

SEQUENCE LISTING

<110> Pieris Pharmaceuticals GmbH

<120> Novel fusion proteins specific for CD137 and GPC3

<130> PIE16678PCT

<150> EP 19000100.8

<151> 2019-02-26

<160> 129

<170> PatentIn version 3.5

<210> 1

<211> 158

<212> PRT

<213> human

<400> 1

His His Leu Leu Ala Ser Asp Glu Glu Ile Gln Asp Val Ser Gly Thr
1 5 10 15

Trp Tyr Leu Lys Ala Met Thr Val Asp Arg Glu Phe Pro Glu Met Asn
20 25 30

Leu Glu Ser Val Thr Pro Met Thr Leu Thr Thr Leu Glu Gly Gly Asn
35 40 45

Leu Glu Ala Lys Val Thr Met Leu Ile Ser Gly Arg Cys Gln Glu Val
50 55 60

Lys Ala Val Leu Glu Lys Thr Asp Glu Pro Gly Lys Tyr Thr Ala Asp
65 70 75 80

Gly Gly Lys His Val Ala Tyr Ile Ile Arg Ser His Val Lys Asp His
85 90 95

Tyr Ile Phe Tyr Cys Glu Gly Glu Leu His Gly Lys Pro Val Arg Gly
100 105 110

Val Lys Leu Val Gly Arg Asp Pro Lys Asn Asn Leu Glu Ala Leu Glu
115 120 125

Asp Phe Glu Lys Ala Ala Gly Ala Arg Gly Leu Ser Thr Glu Ser Ile
130 135 140

Leu Ile Pro Arg Gln Ser Glu Thr Cys Ser Pro Gly Ser Asp
145 150 155

<210> 2
<211> 178
<212> PRT
<213> human

<400> 2

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe Gln Gly Lys Trp Tyr
20 25 30

Val Val Gly Leu Ala Gly Asn Ala Ile Leu Arg Glu Asp Lys Asp Pro
35 40 45

Gln Lys Met Tyr Ala Thr Ile Tyr Glu Leu Lys Glu Asp Lys Ser Tyr
50 55 60

Asn Val Thr Ser Val Leu Phe Arg Lys Lys Lys Cys Asp Tyr Trp Ile
65 70 75 80

Arg Thr Phe Val Pro Gly Cys Gln Pro Gly Glu Phe Thr Leu Gly Asn
85 90 95

Ile Lys Ser Tyr Pro Gly Leu Thr Ser Tyr Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Lys Val Ser Gln
115 120 125

Asn Arg Glu Tyr Phe Lys Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly

<210> 3
<211> 178
<212> PRT
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 3

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe His Gly Lys Trp Tyr
20 25 30

Val Val Gly Leu Ala Gly Asn Ala Ile Leu Arg Glu Asp Lys Asp Pro
35 40 45

Gln Lys Met Tyr Ala Thr Ile Tyr Glu Leu Lys Glu Asp Lys Ser Tyr
50 55 60

Asn Val Thr Ser Val Leu Phe Arg Lys Lys Lys Cys Asp Tyr Trp Ile
65 70 75 80

Arg Thr Phe Val Pro Gly Ser Gln Pro Gly Glu Phe Thr Leu Gly Asn
85 90 95

Ile Lys Ser Tyr Pro Gly Leu Thr Ser Tyr Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Lys Val Ser Gln
115 120 125

Asn Arg Glu Tyr Phe Lys Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly

<210> 4
<211> 152
<212> PRT
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 4

