ctg tgc acg cgg cgg acg gcc cgc acc      240
Ala Ala Leu Arg Ser Tyr Ala Leu Cys Thr Arg Arg Thr Ala Arg Thr
65                  70                  75                  80

tgc cgg ggt gac ctg gcc tac cac tcg gcc gtc cat ggc ata gag gac      288
Cys Arg Gly Asp Leu Ala Tyr His Ser Ala Val His Gly Ile Glu Asp
                85                  90                  95
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ctc atg agc cag cac aac tgc tcc aag gat ggc ccc acc tcg cag cca      336
Leu Met Ser Gln His Asn Cys Ser Lys Asp Gly Pro Thr Ser Gln Pro
            100                 105                 110

cgc ctg cgc acg ctc cca ccg gcc gga gac agc cag gag cgc tcg gac      384
Arg Leu Arg Thr Leu Pro Pro Ala Gly Asp Ser Gln Glu Arg Ser Asp
        115                 120                 125

agc ccc gag atc tgc cat tac gag aag agc ttt cac aag cac tcg gcc      432
Ser Pro Glu Ile Cys His Tyr Glu Lys Ser Phe His Lys His Ser Ala
    130                 135                 140

acc ccc aac tac acg cac tgt ggc ctc ttc ggg gac cca cac ctc agg      480
Thr Pro Asn Tyr Thr His Cys Gly Leu Phe Gly Asp Pro His Leu Arg
145                 150                 155                 160

act ttc acc gac cgc ttc cag acc tgc aag gtg cag ggc gcc tgg ccg      528
Thr Phe Thr Asp Arg Phe Gln Thr Cys Lys Val Gln Gly Ala Trp Pro
                165                 170                 175

ctc atc gac aat aat tac ctg aac gtg cag gtc acc aac acg cct gtg      576
Leu Ile Asp Asn Asn Tyr Leu Asn Val Gln Val Thr Asn Thr Pro Val
            180                 185                 190

ctg ccc ggc tca gcg gcc act gcc acc agc aag ctc acc atc atc ttc      624
Leu Pro Gly Ser Ala Ala Thr Ala Thr Ser Lys Leu Thr Ile Ile Phe
        195                 200                 205

aag aac ttc cag gag tgt gtg gac cag aag gtg tac cag gct gag atg      672
Lys Asn Phe Gln Glu Cys Val Asp Gln Lys Val Tyr Gln Ala Glu Met
    210                 215                 220

gac gag ctc ccg gcc gcc ttc gtg gat ggc tct aag aac ggt ggg gac      720
Asp Glu Leu Pro Ala Ala Phe Val Asp Gly Ser Lys Asn Gly Gly Asp
225                 230                 235                 240

aag cac ggg gcc aac agc ctg aag atc act gag aag gtg tca ggc cag      768
Lys His Gly Ala Asn Ser Leu Lys Ile Thr Glu Lys Val Ser Gly Gln
                245                 250                 255

cac gtg gag atc cag gcc aag tac atc ggc acc acc atc gtg gtg cgc      816
His Val Glu Ile Gln Ala Lys Tyr Ile Gly Thr Thr Ile Val Val Arg
            260                 265                 270

cag gtg ggc cgc tac ctg acc ttt gcc gtc cgc atg cca gag gaa gtg      864
Gln Val Gly Arg Tyr Leu Thr Phe Ala Val Arg Met Pro Glu Glu Val
        275                 280                 285

gtc aat gct gtg gag gac tgg gac agc cag ggt ctc tac ctc tgc ctg      912
Val Asn Ala Val Glu Asp Trp Asp Ser Gln Gly Leu Tyr Leu Cys Leu
    290                 295                 300

cgg ggc tgc ccc ctc aac cag cag atc gac ttc cag gcc ttc cac acc      960
Arg Gly Cys Pro Leu Asn Gln Gln Ile Asp Phe Gln Ala Phe His Thr
305                 310                 315                 320

aat gct gag ggc acc ggt gcc cgc agg ctg gca gcc gcc agc cct gca     1008
Asn Ala Glu Gly Thr Gly Ala Arg Arg Leu Ala Ala Ala Ser Pro Ala
                325                 330                 335

ccc aca gcc ccc gag acc ttc cca tac gag aca gcc gtg gcc aag tgc     1056
Pro Thr Ala Pro Glu Thr Phe Pro Tyr Glu Thr Ala Val Ala Lys Cys
            340                 345                 350
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aag gag aag ctg ccg gtg gag gac ctg tac tac cag gcc tgc gtc ttc     1104
Lys Glu Lys Leu Pro Val Glu Asp Leu Tyr Tyr Gln Ala Cys Val Phe
        355                 360                 365

gac ctc ctc acc acg ggc gac gtg aac ttc aca ctg gcc gcc tac tac     1152
Asp Leu Leu Thr Thr Gly Asp Val Asn Phe Thr Leu Ala Ala Tyr Tyr
    370                 375                 380

gcg ttg gag gat gtc aag atg ctc cac tcc aac aaa gac aaa ctg cac     1200
Ala Leu Glu Asp Val Lys Met Leu His Ser Asn Lys Asp Lys Leu His
385                 390                 395                 400

ctg tat gag agg act cgg gac ctg cca ggc ttg aat tct gca gat atc     1248
Leu Tyr Glu Arg Thr Arg Asp Leu Pro Gly Leu Asn Ser Ala Asp Ile
                405                 410                 415

gag gga cga atg gat cca ccg tgc cca gca cct gaa ctc ctg ggg gga     1296
Glu Gly Arg Met Asp Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly
            420                 425                 430

ccg tca gtc ttc ctc ttc ccc cca aaa ccc aag gac acc ctc atg atc     1344
Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile
        435                 440                 445

tcc cgg acc cct gag gtc aca tgc gtg gtg gtg gac gtg agc cac gaa     1392
Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His Glu
    450                 455                 460

gac cct gag gtc aag ttc aac tgg tac gtg gac ggc gtg gag gtg cat     1440
Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His
465                 470                 475                 480

aat gcc aag aca aag ccg cgg gag gag cag tac aac agc acg tac cgt     1488
Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg
                485                 490                 495

gtg gtc agc gtc ctc acc gtc ctg cac cag gac tgg ctg aat ggc aag     1536
Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys
            500                 505                 510

gag tac aag tgc aag gtc tcc aac aaa gcc ctc cca gcc ccc atc gag     1584
Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu
        515                 520                 525

aaa acc atc tcc aaa gcc aaa ggg cag ccc cga gaa cca cag gtg tac     1632
Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr
    530                 535                 540

acc ctg ccc cca tcc cgg gag gag atg acc aag aac cag gtc agc ctg     1680
Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu
545                 550                 555                 560

acc tgc ctg gtc aaa ggc ttc tat ccc agc gac atc gcc gtg gag tgg     1728
Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp
                565                 570                 575

gag agc aat ggg cag ccg gag aac aac tac aag acc acg cct ccc gtg     1776
Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val
            580                 585                 590

ctg gac tcc gac ggc tcc ttc ttc ctc tat agc aag ctc acc gtg gac     1824
Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp
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        595                 600                 605

aag agc agg tgg cag cag ggg aac gtc ttc tca tgc tcc gtg atg cat     1872
Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His
    610                 615                 620

gag gct ctg cac aac cac tac acg cag aag agc ctc tcc ctg tct ccg     1920
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625                 630                 635                 640

