

SEQUENCE LISTING

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<120> HUMAN IMMUNODEFICIENCY VIRUS NEUTRALIZING ANTIBODIES

<130> GILE-112/01W0

<150> US 62/267,652

<151> 2015-12-15

<160> 450

<170> PatentIn version 3.5

<210> 1

<211> 24

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic heavy chain signal sequence

<400> 1

Met	Asp	Pro	Lys	Gly	Ser	Leu	Ser	Trp	Arg	Ile	Leu	Leu	Phe	Leu	Ser
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Leu	Ala	Phe	Glu	Leu	Ser	Tyr	Gly
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<210> 2

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic heavy chain signal sequence

<400> 2

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

Asp Ala Arg Cys

<210> 3
 <211> 1446
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> synthetic polynucleotide sequence encoding the gamma heavy chain
 of PGT-121 L06

<400> 3
 atgaaacacc tgtggttctt ctttctcctg gtggcagctc ccagatgggt cctgtcacag 60
 atgcagttac aggagtcggg ccccgactg gtgaagcctt cggaaccct gtcctcacg 120
 tgcagtgtgt ctggtgcctc cataagtac agttactgga gctggatccg gcggtcccca 180
 gggaaggac ttgagtggat tgggtatgtc caaaaagcg gcgacacaaa ttacagcccc 240
 tccctcaaga gtcgagtcaa cttgtcgta gacacgtcca aaaatcaggt gtcctgagc 300
 cttgtggccg cgaccgtgc ggactcgggc aaatattatt gcgcgagaac actgcacggg 360
 aggagaattt atggaatcgt tgccttcaat gagggttca cctacttcta catggacgtc 420
 tggggcaatg ggactcaggt caccgtctcc tcagcctcca ccaaggccc atcggcttcc 480
 cccctggcac cctcctcaa gagcacctct gggggcacag cggccctggg ctgcctggtc 540
 aaggactact tccccgaacc ggtgacggtg tcgtggaact caggcgcctt gaccagcggc 600
 gtgcacacct tcccggctgt cctacagtcc tcaggactct actccctcag cagcgtggtg 660
 accgtgccct ccagcagctt gggcacccag acctacatct gcaacgtgaa tcacaagccc 720
 agcaacacca aggtggacaa gagagttgag cccaaatctt gtgacaaaac tcacacatgc 780
 ccaccgtgcc cagcacctga actcctgggg ggaccgtcag tcttctctt cccccaaaa 840
 cccaaggaca ccctcatgat ctcccgacc cctgaggtca catgcgtggt ggtggacgtg 900
 agccacgaag acctgaggt caagttcaac tggtagctgg acggcgtgga ggtgcataat 960
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 gccctcccag ccccatcga gaaaaccatc tccaaagcca aagggcagcc ccgagaacca 1140
 cagggtgtaca ccctgcccc atcccgggag gagatgacca agaaccaggt cagcctgacc 1200
 tgcctggtca aaggcttcta tcccagcgac atcgccgtgg agtgggagag caatgggcag 1260

ccggagaaca actacaagac cacgcctccc gtgctggact ccgacggctc cttcttcctc	1320
tatagcaagc tcaccgtgga caagagcagg tggcagcagg ggaacgtctt ctcatgctcc	1380
gtgatgcatg aggctctgca caaccactac acgcagaaga gcctctccct gtctccgggt	1440
aaatga	1446

<210> 4
 <211> 396
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> synthetic polynucleotide encoding the gamma heavy chain variable region of PGT-121 L06

<400> 4 cagatgcagt tacaggagtc gggccccgga ctggtgaagc cttcggaac cctgtccctc	60
acgtgcagtg tgtctggtgc ctccataagt gacagttact ggagctggat ccggcgggtcc	120
ccagggaagg gacttgagtg gattgggtat gtccacaaaa gcggcgacac aaattacagc	180
ccctccctca agagtcgagt caacttgctg ttagacacgt ccaaaaatca ggtgtccctg	240
agccttggtg ccgcgaccgc tgcggactcg ggcaaattatt attgcgcgag aacactgcac	300
gggaggagaa tttatggaat cgttgccttc aatgagtggg tcacctactt ctacatggac	360
gtctggggca atgggactca ggtcaccgtc tcctca	396

<210> 5
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 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic CDR of PGT antibody

<400> 5

Asp Asn Tyr Trp Ser
1 5

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

<220>

<223> Synthetic CDR of PGT antibody

<400> 6

Gly Thr Leu Val Asp Arg
1 5

<210> 7

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic CDR of PGT antibody

<400> 7

Asp Ala Tyr Trp Ser
1 5

<210> 8

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic CDR of PGT antibody

<400> 8

Gly Ala Ser Ile Asn Asp
1 5

<210> 9

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic CDR of PGT antibody

<400> 9

Asn Tyr Tyr Trp Thr
1 5

<210> 10

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic CDR of PGT antibody

<400> 10

Gly Gly Ser Ile Ser Asn
1 5

<210> 11

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic CDR of PGT antibody

<400> 11

Gly Arg Phe Trp Ser
1 5

<210> 12

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic CDR of PGT antibody

<400> 12

Asn Gly Ser Val Ser Gly
1 5

<210> 13

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic CDR of PGT antibody

<400> 13

Tyr His Asp Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys Ser
1 5 10 15

<210> 14

<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic CDR of PGT antibody

<400> 14

Tyr Val His Asp Ser Gly Asp Thr Asn
1 5

<210> 15
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic CDR of PGT antibody

<400> 15

Tyr Val His His Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys Arg
1 5 10 15

<210> 16
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic CDR of PGT antibody

<400> 16

Tyr Val His His Ser Gly Asp Thr Asn
1 5

<210> 17
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic CDR of PGT antibody

<400> 17

Tyr Ile Ser Asp Arg Glu Thr Thr Thr Tyr Asn Pro Ser Leu Asn Ser
1 5 10 15

<210> 18
 <211> 9
 <212> PRT
 <213> Artificial Sequence

 <220>
 <223> Synthetic CDR of PGT antibody

 <400> 18

Tyr Ile Ser Asp Arg Glu Thr Thr Thr
 1 5

<210> 19
 <211> 693
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> synthetic polynucleotide encoding the lambda light chain of
 PGT-121 L06

<400> 19
 atggcctgga cttttctcct cctcggcctc ctctctcact gcacagcctc tgtgacctcc 60
 gatatatctg tggccccagg agagacggcc aggatttcct gtggggaaaa gagccttgga 120
 agtagagctg tacaatggta tcaacacagg gccggccagg cccctctttt aatcatatat 180
 aataatcagg accggccctc agggatccct gagcgattct ctggctcccc tgactccctt 240
 tttgggacca cggccaccct gaccatcacc agtgtcgaag ccggggatga ggccgactat 300
 tactgtcata tatgggatag tagagttccc accaaatggg tcttcggcgg agggaccacg 360
 ctgaccgtgt taggtcagcc caaggctgcc ccctcgttca ctctgttccc gccctcctct 420
 gaggagcttc aagccaacaa ggccacactg gtgtgttctca taagtgactt ctaccgggga 480
 gccgtgacag tggcctggaa ggcagatagc agccccgtca aggcgggagt ggagaccacc 540
 acaccctcca aacaaagcaa caacaagtac gcggccagca gctacctgag cctgacgcct 600
 gagcagtgga agtcccacaa aagctacagc tgccaggtca cgcatagaagg gagcaccgtg 660
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<210> 20
 <211> 315
 <212> DNA
 <213> Artificial Sequence

<220>

<223> synthetic polynucleotide encoding the lambda light chain variable region of PGT-121 L06