Ala Ser Asp Glu Glu Ile Gln Asp Val Ser Gly Thr Trp Tyr Leu Lys
1 5 10 15

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

Thr Pro Met Thr Leu Thr Thr Leu Glu Gly Gly Asn Leu Glu Ala Lys
35 40 45

Val Thr Met Leu Ile Ser Gly Arg Ser Gln Glu Val Lys Ala Val Leu
50 55 60

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

Val Ala Tyr Ile Ile Arg Ser His Val Lys Asp His Tyr Ile Phe Tyr
85 90 95

Ser Glu Gly Glu Cys His Gly Lys Pro Val Pro Gly Val Trp Leu Val
100 105 110

Gly Arg Asp Pro Lys Asn Asn Leu Glu Ala Leu Glu Asp Phe Glu Lys
115 120 125

Ala Ala Gly Ala Arg Gly Leu Ser Thr Glu Ser Ile Leu Ile Pro Arg
130 135 140

Gln Ser Glu Thr Ser Ser Pro Gly
145 150

<210> 5
<211> 4
<212> PRT
<213> human

<400> 5

His His Leu Leu
1

<210> 6
<211> 535
<212> PRT
<213> human

<400> 6

Gln Pro Pro Pro Pro Pro Pro Asp Ala Thr Cys His Gln Val Arg Ser
1 5 10 15

Phe Phe Gln Arg Leu Gln Pro Gly Leu Lys Trp Val Pro Glu Thr Pro
20 25 30

Val Pro Gly Ser Asp Leu Gln Val Cys Leu Pro Lys Gly Pro Thr Cys
35 40 45

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

Met Glu Gln Leu Leu Gln Ser Ala Ser Met Glu Leu Lys Phe Leu Ile
65 70 75 80

Ile Gln Asn Ala Ala Val Phe Gln Glu Ala Phe Glu Ile Val Val Arg
85 90 95

His Ala Lys Asn Tyr Thr Asn Ala Met Phe Lys Asn Asn Tyr Pro Ser
100 105 110

Leu Thr Pro Gln Ala Phe Glu Phe Val Gly Glu Phe Phe Thr Asp Val
115 120 125

Ser Leu Tyr Ile Leu Gly Ser Asp Ile Asn Val Asp Asp Met Val Asn
130 135 140

Glu Leu Phe Asp Ser Leu Phe Pro Val Ile Tyr Thr Gln Leu Met Asn
145 150 155 160

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

Ala Arg Arg Asp Leu Lys Val Phe Gly Asn Phe Pro Lys Leu Ile Met
180 185 190

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

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

Ser Lys Asp Cys Gly Arg Met Leu Thr Arg Met Trp Tyr Cys Ser Tyr
225 230 235 240

Cys Gln Gly Leu Met Met Val Lys Pro Cys Gly Gly Tyr Cys Asn Val
245 250 255

Val Met Gln Gly Cys Met Ala Gly Val Val Glu Ile Asp Lys Tyr Trp
260 265 270

Arg Glu Tyr Ile Leu Ser Leu Glu Glu Leu Val Asn Gly Met Tyr Arg
275 280 285

Ile Tyr Asp Met Glu Asn Val Leu Leu Gly Leu Phe Ser Thr Ile His
290 295 300

Asp Ser Ile Gln Tyr Val Gln Lys Asn Ala Gly Lys Leu Thr Thr Thr
305 310 315 320

Ile Gly Lys Leu Cys Ala His Ser Gln Gln Arg Gln Tyr Arg Ser Ala

325

330

335

Tyr Tyr Pro Glu Asp Leu Phe Ile Asp Lys Lys Val Leu Lys Val Ala
 340 345 350

His Val Glu His Glu Glu Thr Leu Ser Ser Arg Arg Arg Glu Leu Ile
 355 360 365

Gln Lys Leu Lys Ser Phe Ile Ser Phe Tyr Ser Ala Leu Pro Gly Tyr
 370 375 380

Ile Cys Ser His Ser Pro Val Ala Glu Asn Asp Thr Leu Cys Trp Asn
 385 390 395 400

Gly Gln Glu Leu Val Glu Arg Tyr Ser Gln Lys Ala Ala Arg Asn Gly
 405 410 415

Met Lys Asn Gln Phe Asn Leu His Glu Leu Lys Met Lys Gly Pro Glu
 420 425 430

Pro Val Val Ser Gln Ile Ile Asp Lys Leu Lys His Ile Asn Gln Leu
 435 440 445

Leu Arg Thr Met Ser Met Pro Lys Gly Arg Val Leu Asp Lys Asn Leu
 450 455 460

Asp Glu Glu Gly Phe Glu Ser Gly Asp Cys Gly Asp Asp Glu Asp Glu
 465 470 475 480

Cys Ile Gly Gly Ser Gly Asp Gly Met Ile Lys Val Lys Asn Gln Leu
 485 490 495

Arg Phe Leu Ala Glu Leu Ala Tyr Asp Leu Asp Val Asp Asp Ala Pro
 500 505 510

Gly Asn Ser Gln Gln Ala Thr Pro Lys Asp Asn Glu Ile Ser Thr Phe
 515 520 525

His Asn Leu Gly Asn Val His
 530 535

<210> 7
<211> 232
<212> PRT
<213> human

<400> 7

Leu Gln Asp Pro Cys Ser Asn Cys Pro Ala Gly Thr Phe Cys Asp Asn
1 5 10 15

Asn Arg Asn Gln Ile Cys Ser Pro Cys Pro Pro Asn Ser Phe Ser Ser
20 25 30

Ala Gly Gly Gln Arg Thr Cys Asp Ile Cys Arg Gln Cys Lys Gly Val
35 40 45

Phe Arg Thr Arg Lys Glu Cys Ser Ser Thr Ser Asn Ala Glu Cys Asp
50 55 60

Cys Thr Pro Gly Phe His Cys Leu Gly Ala Gly Cys Ser Met Cys Glu
65 70 75 80

Gln Asp Cys Lys Gln Gly Gln Glu Leu Thr Lys Lys Gly Cys Lys Asp
85 90 95

Cys Cys Phe Gly Thr Phe Asn Asp Gln Lys Arg Gly Ile Cys Arg Pro
100 105 110

Trp Thr Asn Cys Ser Leu Asp Gly Lys Ser Val Leu Val Asn Gly Thr
115 120 125

Lys Glu Arg Asp Val Val Cys Gly Pro Ser Pro Ala Asp Leu Ser Pro
130 135 140

Gly Ala Ser Ser Val Thr Pro Pro Ala Pro Ala Arg Glu Pro Gly His
145 150 155 160

Ser Pro Gln Ile Ile Ser Phe Phe Leu Ala Leu Thr Ser Thr Ala Leu
165 170 175

Leu Phe Leu Leu Phe Phe Leu Thr Leu Arg Phe Ser Val Val Lys Arg
180 185 190

Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg Pro
195 200 205

Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro Glu
210 215 220

Glu Glu Glu Gly Gly Cys Glu Leu
225 230

<210> 8

<211> 535

<212> PRT

<213> Macaca fascicularis

<400> 8

Gln Pro Pro Pro Pro Pro Pro Asp Ala Thr Cys His Gln Val Arg Ser
1 5 10 15

Phe Phe Gln Arg Leu Gln Pro Gly Leu Lys Trp Val Pro Glu Thr Pro
20 25 30

Val Pro Gly Ser Asp Leu Gln Val Cys Leu Pro Lys Gly Pro Thr Cys
35 40 45

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

Met Glu Gln Leu Leu Gln Ser Ala Ser Met Glu Leu Lys Phe Leu Ile
65 70 75 80

Ile Gln Asn Ala Ala Val Phe Gln Glu Ala Phe Glu Ile Val Val Arg
85 90 95

His Ala Lys Asn Tyr Thr Asn Ala Met Phe Lys Asn Asn Tyr Pro Ser
100 105 110

Leu Thr Pro Gln Ala Phe Glu Phe Val Gly Glu Phe Phe Thr Asp Val
115 120 125

Ser Leu Tyr Ile Leu Gly Ser Asp Ile Asn Val Asp Asp Met Val Asn

130

135

140

Glu Leu Phe Asp Ser Leu Phe Pro Val Ile Tyr Thr Gln Leu Met Asn
 145 150 155 160

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

Ala Arg Arg Asp Leu Lys Val Phe Gly Asn Phe Pro Lys Leu Ile Met
 180 185 190

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

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

Ser Lys Asp Cys Gly Arg Met Leu Thr Arg Met Trp Tyr Cys Ser Tyr
 225 230 235 240

Cys Gln Gly Leu Met Met Val Lys Pro Cys Gly Gly Tyr Cys Asn Val
 245 250 255

Val Met Gln Gly Cys Met Ala Gly Val Val Glu Ile Asp Lys Tyr Trp
 260 265 270

Arg Glu Tyr Ile Leu Ser Leu Glu Glu Leu Val Asn Gly Met Tyr Arg
 275 280 285

Ile Tyr Asp Met Glu Asn Val Leu Leu Gly Leu Phe Ser Thr Ile His
 290 295 300

Asp Ser Ile Gln Tyr Val Gln Lys Asn Ala Gly Lys Leu Thr Thr Thr
 305 310 315 320

Ile Gly Lys Leu Cys Ala His Ser Gln Gln Arg Gln Tyr Arg Ser Ala
 325 330 335

Tyr Tyr Pro Glu Asp Leu Phe Ile Asp Lys Lys Val Leu Lys Val Ala
 340 345 350

His Val Glu His Glu Glu Thr Leu Ser Ser Arg Arg Arg Glu Leu Ile
355 360 365

Gln Lys Leu Lys Ser Phe Ile Ser Phe Tyr Ser Ala Leu Pro Gly Tyr
370 375 380

Ile Cys Ser His Ser Pro Val Ala Glu Asn Asp Thr Leu Cys Trp Asn
385 390 395 400

Gly Gln Glu Leu Val Glu Arg Tyr Ser Gln Lys Ala Ala Arg Asn Gly
405 410 415

Met Lys Asn Gln Phe Asn Leu His Glu Leu Lys Met Lys Gly Pro Glu
420 425 430

Pro Val Val Ser Gln Ile Ile Asp Lys Leu Lys His Ile Asn Gln Leu
435 440 445

Leu Arg Thr Met Ser Val Pro Lys Gly Arg Val Leu Asp Lys Asn Leu
450 455 460

Asp Glu Glu Gly Phe Glu Ser Gly Asp Cys Gly Asp Asp Glu Asp Glu
465 470 475 480

Cys Ile Gly Gly Ser Gly Asp Gly Met Met Lys Val Lys Asn Gln Leu
485 490 495

Arg Phe Leu Ala Glu Leu Ala Tyr Asp Leu Asp Val Asp Asp Val Pro
500 505 510

Gly Asn Asn Gln Gln Ala Thr Pro Lys Asp Asn Glu Ile Ser Thr Phe
515 520 525

His Asn Leu Gly Asn Val His
530 535

<210> 9

<211> 231

<212> PRT

<213> Macaca fascicularis

<400> 9

Leu Gln Asp Leu Cys Ser Asn Cys Pro Ala Gly Thr Phe Cys Asp Asn
1 5 10 15

Asn Arg Ser Gln Ile Cys Ser Pro Cys Pro Pro Asn Ser Phe Ser Ser
20 25 30

Ala Gly Gly Gln Arg Thr Cys Asp Ile Cys Arg Gln Cys Lys Gly Val