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

Thr Ser Gly Ser His Ala Pro Ala Ser Asp Asp Thr Pro Glu Phe Cys
    50                  55                  60

Ala Ala Leu Arg Ser Tyr Ala Leu Cys Thr Arg Arg Thr Ala Arg Thr
65                  70                  75                  80

Cys Arg Gly Asp Leu Ala Tyr His Ser Ala Val His Gly Ile Glu Asp
                85                  90                  95

Leu Met Ser Gln His Asn Cys Ser Lys Asp Gly Pro Thr Ser Gln Pro
            100                 105                 110

Arg Leu Arg Thr Leu Pro Pro Ala Gly Asp Ser Gln Glu Arg Ser Asp
        115                 120                 125

Ser Pro Glu Ile Cys His Tyr Glu Lys Ser Phe His Lys His Ser Ala
    130                 135                 140

Thr Pro Asn Tyr Thr His Cys Gly Leu Phe Gly Asp Pro His Leu Arg
145                 150                 155                 160
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Thr Phe Thr Asp Arg Phe Gln Thr Cys Lys Val Gln Gly Ala Trp Pro
                165                 170                 175

Leu Ile Asp Asn Asn Tyr Leu Asn Val Gln Val Thr Asn Thr Pro Val
            180                 185                 190

Leu Pro Gly Ser Ala Ala Thr Ala Thr Ser Lys Leu Thr Ile Ile Phe
        195                 200                 205

Lys Asn Phe Gln Glu Cys Val Asp Gln Lys Val Tyr Gln Ala Glu Met
    210                 215                 220

Asp Glu Leu Pro Ala Ala Phe Val Asp Gly Ser Lys Asn Gly Gly Asp
225                 230                 235                 240

Lys His Gly Ala Asn Ser Leu Lys Ile Thr Glu Lys Val Ser Gly Gln
                245                 250                 255

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

Gln Val Gly Arg Tyr Leu Thr Phe Ala Val Arg Met Pro Glu Glu Val
        275                 280                 285

Val Asn Ala Val Glu Asp Trp Asp Ser Gln Gly Leu Tyr Leu Cys Leu
    290                 295                 300

Arg Gly Cys Pro Leu Asn Gln Gln Ile Asp Phe Gln Ala Phe His Thr
305                 310                 315                 320

Asn Ala Glu Gly Thr Gly Ala Arg Arg Leu Ala Ala Ala Ser Pro Ala
                325                 330                 335

Pro Thr Ala Pro Glu Thr Phe Pro Tyr Glu Thr Ala Val Ala Lys Cys
            340                 345                 350

Lys Glu Lys Leu Pro Val Glu Asp Leu Tyr Tyr Gln Ala Cys Val Phe
        355                 360                 365

Asp Leu Leu Thr Thr Gly Asp Val Asn Phe Thr Leu Ala Ala Tyr Tyr
    370                 375                 380

Ala Leu Glu Asp Val Lys Met Leu His Ser Asn Lys Asp Lys Leu His
385                 390                 395                 400

Leu Tyr Glu Arg Thr Arg Asp Leu Pro Gly Leu Asn Ser Ala Asp Ile
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405 410 415

Glu Gly Arg Met Asp Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly
420 425 430

Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile
435 440 445

Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His Glu
450 455 460

Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His
465 470 475 480

Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg
485 490 495

Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys
500 505 510

Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu
515 520 525

Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr
530 535 540

Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu
545 550 555 560

Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp
565 570 575

Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val
580 585 590

Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp
595 600 605

Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His
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Gly Lys

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1               5                   10                  15

ggt tcc act ggt gac gcg gcc cag ccg gcc agg cgc gcg cgc cgt acg       96
Gly Ser Thr Gly Asp Ala Ala Gln Pro Ala Arg Arg Ala Arg Arg Thr
            20                  25                  30

aag ctt ccg tgc aag atc ctc aag tgc aac tct gag ttc tgg agc gcc      144
Lys Leu Pro Cys Lys Ile Leu Lys Cys Asn Ser Glu Phe Trp Ser Ala
        35                  40                  45

acg tcg ggc agc cac gcc cca gcc tca gac gac acc ccc gag ttc tgt      192
Thr Ser Gly Ser His Ala Pro Ala Ser Asp Asp Thr Pro Glu Phe Cys
    50                  55                  60

gca gcc ttg cgc agc tac gcc ctg tgc acg cgg cgg acg gcc cgc acc      240
Ala Ala Leu Arg Ser Tyr Ala Leu Cys Thr Arg Arg Thr Ala Arg Thr
65                  70                  75                  80

tgc cgg ggt gac ctg gcc tac cac tcg gcc gtc cat ggc ata gag gac      288
Cys Arg Gly Asp Leu Ala Tyr His Ser Ala Val His Gly Ile Glu Asp
                85                  90                  95

ctc atg agc cag cac aac tgc tcc aag gat ggc ccc acc tcg cag cca      336
Leu Met Ser Gln His Asn Cys Ser Lys Asp Gly Pro Thr Ser Gln Pro
            100                 105                 110

cgc ctg cgc acg ctc cca ccg gcc gga gac agc cag gag cgc tcg gac      384
Arg Leu Arg Thr Leu Pro Pro Ala Gly Asp Ser Gln Glu Arg Ser Asp
        115                 120                 125

agc ccc gag atc tgc cat tac gag aag agc ttt cac aag cac tcg gcc      432
Ser Pro Glu Ile Cys His Tyr Glu Lys Ser Phe His Lys His Ser Ala
    130                 135                 140
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acc ccc aac tac acg cac tgt ggc ctc ttc ggg gac ttg aat tct gca      480
Thr Pro Asn Tyr Thr His Cys Gly Leu Phe Gly Asp Leu Asn Ser Ala
145                 150                 155                 160

gat atc gag gga cga atg gat cca ccg tgc cca gca cct gaa ctc ctg      528
Asp Ile Glu Gly Arg Met Asp Pro Pro Cys Pro Ala Pro Glu Leu Leu
                165                 170                 175

ggg gga ccg tca gtc ttc ctc ttc ccc cca aaa ccc aag gac acc ctc      576
Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu
            180                 185                 190

atg atc tcc cgg acc cct gag gtc aca tgc gtg gtg gtg gac gtg agc      624
Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser
        195                 200                 205

cac gaa gac cct gag gtc aag ttc aac tgg tac gtg gac ggc gtg gag      672
His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu
    210                 215                 220

gtg cat aat gcc aag aca aag ccg cgg gag gag cag tac aac agc acg      720
Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr
225                 230                 235                 240

tac cgt gtg gtc agc gtc ctc acc gtc ctg cac cag gac tgg ctg aat      768
Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn
                245                 250                 255