<400> 20

tccgatatat ctgtggcccc aggagagacg gccaggattt cctgtgggga aaagagcctt 60

ggaagtagag ctgtacaatg gtatcaacac agggccggcc agggcccctc tttaatcata 120

tataataatc aggaccggcc ctcagggatc cctgagcgat tctctggctc ccctgactcc 180

ccttttggga ccacggccac cctgaccatc accagtgtcg aagccgggga tgaggccgac 240

tattactgtc atatatggga tagtagagtt cccaccaaat gggctcttcg cgaggaggacc 300

acgctgaccg tgta 315

<210> 21

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic CDR of PGT antibody

<400> 21

Tyr Phe Ser Asp Thr Asp Arg Ser Glu Tyr Asn Pro Ser Leu Arg Ser
1 5 10 15

<210> 22

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic CDR of PGT antibody

<400> 22

Tyr Phe Ser Asp Thr Asp Arg Ser Glu
1 5

<210> 23

<211> 24

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic CDR of PGT antibody

<400> 23

Thr Lys His Gly Arg Arg Ile Tyr Gly Val Val Ala Phe Lys Glu Trp
1 5 10 15

Phe Thr Tyr Phe Tyr Met Asp Val
20

<210> 24

<211> 24

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic CDR of PGT antibody

<400> 24

Ala Leu His Gly Lys Arg Ile Tyr Gly Ile Val Ala Leu Gly Glu Leu
1 5 10 15

Phe Thr Tyr Phe Tyr Met Asp Val
20

<210> 25

<211> 24

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic CDR of PGT antibody

<400> 25

Ala Arg Arg Gly Gln Arg Ile Tyr Gly Val Val Ser Phe Gly Glu Phe
1 5 10 15

Phe Tyr Tyr Tyr Tyr Met Asp Val
20

<210> 26

<211> 24

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic CDR of PGT antibody

<400> 26

Ala Gln Gln Gly Lys Arg Ile Tyr Gly Ile Gly Ser Phe Gly Glu Phe
1 5 10 15

Phe Tyr Tyr Tyr Tyr Met Asp Ala
20

<210> 27

<211> 24

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic CDR of PGT antibody

<400> 27

Ala Gln Gln Gly Lys Arg Ile Tyr Gly Ile Val Ser Phe Gly Glu Phe
1 5 10 15

Phe Tyr Tyr Tyr Tyr Met Asp Ala
20

<210> 28

<211> 24

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic CDR of PGT antibody

<400> 28

Ala Gln Gln Gly Lys Arg Ile Tyr Gly Ile Val Ser Phe Gly Glu Leu
1 5 10 15

Phe Tyr Tyr Tyr Tyr Met Asp Ala
20

<210> 29

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic CDR of PGT antibody

<400> 29

Gly Glu Glu Ser Leu Gly Ser Arg Ser Val Ile
1 5 10

<210> 30

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic CDR of PGT antibody

<400> 30

Gly Lys Glu Ser Ile Gly Ser Arg Ala Val Gln
1 5 10

<210> 31

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic CDR of PGT antibody

<400> 31

Gly Arg Gln Ala Leu Gly Ser Arg Ala Val Gln
1 5 10

<210> 32

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic CDR of PGT antibody

<400> 32

Gly Glu Arg Ser Arg Gly Ser Arg Ala Val Ala
1 5 10

<210> 33

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic CDR of PGT antibody

<400> 33

Gly Glu Arg Ser Arg Gly Ser Arg Ala Val Gln
1 5 10

<210> 34

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic CDR of PGT antibody

<400> 34

Asn Asn Asn Asp Arg Pro Ser
1 5

<210> 35

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic CDR of PGT antibody

<400> 35

Asn Asn Gln Asp Arg Pro Ala
1 5

<210> 36

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic CDR of PGT antibody

<400> 36

Asn Asn Gln Asp Arg Pro Ser
1 5

<210> 37

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic CDR of PGT antibody

<400> 37

His	Ile	Trp	Asp	Ser	Arg	Arg	Pro	Thr	Asn	Trp	Val
1				5					10		

<210> 38

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic CDR of PGT antibody

<400> 38

His	Ile	Tyr	Asp	Ala	Arg	Gly	Gly	Thr	Asn	Trp	Val
1				5					10		

<210> 39

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic CDR of PGT antibody

<400> 39

His	Met	Trp	Asp	Ser	Arg	Ser	Gly	Phe	Ser	Trp	Ser
1				5					10		

<210> 40

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic CDR of PGT antibody

<400> 40

His	Tyr	Trp	Asp	Ser	Arg	Ser	Pro	Ile	Ser	Trp	Ile
1				5					10		

<210> 41

<211> 330
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic IgG1m3 antibody

<400> 41

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

Arg 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> 42

<211> 330

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic IgG1m17,1 antibody

<400> 42

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

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

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

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

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

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

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

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

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

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

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

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

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

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

<210> 43

<211> 330

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic IgG1m17,1,2 antibody

<400> 43

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

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

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

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

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

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

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

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

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

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

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

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

290

295

300

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

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

<210> 44

<211> 330

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic IgG1m3,1 antibody

<400> 44

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

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

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

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

130

135

140

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

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

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

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

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

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

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

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

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

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

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

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

<210> 45

<211> 330

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic IgG1m17 antibody

<400> 45

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 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> 46
<211> 462
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic allotype IgG1m17 antibody

<400> 46

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe

245

250

255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
 260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
 275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
 355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
 370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
 385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
 405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
 420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
 435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 47
<211> 106
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic IgG1 kappa light chain

<400> 47

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 Val 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 Leu 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> 48
<211> 106
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic IgG1 kappa light chain

<400> 48

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 Leu 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> 49

<211> 106

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic IgG1 kappa light chain

<400> 49

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> 50

<211> 106

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic IgG1 lambda light chain

<400> 50

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

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

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

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

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

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

Glu Lys Thr Val Ala Pro Thr Glu Cys Ser
 100 105

<210> 51

<211> 106

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic IgG1 lambda light chain

<400> 51

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

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

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

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

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

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

Glu Lys Thr Val Ala Pro Thr Glu Cys Ser
100 105

<210> 52

<211> 106

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic IgG1 lambda light chain

<400> 52

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

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

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

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

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

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

Glu Lys Thr Val Ala Pro Thr Glu Cys Ser
100 105

<210> 53
<211> 106
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic IgG1 lambda light chain

<400> 53

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

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

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

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

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

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

Glu Lys Thr Val Ala Pro Ala Glu Cys Ser
100 105

<210> 54
<211> 211
<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic light chain sequence

<400> 54

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 55
<211> 105
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic light chain variable region

<400> 55

Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly Glu
1 5 10 15

Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala Gly
20 25 30

Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser Gly
35 40 45

Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr Thr
50 55 60

Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp Tyr
65 70 75 80

Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe Gly
85 90 95

Gly Gly Thr Thr Leu Thr Val Leu Gly
100 105

<210> 56
<211> 106
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic light chain variable region

<400> 56

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Lys Leu Thr Val Leu Gly
100 105

<210> 57

<211> 106

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic light chain variable region

<400> 57

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Arg Pro Gly Thr

50

55

60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
 65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
 85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly
 100 105

<210> 58

<211> 107

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic light chain variable region

<400> 58

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
 1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
 20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
 35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Arg Pro Phe Gly
 50 55 60

Thr Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala
 65 70 75 80

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

Phe Gly Gly Gly Thr Lys Leu Thr Val Leu Gly
 100 105

<210> 59

<211> 5428
<212> DNA
<213> Artificial Sequence

<220>

<223> synthetic vector pcDNA3.1

<400> 59

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cgagcaaaat ttaagctaca acaaggcaag gcttgaccga caattgcatg aagaatctgc	180
ttagggttag gcgttttgcg ctgcttcgcg atgtacgggc cagatatacg cgttgacatt	240
gattattgac tagttattaa tagtaatcaa ttacgggggtc attagttcat agcccatata	300
tggagttccg cgttacataa cttacggtaa atggcccgcc tggctgaccg cccaacgacc	360
cccgcccatt gacgtcaata atgacgtatg ttcccatagt aacgccaata gggactttcc	420
attgacgtca atgggtggag tattttacggg aaactgcccc cttggcagta catcaagtgt	480
atcatatgcc aagtacgccc cctattgacg tcaatgacgg taaatggccc gcctggcatt	540
atgcccagta catgacctta tgggactttc ctacttggca gtacatctac gtattagtca	600
tcgctattac catggtgatg cggttttggc agtacatcaa tgggcgtgga tagcggtttg	660
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tgcatctcaa ttagtcagca accaggtgtg gaaagtcccc aggctcccca gcaggcagaa	1860
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<210> 60
 <211> 24
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> synthetic histidine tag coding sequence

<400> 60
 caccatcacc atcaccatca ccat 24

<210> 61
 <211> 138
 <212> PRT
 <213> Mus musculus

<400> 61

Met Glu Trp Ser Arg Val Phe Ile Phe Leu Leu Ser Val Thr Ala Gly
 1 5 10 15

Val His Ser Gln Val Gln Leu Gln Gln Ser Gly Ala Glu Leu Val Arg
 20 25 30

Pro Gly Thr Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Ala Phe
35 40 45

Thr Asn Tyr Leu Ile Glu Trp Val Lys Gln Arg Pro Gly Gln Gly Leu
50 55 60

Glu Trp Ile Gly Val Ile Asn Pro Gly Ser Gly Gly Thr Asn Tyr Asn
65 70 75 80

Glu Lys Phe Lys Gly Lys Ala Thr Leu Thr Ala Asp Lys Ser Ser Ser
85 90 95

Thr Ala Tyr Met Gln Leu Ser Ser Leu Thr Ser Glu Asp Ser Ala Val
100 105 110

Tyr Phe Cys Ala Arg Ser Tyr Tyr Gly Tyr Asp Trp Phe Ala Tyr Trp
115 120 125

Gly Gln Gly Thr Leu Val Thr Val Ser Ala
130 135

<210> 62
<211> 120
<212> PRT
<213> Mus musculus

<400> 62

Met Arg Cys Leu Ala Glu Phe Leu Gly Leu Leu Val Leu Trp Ile Pro
1 5 10 15

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

Val Thr Pro Gly Glu Ser Val Ser Ile Ser Cys Arg Ser Ser Thr Ser
35 40 45

Leu Leu His Ser Ser Gly Lys His Arg Leu Tyr Trp Phe Leu Gln Arg
50 55 60

Pro Gly Gln Ser Pro Gln Leu Leu Ile Tyr Tyr Met Ser Asn Leu Ala

65

70

75

80

Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe
 85 90 95

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

Cys Met Gln Ser Leu Glu Tyr Pro
 115 120

<210> 63
 <211> 9
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> synthetic T cell epitope sequence

<400> 63

Met Gln Leu Gln Glu Ser Gly Pro Gly
 1 5

<210> 64
 <211> 9
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> synthetic T cell epitope sequence

<400> 64

Val Gln Leu Gln Glu Ser Gly Pro Gly
 1 5

<210> 65
 <211> 9
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> synthetic T cell epitope sequence

<400> 65

Val His Leu Gln Glu Ser Gly Pro Gly

1

5

<210> 66
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic T cell epitope sequence