35 40 45

Phe Lys Thr Arg Lys Glu Cys Ser Ser Thr Ser Asn Ala Glu Cys Asp
50 55 60

Cys Ile Ser Gly Tyr His Cys Leu Gly Ala Glu Cys Ser Met Cys Glu
65 70 75 80

Gln Asp Cys Lys Gln Gly Gln Glu Leu Thr Lys Lys Gly Cys Lys Asp
85 90 95

Cys Cys Phe Gly Thr Phe Asn Asp Gln Lys Arg Gly Ile Cys Arg Pro
100 105 110

Trp Thr Asn Cys Ser Leu Asp Gly Lys Ser Val Leu Val Asn Gly Thr
115 120 125

Lys Glu Arg Asp Val Val Cys Gly Pro Ser Pro Ala Asp Leu Ser Pro
130 135 140

Gly Ala Ser Ser Ala Thr Pro Pro Ala Pro Ala Arg Glu Pro Gly His
145 150 155 160

Ser Pro Gln Ile Ile Phe Phe Leu Ala Leu Thr Ser Thr Val Val Leu
165 170 175

Phe Leu Leu Phe Phe Leu Val Leu Arg Phe Ser Val Val Lys Arg Ser
180 185 190

Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg Pro Val
195 200 205

Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro Glu Glu
210 215 220

Glu Glu Gly Gly Cys Glu Leu
225 230

<210> 10
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> cleavage site

<400> 10

Ile Glu Gly Arg
1

<210> 11
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> fusion peptide

<400> 11

Ser Ala Trp Ser His Pro Gln Phe Glu Lys
1 5 10

<210> 12
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> strep tag II peptide

<400> 12

Trp Ser His Pro Gln Phe Glu Lys
1 5

<210> 13
<211> 15
<212> PRT
<213> Artificial Sequence

<220>

<223> linker

<400> 13

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser
1 5 10 15

<210> 14

<211> 18

<212> PRT

<213> Artificial Sequence

<220>

<223> linker

<400> 14

Pro Ser Thr Pro Pro Thr Asn Ser Ser Ser Thr Pro Pro Thr Pro Ser
1 5 10 15

Pro Ser

<210> 15

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> linker

<400> 15

Gly Gly Ser Gly Asn Ser Ser Gly Ser Gly Gly Ser Pro Val
1 5 10

<210> 16

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> linker

<400> 16

Ala Ser Pro Ala Ala Pro Ala Pro Ala Ser Pro Ala Ala Pro Ala Pro
1 5 10 15

Ser Ala Pro Ala
20

<210> 17
<211> 66
<212> PRT
<213> Artificial Sequence

<220>
<223> linker

<400> 17

Ala Gly Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser Pro Val Pro Ser
1 5 10 15

Thr Pro Pro Thr Pro Ser Pro Ser Thr Pro Pro Thr Pro Ser Pro Ser
20 25 30

Gly Gly Ser Gly Asn Ser Ser Gly Ser Gly Gly Ser Pro Val Pro Ser
35 40 45

Thr Pro Pro Thr Pro Ser Pro Ser Thr Pro Pro Thr Pro Ser Pro Ser
50 55 60

Ala Ser
65

<210> 18
<211> 32
<212> PRT
<213> Artificial Sequence

<220>
<223> linker

<400> 18

Pro Ser Thr Pro Pro Thr Pro Ser Pro Ser Thr Pro Pro Thr Pro Ser
1 5 10 15

Pro Ser Gly Gly Ser Gly Asn Ser Ser Gly Ser Gly Gly Ser Pro Val
20 25 30

<210> 19
<211> 74
<212> PRT
<213> Artificial Sequence

<220>
<223> linker

<400> 19

Ala Gly Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser Pro Val Pro Ser
1 5 10 15

Thr Pro Pro Thr Asn Ser Ser Ser Thr Pro Pro Thr Pro Ser Pro Ser
20 25 30

Pro Val Pro Ser Thr Pro Pro Thr Asn Ser Ser Ser Thr Pro Pro Thr
35 40 45

Pro Ser Pro Ser Pro Val Pro Ser Thr Pro Pro Thr Asn Ser Ser Ser
50 55 60

Thr Pro Pro Thr Pro Ser Pro Ser Ala Ser
65 70

<210> 20
<211> 40
<212> PRT
<213> Artificial Sequence

<220>
<223> linker

<400> 20

Ala Ser Pro Ala Ala Pro Ala Pro Ala Ser Pro Ala Ala Pro Ala Pro
1 5 10 15

Ser Ala Pro Ala Ala Ser Pro Ala Ala Pro Ala Pro Ala Ser Pro Ala
20 25 30

Ala Pro Ala Pro Ser Ala Pro Ala
35 40

<210> 21
<211> 10

<212> PRT
<213> Artificial Sequence

<220>
<223> linker

<400> 21

Val Asp Asp Ile Glu Gly Arg Met Asp Glu
1 5 10

<210> 22
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> linker

<400> 22

Glu Asn Leu Tyr Phe Gln Gly Arg Met Asp Glu
1 5 10

<210> 23
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> linker

<400> 23

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser
1 5 10

<210> 24
<211> 327
<212> PRT
<213> Artificial Sequence

<220>
<223> antibody heavy chain

<400> 24

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

Ser Thr Ser Glu Ser 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 Lys Thr
65 70 75 80

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

Arg Val Glu Ser Lys Tyr Gly Pro Pro Cys Pro Ser Cys Pro Ala Pro
100 105 110

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

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

Asp Val Ser Gln Glu Asp Pro Glu Val Gln Phe Asn Trp Tyr Val Asp
145 150 155 160

Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Phe
165 170 175

Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp
180 185 190

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

Pro Ser Ser Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg
210 215 220

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

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

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

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

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

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

Leu Ser Leu Ser Leu Gly Lys
325

<210> 25

<211> 214

<212> PRT

<213> Artificial Sequence

<220>

<223> antibody light chain

<400> 25

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

Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln Ser Val Ser Ser Tyr
20 25 30

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

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

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Glu Pro
65 70 75 80

Glu Asp Phe Ala Val Tyr Tyr Cys Gln Gln Ser Ser Asn Trp Pro Arg
85 90 95

Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys Arg Thr Val Ala Ala
100 105 110

Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu Gln Leu Lys Ser Gly
115 120 125

Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe Tyr Pro Arg Glu Ala
130 135 140

Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln Ser Gly Asn Ser Gln
145 150 155 160

Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser Thr Tyr Ser Leu Ser
165 170 175

Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu Lys His Lys Val Tyr
180 185 190

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

Phe Asn Arg Gly Glu Cys
210

<210> 26
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> antibody heavy chain

<400> 26

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

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

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

Gly Glu Ile Asn His Gly Gly Tyr Val Thr Tyr Asn Pro Ser Leu Glu
50 55 60

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

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

Arg Asp Tyr Gly Pro Gly Asn Tyr Asp Trp Tyr Phe Asp Leu Trp Gly
100 105 110

Arg Gly Thr Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser
115 120 125

Val Phe Pro Leu Ala Pro Cys Ser Arg Ser Thr Ser Glu Ser Thr Ala
130 135 140

Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val
145 150 155 160

Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala
165 170 175

Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val
180 185 190

Pro Ser Ser Ser Leu Gly Thr Lys Thr Tyr Thr Cys Asn Val Asp His
195 200 205

Lys Pro Ser Asn Thr Lys Val Asp Lys Arg Val Glu Ser Lys Tyr Gly
210 215 220

Pro Pro Cys Pro Pro Cys Pro Ala Pro Glu Phe Leu Gly Gly Pro Ser
225 230 235 240

Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg
245 250 255

Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser Gln Glu Asp Pro
260 265 270