ggc aag gag tac aag tgc aag gtc tcc aac aaa gcc ctc cca gcc ccc      816
Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro
            260                 265                 270

atc gag aaa acc atc tcc aaa gcc aaa ggg cag ccc cga gaa cca cag      864
Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln
        275                 280                 285

gtg tac acc ctg ccc cca tcc cgg gag gag atg acc aag aac cag gtc      912
Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln Val
    290                 295                 300

agc ctg acc tgc ctg gtc aaa ggc ttc tat ccc agc gac atc gcc gtg      960
Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val
305                 310                 315                 320

gag tgg gag agc aat ggg cag ccg gag aac aac tac aag acc acg cct     1008
Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro
                325                 330                 335

ccc gtg ctg gac tcc gac ggc tcc ttc ttc ctc tat agc aag ctc acc     1056
Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr
            340                 345                 350

gtg gac aag agc agg tgg cag cag ggg aac gtc ttc tca tgc tcc gtg     1104
Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val
        355                 360                 365

atg cat gag gct ctg cac aac cac tac acg cag aag agc ctc tcc ctg     1152
Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu
    370                 375                 380

tct ccg ggt aaa tga                                                1167
Ser Pro Gly Lys
```

385

<210> 6
<211> 388
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 6

```
Met Glu Thr Asp Thr Leu Leu Leu Trp Val Leu Leu Leu Trp Val Pro
1               5                  10                  15

Gly Ser Thr Gly Asp Ala Ala Gln Pro Ala Arg Arg Ala Arg Arg Thr
            20                  25                  30

Lys Leu Pro Cys Lys Ile Leu Lys Cys Asn Ser Glu Phe Trp Ser Ala
        35                  40                  45

Thr Ser Gly Ser His Ala Pro Ala Ser Asp Asp Thr Pro Glu Phe Cys
    50                  55                  60

Ala Ala Leu Arg Ser Tyr Ala Leu Cys Thr Arg Arg Thr Ala Arg Thr
65                  70                  75                  80

Cys Arg Gly Asp Leu Ala Tyr His Ser Ala Val His Gly Ile Glu Asp
                85                  90                  95

Leu Met Ser Gln His Asn Cys Ser Lys Asp Gly Pro Thr Ser Gln Pro
            100                 105                 110

Arg Leu Arg Thr Leu Pro Pro Ala Gly Asp Ser Gln Glu Arg Ser Asp
        115                 120                 125

Ser Pro Glu Ile Cys His Tyr Glu Lys Ser Phe His Lys His Ser Ala
    130                 135                 140

Thr Pro Asn Tyr Thr His Cys Gly Leu Phe Gly Asp Leu Asn Ser Ala
145                 150                 155                 160

Asp Ile Glu Gly Arg Met Asp Pro Pro Cys Pro Ala Pro Glu Leu Leu
                165                 170                 175

Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu
            180                 185                 190

Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser
        195                 200                 205
```

```
His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu
    210                 215                 220

Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr
225                 230                 235                 240

Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn
                245                 250                 255

Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro
            260                 265                 270

Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln
        275                 280                 285

Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln Val
    290                 295                 300

Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val
305                 310                 315                 320

Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro
                325                 330                 335

Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr
            340                 345                 350

Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val
        355                 360                 365

Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu
    370                 375                 380

Ser Pro Gly Lys
385
```

<210> 7
<211> 1431
<212> DNA
<213> Rattus sp.

<220>
<221> CDS
<222> (1)..(1431)

<400> 7

```
atg gag aca gac aca ctc ctg cta tgg gta ctg ctg ctc tgg gtt cca      48
Met Glu Thr Asp Thr Leu Leu Leu Trp Val Leu Leu Leu Trp Val Pro
```

```
1               5                   10                  15

ggt tcc act ggt gac gcg gcc cag ccg gcc agg cgc gcg cgc cgt acg      96
Gly Ser Thr Gly Asp Ala Ala Gln Pro Ala Arg Arg Ala Arg Arg Thr
            20                  25                  30

aag ctt ggt acc gag ctc gga tcc act agt cca gtg tgg tgg aat tct     144
Lys Leu Gly Thr Glu Leu Gly Ser Thr Ser Pro Val Trp Trp Asn Ser
        35                  40                  45

gca gat atc aca agt ttg tac aaa aaa gca ggc tcc ccg tgc aag atc     192
Ala Asp Ile Thr Ser Leu Tyr Lys Lys Ala Gly Ser Pro Cys Lys Ile
    50                  55                  60

ctc aag tgc aac tct gag ttc tgg agc gcc acg tcg tca ggc agc cac     240
Leu Lys Cys Asn Ser Glu Phe Trp Ser Ala Thr Ser Ser Gly Ser His
65                  70                  75                  80

gcc cct gcc tct gac gac gtg ccc gag ttc tgt gct gcc ctg cgc acc     288
Ala Pro Ala Ser Asp Asp Val Pro Glu Phe Cys Ala Ala Leu Arg Thr
                85                  90                  95

tac gcc ctg tgc acg cga cgg aca gcc cgc acc tgc cgg ggc gac ctg     336
Tyr Ala Leu Cys Thr Arg Arg Thr Ala Arg Thr Cys Arg Gly Asp Leu
            100                 105                 110

gct tac cac tcg gct gtc cat ggc ata gag gac ctc atg agc cag cac     384
Ala Tyr His Ser Ala Val His Gly Ile Glu Asp Leu Met Ser Gln His
        115                 120                 125

aac tgc tcc aag gat ggc ccc acc tca cag cct cga gtg cgc acg ctc     432
Asn Cys Ser Lys Asp Gly Pro Thr Ser Gln Pro Arg Val Arg Thr Leu
    130                 135                 140

ccg cca gct ggg gac agc cag gag cgc tca gat agc ccc gag atc tgc     480
Pro Pro Ala Gly Asp Ser Gln Glu Arg Ser Asp Ser Pro Glu Ile Cys
145                 150                 155                 160

cac tat gag aag agt ttc cac aag cac tca gct gcc ccc aac tac act     528
His Tyr Glu Lys Ser Phe His Lys His Ser Ala Ala Pro Asn Tyr Thr
                165                 170                 175

cac tgc ggc ctc ttt ggg gac cca cac ctc agg act ttc aca gac cac     576
His Cys Gly Leu Phe Gly Asp Pro His Leu Arg Thr Phe Thr Asp His
            180                 185                 190

ttc cag aca tgt aag gtg caa ggc gct tgg cct ctc atc gac aat aat     624
Phe Gln Thr Cys Lys Val Gln Gly Ala Trp Pro Leu Ile Asp Asn Asn
        195                 200                 205

tac ctg aac gtg cag gtc acc aat aca cct gtg ctg ccc ggc tct gcc     672
Tyr Leu Asn Val Gln Val Thr Asn Thr Pro Val Leu Pro Gly Ser Ala
    210                 215                 220

gcc act gcc acc agc aag ctc acc atc atc ttc aag aac ttc caa gag     720
Ala Thr Ala Thr Ser Lys Leu Thr Ile Ile Phe Lys Asn Phe Gln Glu
225                 230                 235                 240