<400> 66

Leu His Leu Gln Glu Ser Gly Pro Gly
1 5

<210> 67
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic T cell epitope sequence

<400> 67

Val Ser Gly Ala Ser Ile Ser Asp Ser
1 5

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

<220>
<223> synthetic T cell epitope sequence

<400> 68

Val Ser Gly Gly Ser Ile Ser Asp Ser
1 5

<210> 69
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic T cell epitope sequence

<400> 69

Val Ser Gly Ala Ser Ile Ser Asp Ala
1 5

<210> 70
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic T cell epitope sequence

<400> 70

Val Ser Gly Gly Ser Ile Ser Asp Ala
1 5

<210> 71
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic T cell epitope sequence

<400> 71

Val Ser Gly Thr Leu Val Arg Asp Asn
1 5

<210> 72
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic T cell epitope sequence

<400> 72

Val Ser Gly Ala Ser Ile Asn Asp Ala
1 5

<210> 73
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Leu Lys Ser Val Thr Ala Ala Asp Ser
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Tyr Tyr Cys Ala Thr Thr Lys His Gly
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Tyr Phe Cys Ala Arg Ala Leu His Gly
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Lys His Gly Arg Arg Ile Tyr Gly Val
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Val Ser Pro Gly Glu Thr Ala Lys Ile
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Leu Ala Pro Gly Ala Thr Ala Lys Ile
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<400> 144

Leu Ile Ile Tyr Asn Asn Gln Asp Arg
1 5

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Leu Ile Ile Tyr Asn Asn Asn Asp Arg
1 5

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Leu Leu Ile Tyr Asn Asn Gln Asp Arg

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Phe Gly Thr Thr Ala Thr Leu Thr Ile
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Phe Gly Glu Gly Thr Thr Leu Ile Val
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Phe Asp Arg Gly Thr Thr Leu Thr Val
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Phe Gly Gly Ala Thr Arg Leu Thr Val
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Phe Gly Gly Gly Thr Gln Leu Thr Val
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Phe Ala Gly Gly Thr Gln Leu Thr Val
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Val Ser Gly Ala Ser Ile Ser Asp Ser Tyr Trp Ser Trp Ile Arg
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Ser Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu
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Gln	Val	Ser	Leu	Ser	Leu	Val	Ala	Ala	Thr	Ala	Ala	Asp	Ser	Gly
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Gln	Val	Ser	Leu	Ser	Leu	Thr	Ser	Val	Thr	Ala	Ala	Asp	Ser	Gly
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Gln	Val	Ser	Leu	Ser	Leu	Ser	Ser	Val	Thr	Ala	Ala	Asp	Ser	Gly
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Gln	Val	Ser	Leu	Ser	Leu	Thr	Gly	Val	Thr	Ala	Ala	Asp	Ser	Gly
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Ile	Tyr	Gly	Ile	Val	Ala	Phe	Asn	Glu	Trp	Phe	Thr	Tyr	Phe	Tyr
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<400> 163

Phe	Asn	Glu	Trp	Phe	Thr	Tyr	Phe	Tyr	Met	Asp	Val	Trp	Gly	Asn
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Phe	Asn	Glu	Trp	Phe	Thr	Tyr	Phe	Tyr	Met	Asp	Val	Trp	Gly	Lys
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<400> 165

Phe	Asn	Glu	Trp	Phe	Thr	Tyr	Phe	Tyr	Met	Asp	Val	Trp	Gly	His
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<400> 166

Phe	Asn	Glu	Trp	Phe	Thr	Tyr	Phe	Tyr	Met	Asp	Val	Trp	Gly	Ala
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<400> 167

Phe	Asn	Glu	Trp	Phe	Thr	Tyr	Phe	Tyr	Met	Asp	Val	Trp	Gly	Thr
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<400> 168

Trp	Phe	Thr	Tyr	Phe	Tyr	Met	Asp	Val	Trp	Gly	Asn	Gly	Thr	Gln
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Trp	Phe	Thr	Tyr	Phe	Tyr	Met	Asp	Val	Trp	Gly	Lys	Gly	Thr	Gln
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Trp	Phe	Thr	Tyr	Phe	Tyr	Met	Asp	Val	Trp	Gly	His	Gly	Thr	Gln
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Trp	Phe	Thr	Tyr	Phe	Tyr	Met	Asp	Val	Trp	Gly	Ala	Gly	Thr	Gln
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Trp	Phe	Thr	Tyr	Phe	Tyr	Met	Asp	Val	Trp	Gly	Thr	Gly	Thr	Gln
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<400> 173

Tyr	Phe	Tyr	Met	Asp	Val	Trp	Gly	Asn	Gly	Thr	Gln	Val	Thr	Val
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<400> 174

Tyr	Phe	Tyr	Met	Asp	Val	Trp	Gly	Lys	Gly	Thr	Gln	Val	Thr	Val
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Tyr	Phe	Tyr	Met	Asp	Val	Trp	Gly	His	Gly	Thr	Gln	Val	Thr	Val
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<400> 176

Tyr	Phe	Tyr	Met	Asp	Val	Trp	Gly	Ala	Gly	Thr	Gln	Val	Thr	Val
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Tyr Phe Tyr Met Asp Val Trp Gly Thr Gly Thr Gln Val Thr Val
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<400> 178

Phe Gly Thr Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly
1 5 10 15

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Ser Pro Phe Gly Thr Thr Ala Thr Leu Thr Ile Thr Ser Val Glu
1 5 10 15

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Ser Pro Asp Ser Pro Phe Gly Thr Thr Ala Thr Leu Thr Ile Thr
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Pro	Thr	Lys	Trp	Val	Phe	Gly	Gly	Gly	Thr	Thr	Leu	Thr	Val	Leu
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Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp

420

425

430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
 435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 191

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 191

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
 20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
 35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
 50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
 65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
 100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
 115 120 125

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

130

135

140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
 145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
 165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
 180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
 195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
 210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
 225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Ser Val Phe
 245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
 260 265 270

Glu Val Thr Cys Val Val Val Asp Val Glu Phe Glu Asp Pro Glu Val
 275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Thr Asn Lys Ala Leu Pro Ala Pro Glu Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 192
<211> 462
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy chain antibody sequence

<400> 192

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val

275

280

285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Glu Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 193

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 193

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Asp Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp

420

425

430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
 435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 194

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 194

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
 20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
 35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
 50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
 65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
 100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
 115 120 125

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

130

135

140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
 145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
 165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
 180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
 195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
 210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
 225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Phe Glu Gly Gly Pro Ser Val Phe
 245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
 260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
 275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Ser Ile Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 195
<211> 462
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy chain antibody sequence

<400> 195

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Phe Glu Gly Gly Pro Ser Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Ala Val Ser His Glu Asp Pro Glu Val

275

280

285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Gln Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Ser Ile Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
 355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
 370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
 385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
 405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
 420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
 435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 196

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 196

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Glu Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Arg Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp

420

425

430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
 435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 197

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 197

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
 20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
 35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
 50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
 65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
 100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
 115 120 125

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

130

135

140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
 145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
 165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
 180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
 195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
 210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
 225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
 245 250 255

Leu Leu Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
 260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
 275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Pro Glu Glu Gln Tyr Asn Ser Thr Leu Arg Val Val Ser Ile
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Leu Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 198
<211> 462
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy chain antibody sequence

<400> 198

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Ser Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser Phe Glu Asp Pro Glu Val

275

280

285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Thr Asn Lys Ala Leu Pro Ala Pro Glu Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
 355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
 370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
 385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
 405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
 420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
 435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 199

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 199

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Asp Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser Phe Glu Asp Pro Glu Val
275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Thr Asn Lys Ala Leu Pro Ala Pro Glu Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp

420

425

430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
 435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 200

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 200

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
 20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
 35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
 50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
 65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
 100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
 115 120 125

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

130

135

140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
 145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
 165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
 180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
 195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
 210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
 225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
 245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
 260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
 275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ala Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Ala Ala Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 201
<211> 462
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy chain antibody sequence

<400> 201

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Val Gly Gly Pro Ser Val Phe
245 250 255

Leu Leu Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val

275

280

285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Pro Glu Glu Gln Tyr Asn Ser Thr Leu Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Leu Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 202

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 202

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Asp Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Glu Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp

420

425

430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
 435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 203

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 203

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
 20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
 35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
 50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
 65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
 100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
 115 120 125

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

130

135

140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
 145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
 165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
 180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
 195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
 210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
 225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Asp Val Phe
 245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
 260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
 275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ala Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Glu Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 204
<211> 462
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy chain antibody sequence

<400> 204

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val

275

280

285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Glu Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
 355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
 370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
 385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
 405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
 420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
 435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 205

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 205

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp

420

425

430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
 435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 206

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 206

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
 20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
 35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
 50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
 65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
 100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
 115 120 125

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

130

135

140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
 145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
 165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
 180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
 195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
 210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
 225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Asp Val Phe
 245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
 260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
 275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ala Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Glu Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Gly Ala Leu His
435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 207
<211> 462
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy chain antibody sequence

<400> 207

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val

275

280

285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Glu Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
 355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
 370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
 385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
 405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
 420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Gly Ala Leu His
 435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 208

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 208

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Asp Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Glu Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp

420

425

430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Gly Ala Leu His
 435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 209

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 209

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
 20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
 35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
 50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
 65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
 100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
 115 120 125

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

130

135

140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
 145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
 165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
 180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
 195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
 210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
 225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
 245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
 260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
 275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 210
<211> 462
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy chain antibody sequence