Glu Val Gln Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala
275 280 285

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

Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr
305 310 315 320

Lys Cys Lys Val Ser Asn Lys Gly Leu Pro Ser Ser Ile Glu Lys Thr
325 330 335

Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu
340 345 350

Pro Pro Ser Gln Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys
355 360 365

Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser
370 375 380

Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp
385 390 395 400

Ser Asp Gly Ser Phe Phe Leu Tyr Ser Arg Leu Thr Val Asp Lys Ser
405 410 415

Arg Trp Gln Glu Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala
420 425 430

Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Leu Gly Lys
435 440 445

<210> 27
<211> 216

<212> PRT
<213> Artificial Sequence

<220>
<223> antibody light chain

<400> 27

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

Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln Ser Val Ser Ser Tyr
20 25 30

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

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

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Glu Pro
65 70 75 80

Glu Asp Phe Ala Val Tyr Tyr Cys Gln Gln Arg Ser Asn Trp Pro Pro
85 90 95

Ala Leu Thr Phe Gly Gly Gly Thr Lys Val Glu Ile Lys Arg Thr Val
100 105 110

Ala Ala Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu Gln Leu Lys
115 120 125

Ser Gly Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe Tyr Pro Arg
130 135 140

Glu Ala Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln Ser Gly Asn
145 150 155 160

Ser Gln Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser Thr Tyr Ser
165 170 175

Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu Lys His Lys
180 185 190

Val Tyr Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser Pro Val Thr
195 200 205

Lys Ser Phe Asn Arg Gly Glu Cys
210 215

<210> 28
<211> 228
<212> PRT
<213> Artificial Sequence

<220>
<223> antibody Fc region

<400> 28

Glu Ser Lys Tyr Gly Pro Pro Cys Pro Pro Cys Pro Ala Pro Glu Ala
1 5 10 15

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

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
35 40 45

Ser Gln Glu Asp Pro Glu Val Gln Phe Asn Trp Tyr Val Asp Gly Val
50 55 60

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Phe Asn Ser
65 70 75 80

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
85 90 95

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Gly Leu Pro Ser
100 105 110

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

Gln Val Tyr Thr Leu Pro Pro Ser Gln Glu Glu Met Thr Lys Asn Gln
130 135 140

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
145 150 155 160

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

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Arg Leu
180 185 190

Thr Val Asp Lys Ser Arg Trp Gln Glu Gly Asn Val Phe Ser Cys Ser
195 200 205

Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser
210 215 220

Leu Ser Leu Gly
225

<210> 29
<211> 228
<212> PRT
<213> Artificial Sequence

<220>
<223> antibody Fc region

<400> 29

Glu Ser Lys Tyr Gly Pro Pro Cys Pro Pro Cys Pro Ala Pro Glu Phe
1 5 10 15

Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
20 25 30

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
35 40 45

Ser Gln Glu Asp Pro Glu Val Gln Phe Asn Trp Tyr Val Asp Gly Val
50 55 60

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Phe Asn Ser
65 70 75 80

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
85 90 95

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Gly Leu Pro Ser
100 105 110

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

Gln Val Tyr Thr Leu Pro Pro Ser Gln Glu Glu Met Thr Lys Asn Gln
130 135 140

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
145 150 155 160

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

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Arg Leu
180 185 190

Thr Val Asp Lys Ser Arg Trp Gln Glu Gly Asn Val Phe Ser Cys Ser
195 200 205

Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser
210 215 220

Leu Ser Leu Gly
225

<210> 30
<211> 228
<212> PRT
<213> Artificial Sequence

<220>
<223> antibody Fc region

<400> 30

Glu Ser Lys Tyr Gly Pro Pro Cys Pro Pro Cys Pro Ala Pro Glu Phe
1 5 10 15

Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
20 25 30

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
35 40 45

Ser Gln Glu Asp Pro Glu Val Gln Phe Asn Trp Tyr Val Asp Gly Val
50 55 60

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Phe Asn Ser
65 70 75 80

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
85 90 95

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Gly Leu Pro Ser
100 105 110

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

Gln Val Tyr Thr Leu Pro Pro Ser Gln Glu Glu Met Thr Lys Asn Gln
130 135 140

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
145 150 155 160

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

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Arg Leu
180 185 190

Thr Val Asp Lys Ser Arg Trp Gln Glu Gly Asn Val Phe Ser Cys Ser
195 200 205

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
210 215 220

Leu Ser Leu Gly
225

<210> 31
<211> 228
<212> PRT
<213> Artificial Sequence

<220>
<223> antibody Fc region

<400> 31

Glu Ser Lys Tyr Gly Pro Pro Cys Pro Pro Cys Pro Ala Pro Glu Phe
1 5 10 15

Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
20 25 30

Leu Tyr Ile Thr Arg Glu Pro Glu Val Thr Cys Val Val Val Asp Val
35 40 45

Ser Gln Glu Asp Pro Glu Val Gln Phe Asn Trp Tyr Val Asp Gly Val
50 55 60

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Phe Asn Ser
65 70 75 80

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
85 90 95

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Gly Leu Pro Ser
100 105 110

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

Gln Val Tyr Thr Leu Pro Pro Ser Gln Glu Glu Met Thr Lys Asn Gln
130 135 140

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
145 150 155 160

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

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Arg Leu
180 185 190

Thr Val Asp Lys Ser Arg Trp Gln Glu Gly Asn Val Phe Ser Cys Ser
195 200 205

Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser
210 215 220

Leu Ser Leu Gly
225

<210> 32
<211> 152
<212> PRT
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 32

Ala Ser Asp Glu Glu Ile Gln Asp Val Ser Gly Thr Trp Tyr Leu Lys
1 5 10 15

Ala Met Thr Val Asp Glu Gly Cys Arg Pro Trp Asn Ile Phe Ser Val
20 25 30

Thr Pro Met Thr Leu Thr Thr Leu Glu Gly Gly Asn Leu Glu Ala Lys
35 40 45

Val Thr Met Ala Ile Asp Gly Pro Ala Gln Glu Val Lys Ala Val Leu
50 55 60

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

Val Ala Tyr Ile Ile Arg Ser His Val Lys Asp His Tyr Ile Phe Tyr
85 90 95

Ser Glu Gly Val Cys Asp Gly Ser Pro Val Pro Gly Val Trp Leu Val
100 105 110

Gly Arg Asp Pro Lys Asn Asn Leu Glu Ala Leu Glu Asp Phe Glu Lys
115 120 125

Ala Ala Gly Ala Arg Gly Leu Ser Thr Glu Ser Ile Leu Ile Pro Arg
130 135 140

Gln Ser Glu Thr Ser Ser Pro Gly
145 150

<210> 33
<211> 152
<212> PRT
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 33