tgt gtg gac cag aaa gta tac caa gcc gag atg gac gag ctt ccg tcc     768
Cys Val Asp Gln Lys Val Tyr Gln Ala Glu Met Asp Glu Leu Pro Ser
                245                 250                 255

gcc ttt gcc gat ggc tcc aaa aac ggt gga gat aaa cac gga gcc aac     816
```

```
Ala Phe Ala Asp Gly Ser Lys Asn Gly Gly Asp Lys His Gly Ala Asn
            260                 265                 270

agc ctg aag atc aca gag aag gtg tca ggc cag cac gtg gag atc cag      864
Ser Leu Lys Ile Thr Glu Lys Val Ser Gly Gln His Val Glu Ile Gln
        275                 280                 285

gcc aag tac atc ggc acc acc atc gtg gtg aga cag gtg ggc cgc tac      912
Ala Lys Tyr Ile Gly Thr Thr Ile Val Val Arg Gln Val Gly Arg Tyr
    290                 295                 300

ctg acc ttc gcc gtc cgg atg ccc gag gag gta gtc aac gcc gtg gag      960
Leu Thr Phe Ala Val Arg Met Pro Glu Glu Val Val Asn Ala Val Glu
305                 310                 315                 320

gac cgt gac agc caa ggc ctc tac ctc tgc ctg cgg ggc tgc ccg ctc     1008
Asp Arg Asp Ser Gln Gly Leu Tyr Leu Cys Leu Arg Gly Cys Pro Leu
                325                 330                 335

aac cag cag atc gac ttc cag gct ttc cgt gcc aac gcc gag agc cct     1056
Asn Gln Gln Ile Asp Phe Gln Ala Phe Arg Ala Asn Ala Glu Ser Pro
            340                 345                 350

cgc agg cca gca gct gcc agc ccc tct cct gtg gtc ccc gag aca ttt     1104
Arg Arg Pro Ala Ala Ala Ser Pro Ser Pro Val Val Pro Glu Thr Phe
        355                 360                 365

ccg tac gag aca gct gtg gcc aag tgc aaa gag aag ctg cct gta gaa     1152
Pro Tyr Glu Thr Ala Val Ala Lys Cys Lys Glu Lys Leu Pro Val Glu
    370                 375                 380

gac ttg tac tac cag gcc tgt gtc ttc gac ctc ctc acg act ggc gac     1200
Asp Leu Tyr Tyr Gln Ala Cys Val Phe Asp Leu Leu Thr Thr Gly Asp
385                 390                 395                 400

gtg aac ttc acg ctg gcc gcc tac tat gct ttg gag gat ggc aag atg     1248
Val Asn Phe Thr Leu Ala Ala Tyr Tyr Ala Leu Glu Asp Gly Lys Met
                405                 410                 415

ctc cac tcc aac aag gac aag cta cac ctg ttt gaa agg act cgg gag     1296
Leu His Ser Asn Lys Asp Lys Leu His Leu Phe Glu Arg Thr Arg Glu
            420                 425                 430

ctg cct gac cca gct ttc ttg tac aaa gtg gtg ata tcc agc aca gtg     1344
Leu Pro Asp Pro Ala Phe Leu Tyr Lys Val Val Ile Ser Ser Thr Val
        435                 440                 445

gcg gcc gct cga gga ggg ccc gaa caa aaa ctc atc tca gaa gag gat     1392
Ala Ala Ala Arg Gly Gly Pro Glu Gln Lys Leu Ile Ser Glu Glu Asp
    450                 455                 460

ctg aat agc gcc gtc gac cat cat cat cat cat cat tga                 1431
Leu Asn Ser Ala Val Asp His His His His His His
465                 470                 475
```

<210> 8
<211> 476
<212> PRT
<213> Rattus sp.

<400> 8

```
Met Glu Thr Asp Thr Leu Leu Leu Trp Val Leu Leu Leu Trp Val Pro
1               5                  10                  15

Gly Ser Thr Gly Asp Ala Ala Gln Pro Ala Arg Arg Ala Arg Arg Thr
            20                  25                  30

Lys Leu Gly Thr Glu Leu Gly Ser Thr Ser Pro Val Trp Trp Asn Ser
        35                  40                  45

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

Leu Lys Cys Asn Ser Glu Phe Trp Ser Ala Thr Ser Ser Gly Ser His
65                  70                  75                  80

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

Tyr Ala Leu Cys Thr Arg Arg Thr Ala Arg Thr Cys Arg Gly Asp Leu
            100                 105                 110

Ala Tyr His Ser Ala Val His Gly Ile Glu Asp Leu Met Ser Gln His
        115                 120                 125

Asn Cys Ser Lys Asp Gly Pro Thr Ser Gln Pro Arg Val Arg Thr Leu
    130                 135                 140

Pro Pro Ala Gly Asp Ser Gln Glu Arg Ser Asp Ser Pro Glu Ile Cys
145                 150                 155                 160

His Tyr Glu Lys Ser Phe His Lys His Ser Ala Ala Pro Asn Tyr Thr
                165                 170                 175

His Cys Gly Leu Phe Gly Asp Pro His Leu Arg Thr Phe Thr Asp His
            180                 185                 190

Phe Gln Thr Cys Lys Val Gln Gly Ala Trp Pro Leu Ile Asp Asn Asn
        195                 200                 205

Tyr Leu Asn Val Gln Val Thr Asn Thr Pro Val Leu Pro Gly Ser Ala
    210                 215                 220

Ala Thr Ala Thr Ser Lys Leu Thr Ile Ile Phe Lys Asn Phe Gln Glu
225                 230                 235                 240

Cys Val Asp Gln Lys Val Tyr Gln Ala Glu Met Asp Glu Leu Pro Ser
                245                 250                 255
```

```
Ala Phe Ala Asp Gly Ser Lys Asn Gly Gly Asp Lys His Gly Ala Asn
            260                 265                 270

Ser Leu Lys Ile Thr Glu Lys Val Ser Gly Gln His Val Glu Ile Gln
        275                 280                 285

Ala Lys Tyr Ile Gly Thr Thr Ile Val Val Arg Gln Val Gly Arg Tyr
    290                 295                 300

Leu Thr Phe Ala Val Arg Met Pro Glu Glu Val Val Asn Ala Val Glu
305                 310                 315                 320

Asp Arg Asp Ser Gln Gly Leu Tyr Leu Cys Leu Arg Gly Cys Pro Leu
                325                 330                 335

Asn Gln Gln Ile Asp Phe Gln Ala Phe Arg Ala Asn Ala Glu Ser Pro
            340                 345                 350

Arg Arg Pro Ala Ala Ala Ser Pro Ser Pro Val Val Pro Glu Thr Phe
        355                 360                 365

Pro Tyr Glu Thr Ala Val Ala Lys Cys Lys Glu Lys Leu Pro Val Glu
    370                 375                 380