<400> 210

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Ser Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val

275

280

285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Glu Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 211

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 211

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys
50 55 60

Ser Arg Val Thr Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Lys Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp

420

425

430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
 435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 212

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 212

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ala
 20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
 35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys
 50 55 60

Ser Arg Val Thr Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
 65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
 100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Lys Gly Thr Gln Val
 115 120 125

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

130

135

140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
 145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
 165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
 180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
 195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
 210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
 225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
 245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
 260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
 275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 213
<211> 462
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy chain antibody sequence

<400> 213

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys
50 55 60

Ser Arg Val Thr Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Lys Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val

275

280

285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 214

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 214

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp

420

425

430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
 435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 215

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 215

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
 20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
 35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
 50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
 65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
 100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
 115 120 125

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

130

135

140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
 145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
 165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
 180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
 195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
 210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
 225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
 245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
 260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
 275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 216
<211> 462
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy chain antibody sequence

<400> 216

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val

275

280

285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 217

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 217

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp

420

425

430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
 435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 218

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 218

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
 20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
 35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
 50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
 65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
 100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Gln Gly Thr Gln Val
 115 120 125

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

130

135

140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
 145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
 165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
 180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
 195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
 210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
 225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
 245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
 260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
 275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 219
<211> 462
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy chain antibody sequence

<400> 219

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Lys Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val

275

280

285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
 355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
 370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
 385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
 405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
 420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
 435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 220

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 220

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Leu Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp

420

425

430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
 435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 221

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 221

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
 20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
 35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
 50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
 65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
 100 105 110

Ala Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
 115 120 125

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

130

135

140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
 145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
 165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
 180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
 195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
 210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
 225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
 245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
 260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
 275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 222
<211> 462
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy chain antibody sequence

<400> 222

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val

275

280

285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
 355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
 370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
 385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
 405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
 420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
 435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 223

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 223

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp

420

425

430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
 435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 224

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 224

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
 20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
 35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
 50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
 65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
 100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
 115 120 125

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

130

135

140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
 145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
 165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
 180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
 195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
 210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
 225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
 245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
 260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
 275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 225
<211> 462
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy chain antibody sequence

<400> 225

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val His Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val

275

280

285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 226

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 226

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val Thr Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp

420

425

430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
 435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 227

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 227

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
 20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
 35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys
 50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
 65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
 100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
 115 120 125

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

130

135

140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
 145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
 165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
 180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
 195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
 210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
 225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
 245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
 260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
 275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 228
<211> 462
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy chain antibody sequence

<400> 228

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

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

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val

275

280

285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
 355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
 370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
 385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
 405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
 420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
 435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 229

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 229

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ala
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp

420

425

430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
 435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 230

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 230

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Gly Ser Ile Ser Asp Ser
 20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
 35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
 50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
 65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
 100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
 115 120 125

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

130

135

140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
 145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
 165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
 180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
 195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
 210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
 225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
 245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
 260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
 275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 231
<211> 462
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy chain antibody sequence

<400> 231

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val

275

280

285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 232

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 232

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp

420

425

430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
 435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 233

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 233

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
 20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
 35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
 50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
 65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
 100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Thr Gly Thr Gln Val
 115 120 125

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

130

135

140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
 145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
 165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
 180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
 195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
 210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
 225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
 245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
 260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
 275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 234
<211> 462
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy chain antibody sequence

<400> 234

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly His Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val

275

280

285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 235

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 235

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Ala Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp

420

425

430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
 435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 236

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 236

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
 20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
 35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
 50 55 60

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

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
 100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
 115 120 125

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

130

135

140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
 145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
 165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
 180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
 195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
 210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
 225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
 245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
 260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
 275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 237
<211> 462
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy chain antibody sequence

<400> 237

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val

275

280

285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 238

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 238

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp

420

425

430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
 435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 239

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 239

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
 20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
 35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ala Pro Ser Leu Lys
 50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
 65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
 100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
 115 120 125

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

130

135

140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
 145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
 165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
 180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
 195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
 210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
 225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
 245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
 260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
 275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 240
<211> 462
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy chain antibody sequence

<400> 240

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

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

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val

275

280

285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 241

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 241

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp

420

425

430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
 435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 242

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 242

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
 20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
 35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
 50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
 65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
 100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
 115 120 125

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

130

135

140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
 145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
 165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
 180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
 195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
 210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
 225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
 245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
 260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
 275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 243
<211> 462
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy chain antibody sequence

<400> 243

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Lys Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val

275

280

285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 244

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 244

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly His Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp

420

425

430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
 435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 245

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 245

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
 20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
 35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
 50 55 60

Ser Arg Val His Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
 65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
 100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
 115 120 125

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

130

135

140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
 145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
 165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
 180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
 195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
 210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
 225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
 245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
 260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
 275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 246
<211> 462
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy chain antibody sequence

<400> 246

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val His Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Lys Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val

275

280

285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
 355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
 370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
 385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
 405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
 420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
 435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 247

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 247

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val His Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly His Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp

420

425

430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
 435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 248

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 248

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
 20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
 35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys
 50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
 65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
 100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
 115 120 125

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

130

135

140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
 145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
 165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
 180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
 195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
 210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
 225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
 245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
 260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
 275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 249
<211> 462
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy chain antibody sequence

<400> 249

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Lys Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val

275

280

285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
 355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
 370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
 385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
 405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
 420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
 435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 250

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 250

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly His Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp

420

425

430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
 435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 251

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 251

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
 20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
 35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys
 50 55 60

Ser Arg Val His Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
 65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
 100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
 115 120 125

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

130

135

140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
 145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
 165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
 180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
 195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
 210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
 225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
 245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
 260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
 275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 252
<211> 462
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy chain antibody sequence

<400> 252

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys
50 55 60

Ser Arg Val His Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Lys Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val

275

280

285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
 355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
 370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
 385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
 405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
 420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
 435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 253

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 253

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys
50 55 60

Ser Arg Val His Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Lys Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Phe Glu Gly Gly Pro Ser Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Ala Val Ser His Glu Asp Pro Glu Val
275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Gln Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Ser Ile Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp

420

425

430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
 435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 254

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 254

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
 20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
 35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys
 50 55 60

Ser Arg Val His Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
 65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
 100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Lys Gly Thr Gln Val
 115 120 125

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

130

135

140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
 145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
 165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
 180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
 195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
 210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
 225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
 245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
 260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
 275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 255
<211> 462
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy chain antibody sequence

<400> 255

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys
50 55 60

Ser Arg Val His Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly His Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val

275

280

285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 256

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 256

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

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

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp

420

425

430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
 435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 257

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 257

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
 20 25 30

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

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
 50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
 65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
 100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Lys Gly Thr Gln Val
 115 120 125

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

130

135

140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
 145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
 165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
 180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
 195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
 210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
 225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
 245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
 260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
 275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 258
<211> 462
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy chain antibody sequence

<400> 258

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

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

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly His Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val

275

280

285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
 355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
 370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
 385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
 405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
 420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
 435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 259

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 259

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

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

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val His Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp

420

425

430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
 435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 260

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 260

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
 20 25 30

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

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
 50 55 60

Ser Arg Val His Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
 65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
 100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Lys Gly Thr Gln Val
 115 120 125

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

130

135

140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
 145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
 165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
 180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
 195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
 210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
 225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
 245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
 260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
 275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 261
<211> 462
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy chain antibody sequence

<400> 261

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

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

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val His Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly His Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val

275

280

285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
 355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
 370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
 385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
 405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
 420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
 435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 262

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 262

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

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

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp

420

425

430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
 435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 263

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 263

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
 20 25 30

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

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys
 50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
 65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
 100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Lys Gly Thr Gln Val
 115 120 125

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

130

135

140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
 145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
 165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
 180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
 195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
 210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
 225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
 245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
 260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
 275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 264
<211> 462
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy chain antibody sequence

<400> 264

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

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

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly His Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val

275

280

285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 265

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 265

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

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

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys
50 55 60

Ser Arg Val His Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp

420

425

430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
 435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 266

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 266

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
 20 25 30

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

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys
 50 55 60

Ser Arg Val His Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
 65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
 100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Lys Gly Thr Gln Val
 115 120 125

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

130

135

140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
 145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
 165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
 180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
 195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
 210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
 225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
 245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
 260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
 275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 267
<211> 462
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy chain antibody sequence

<400> 267

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

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

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys
50 55 60

Ser Arg Val His Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly His Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val

275

280

285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 268

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 268

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ala
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys
50 55 60

Ser Arg Val His Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Ala Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Thr Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp

420

425

430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
 435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 269

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 269

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ala
 20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
 35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys
 50 55 60

Ser Arg Val His Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
 65 70 75 80

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

Arg Ala Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
 100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Thr Gly Thr Gln Val
 115 120 125

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

130

135

140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
 145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
 165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
 180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
 195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
 210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
 225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
 245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
 260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
 275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 270
<211> 462
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy chain antibody sequence

<400> 270

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ala
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys
50 55 60

Ser Arg Val His Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Ala Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Thr Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val

275

280

285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 271

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 271

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ala
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys
50 55 60

Ser Arg Val His Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Ala Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Thr Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp

420

425

430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
 435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 272

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 272

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
 20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
 35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys
 50 55 60

Ser Arg Val His Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
 65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
 100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Thr Gly Thr Gln Val
 115 120 125

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

130

135

140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
 145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
 165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
 180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
 195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
 210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
 225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
 245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
 260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
 275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 273
<211> 462
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy chain antibody sequence