Thr Ser Asp Glu Glu Ile Gln Asp Val Ser Gly Thr Trp Tyr Leu Lys
1 5 10 15

Ala Met Thr Val Asp Glu Gly Cys Arg Pro Trp Asn Ile Phe Ser Val
20 25 30

Thr Pro Met Thr Leu Thr Thr Leu Glu Gly Gly Asn Leu Glu Ala Lys
35 40 45

Val Thr Met Ala Ile Asp Gly Pro Ala Gln Glu Val Arg Ala Val Leu
50 55 60

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

Asp Ala Tyr Ile Ile Arg Ser His Val Lys Asp His Tyr Ile Phe Tyr
85 90 95

Ser Glu Gly Val Cys Asp Gly Ser Pro Val Pro Gly Val Trp Leu Val
100 105 110

Gly Arg Asp Pro Glu Asn Asn Leu Glu Ala Leu Glu Asp Phe Glu Lys
115 120 125

Thr Ala Gly Ala Arg Gly Leu Ser Thr Glu Ser Ile Leu Ile Pro Arg
130 135 140

Gln Ser Glu Thr Ser Ser Pro Gly
145 150

<210> 34
<211> 152
<212> PRT
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 34

Ala Ser Asp Glu Glu Ile Gln Asp Val Ser Gly Thr Trp Tyr Leu Lys
1 5 10 15

Ala Met Thr Val Asp Glu Gly Cys Arg Pro Trp Asn Ile Phe Ser Val
20 25 30

Thr Pro Met Thr Leu Thr Thr Leu Glu Gly Gly Asn Leu Glu Ala Lys
35 40 45

Val Thr Met Ala Ile Asp Gly Pro Ala Gln Glu Val Asn Ala Val Leu
50 55 60

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

Val Ala Tyr Ile Ile Arg Ser His Val Arg Asp His Tyr Ile Phe Tyr
85 90 95

Ser Glu Gly Val Cys Asp Gly Ser Pro Val Pro Gly Val Trp Leu Val
100 105 110

Gly Arg Asp Pro Glu Asn Asn Leu Glu Ala Leu Glu Asp Phe Glu Lys
115 120 125

Thr Ala Gly Ala Arg Gly Leu Ser Thr Glu Ser Ile Leu Ile Pro Arg
130 135 140

Gln Ser Glu Thr Ser Ser Pro Gly
145 150

<210> 35
<211> 152
<212> PRT
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 35

Val Ser Asp Glu Glu Ile Gln Asp Val Ser Gly Thr Trp Tyr Leu Lys
1 5 10 15

Ala Met Thr Val Asp Glu Gly Cys Arg Pro Trp Asn Ile Phe Ser Val
20 25 30

Thr Pro Met Thr Leu Thr Thr Leu Glu Gly Gly Asn Leu Glu Ala Lys
35 40 45

Val Thr Met Ala Ile Asp Gly Pro Ala Gln Glu Val Arg Ala Val Leu
50 55 60

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

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

Ser Glu Gly Val Cys Asp Gly Ser Pro Val Pro Gly Val Trp Leu Val
100 105 110

Gly Arg Asp Pro Glu Asn Asn Leu Glu Ala Leu Glu Asp Phe Glu Lys
115 120 125

Thr Ala Gly Ala Arg Gly Leu Ser Thr Glu Ser Ile Leu Ile Pro Arg
130 135 140

Gln Ser Glu Thr Ser Ser Pro Gly
145 150

<210> 36
<211> 152
<212> PRT
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 36

Ala Ser Asp Glu Glu Ile Gln Asp Val Ser Gly Thr Trp Tyr Leu Lys
1 5 10 15

Ala Met Thr Val Asp Glu Gly Cys Arg Pro Trp Asn Ile Phe Ser Val
20 25 30

Thr Pro Met Thr Leu Ser Thr Leu Glu Gly Gly Asn Leu Glu Ala Lys
35 40 45

Val Thr Met Ala Ile Asp Gly Pro Ala Gln Glu Val Lys Ala Val Leu
50 55 60

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

Val Ala Tyr Ile Ile Arg Ser His Val Lys Asp His Tyr Ile Phe Tyr
85 90 95

Ser Glu Gly Val Cys Asp Gly Ser Pro Val Pro Gly Val Trp Leu Val
100 105 110

Gly Arg Asp Pro Lys Asn Asn Leu Glu Ala Leu Glu Asp Phe Glu Lys
115 120 125

Ala Ala Gly Ala Arg Gly Leu Ser Thr Glu Ser Ile Leu Ile Pro Arg
130 135 140

Gln Ile Glu Thr Ser Ser Pro Gly
145 150

<210> 37
<211> 152
<212> PRT
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 37

Ala Ser Asp Glu Glu Ile Gln Asp Val Ser Gly Thr Trp Tyr Leu Lys
1 5 10 15

Ala Met Thr Val Asp Glu Gly Cys Arg Pro Trp Asn Ile Phe Ser Val
20 25 30

Thr Pro Met Thr Leu Thr Thr Leu Glu Gly Gly Asn Leu Glu Ala Glu
35 40 45

Val Thr Met Ala Ile Asp Gly Pro Ala Gln Glu Val Lys Ala Val Leu
50 55 60

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

Val Ala Tyr Ile Ile Arg Ser His Val Lys Asp His Tyr Ile Phe Tyr
85 90 95

Ser Glu Gly Val Cys Asp Gly Ser Pro Val Pro Gly Val Trp Leu Val
100 105 110

Gly Arg Asp Pro Lys Asn Asn Leu Glu Ala Leu Glu Asp Phe Glu Lys
115 120 125

Thr Ala Gly Ala Arg Gly Leu Ser Thr Glu Ser Ile Leu Ile Pro Ser
130 135 140

Gln Ile Glu Thr Ser Ser Pro Gly
145 150

<210> 38
<211> 152
<212> PRT
<213> Artificial Sequence

<220>

<223> lipocalin mutein

<400> 38

Thr Ser Asp Glu Glu Ile Gln Asp Val Ser Gly Thr Trp Tyr Leu Lys
1 5 10 15

Ala Met Thr Val Asp Glu Gly Cys Arg Pro Trp Asn Ile Phe Ser Val
20 25 30

Thr Pro Met Thr Leu Thr Thr Leu Glu Asp Gly Asn Leu Glu Ala Lys
35 40 45

Val Thr Met Ala Ile Asp Gly Pro Ala Gln Glu Val Lys Ala Val Leu
50 55 60

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

Val Ala Tyr Ile Ile Arg Ser His Val Lys Asp His Tyr Ile Phe Tyr
85 90 95

Ser Glu Gly Val Cys Asp Gly Ser Pro Val Pro Gly Val Trp Leu Val
100 105 110

Gly Arg Asp Pro Lys Asn Asn Leu Glu Ala Leu Glu Asp Phe Glu Lys
115 120 125

Ala Ala Gly Ala Arg Gly Leu Ser Thr Glu Ser Ile Leu Ile Pro Arg
130 135 140

Gln Ile Glu Thr Ser Ser Pro Gly
145 150

<210> 39

<211> 178

<212> PRT

<213> Artificial Sequence

<220>

<223> lipocalin mutein

<400> 39

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe His Gly Lys Trp Tyr
20 25 30

Val Val Gly Gln Ala Gly Asn Ile Lys Leu Arg Glu Asp Lys Asp Pro
35 40 45

Asn Lys Met Met Ala Thr Ile Tyr Glu Leu Lys Glu Asp Lys Ser Tyr
50 55 60

Asn Val Thr Gly Val Thr Phe Asp Asp Lys Lys Cys Thr Tyr Ala Ile
65 70 75 80

Ser Thr Phe Val Pro Gly Ser Gln Pro Gly Glu Phe Thr Leu Gly Lys
85 90 95

Ile Lys Ser Phe Pro Gly His Thr Ser Ser Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Phe Val Phe Gln
115 120 125