Asp Leu Tyr Tyr Gln Ala Cys Val Phe Asp Leu Leu Thr Thr Gly Asp
385                 390                 395                 400

Val Asn Phe Thr Leu Ala Ala Tyr Tyr Ala Leu Glu Asp Gly Lys Met
                405                 410                 415

Leu His Ser Asn Lys Asp Lys Leu His Leu Phe Glu Arg Thr Arg Glu
            420                 425                 430

Leu Pro Asp Pro Ala Phe Leu Tyr Lys Val Val Ile Ser Ser Thr Val
        435                 440                 445

Ala Ala Ala Arg Gly Gly Pro Glu Gln Lys Leu Ile Ser Glu Glu Asp
    450                 455                 460

Leu Asn Ser Ala Val Asp His His His His His His
465                 470                 475
```

<210> 9
<211> 115
<212> PRT
<213> Artificial

<220>

<223> VH 5F9

<220>
<221> misc_feature
<222> (62)..(62)
<223> Xaa can be any naturally occurring amino acid

<400> 9

Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Ser
1 5 10 15

Ser Leu Lys Leu Ser Cys Val Ala Ser Gly Phe Thr Phe Ser Asn Tyr
20 25 30

Gly Met Asn Trp Ile Arg Gln Ala Pro Lys Lys Gly Leu Glu Trp Ile
35 40 45

Gly Met Ile Tyr Tyr Asp Ser Ser Glu Lys His Tyr Ala Xaa Ser Val
50 55 60

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

Leu Glu Met Asn Ser Leu Arg Ser Glu Asp Thr Ala Ile Tyr Tyr Cys
85 90 95

Ala Lys Gly Thr Thr Pro Asp Tyr Trp Gly Gln Gly Val Met Val Thr
100 105 110

Val Ser Ser
115

<210> 10
<211> 113
<212> PRT
<213> Artificial

<220>
<223> VL 5F9

<400> 10

Asp Val Val Leu Thr Gln Thr Pro Val Ser Leu Ser Val Thr Leu Gly
1 5 10 15

Asp Gln Ala Ser Met Ser Cys Arg Ser Ser Gln Ser Leu Glu Tyr Ser
20 25 30

Asp Gly Tyr Thr Phe Leu Glu Trp Phe Leu Gln Lys Pro Gly Gln Ser
35 40 45

```
Pro Gln Leu Leu Ile Tyr Glu Val Ser Asn Arg Phe Ser Gly Val Pro
    50                  55                  60

Asp Arg Phe Ile Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile
65                  70                  75                  80

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

Thr His Asp Pro Leu Thr Phe Gly Ser Gly Thr Lys Leu Glu Ile Lys
            100                 105                 110

Arg
```

<210> 11
<211> 330
<212> PRT
<213> Artificial

<220>
<223> Ig gamma-1 constant region

<400> 11

```
Ala Ser Thr Lys Gly Pro Ser Val Phe Phe Leu Ala Pro Ser Ser Lys
1               5                   10                  15

Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr
            20                  25                  30

Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser
        35                  40                  45

Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser
    50                  55                  60

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

Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys
                85                  90                  95

Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys
            100                 105                 110

Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro
        115                 120                 125
```

```
Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys
    130                 135                 140

Val Val Val Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp
145                 150                 155                 160

Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu
                165                 170                 175

Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu
            180                 185                 190

His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn
        195                 200                 205

Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly
    210                 215                 220

Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu
225                 230                 235                 240

Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr
                245                 250                 255

Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn
            260                 265                 270

Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe
        275                 280                 285

Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn
    290                 295                 300

Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr
305                 310                 315                 320

Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
                325                 330
```

<210> 12
<211> 330
<212> PRT
<213> Artificial

<220>
<223> Ig gamma-1 constant region mutant

<400> 12

```
Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys
```

```
1               5                   10                  15

Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr
            20                  25                  30

Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser
        35                  40                  45

Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser
    50                  55                  60

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

Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys
                85                  90                  95

Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys
            100                 105                 110

Pro Ala Pro Glu Ala Ala Gly Gly Pro Ser Val Phe Leu Phe Pro Pro
        115                 120                 125

Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys
    130                 135                 140

Val Val Val Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp
145                 150                 155                 160

Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu
                165                 170                 175

Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu
            180                 185                 190

His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn
        195                 200                 205

Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly
    210                 215                 220

Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu
225                 230                 235                 240

Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr
                245                 250                 255
```

```
Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn
            260                 265                 270

Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe
        275                 280                 285

Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn
    290                 295                 300

Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr
305                 310                 315                 320

Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
                325                 330
```

<210> 13
<211> 106
<212> PRT
<213> Artificial

<220>
<223> Ig Kappa constant region

<400> 13

```
Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu Gln
1               5                   10                  15

Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe Tyr
            20                  25                  30

Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln Ser
        35                  40                  45

Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser Thr
    50                  55                  60

Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu Lys
65                  70                  75                  80

His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser Pro
                85                  90                  95

Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
            100                 105
```

<210> 14
<211> 105
<212> PRT
<213> Artificial

<220>
<223> lg Lambda constant region

<400> 14

Gln Pro Lys Ala Ala Pro Ser Val Thr Leu Phe Pro Pro Ser Ser Glu
1 5 10 15

Glu Leu Gln Ala Asn Lys Ala Thr Leu Val Cys Leu Ile Ser Asp Phe
20 25 30

Tyr Pro Gly Ala Val Thr Val Ala Trp Lys Ala Asp Ser Ser Pro Val
35 40 45

Lys Ala Gly Val Glu Thr Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys
50 55 60

Tyr Ala Ala Ser Ser Tyr Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser
65 70 75 80

His Arg Ser Tyr Ser Cys Gln Val Thr His Glu Gly Ser Thr Val Glu
85 90 95

Lys Thr Val Ala Pro Thr Glu Cys Ser
100 105

<210> 15
<211> 30
<212> PRT
<213> Artificial

<220>
<223> VH3-48/JH3 FR1

<400> 15

Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15

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

<210> 16
<211> 14
<212> PRT
<213> Artificial

<220>
<223> VH3-48/JH3 FR2

<400> 16

Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val Ser
1 5 10

<210> 17
<211> 32
<212> PRT
<213> Artificial

<220>
<223> VH3-48/JH3 FR3

<400> 17

Arg Phe Thr Ile Ser Arg Asp Asn Ala Lys Asn Ser Leu Tyr Leu Gln
1 5 10 15

Met Asn Ser Leu Arg Asp Glu Asp Thr Ala Val Tyr Tyr Cys Ala Arg
20 25 30

<210> 18
<211> 11
<212> PRT
<213> Artificial

<220>
<223> VH3-49/JH3 FR4

<400> 18

Trp Gly Gln Gly Thr Met Val Thr Val Ser Ser
1 5 10

<210> 19
<211> 11
<212> PRT
<213> Artificial

<220>
<223> VH3-48/JH4 FR4

<400> 19

Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser
1 5 10

<210> 20
<211> 11
<212> PRT
<213> Artificial

<220>
<223> VH3-48/JH6 FR4

<400> 20

Trp Gly Gln Gly Thr Thr Val Thr Val Ser Ser
1 5 10

<210> 21

<211> 30
<212> PRT
<213> Artificial

<220>
<223> VH3-33/JH6 FR!

<400> 21

Gln Val Gln Leu Val Glu Ser Gly Gly Gly Val Val Gln Pro Gly Arg
1 5 10 15

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

<210> 22
<211> 14
<212> PRT
<213> Artificial

<220>
<223> VH3-33/JH6 FR2

<400> 22

Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val Ala
1 5 10

<210> 23
<211> 32
<212> PRT
<213> Artificial

<220>
<223> VH3-33/JH6 FR3

<400> 23

Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr Leu Gln
1 5 10 15

Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys Ala Arg
20 25 30

<210> 24
<211> 30
<212> PRT
<213> Artificial

<220>
<223> VH3-23/JH3 FR1

<400> 24

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15

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

<210> 25
<211> 14
<212> PRT
<213> Artificial

<220>
<223> VH3-23/JH3 FR2

<400> 25

Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val Ser
1 5 10

<210> 26
<211> 32
<212> PRT
<213> Artificial

<220>
<223> VH3-23/JH3 FR3

<400> 26

Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr Leu Gln
1 5 10 15

Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys Ala Lys
20 25 30

<210> 27
<211> 23
<212> PRT
<213> Artificial

<220>
<223> A18/JK2 FR1

<400> 27

Asp Ile Val Met Thr Gln Thr Pro Leu Ser Leu Ser Val Thr Pro Gly
1 5 10 15

Gln Pro Ala Ser Ile Ser Cys
20

<210> 28
<211> 15
<212> PRT
<213> Artificial

<220>
<223> A18/JK2 FR2

<400> 28