<400> 273

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys
50 55 60

Ser Arg Val His Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Thr Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val

275

280

285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 274

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 274

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys
50 55 60

Ser Arg Val His Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Thr Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp

420

425

430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
 435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 275

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 275

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
 20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
 35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys
 50 55 60

Ser Arg Val His Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
 65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
 100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Thr Gly Thr Gln Val
 115 120 125

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

130

135

140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
 145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
 165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
 180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
 195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
 210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
 225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
 245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
 260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
 275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 276
<211> 211
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 276

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 277
<211> 211
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 277

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 278

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

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 278

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys

180

185

190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
 195 200 205

Glu Cys Ser
 210

<210> 279
 <211> 211
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic PG121 light chain antibody sequence

<400> 279

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
 1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
 20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
 35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
 50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
 65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
 85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
 100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
 115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr

130

135

140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
 145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
 165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
 180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
 195 200 205

Glu Cys Ser
 210

<210> 280

<211> 211

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 light chain antibody sequence

<400> 280

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
 1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
 20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
 35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
 50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
 65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe

85

90

95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
 100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
 115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
 130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
 145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
 165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
 180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
 195 200 205

Glu Cys Ser
 210

<210> 281
 <211> 211
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic PG121 light chain antibody sequence

<400> 281

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
 1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
 20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser

35

40

45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
 50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
 65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
 85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
 100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
 115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
 130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
 145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
 165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
 180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
 195 200 205

Glu Cys Ser
 210

<210> 282

<211> 211

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 light chain antibody sequence

<400> 282

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 283

<211> 211

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 light chain antibody sequence

<400> 283

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 284
<211> 211
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 284

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 285
<211> 211
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 285

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 286
<211> 211
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 286

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 287

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

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 287

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys

180

185

190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
 195 200 205

Glu Cys Ser
 210

<210> 288

<211> 211

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 light chain antibody sequence

<400> 288

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
 1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
 20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
 35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
 50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
 65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
 85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
 100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
 115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr

130

135

140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
 145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
 165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
 180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
 195 200 205

Glu Cys Ser
 210

<210> 289

<211> 211

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 light chain antibody sequence

<400> 289

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
 1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
 20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
 35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
 50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
 65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe

85

90

95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
 100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
 115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
 130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
 145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
 165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
 180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
 195 200 205

Glu Cys Ser
 210

<210> 290

<211> 211

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 light chain antibody sequence

<400> 290

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
 1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
 20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser

35

40

45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
 50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
 65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
 85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
 100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
 115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
 130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
 145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
 165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
 180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
 195 200 205

Glu Cys Ser
 210

<210> 291

<211> 211

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 light chain antibody sequence

<400> 291

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 292
<211> 211
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 292

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 293
<211> 211
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 293

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 294
<211> 211
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 294

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 295
<211> 211
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 295

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 296

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

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 296

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys

180

185

190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
 195 200 205

Glu Cys Ser
 210

<210> 297
 <211> 218
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic PG121 light chain antibody sequence

<400> 297

Ser Tyr Val Leu Thr Gln Pro Ser Asp Ile Ser Val Ala Pro Gly Glu
 1 5 10 15

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

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

Asn Asn Gln Asp Arg Pro Ser Gly Ile Pro Glu Arg Phe Ser Gly Ser
 50 55 60

Pro Asp Ser Pro Phe Gly Thr Thr Ala Thr Leu Thr Ile Thr Ser Val
 65 70 75 80

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

Val Pro Thr Lys Trp Val Phe Gly Gly Gly Thr Thr Leu Thr Val Leu
 100 105 110

Gly Gln Pro Lys Ala Ala Pro Ser Val Thr Leu Phe Pro Pro Ser Ser
 115 120 125

Glu Glu Leu Gln Ala Asn Lys Ala Thr Leu Val Cys Leu Ile Ser Asp

130

135

140

Phe Tyr Pro Gly Ala Val Thr Val Ala Trp Lys Ala Asp Ser Ser Pro
 145 150 155 160

Val Lys Ala Gly Val Glu Thr Thr Thr Pro Ser Lys Gln Ser Asn Asn
 165 170 175

Lys Tyr Ala Ala Ser Ser Tyr Leu Ser Leu Thr Pro Glu Gln Trp Lys
 180 185 190

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

Glu Lys Thr Val Ala Pro Thr Glu Cys Ser
 210 215

<210> 298

<211> 211

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 light chain antibody sequence

<400> 298

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
 1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
 20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
 35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
 50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
 65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe

85

90

95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
 100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
 115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
 130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
 145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
 165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
 180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
 195 200 205

Glu Cys Ser
 210

<210> 299

<211> 211

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 light chain antibody sequence

<400> 299

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
 1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
 20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser

35

40

45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 300

<211> 211

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 light chain antibody sequence

<400> 300

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Asn Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 301
<211> 211
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 301

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

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

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 302
<211> 218
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 302

Ser Ser Val Thr Ser Tyr Val Ser Asp Ile Ser Val Ala Pro Gly Glu
1 5 10 15

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

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

Asn Asn Gln Asp Arg Pro Ser Gly Ile Pro Glu Arg Phe Ser Gly Ser
50 55 60

Pro Asp Ser Pro Phe Gly Thr Thr Ala Thr Leu Thr Ile Thr Ser Val
65 70 75 80

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

Val Pro Thr Lys Trp Val Phe Gly Gly Gly Thr Thr Leu Thr Val Leu
100 105 110

Gly Gln Pro Lys Ala Ala Pro Ser Val Thr Leu Phe Pro Pro Ser Ser
115 120 125

Glu Glu Leu Gln Ala Asn Lys Ala Thr Leu Val Cys Leu Ile Ser Asp
130 135 140

Phe Tyr Pro Gly Ala Val Thr Val Ala Trp Lys Ala Asp Ser Ser Pro
145 150 155 160

Val Lys Ala Gly Val Glu Thr Thr Thr Pro Ser Lys Gln Ser Asn Asn
165 170 175

Lys Tyr Ala Ala Ser Ser Tyr Leu Ser Leu Thr Pro Glu Gln Trp Lys
180 185 190

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

Glu Lys Thr Val Ala Pro Thr Glu Cys Ser
210 215

<210> 303
<211> 218
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 303

Ser Tyr Val Leu Thr Gln Pro Ser Asp Ile Ser Val Ala Pro Gly Glu
1 5 10 15

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

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

Asn Asn Gln Asp Arg Pro Ser Gly Ile Pro Glu Arg Phe Ser Gly Ser
50 55 60

Pro Asp Ser Pro Phe Gly Thr Thr Ala Thr Leu Thr Ile Thr Ser Val
65 70 75 80

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

Val Pro Thr Lys Trp Val Phe Gly Gly Gly Thr Thr Leu Thr Val Leu
100 105 110

Gly Gln Pro Lys Ala Ala Pro Ser Val Thr Leu Phe Pro Pro Ser Ser
115 120 125

Glu Glu Leu Gln Ala Asn Lys Ala Thr Leu Val Cys Leu Ile Ser Asp
130 135 140

Phe Tyr Pro Gly Ala Val Thr Val Ala Trp Lys Ala Asp Ser Ser Pro
145 150 155 160

Val Lys Ala Gly Val Glu Thr Thr Thr Pro Ser Lys Gln Ser Asn Asn
165 170 175

Lys Tyr Ala Ala Ser Ser Tyr Leu Ser Leu Thr Pro Glu Gln Trp Lys
180 185 190

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

Glu Lys Thr Val Ala Pro Thr Glu Cys Ser
210 215

<210> 304
<211> 211
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 304

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 305

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

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 305

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys

180

185

190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
 195 200 205

Glu Cys Ser
 210

<210> 306
 <211> 211
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic PG121 light chain antibody sequence

<400> 306

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
 1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
 20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
 35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
 50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
 65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
 85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
 100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
 115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr

130

135

140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
 145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
 165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
 180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
 195 200 205

Glu Cys Ser
 210

<210> 307

<211> 211

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 light chain antibody sequence

<400> 307

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
 1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
 20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
 35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
 50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
 65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe

85

90

95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
 100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
 115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
 130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
 145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
 165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
 180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
 195 200 205

Glu Cys Ser
 210

<210> 308
 <211> 211
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic PG121 light chain antibody sequence

<400> 308

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
 1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
 20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser

35

40

45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
 50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
 65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
 85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
 100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
 115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
 130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
 145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
 165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
 180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
 195 200 205

Glu Cys Ser
 210

<210> 309

<211> 211

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 light chain antibody sequence

<400> 309

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 310
<211> 211
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 310

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 311
<211> 211
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 311

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 312
<211> 211
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 312

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 313
<211> 211
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 313

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 314

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

<220>

<223> Synthetic PG121 light chain antibody sequence

<400> 314

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln Gln Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys

180

185

190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
 195 200 205

Glu Cys Ser
 210

<210> 315
 <211> 211
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic PG121 light chain antibody sequence

<400> 315

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
 1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
 20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
 35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
 50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
 65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
 85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
 100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
 115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr

130

135

140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
 145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
 165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
 180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
 195 200 205

Glu Cys Ser
 210

<210> 316

<211> 211

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 light chain antibody sequence

<400> 316

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
 1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
 20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
 35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
 50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
 65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe

85

90

95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
 100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
 115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
 130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
 145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
 165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
 180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
 195 200 205

Glu Cys Ser
 210

<210> 317

<211> 211

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 light chain antibody sequence