Asn Arg Glu Glu Phe Tyr Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly

<210> 40

<211> 178

<212> PRT

<213> Artificial Sequence

<220>

<223> lipocalin mutein

<400> 40

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe His Gly Lys Trp Tyr
20 25 30

Val Val Gly Gln Ala Gly Asn Ile Arg Leu Arg Glu Asp Lys Asp Pro
35 40 45

Ile Lys Met Met Ala Thr Ile Tyr Glu Leu Lys Glu Asp Lys Ser Tyr
50 55 60

Asp Val Thr Met Val Lys Phe Asp Asp Lys Lys Cys Met Tyr Asp Ile
65 70 75 80

Trp Thr Phe Val Pro Gly Ser Gln Pro Gly Glu Phe Thr Leu Gly Lys
85 90 95

Ile Lys Ser Phe Pro Gly His Thr Ser Ser Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Phe Val Phe Gln
115 120 125

Asn Arg Glu Glu Phe Tyr Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly

<210> 41
<211> 178
<212> PRT
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 41

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe His Gly Lys Trp Tyr
20 25 30

Val Val Gly Gln Ala Gly Asn Ile Arg Leu Arg Glu Asp Lys Asp Pro
35 40 45

Asn Lys Met Met Ala Thr Ile Tyr Glu Leu Lys Glu Asp Lys Ser Tyr
50 55 60

Asp Val Thr Ala Val Ala Phe Asp Asp Lys Lys Cys Thr Tyr Asp Ile
65 70 75 80

Trp Thr Phe Val Pro Gly Ser Gln Pro Gly Glu Phe Thr Leu Gly Lys
85 90 95

Ile Lys Ser Phe Pro Gly His Thr Ser Ser Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Phe Val Phe Gln
115 120 125

Asn Arg Glu Glu Phe Tyr Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly

<210> 42
<211> 178
<212> PRT
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 42

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe His Gly Lys Trp Tyr
20 25 30

Val Val Gly Gln Ala Gly Asn Ile Lys Leu Arg Glu Asp Lys Asp Pro
35 40 45

Asn Lys Met Met Ala Thr Ile Tyr Glu Leu Lys Glu Asp Lys Ser Tyr
50 55 60

Asp Val Thr Ala Val Ala Phe Asp Asp Lys Lys Cys Thr Tyr Asp Ile
65 70 75 80

Trp Thr Phe Val Pro Gly Ser Gln Pro Gly Glu Phe Thr Leu Gly Lys
85 90 95

Ile Lys Ser Phe Pro Gly His Thr Ser Ser Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Phe Val Phe Gln
115 120 125

Asn Arg Glu Glu Phe Tyr Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly

<210> 43
<211> 175
<212> PRT
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 43

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe His Gly Lys Trp Tyr
20 25 30

Val Val Gly Gln Ala Gly Asn Ile Lys Leu Arg Glu Asp Ser Lys Met
35 40 45

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

Gly Val Ser Phe Asp Asp Lys Lys Cys Thr Tyr Ala Ile Met Thr Phe
65 70 75 80

Val Pro Gly Ser Gln Pro Gly Glu Phe Thr Leu Gly Lys Ile Lys Ser
85 90 95

Phe Pro Gly His Thr Ser Ser Leu Val Arg Val Val Ser Thr Asn Tyr
100 105 110

Asn Gln His Ala Met Val Phe Phe Lys Phe Val Phe Gln Asn Arg Glu
115 120 125

Glu Phe Tyr Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu Thr Ser Glu
130 135 140

Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly Leu Pro Glu
145 150 155 160

Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile Asp Gly
165 170 175

<210> 44
<211> 178
<212> PRT
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 44

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe His Gly Lys Trp Tyr
20 25 30

Val Val Gly Gln Ala Gly Asn Ile Lys Leu Arg Glu Asp Lys Asp Pro
35 40 45

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

Asp Val Thr Gly Val Thr Phe Asp Asp Lys Lys Cys Arg Tyr Asp Ile
65 70 75 80

Ser Thr Phe Val Pro Gly Ser Gln Pro Gly Glu Phe Thr Phe Gly Lys
85 90 95

Ile Lys Ser Phe Pro Gly His Thr Ser Ser Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Phe Val Phe Gln
115 120 125

Asn Arg Glu Glu Phe Tyr Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly

<210> 45
<211> 178
<212> PRT
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 45

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe His Gly Lys Trp Tyr
20 25 30

Val Val Gly Gln Ala Gly Asn Ile Arg Leu Arg Glu Asp Lys Asp Pro
35 40 45

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

Asp Val Thr Gly Val Thr Phe Asp Asp Lys Lys Cys Thr Tyr Ala Ile
65 70 75 80

Ser Thr Phe Val Pro Gly Ser Gln Pro Gly Glu Phe Thr Leu Gly Lys
85 90 95

Ile Lys Ser Phe Pro Gly His Thr Ser Ser Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Phe Val Phe Gln
115 120 125

Asn Arg Glu Glu Phe Tyr Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly

<210> 46
<211> 178
<212> PRT
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 46

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe His Gly Lys Trp Tyr
20 25 30

Val Val Gly Gln Ala Gly Asn Ile Lys Leu Arg Glu Asp Lys Asp Pro
35 40 45

Asn Lys Met Met Ala Thr Ile Tyr Glu Leu Lys Glu Asp Lys Ser Tyr
50 55 60

Asp Val Thr Gly Val Thr Phe Asp Asp Lys Lys Cys Thr Tyr Ala Ile
65 70 75 80

Ser Thr Leu Val Pro Gly Ser Gln Pro Gly Glu Phe Thr Phe Gly Lys
85 90 95

Ile Lys Ser Phe Pro Gly His Thr Ser Ser Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Phe Val Phe Gln
115 120 125

Asn Arg Glu Glu Phe Tyr Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly

<210> 47
<211> 178
<212> PRT
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 47

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe His Gly Lys Trp Tyr
20 25 30

Val Val Gly Gln Ala Gly Asn Ile Arg Leu Arg Glu Asp Lys Asp Pro
35 40 45

Ser Lys Met Met Ala Thr Ile Tyr Glu Leu Lys Glu Asp Lys Ser Tyr
50 55 60

Asp Val Thr Ala Val Thr Phe Asp Asp Lys Lys Cys Asn Tyr Ala Ile
65 70 75 80

Ser Thr Phe Val Pro Gly Ser Gln Pro Gly Glu Phe Thr Leu Gly Lys
85 90 95

Ile Lys Ser Phe Pro Gly His Thr Ser Ser Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Phe Val Phe Gln
115 120 125

Asn Arg Glu Glu Phe Tyr Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly

<210> 48
<211> 178
<212> PRT
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 48

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe His Gly Lys Trp Tyr
20 25 30

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

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

Asn Val Thr Asp Val Met Phe Leu Asp Lys Lys Cys Gln Tyr Ile Ile
65 70 75 80

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

Ile Lys Ser Asp Pro Gly His Thr Ser Tyr Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Ser Val Ile Gln
115 120 125

Asn Arg Glu Trp Phe Gly Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly

<210> 49
<211> 178
<212> PRT
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 49

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe Gln Gly Lys Trp Tyr
20 25 30

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

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

Asn Val Thr Asp Val Met Phe Leu Asp Lys Lys Cys Gln Tyr Ile Ile
65 70 75 80

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

Ile Arg Ser Asp Leu Gly His Thr Ser Tyr Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Ser Val Ile Gln
115 120 125

Asn Arg Glu Trp Phe Gly Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly

<210> 50
<211> 178
<212> PRT
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 50