```
Trp Tyr Leu Gln Lys Pro Gly Gln Ser Pro Gln Leu Leu Ile Tyr
1               5                   10                  15


<210>  29
<211>  32
<212>  PRT
<213>  Artificial

<220>
<223>  A18/JK2 FR3

<400>  29

Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr
1               5                   10                  15


Leu Lys Ile Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr Cys
            20                  25                  30


<210>  30
<211>  11
<212>  PRT
<213>  Artificial

<220>
<223>  A18/JK2 FR4

<400>  30

Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys Arg
1               5                   10


<210>  31
<211>  23
<212>  PRT
<213>  Artificial

<220>
<223>  A17/JK2 FR1

<400>  31

Asp Val Val Met Thr Gln Ser Pro Leu Ser Leu Pro Val Thr Leu Gly
1               5                   10                  15


Gln Pro Ala Ser Ile Ser Cys
            20


<210>  32
<211>  15
<212>  PRT
<213>  Artificial

<220>
<223>  A17/JK2 FR2
```

<400> 32

Trp Phe Gln Gln Arg Pro Gly Gln Ser Pro Arg Arg Leu Ile Tyr
1 5 10 15

<210> 33
<211> 32
<212> PRT
<213> Artificial

<220>
<223> A17/JK2 FR3

<400> 33

Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr
1 5 10 15

Leu Lys Ile Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr Cys
20 25 30

<210> 34
<211> 115
<212> PRT
<213> Artificial

<220>
<223> VH 5F9

<400> 34

Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Ser
1 5 10 15

Ser Leu Lys Leu Ser Cys Val Ala Ser Gly Phe Thr Phe Ser Asn Tyr
20 25 30

Gly Met Asn Trp Ile Arg Gln Ala Pro Lys Lys Gly Leu Glu Trp Ile
35 40 45

Gly Met Ile Tyr Tyr Asp Ser Ser Glu Lys His Tyr Ala Asp Ser Val
50 55 60

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

Leu Glu Met Asn Ser Leu Arg Ser Glu Asp Thr Ala Ile Tyr Tyr Cys
85 90 95

Ala Lys Gly Thr Thr Pro Asp Tyr Trp Gly Gln Gly Val Met Val Thr
100 105 110

Val Ser Ser

115

<210> 35
<211> 115
<212> PRT
<213> Artificial

<220>
<223> VH 5F9.1-GL

<400> 35

Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15

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

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

Ser Met Ile Tyr Tyr Asp Ser Ser Glu Lys His Tyr Ala Asp Ser Val
50 55 60

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

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

Ala Arg Gly Thr Thr Pro Asp Tyr Trp Gly Gln Gly Thr Met Val Thr
100 105 110

Val Ser Ser
115

<210> 36
<211> 115
<212> PRT
<213> Artificial

<220>
<223> VH 5F9.2-GL

<400> 36

Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15

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

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

Ser Met Ile Tyr Tyr Asp Ser Ser Glu Lys His Tyr Ala Asp Ser Val
    50                  55                  60

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

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

Ala Arg Gly Thr Thr Pro Asp Tyr Trp Gly Gln Gly Thr Leu Val Thr
            100                 105                 110

Val Ser Ser
        115
```

<210> 37
<211> 115
<212> PRT
<213> Artificial

<220>
<223> VH 5F9.3-GL

<400> 37

```
Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1               5                   10                  15

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

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

Ser Met Ile Tyr Tyr Asp Ser Ser Glu Lys His Tyr Ala Asp Ser Val
    50                  55                  60

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

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

Ala Arg Gly Thr Thr Pro Asp Tyr Trp Gly Gln Gly Thr Thr Val Thr
            100                 105                 110

Val Ser Ser
```

115

<210> 38
<211> 115
<212> PRT
<213> Artificial

<220>
<223> VH 5F9.4-GL

<400> 38

Gln Val Gln Leu Val Glu Ser Gly Gly Gly Val Val Gln Pro Gly Arg
1 5 10 15

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

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

Ala Met Ile Tyr Tyr Asp Ser Ser Glu Lys His Tyr Ala Asp Ser Val
50 55 60

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

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

Ala Arg Gly Thr Thr Pro Asp Tyr Trp Gly Gln Gly Thr Met Val Thr
100 105 110

Val Ser Ser
115

<210> 39
<211> 115
<212> PRT
<213> Artificial

<220>
<223> VH 5F9.5-GL

<400> 39

Gln Val Gln Leu Val Glu Ser Gly Gly Gly Val Val Gln Pro Gly Arg
1 5 10 15

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

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

Ala Met Ile Tyr Tyr Asp Ser Ser Glu Lys His Tyr Ala Asp Ser Val
    50                  55                  60

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

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

Ala Arg Gly Thr Thr Pro Asp Tyr Trp Gly Gln Gly Thr Leu Val Thr
            100                 105                 110

Val Ser Ser
        115
```

<210> 40
<211> 115
<212> PRT
<213> Artificial

<220>
<223> VH 5F9.6-GL

<400> 40

```
Gln Val Gln Leu Val Glu Ser Gly Gly Gly Val Val Gln Pro Gly Arg
1               5                   10                  15

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

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

Ala Met Ile Tyr Tyr Asp Ser Ser Glu Lys His Tyr Ala Asp Ser Val
    50                  55                  60