<400> 317

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
 1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
 20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser

35

40

45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
 50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
 65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
 85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
 100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
 115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
 130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
 145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
 165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
 180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
 195 200 205

Glu Cys Ser
 210

<210> 318

<211> 211

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 light chain antibody sequence

<400> 318

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 319

<211> 211

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 light chain antibody sequence

<400> 319

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 320
<211> 211
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 320

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 321
<211> 211
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 321

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 322
<211> 211
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 322

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 323

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

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 323

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys

180

185

190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
 195 200 205

Glu Cys Ser
 210

<210> 324
 <211> 211
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic PG121 light chain antibody sequence

<400> 324

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
 1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
 20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
 35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
 50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
 65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
 85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
 100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
 115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr

130

135

140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
 145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
 165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
 180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
 195 200 205

Glu Cys Ser
 210

<210> 325

<211> 211

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 light chain antibody sequence

<400> 325

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
 1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
 20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
 35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
 50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
 65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe

85

90

95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
 100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
 115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
 130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
 145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
 165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
 180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
 195 200 205

Glu Cys Ser
 210

<210> 326
 <211> 211
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic PG121 light chain antibody sequence

<400> 326

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
 1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
 20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser

35

40

45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 327

<211> 211

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 light chain antibody sequence

<400> 327

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 328
<211> 211
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 328

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 329
<211> 211
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 329

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

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

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 330

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 331
<211> 211
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 331

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 332

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

<220>

<223> Synthetic PG121 light chain antibody sequence

<400> 332

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys

180

185

190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
 195 200 205

Glu Cys Ser
 210

<210> 333

<211> 211

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 light chain antibody sequence

<400> 333

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
 1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
 20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
 35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
 50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
 65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
 85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
 100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
 115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr

130

135

140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
 145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
 165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
 180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
 195 200 205

Glu Cys Ser
 210

<210> 334
 <211> 211
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic PG121 light chain antibody sequence

<400> 334

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
 1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
 20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
 35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
 50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
 65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe

85

90

95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
 100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
 115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
 130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
 145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
 165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
 180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
 195 200 205

Glu Cys Ser
 210

<210> 335

<211> 211

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 light chain antibody sequence

<400> 335

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
 1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
 20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser

35

40

45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
 50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
 65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
 85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
 100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
 115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
 130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
 145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
 165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
 180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
 195 200 205

Glu Cys Ser
 210

<210> 336
 <211> 211
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic PG121 light chain antibody sequence

<400> 336

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 337
<211> 211
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 337

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 338
<211> 211
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 338

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 339
<211> 211
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 339

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 340
<211> 211
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 340

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 341

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

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 341

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys

180

185

190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
 195 200 205

Glu Cys Ser
 210

<210> 342
 <211> 211
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic PG121 light chain antibody sequence

<400> 342

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
 1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
 20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
 35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
 50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
 65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
 85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
 100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
 115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr

130

135

140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
 145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
 165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
 180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
 195 200 205

Glu Cys Ser
 210

<210> 343

<211> 211

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 light chain antibody sequence

<400> 343

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
 1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
 20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
 35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
 50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
 65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe

85

90

95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
 100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
 115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
 130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
 145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
 165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
 180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
 195 200 205

Glu Cys Ser
 210

<210> 344
 <211> 211
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic PG121 light chain antibody sequence

<400> 344

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
 1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
 20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser

35

40

45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
 50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
 65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
 85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
 100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
 115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
 130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
 145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
 165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
 180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
 195 200 205

Glu Cys Ser
 210

<210> 345

<211> 211

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 light chain antibody sequence

<400> 345

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 346
<211> 211
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 346

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 347
<211> 211
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 347

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 348
<211> 211
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 348

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 349
<211> 211
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 349

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 350

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

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 350

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys

180

185

190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
 195 200 205

Glu Cys Ser
 210

<210> 351
 <211> 211
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic PG121 light chain antibody sequence

<400> 351

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
 1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
 20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
 35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
 50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
 65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
 85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
 100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
 115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr

130

135

140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
 145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
 165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
 180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
 195 200 205

Glu Cys Ser
 210

<210> 352

<211> 211

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 light chain antibody sequence

<400> 352

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
 1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
 20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
 35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
 50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
 65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe

85

90

95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
 100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
 115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
 130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
 145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
 165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
 180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
 195 200 205

Glu Cys Ser
 210

<210> 353
 <211> 211
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic PG121 light chain antibody sequence

<400> 353

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
 1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
 20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser

35

40

45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
 50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
 65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
 85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
 100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
 115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
 130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
 145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
 165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
 180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
 195 200 205

Glu Cys Ser
 210

<210> 354

<211> 211

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 light chain antibody sequence

<400> 354

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Arg Pro Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Lys Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 355
<211> 211
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 355

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Arg Pro Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 356
<211> 211
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 356

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Lys Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 357
<211> 211
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 357

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 358
<211> 211
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 358

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Arg Pro Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Lys Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 359

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

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 359

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Arg Pro Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys

180

185

190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
 195 200 205

Glu Cys Ser
 210

<210> 360

<211> 211

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 light chain antibody sequence

<400> 360

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
 1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
 20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
 35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
 50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
 65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
 85 90 95

Gly Gly Gly Thr Lys Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
 100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
 115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr

130

135

140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
 145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
 165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
 180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
 195 200 205

Glu Cys Ser
 210

<210> 361

<211> 211

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 light chain antibody sequence

<400> 361

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
 1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
 20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
 35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
 50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
 65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe

85

90

95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
 100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
 115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
 130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
 145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
 165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
 180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
 195 200 205

Glu Cys Ser
 210

<210> 362
 <211> 5
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic PG121 heavy CDR1 (kabat) sequence

<400> 362

Asp Ser Tyr Trp Ser
 1 5

<210> 363
 <211> 5
 <212> PRT
 <213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy CDR1 (kabat) sequence

<400> 363

Asp Ala Tyr Trp Ser
1 5

<210> 364

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy CDR2 (kabat) sequence

<400> 364

Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys Ser
1 5 10 15

<210> 365

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy CDR2 (kabat) sequence

<400> 365

Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ala Pro Ser Leu Lys Ser
1 5 10 15

<210> 366

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy CDR2 (kabat) sequence

<400> 366

Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys Ser
1 5 10 15

<210> 367

<211> 24

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy CDR3 (kabat) sequence

<400> 367

Thr	Leu	His	Gly	Arg	Arg	Ile	Tyr	Gly	Ile	Val	Ala	Phe	Asn	Glu	Trp
1				5					10					15	

Phe	Thr	Tyr	Phe	Tyr	Met	Asp	Val
				20			

<210> 368

<211> 24

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy CDR3 (kabat) sequence

<400> 368

Ala	Leu	His	Gly	Arg	Arg	Ile	Tyr	Gly	Ile	Val	Ala	Phe	Asn	Glu	Trp
1				5					10					15	

Phe	Thr	Tyr	Phe	Tyr	Met	Asp	Val
				20			

<210> 369

<211> 24

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy CDR3 (kabat) sequence

<400> 369

Thr	Leu	His	Gly	Arg	Arg	Ile	Tyr	Gly	Ile	Val	Ala	Phe	Asn	Glu	Ala
1				5					10					15	

Phe	Thr	Tyr	Phe	Tyr	Met	Asp	Val
				20			

<210> 370

<211> 24

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy CDR3 (kabat) sequence

<400> 370

Thr	Leu	His	Gly	Arg	Arg	Ile	Tyr	Gly	Ile	Val	Ala	Phe	Asn	Glu	Leu
1				5				10					15		

Phe	Thr	Tyr	Phe	Tyr	Met	Asp	Val
			20				

<210> 371

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy CDR1 (IMGT) sequence

<400> 371

Gly	Ala	Ser	Ile	Ser	Asp	Ser	Tyr
1				5			

<210> 372

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy CDR1 (IMGT) sequence

<400> 372

Gly	Ala	Ser	Ile	Ser	Asp	Ala	Tyr
1				5			

<210> 373

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy CDR1 (IMGT) sequence

<400> 373

Gly	Gly	Ser	Ile	Ser	Asp	Ser	Tyr
-----	-----	-----	-----	-----	-----	-----	-----

1 5

<210> 374
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy CDR2 (IMGT) sequence

<400> 374

Val His Lys Ser Gly Asp Thr
1 5

<210> 375
<211> 26
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy CDR3 (IMGT) sequence

<400> 375

Ala Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn
1 5 10 15

Glu Trp Phe Thr Tyr Phe Tyr Met Asp Val
20 25

<210> 376
<211> 26
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy CDR3 (IMGT) sequence

<400> 376

Ala Arg Ala Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn
1 5 10 15

Glu Trp Phe Thr Tyr Phe Tyr Met Asp Val
20 25

<210> 377

<211> 26
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy CDR3 (IMGT) sequence

<400> 377

Ala	Arg	Thr	Leu	His	Gly	Arg	Arg	Ile	Tyr	Gly	Ile	Val	Ala	Phe	Asn
1				5					10					15	

Glu	Ala	Phe	Thr	Tyr	Phe	Tyr	Met	Asp	Val
			20					25	

<210> 378
<211> 26
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy CDR3 (IMGT) sequence

<400> 378

Ala	Arg	Thr	Leu	His	Gly	Arg	Arg	Ile	Tyr	Gly	Ile	Val	Ala	Phe	Asn
1				5					10					15	