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Tyr Gln Phe Gln Gly Lys Trp Tyr
20 25 30

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

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

Asn Val Thr Asp Val Met Leu Leu Asp Lys Lys Cys Gln Tyr Ile Ile
65 70 75 80

Gln Thr Phe Val Pro Gly Ser Gln Pro Gly Glu Ser Thr Leu Gly Phe
85 90 95

Ile Lys Ser Asp Pro Gly His Thr Ser Tyr Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Ser Val Ile Gln
115 120 125

Asn Arg Glu Trp Phe Gly Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly

<210> 51
<211> 178
<212> PRT
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 51

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe Gln Gly Lys Trp Tyr
20 25 30

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

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

Asn Val Thr Asp Val Met Phe Leu Asp Lys Lys Cys Gln His Ile Ile
65 70 75 80

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

Ile Lys Ser Asp Pro Gly His Thr Ser Tyr Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Ser Val Ile Gln
115 120 125

Asn Arg Glu Trp Phe Gly Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly

<210> 52

<211> 178

<212> PRT

<213> Artificial Sequence

<220>

<223> lipocalin mutein

<400> 52

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asp Gln Phe Gln Gly Lys Trp Tyr
20 25 30

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

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

Asn Val Thr Asp Val Met Phe Leu Asp Lys Lys Cys Gln Tyr Ile Ile
65 70 75 80

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

Ile Lys Ser Asp Pro Gly His Thr Ser Tyr Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Ser Val Ile Gln
115 120 125

Asn Arg Glu Trp Phe Gly Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly

<210> 53
<211> 178
<212> PRT
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 53

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe Gln Gly Lys Trp Tyr
20 25 30

Ile Val Gly Met Ala Gly Asn Asn Leu Leu Arg Glu Asp Lys Asp Pro
35 40 45

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

Asn Val Thr Asp Val Met Phe Leu Asp Lys Lys Cys Gln Tyr Ile Ile
65 70 75 80

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

Ile Lys Ser Asp Pro Gly His Thr Ser Tyr Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Ser Val Ile Gln
115 120 125

Asn Arg Glu Trp Phe Gly Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly

<210> 54

<211> 178

<212> PRT

<213> Artificial Sequence

<220>

<223> lipocalin mutein

<400> 54

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Arg Asn Phe Gln Asp Asn Gln Phe Gln Gly Lys Trp Tyr
20 25 30

Val Val Gly Met Ala Gly Asn Asn Leu Leu Arg Val Asp Lys Asp Pro
35 40 45

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

Asn Val Thr Asp Val Met Phe Leu Asp Lys Lys Cys Gln Tyr Ile Ile
65 70 75 80

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

Ile Lys Ser Asp Pro Gly His Thr Ser Tyr Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Tyr Phe Lys Ser Val Ile Gln
115 120 125

Asn Arg Glu Trp Phe Gly Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly

<210> 55

<211> 178

<212> PRT
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 55

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe Gln Gly Lys Trp Tyr
20 25 30

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

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

Asn Val Thr Asp Val Met Phe Leu Asp Lys Lys Cys Gln Tyr Ile Asn
65 70 75 80

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

Ile Lys Ser Asp Leu Gly Pro Thr Ser Tyr Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Ser Val Ile Gln
115 120 125

Asn Arg Glu Trp Phe Gly Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly

<210> 56
<211> 178
<212> PRT
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 56

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe Gln Gly Lys Trp Tyr
20 25 30

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

His Lys Met Gly Ala Thr Ile Tyr Glu Leu Asn Glu Asp Lys Ser Tyr
50 55 60

Asn Val Thr Asp Val Met Phe Leu Asp Lys Lys Cys Gln Tyr Ile Ile
65 70 75 80

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

Ile Lys Ser Asp Pro Gly His Thr Ser Tyr Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Ser Val Ile Gln
115 120 125

Asn Arg Glu Trp Phe Gly Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly

<210> 57
<211> 178
<212> PRT
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 57

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe Gln Gly Lys Trp Tyr
20 25 30

Val Val Gly Met Ala Gly Asn Asn Leu Leu Arg Asp Asp Lys Asp Pro
35 40 45

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

Asn Val Thr Asp Val Met Leu Leu Asp Lys Lys Cys His Tyr Ile Ile
65 70 75 80

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

Ile Lys Ser Asp Pro Gly His Thr Ser Tyr Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Ser Val Ile Gln
115 120 125

Asn Arg Glu Trp Phe Gly Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly

<210> 58
<211> 178
<212> PRT
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 58

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe His Gly Lys Trp Tyr
20 25 30

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

Leu Lys Met Arg Ala Thr Ile Tyr Glu Leu Lys Glu Asp Lys Ser Tyr
50 55 60

Asn Val Thr Gly Val Ser Phe Trp Arg Lys Lys Cys His Tyr Lys Ile
65 70 75 80

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

Ile Lys Ser Gly Pro Gly Gln Thr Ser Asn Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Glu Val Arg Gln
115 120 125

Asn Arg Glu Trp Phe Ala Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly

<210> 59
<211> 178
<212> PRT
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 59

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe His Gly Lys Trp Tyr
20 25 30

Val Val Gly Arg Ala Gly Asn Val Ala Leu Arg Glu Asp Lys Asp Pro
35 40 45

Pro Lys Met Arg Ala Thr Ile Tyr Glu Leu Lys Glu Asp Lys Ser Tyr
50 55 60

Asn Val Thr Asn Val Arg Phe Ala Met Lys Lys Cys Met Tyr Ser Ile
65 70 75 80

Gly Thr Phe Val Pro Gly Ser Gln Pro Gly Glu Phe Thr Leu Gly Gln
85 90 95

Ile Lys Ser Glu Pro Gly Asn Thr Ser Asn Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Glu Val Tyr Gln
115 120 125

Asn Arg Glu Ile Phe Phe Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly

<210> 60
<211> 178
<212> PRT
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 60

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe Gln Gly Lys Trp Tyr
20 25 30

Val Val Gly Val Ala Gly Asn Ala Leu Leu Arg Glu Asp Lys Asp Pro
35 40 45

Leu Lys Met Arg Ala Thr Ile Tyr Glu Leu Lys Glu Asp Lys Ser Tyr
50 55 60

Asp Val Thr Val Val Ser Phe Trp Arg Lys Lys Cys His Tyr Lys Ile
65 70 75 80

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

Ile Lys Ser Gly Pro Gly Gln Thr Ser Asn Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Glu Val Arg Gln
115 120 125

Asn Arg Glu Trp Phe Ala Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly

<210> 61
<211> 178
<212> PRT
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 61

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe Gln Gly Lys Trp Tyr
20 25 30

Val Val Gly Val Ala Gly Asn Val Arg Leu Arg Glu Asp Lys Asp Pro
35 40 45

Pro Lys Met Arg Ala Thr Ile Tyr Glu Leu Lys Glu Asp Lys Ser Tyr
50 55 60

Asp Val Thr Gly Val Ser Phe Arg Gly Lys Lys Cys His Tyr Lys Ile
65 70 75 80

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

Ile Lys Ser Gly Pro Gly Glu Thr Ser Asn Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Glu Val Arg Gln
115 120 125

Asn Arg Glu Trp Phe Phe Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly

<210> 62
<211> 178
<212> PRT
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 62

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe Gln Gly Lys Trp Tyr
20 25 30