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

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

Ala Arg Gly Thr Thr Pro Asp Tyr Trp Gly Gln Gly Thr Thr Val Thr
            100                 105                 110

Val Ser Ser
```

115

<210> 41
<211> 115
<212> PRT
<213> Artificial

<220>
<223> VH 5F9.7-GL

<400> 41

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15

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

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

Ser Met Ile Tyr Tyr Asp Ser Ser Glu Lys His Tyr Ala Asp Ser Val
50 55 60

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

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

Ala Lys Gly Thr Thr Pro Asp Tyr Trp Gly Gln Gly Thr Met Val Thr
100 105 110

Val Ser Ser
115

<210> 42
<211> 115
<212> PRT
<213> Artificial

<220>
<223> VH 5F9.8-GL

<400> 42

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15

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

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

Ser Met Ile Tyr Tyr Asp Ser Ser Glu Lys His Tyr Ala Asp Ser Val
    50                  55                  60

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

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

Ala Lys Gly Thr Thr Pro Asp Tyr Trp Gly Gln Gly Thr Leu Val Thr
            100                 105                 110

Val Ser Ser
        115
```

<210> 43
<211> 115
<212> PRT
<213> Artificial

<220>
<223> VH 5F9.9-GL

<400> 43

```
Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1               5                   10                  15

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

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

Ser Met Ile Tyr Tyr Asp Ser Ser Glu Lys His Tyr Ala Asp Ser Val
    50                  55                  60

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

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

Ala Lys Gly Thr Thr Pro Asp Tyr Trp Gly Gln Gly Thr Thr Val Thr
            100                 105                 110

Val Ser Ser
```

115

<210> 44
<211> 113
<212> PRT
<213> Artificial

<220>
<223> VL 5F9.1-GL

<400> 44

Asp Ile Val Met Thr Gln Thr Pro Leu Ser Leu Ser Val Thr Pro Gly
1 5 10 15

Gln Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser Leu Glu Tyr Ser
20 25 30

Asp Gly Tyr Thr Phe Leu Glu Trp Tyr Leu Gln Lys Pro Gly Gln Ser
35 40 45

Pro Gln Leu Leu Ile Tyr Glu Val Ser Asn Arg Phe Ser Gly Val Pro
50 55 60

Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile
65 70 75 80

Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr Cys Phe Gln Ala
85 90 95

Thr His Asp Pro Leu Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys
100 105 110

Arg

<210> 45
<211> 113
<212> PRT
<213> Artificial

<220>
<223> VL 5F9.2-GL

<400> 45

Asp Val Val Met Thr Gln Ser Pro Leu Ser Leu Pro Val Thr Leu Gly
1 5 10 15

Gln Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser Leu Glu Tyr Ser
20 25 30

```
Asp Gly Tyr Thr Phe Leu Glu Trp Phe Gln Gln Arg Pro Gly Gln Ser
        35                  40                  45

Pro Arg Arg Leu Ile Tyr Glu Val Ser Asn Arg Phe Ser Gly Val Pro
    50                  55                  60

Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile
65                  70                  75                  80

Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr Cys Phe Gln Ala
                85                  90                  95

Thr His Asp Pro Leu Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys
            100                 105                 110

Arg
```

<210> 46
<211> 113
<212> PRT
<213> Artificial

<220>
<223> VL 5F9.3-GL

<400> 46

```
Asp Val Val Met Thr Gln Ser Pro Leu Ser Leu Pro Val Thr Leu Gly
1               5                   10                  15

Gln Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser Leu Glu Tyr Ser
            20                  25                  30

Asp Gly Tyr Thr Phe Leu Glu Trp Tyr Leu Gln Lys Pro Gly Gln Ser
        35                  40                  45

Pro Gln Leu Leu Ile Tyr Glu Val Ser Asn Arg Phe Ser Gly Val Pro
    50                  55                  60

Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile
65                  70                  75                  80

Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr Cys Phe Gln Ala
                85                  90                  95

Thr His Asp Pro Leu Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys
            100                 105                 110

Arg
```

<210> 47
<211> 115
<212> PRT
<213> Artificial

<220>
<223> VH h5F9.1

<400> 47

Glu Val Gln Leu Val Glu Ser Gly Gly Gly Val Val Gln Pro Gly Arg
1 5 10 15

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

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

Ala Met Ile Tyr Tyr Asp Ser Ser Glu Lys His Tyr Ala Asp Ser Val
50 55 60

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

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

Ala Arg Gly Thr Thr Pro Asp Tyr Trp Gly Gln Gly Thr Met Val Thr
100 105 110

Val Ser Ser
115

<210> 48
<211> 115
<212> PRT
<213> Artificial

<220>
<223> VH h5F9.2

<400> 48

Glu Val Gln Leu Val Glu Ser Gly Gly Gly Val Val Gln Pro Gly Arg
1 5 10 15

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

```
Gly Met Asn Trp Ile Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Ile
        35                  40                  45

Gly Met Ile Tyr Tyr Asp Ser Ser Glu Lys His Tyr Ala Asp Ser Val
    50                  55                  60

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

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

Ala Lys Gly Thr Thr Pro Asp Tyr Trp Gly Gln Gly Thr Met Val Thr
            100                 105                 110

Val Ser Ser
        115
```

<210> 49
<211> 115
<212> PRT
<213> Artificial

<220>
<223> VH h5F9.3

<400> 49

```
Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1               5                   10                  15

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

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

Ser Met Ile Tyr Tyr Asp Ser Ser Glu Lys His Tyr Ala Asp Ser Val
    50                  55                  60

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

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

Ala Lys Gly Thr Thr Pro Asp Tyr Trp Gly Gln Gly Thr Met Val Thr
            100                 105                 110

Val Ser Ser
```

115

<210> 50
<211> 115
<212> PRT
<213> Artificial

<220>
<223> VH h5F9.4

<400> 50

Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15

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

Gly Met Asn Trp Ile Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Met Ile Tyr Tyr Asp Ser Ser Glu Lys His Tyr Ala Asp Ser Val
50 55 60

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

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

Ala Lys Gly Thr Thr Pro Asp Tyr Trp Gly Gln Gly Thr Met Val Thr
100 105 110

Val Ser Ser
115

<210> 51
<211> 113
<212> PRT
<213> Artificial

<220>
<223> VL h5F9.19

<400> 51

Asp Val Val Leu Thr Gln Ser Pro Leu Ser Leu Pro Val Thr Leu Gly
1 5 10 15

Gln Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser Leu Glu Tyr Ser
20 25 30

```
Asp Gly Tyr Thr Phe Leu Glu Trp Phe Gln Gln Arg Pro Gly Gln Ser
        35                  40                  45

Pro Arg Leu Leu Ile Tyr Glu Val Ser Asn Arg Phe Ser Gly Val Pro
    50                  55                  60

Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile
65                  70                  75                  80

Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr Cys Phe Gln Ala
                85                  90                  95

Thr His Asp Pro Leu Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys
            100                 105                 110

Arg
```