Glu	Leu	Phe	Thr	Tyr	Phe	Tyr	Met	Asp	Val
			20					25	

<210> 379
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy CDR1 (Clothia) sequence

<400> 379

Gly	Ala	Ser	Ile	Ser	Asp	Ser
1				5		

<210> 380
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy CDR1 (Clothia) sequence

<400> 380

Gly Ala Ser Ile Ser Asp Ala
1 5

<210> 381
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy CDR1 (Clothia) sequence

<400> 381

Gly Gly Ser Ile Ser Asp Ser
1 5

<210> 382
<211> 22
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy CDR3 (Clothia) sequence

<400> 382

Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu Trp Phe
1 5 10 15

Thr Tyr Phe Tyr Met Asp
20

<210> 383
<211> 22
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy CDR3 (Clothia) sequence

<400> 383

Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu Ala Phe
1 5 10 15

Thr Tyr Phe Tyr Met Asp
20

<210> 384
<211> 22
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy CDR3 (Clothia) sequence

<400> 384

Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu Leu Phe
1 5 10 15

Thr Tyr Phe Tyr Met Asp
20

<210> 385
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy CDR1 (Honegger) sequence

<400> 385

Val Ser Gly Ala Ser Ile Ser Asp Ser Tyr
1 5 10

<210> 386
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy CDR1 (Honegger) sequence

<400> 386

Val Ser Gly Ala Ser Ile Ser Asp Ala Tyr
1 5 10

<210> 387
<211> 10
<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy CDR1 (Honegger) sequence

<400> 387

Val	Ser	Gly	Gly	Ser	Ile	Ser	Asp	Ser	Tyr
1				5					10

<210> 388

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy CDR2 (Honegger) sequence

<400> 388

Val	His	Lys	Ser	Gly	Asp	Thr	Asn	Tyr	Ser	Pro	Ser	Leu	Lys	Ser	Arg
1				5					10					15	

<210> 389

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy CDR2 (Honegger) sequence

<400> 389

Val	His	Lys	Ser	Gly	Asp	Thr	Asn	Tyr	Ala	Pro	Ser	Leu	Lys	Ser	Arg
1				5					10					15	

<210> 390

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy CDR2 (Honegger) sequence

<400> 390

Val	His	Lys	Ser	Gly	Asp	Thr	Asn	Tyr	Asn	Pro	Ser	Leu	Lys	Ser	Arg
1				5					10					15	

<210> 391

<211> 23
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy CDR3 (Honegger) sequence

<400> 391

Thr	Leu	His	Gly	Arg	Arg	Ile	Tyr	Gly	Ile	Val	Ala	Phe	Asn	Glu	Trp
1				5					10					15	

Phe	Thr	Tyr	Phe	Tyr	Met	Asp
				20		

<210> 392
<211> 23
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy CDR3 (Honegger) sequence

<400> 392

Ala	Leu	His	Gly	Arg	Arg	Ile	Tyr	Gly	Ile	Val	Ala	Phe	Asn	Glu	Trp
1				5					10					15	

Phe	Thr	Tyr	Phe	Tyr	Met	Asp
				20		

<210> 393
<211> 23
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy CDR3 (Honegger) sequence

<400> 393

Thr	Leu	His	Gly	Arg	Arg	Ile	Tyr	Gly	Ile	Val	Ala	Phe	Asn	Glu	Ala
1				5					10					15	

Phe	Thr	Tyr	Phe	Tyr	Met	Asp
				20		

<210> 394

<211> 23
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy CDR3 (Honegger) sequence

<400> 394

Thr	Leu	His	Gly	Arg	Arg	Ile	Tyr	Gly	Ile	Val	Ala	Phe	Asn	Glu	Leu
1				5					10					15	

Phe	Thr	Tyr	Phe	Tyr	Met	Asp
				20		

<210> 395
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121light CDR1 (Kabat) sequence

<400> 395

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

<210> 396
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121light CDR2 (Kabat) sequence

<400> 396

Asn	Asn	Gln	Asp	Arg	Pro	Ser
1				5		

<210> 397
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121light CDR3 (Kabat, IMGT) sequence

<400> 397

His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val
1 5 10

<210> 398
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121light CDR3 (Kabat, IMGT) sequence

<400> 398

His Ile Trp Asp Ser Arg Val Pro Thr Asn Trp Val
1 5 10

<210> 399
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121light CDR1 (IMGT) sequence

<400> 399

Ser Leu Gly Ser Arg Ala
1 5

<210> 400
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121light CDR1 (Clothia, Honegger) sequence

<400> 400

Glu Lys Ser Leu Gly Ser Arg Ala
1 5

<210> 401
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121light CDR3 (Clothia, Honegger) sequence

<400> 401

Trp Asp Ser Arg Val Pro Thr Lys Trp
1 5

<210> 402

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121light CDR3 (Clothia, Honegger) sequence

<400> 402

Trp Asp Ser Arg Val Pro Thr Asn Trp
1 5

<210> 403

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121light CDR2 (Honegger) sequence

<400> 403

Asn Asn Gln Asp Arg Pro Ser Gly Ile Pro Glu Arg
1 5 10

<210> 404

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG123 heavy chain antibody sequence

<400> 404

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Asn Asp Ala
20 25 30

Tyr Trp Ser Trp Ile Arg Gln Ser Pro Gly Lys Arg Pro Glu Trp Val

35

40

45

Gly Tyr Val His His Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys
 50 55 60

Arg Arg Val Thr Phe Ser Leu Asp Thr Ala Lys Asn Glu Val Ser Leu
 65 70 75 80

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

Arg Ala Leu His Gly Lys Arg Ile Tyr Gly Ile Val Ala Leu Gly Glu
 100 105 110

Leu Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Lys Gly Thr Ala Val
 115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
 130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
 145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
 165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
 180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
 195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
 210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
 225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
 245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 405

<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG123 heavy CDR2 (Kabat) sequence

<400> 405

Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys Ser
1 5 10 15

<210> 406
<211> 24
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG123 heavy CDR3 (Kabat) sequence

<400> 406

Ala Leu His Gly Lys Arg Ile Tyr Gly Ile Val Ala Leu Gly Glu Leu
1 5 10 15

Phe Thr Tyr Phe Tyr Met Asp Val
20

<210> 407
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG123 heavy CDR1 (IMGT) sequence

<400> 407

Gly Ala Ser Ile Asn Asp Ala Tyr
1 5

<210> 408
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG123 heavy CDR2 (IMGT) sequence

<400> 408

Val His His Ser Gly Asp Thr
1 5

<210> 409
<211> 26
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG123 heavy CDR3 (IMGT) sequence

<400> 409

Ala Arg Ala Leu His Gly Lys Arg Ile Tyr Gly Ile Val Ala Leu Gly
1 5 10 15

Glu Leu Phe Thr Tyr Phe Tyr Met Asp Val
20 25

<210> 410
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG123 heavy CDR1 (Clothia) sequence

<400> 410

Gly Ala Ser Ile Asn Asp Ala
1 5

<210> 411
<211> 22
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG123 heavy CDR3 (Clothia) sequence

<400> 411

Leu His Gly Lys Arg Ile Tyr Gly Ile Val Ala Leu Gly Glu Leu Phe
1 5 10 15

Thr Tyr Phe Tyr Met Asp
20

<210> 412
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG123 heavy CDR1 (Honegger) sequence

<400> 412

Val Ser Gly Ala Ser Ile Asn Asp Ala Tyr
1 5 10

<210> 413
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG123 heavy CDR2 (Honegger) sequence

<400> 413

Val His His Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys Arg Arg
1 5 10 15

<210> 414
<211> 23
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG123 heavy CDR3 (Honegger) sequence

<400> 414

Ala Leu His Gly Lys Arg Ile Tyr Gly Ile Val Ala Leu Gly Glu Leu
1 5 10 15

Phe Thr Tyr Phe Tyr Met Asp
20

<210> 415
<211> 211
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG123 light chain antibody sequence

<400> 415

Ser Ser Met Ser Val Ser Pro Gly Glu Thr Ala Lys Ile Ser Cys Gly
1 5 10 15

Lys Glu Ser Ile Gly Ser Arg Ala Val Gln Trp Tyr Gln Gln Lys Pro
20 25 30

Gly Gln Pro Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ala
35 40 45

Gly Val Pro Glu Arg Phe Ser Ala Ser Pro Asp Phe Arg Pro Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Asn Val Asp Ala Glu Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Tyr Asp Ala Arg Gly Gly Thr Asn Trp Val Phe
85 90 95

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

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 416
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG123light CDR1 (Kabat) sequence

<400> 416

Gly Lys Glu Ser Ile Gly Ser Arg Ala Val Gln
1 5 10

<210> 417
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG123light CDR2 (Kabat) sequence

<400> 417

Asn Asn Gln Asp Arg Pro Ala
1 5

<210> 418
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG123light CDR3 (Kabat, IMGT) sequence

<400> 418

His Ile Tyr Asp Ala Arg Gly Gly Thr Asn Trp Val
1 5 10

<210> 419
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG123light CDR1 (IMGT) sequence

<400> 419

Ser Ile Gly Ser Arg Ala
1 5

<210> 420

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG123light CDR1 (Clothia, Honegger) sequence

<400> 420

Lys Glu Ser Ile Gly Ser Arg Ala
1 5

<210> 421

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG123 light CDR3 (Clothia, Honegger) sequence

<400> 421

Tyr Asp Ala Arg Gly Gly Thr Asn Trp
1 5

<210> 422

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG123 light CDR2 (Honegger) sequence