<210> 52
<211> 113
<212> PRT
<213> Artificial

<220>
<223> VL h5F9.20

<400> 52

```
Asp Val Val Leu Thr Gln Ser Pro Leu Ser Leu Pro Val Thr Leu Gly
1               5                   10                  15

Gln Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser Leu Glu Tyr Ser
            20                  25                  30

Asp Gly Tyr Thr Phe Leu Glu Trp Phe Gln Gln Arg Pro Gly Gln Ser
        35                  40                  45

Pro Arg Arg Leu Ile Tyr Glu Val Ser Asn Arg Phe Ser Gly Val Pro
    50                  55                  60

Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile
65                  70                  75                  80

Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr Cys Phe Gln Ala
                85                  90                  95

Thr His Asp Pro Leu Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys
            100                 105                 110

Arg
```

<210> 53
<211> 113
<212> PRT
<213> Artificial

<220>
<223> VL h5F9.21

<400> 53

Asp Val Val Leu Thr Gln Ser Pro Leu Ser Leu Pro Val Thr Leu Gly
1 5 10 15

Gln Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser Leu Glu Tyr Ser
20 25 30

Asp Gly Tyr Thr Phe Leu Glu Trp Phe Leu Gln Lys Pro Gly Gln Ser
35 40 45

Pro Gln Leu Leu Ile Tyr Glu Val Ser Asn Arg Phe Ser Gly Val Pro
50 55 60

Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile
65 70 75 80

Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr Cys Phe Gln Ala
85 90 95

Thr His Asp Pro Leu Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys
100 105 110

Arg

<210> 54
<211> 113
<212> PRT
<213> Artificial

<220>
<223> VL h5F9.22

<400> 54

Asp Val Val Leu Thr Gln Ser Pro Leu Ser Leu Pro Val Thr Leu Gly
1 5 10 15

Gln Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser Leu Glu Tyr Ser
20 25 30

```
Asp Gly Tyr Thr Phe Leu Glu Trp Tyr Leu Gln Lys Pro Gly Gln Ser
        35                  40                  45

Pro Gln Leu Leu Ile Tyr Glu Val Ser Asn Arg Phe Ser Gly Val Pro
    50                  55                  60

Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile
65                  70                  75                  80

Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr Cys Phe Gln Ala
                85                  90                  95

Thr His Asp Pro Leu Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys
            100                 105                 110

Arg
```

<210> 55
<211> 121
<212> PRT
<213> Artificial

<220>
<223> VH 8D1

<400> 55

```
Glu Val Gln Leu Gln Gln Ser Gly Pro Glu Leu Val Lys Pro Gly Thr
1               5                   10                  15

Ser Val Lys Met Ser Cys Lys Thr Ser Gly Tyr Thr Phe Thr Ser Tyr
            20                  25                  30

Val Met His Trp Val Lys Gln Lys Pro Gly Gln Gly Leu Glu Trp Ile
        35                  40                  45

Gly Tyr Ile Ile Pro Tyr Asn Asp Asn Thr Lys Tyr Asn Glu Lys Phe
    50                  55                  60

Lys Gly Lys Ala Thr Leu Thr Ser Asp Lys Ser Ser Ser Thr Ala Tyr
65                  70                  75                  80

Met Glu Leu Ser Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr Tyr Cys
                85                  90                  95

Ala Arg Arg Asn Glu Tyr Tyr Gly Ser Ser Phe Phe Asp Tyr Trp Gly
            100                 105                 110

Gln Gly Thr Thr Leu Thr Val Ser Ser
```

115 120

<210> 56
<211> 108
<212> PRT
<213> Artificial

<220>
<223> VL 8D1

<400> 56

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

Glu Ile Val Thr Ile Thr Cys Gln Ala Ser Gln Asp Ile Asp Asn Tyr
20 25 30

Leu Ala Trp Tyr His Gln Lys Pro Gly Lys Ser Pro Arg Leu Leu Ile
35 40 45

Tyr Gly Ala Thr Asn Leu Ala Asp Gly Val Pro Ser Arg Phe Ser Gly
50 55 60

Ser Arg Ser Gly Thr Gln Phe Ser Leu Lys Ile Asn Arg Leu Gln Ile
65 70 75 80

Glu Asp Leu Gly Ile Tyr Tyr Cys Leu Gln Gly Tyr Ile Pro Pro Arg
85 90 95

Thr Phe Gly Gly Gly Thr Lys Leu Glu Leu Lys Arg
100 105

<210> 57
<211> 5
<212> PRT
<213> Artificial

<220>
<223> VH 5F9 CDR H1

<400> 57

Asn Tyr Gly Met Asn
1 5

<210> 58
<211> 17
<212> PRT
<213> Artificial

<220>
<223> VH 5F9 CDR-H2

<400> 58

Met Ile Tyr Tyr Asp Ser Ser Glu Lys His Tyr Ala Asp Ser Val Lys
1 5 10 15

Gly

<210> 59
<211> 6
<212> PRT
<213> Artificial

<220>
<223> VH 5F9 CDR-H3

<400> 59

Gly Thr Thr Pro Asp Tyr
1 5

<210> 60
<211> 16
<212> PRT
<213> Artificial

<220>
<223> VL 5F9 CDR-L1

<400> 60

Arg Ser Ser Gln Ser Leu Glu Tyr Ser Asp Gly Tyr Thr Phe Leu Glu
1 5 10 15

<210> 61
<211> 7
<212> PRT
<213> Artificial

<220>
<223> VL 5F9 CDR-L2

<400> 61

Glu Val Ser Asn Arg Phe Ser
1 5

<210> 62
<211> 9
<212> PRT
<213> Artificial

<220>
<223> VL 5F9 CDR-L3

<400> 62

Phe Gln Ala Thr His Asp Pro Leu Thr

1 5

<210> 63
<211> 5
<212> PRT
<213> Artificial

<220>
<223> VH 8D1 CDR-H1

<400> 63

Ser Tyr Val Met His
1 5

<210> 64
<211> 17
<212> PRT
<213> Artificial

<220>
<223> VH 8D1 CDR-H2

<400> 64

Tyr Ile Ile Pro Tyr Asn Asp Asn Thr Lys Tyr Asn Glu Lys Phe Lys
1 5 10 15

Gly

<210> 65
<211> 14
<212> PRT
<213> Artificial

<220>
<223> VH 8D1 CDR-H3

<400> 65

Ala Arg Arg Asn Glu Tyr Tyr Gly Ser Ser Phe Phe Asp Tyr
1 5 10

<210> 66
<211> 11
<212> PRT
<213> Artificial

<220>
<223> VL 8D1 CDR-L1

<400> 66

Gln Ala Ser Gln Asp Ile Asp Asn Tyr Leu Ala
1 5 10

<210> 67
<211> 7
<212> PRT
<213> Artificial

<220>
<223> VL 8D1 CDR-L2

<400> 67

Gly Ala Thr Asn Leu Ala Asp
1 5

<210> 68
<211> 9
<212> PRT
<213> Artificial

<220>
<223> VL 8D1 CDR-L3

<400> 68

Leu Gln Gly Tyr Ile Pro Pro Arg Thr
1 5