<400> 422

Asn Asn Gln Asp Arg Pro Ala Gly Val Pro Glu Arg
1 5 10

<210> 423

<211> 481

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 423

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu

195

200

205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
 210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
 225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
 245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
 260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
 275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
 355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
 370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
 385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
 405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys Gly Gly
450 455 460

Ser Gly Gly Leu Asn Asp Ile Phe Glu Ala Gln Lys Ile Glu Trp His
465 470 475 480

Glu

<210> 424
<211> 211
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 424

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 425
<211> 481
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 heavy chain antibody sequence

<400> 425

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys
50 55 60

Ser Arg Val His Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Lys Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro

260

265

270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
 275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
 355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
 370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
 385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
 405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
 420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
 435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys Gly Gly
 450 455 460

Ser Gly Gly Leu Asn Asp Ile Phe Glu Ala Gln Lys Ile Glu Trp His
 465 470 475 480

Glu

<210> 426
<211> 211
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG121 light chain antibody sequence

<400> 426

Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 427
<211> 462
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG123 heavy chain antibody sequence

<400> 427

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Asn Asp Ala
20 25 30

Tyr Trp Ser Trp Ile Arg Gln Ser Pro Gly Lys Arg Pro Glu Trp Val
35 40 45

Gly Tyr Val His His Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys
50 55 60

Arg Arg Val Thr Phe Ser Leu Asp Thr Ala Lys Asn Glu Val Ser Leu
65 70 75 80

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

Arg Ala Leu His Gly Lys Arg Ile Tyr Gly Ile Val Ala Leu Gly Glu
100 105 110

Leu Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Lys Gly Thr Ala Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Arg Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys

325

330

335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
 340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
 355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
 370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
 385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
 405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
 420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
 435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 428

<211> 211

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG123 light chain antibody sequence

<400> 428

Ser Ser Met Ser Val Ser Pro Gly Glu Thr Ala Lys Ile Ser Cys Gly
 1 5 10 15

Lys Glu Ser Ile Gly Ser Arg Ala Val Gln Trp Tyr Gln Gln Lys Pro
 20 25 30

Gly Gln Pro Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ala

35

40

45

Gly Val Pro Glu Arg Phe Ser Ala Ser Pro Asp Phe Arg Pro Gly Thr
 50 55 60

Thr Ala Thr Leu Thr Ile Thr Asn Val Asp Ala Glu Asp Glu Ala Asp
 65 70 75 80

Tyr Tyr Cys His Ile Tyr Asp Ala Arg Gly Gly Thr Asn Trp Val Phe
 85 90 95

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

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
 115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
 130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
 145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
 165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Lys Ser Tyr Ser Cys
 180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
 195 200 205

Glu Cys Ser
 210

<210> 429

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG122 heavy chain antibody sequence

<400> 429

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

Thr Leu Ser Leu Thr Cys Asn Val Ser Gly Thr Leu Val Arg Asp Asn
20 25 30

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

Gly Tyr Val His Asp Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys
50 55 60

Ser Arg Val His Leu Ser Leu Asp Lys Ser Lys Asn Leu Val Ser Leu
65 70 75 80

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

Thr Thr Lys His Gly Arg Arg Ile Tyr Gly Val Val Ala Phe Lys Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Lys Gly Thr Ser Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Arg Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp

420

425

430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
 435 440 445

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 450 455 460

<210> 430

<211> 211

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG122 light chain antibody sequence

<400> 430

Thr Phe Val Ser Val Ala Pro Gly Gln Thr Ala Arg Ile Thr Cys Gly
 1 5 10 15

Glu Glu Ser Leu Gly Ser Arg Ser Val Ile Trp Tyr Gln Gln Arg Pro
 20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Asn Asp Arg Pro Ser
 35 40 45

Gly Ile Pro Asp Arg Phe Ser Gly Ser Pro Gly Ser Thr Phe Gly Thr
 50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
 65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Arg Pro Thr Asn Trp Val Phe
 85 90 95

Gly Glu Gly Thr Thr Leu Ile Val Leu Ser Gln Pro Lys Ala Ala Pro
 100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
 115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr

130

135

140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
 145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
 165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Lys Ser Tyr Ser Cys
 180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
 195 200 205

Glu Cys Ser
 210

<210> 431
 <211> 5
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic PG122 heavy CDR1 (Kabat) sequence

<400> 431

Asp Asn Tyr Trp Ser
 1 5

<210> 432
 <211> 16
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic PG122 heavy CDR2 (Kabat) sequence

<400> 432

Tyr Val His Asp Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys Ser
 1 5 10 15

<210> 433
 <211> 24
 <212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG122 heavy CDR3 (Kabat) sequence

<400> 433

Thr Lys His Gly Arg Arg Ile Tyr Gly Val Val Ala Phe Lys Glu Trp
1 5 10 15

Phe Thr Tyr Phe Tyr Met Asp Val
20

<210> 434

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG122 heavy CDR1 (IMGT) sequence

<400> 434

Gly Thr Leu Val Arg Asp Asn Tyr
1 5

<210> 435

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG122 heavy CDR2 (IMGT) sequence

<400> 435

Val His Asp Ser Gly Asp Thr
1 5

<210> 436

<211> 26

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG122 heavy CDR3 (IMGT) sequence

<400> 436

Ala Thr Thr Lys His Gly Arg Arg Ile Tyr Gly Val Val Ala Phe Lys

1 5 10 15

Glu Trp Phe Thr Tyr Phe Tyr Met Asp Val
20 25

<210> 437
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG122 heavy CDR1 (Clothia) sequence

<400> 437

Gly Thr Leu Val Arg Asp Asn
1 5

<210> 438
<211> 22
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG122 heavy CDR3 (Clothia) sequence

<400> 438

Lys His Gly Arg Arg Ile Tyr Gly Val Val Ala Phe Lys Glu Trp Phe
1 5 10 15

Thr Tyr Phe Tyr Met Asp
20

<210> 439
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG122 heavy CDR1 (Honegger) sequence

<400> 439

Val Ser Gly Thr Leu Val Arg Asp Asn Tyr
1 5 10

<210> 440

<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG122 heavy CDR2 (Honegger) sequence

<400> 440

Val	His	Asp	Ser	Gly	Asp	Thr	Asn	Tyr	Asn	Pro	Ser	Leu	Lys	Ser	Arg
1				5					10					15	

<210> 441
<211> 23
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG122 heavy CDR3 (Honegger) sequence

<400> 441

Thr	Lys	His	Gly	Arg	Arg	Ile	Tyr	Gly	Val	Val	Ala	Phe	Lys	Glu	Trp
1				5					10					15	

Phe	Thr	Tyr	Phe	Tyr	Met	Asp
				20		

<210> 442
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG122 light CDR1 (Kabat) sequence

<400> 442

Gly	Glu	Glu	Ser	Leu	Gly	Ser	Arg	Ser	Val	Ile
1				5					10	

<210> 443
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG122 light CDR2 (Kabat) sequence

<400> 443

Asn Asn Asn Asp Arg Pro Ser
1 5

<210> 444
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG122 light CDR3 (Kabat, IMGT) sequence

<400> 444

His Ile Trp Asp Ser Arg Arg Pro Thr Asn Trp Val
1 5 10

<210> 445
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG122 light CDR1 (IMGT) sequence

<400> 445

Ser Leu Gly Ser Arg Ser
1 5

<210> 446
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG122 light CDR1 (Clothia, Honegger) sequence

<400> 446

Glu Glu Ser Leu Gly Ser Arg Ser
1 5

<210> 447
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic PG122 light CDR3 (Clothia, Honegger) sequence

<400> 447

Trp Asp Ser Arg Arg Pro Thr Asn Trp
1 5

<210> 448

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG122 light CDR2 (Honegger) sequence

<400> 448

Asn Asn Asn Asp Arg Pro Ser Gly Ile Pro Asp Arg
1 5 10

<210> 449

<211> 462

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic PG121 heavy chain antibody sequence

<400> 449

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

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Ser Pro Ser Leu Lys
50 55 60

Ser Arg Val Asn Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

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

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Asn Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Arg Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val

305		310		315		320
Leu Thr Val	Leu His Gln Asp Trp	Leu Asn Gly Lys Glu Tyr	Lys Cys			
	325	330	335			
Lys Val Ser	Asn Lys Ala Leu Pro	Ala Pro Ile Glu Lys Thr Ile Ser				
	340	345	350			
Lys Ala Lys Gly Gln Pro Arg	Glu Pro Gln Val Tyr Thr Leu Pro Pro					
	355	360	365			
Ser Arg Glu Glu Met Thr	Lys Asn Gln Val Ser Leu Thr Cys Leu Val					
	370	375	380			
Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val	Glu Trp Glu Ser Asn Gly					
385	390	395	400			
Gln Pro Glu Asn Asn Tyr Lys Thr Thr	Pro Pro Val Leu Asp Ser Asp					
	405	410	415			
Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp						
	420	425	430			
Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His						
	435	440	445			
Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys						
	450	455	460			
<210>	450					
<211>	211					
<212>	PRT					
<213>	Artificial Sequence					
<220>						
<223>	Synthetic PG121 light chain antibody sequence					
<400>	450					
Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly						
1	5	10	15			
Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala						

20

25

30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
 35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
 50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
 65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
 85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
 100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
 115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
 130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
 145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
 165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Lys Ser Tyr Ser Cys
 180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
 195 200 205

Glu Cys Ser
 210