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

Leu Lys Met Arg Ala Thr Ile Tyr Glu Leu Lys Glu Asp Lys Ser Tyr
50 55 60

Asp Val Thr Ser Val Ala Phe Arg Asn Lys Lys Cys His Tyr Lys Ile
65 70 75 80

Gly Thr Phe Val Pro Gly Ser Gln Pro Gly Glu Phe Thr Leu Gly Gln
85 90 95

Ile Lys Ser Gly Pro Gly Glu Thr Ser Asn Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Glu Val Arg Gln
115 120 125

Asn Arg Glu Trp Phe Phe Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly

<210> 63
<211> 178
<212> PRT
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 63

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe Gln Gly Lys Trp Tyr
20 25 30

Val Val Gly Arg Ala Gly Asn Val Gly Leu Arg Glu Asp Lys Asp Pro
35 40 45

Pro Lys Met Trp Ala Thr Ile Tyr Glu Leu Lys Glu Asp Lys Ser Tyr
50 55 60

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

Gly Thr Phe Val Pro Gly Ser Gln Pro Gly Glu Phe Thr Leu Gly Gln
85 90 95

Ile Lys Ser Glu Pro Gly Asn Thr Ala Asn Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Glu Val Tyr Gln
115 120 125

Asn Arg Glu Ile Phe Phe Ile Ile Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly

<210> 64
<211> 178
<212> PRT
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 64

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe Gln Gly Lys Trp Tyr
20 25 30

Val Val Gly Arg Ala Gly Asn Val Gly Leu Arg Glu Asp Lys Asp Pro
35 40 45

Pro Lys Met Trp Ala Thr Ile Tyr Glu Leu Lys Glu Asp Lys Ser Tyr
50 55 60

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

Gly Thr Phe Val Pro Gly Ser Gln Pro Gly Glu Phe Thr Leu Gly Gln
85 90 95

Ile Lys Ser Glu Pro Gly Gly Thr Ala Asn Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Glu Val Tyr Gln
115 120 125

Asn Arg Glu Ile Phe Phe Ile Ile Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly

<210> 65

<211> 178

<212> PRT

<213> Artificial Sequence

<220>

<223> lipocalin mutein

<400> 65

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe Gln Gly Lys Trp Tyr
20 25 30

Val Val Gly Arg Ala Gly Asn Gly Ala Leu Arg Glu Asp Lys Asp Pro
35 40 45

Pro Lys Met Trp Ala Thr Ile Tyr Glu Leu Lys Glu Asp Lys Ser Tyr
50 55 60

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

Gly Thr Phe Val Pro Gly Ser Gln Pro Gly Glu Phe Thr Leu Gly Pro
85 90 95

Ile Lys Ser Glu Pro Gly Asn Thr Ala Ser Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Glu Val Tyr Gln
115 120 125

Asn Arg Glu Ile Phe Phe Ile Ile Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly

<210> 66
<211> 178
<212> PRT
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 66

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe Gln Gly Lys Trp Tyr
20 25 30

Val Val Gly Arg Ala Gly Asn Val Ala Leu Arg Glu Asp Lys Asp Pro
35 40 45

Pro Lys Met Arg Ala Thr Ile Tyr Glu Leu Lys Glu Asp Lys Ser Tyr
50 55 60

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

Gly Thr Phe Val Pro Gly Ser Gln Pro Gly Glu Phe Thr Leu Gly Arg
85 90 95

Ile Lys Ser Glu Pro Gly Tyr Thr Ala Asn Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Glu Val Tyr Gln
115 120 125

Asn Arg Glu Ile Phe Phe Ile Ile Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly

<210> 67

<211> 178

<212> PRT

<213> Artificial Sequence

<220>

<223> lipocalin mutein

<400> 67

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe Gln Gly Lys Trp Tyr
20 25 30

Val Val Gly Arg Ala Gly Asn Val Ala Leu Arg Glu Asp Lys Asp Pro
35 40 45

Pro Lys Met Arg Ala Thr Ile Tyr Glu Leu Lys Glu Asp Lys Ser Tyr
50 55 60

Asp Val Thr Asn Val Val Phe Ala Gly Lys Lys Cys Lys Tyr Ser Ile
65 70 75 80

Gly Thr Phe Val Pro Gly Ser Gln Pro Gly Glu Phe Thr Leu Gly Arg
85 90 95

Ile Lys Ser Pro Pro Gly Asn Thr Ala Asn Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Glu Val Tyr Gln
115 120 125

Asn Arg Glu Ile Phe Phe Ile Ile Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly

<210> 68

<211> 178

<212> PRT

<213> Artificial Sequence

<220>

<223> lipocalin mutein

<400> 68

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe Gln Gly Lys Trp Tyr
20 25 30

Val Val Gly Arg Ala Gly Asn Leu Gly Leu Arg Glu Asp Lys Asp Pro
35 40 45

Pro Lys Met Trp Ala Thr Ile Tyr Glu Leu Lys Glu Asp Lys Ser Tyr
50 55 60

Asp Val Thr Asn Val Arg Phe Ala Arg Lys Lys Cys Met Tyr Ser Ile
65 70 75 80

Gly Thr Phe Val Pro Gly Ser Gln Pro Gly Glu Phe Thr Leu Gly Gln
85 90 95

Ile Lys Ser Glu Pro Gly Ser Thr Ala Asn Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Glu Val Tyr Gln
115 120 125

Asn Arg Glu Ile Phe Phe Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly

<210> 69
<211> 178
<212> PRT
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 69

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe Gln Gly Lys Trp Tyr
20 25 30

Val Val Gly Arg Ala Gly Asn Val Gly Leu Arg Glu Asp Lys Asp Pro
35 40 45

Pro Lys Met Trp Ala Thr Ile Tyr Glu Leu Lys Glu Asp Lys Ser Tyr
50 55 60

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

Gly Thr Phe Val Pro Gly Ser Gln Pro Gly Glu Phe Thr Leu Gly Gln
85 90 95

Ile Lys Ser Glu Pro Gly Asn Thr Ala Thr Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Glu Val Tyr Gln
115 120 125

Asn Arg Glu Ile Phe Phe Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Ala Ile
165 170 175

Asp Gly

<210> 70
<211> 178
<212> PRT
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 70

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe Gln Gly Lys Trp Tyr
20 25 30

Val Val Gly Arg Ala Gly Asn Val Gly Leu Arg Glu Asp Lys Asp Pro
35 40 45

Pro Lys Met Arg Ala Thr Ile Tyr Glu Leu Lys Glu Asp Lys Ser Tyr
50 55 60

Asp Val Thr Gly Val Arg Phe Gly Glu Lys Lys Ile Lys Tyr Ser Ile
65 70 75 80

Gly Thr Phe Val Pro Gly Ser Gln Pro Gly Glu Phe Thr Leu Gly Gln
85 90 95

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

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Glu Val Tyr Gln
115 120 125

Asn Arg Glu Ile Phe Phe Ile Ile Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Ala Ile
165 170 175

Asp Gly

<210> 71
<211> 178
<212> PRT
<213> Artificial Sequence

<220>
<223> lipocalin mutein

<400> 71

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe Gln Gly Lys Trp Tyr
20 25 30

Val Val Gly Arg Ala Gly Asn Val Gly Leu Arg Glu Asp Lys Asp Pro
35 40 45

Pro Lys Met Arg Ala Thr Ile Tyr Glu Leu Lys Glu Asp Lys Ser Tyr
50 55 60

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

Gly Thr Phe Val Pro Gly Ser Gln Pro Gly Glu Phe Thr Leu Gly Gln
85 90 95

Ile Lys Ser Glu Pro Gly Asn Thr Ala Asn Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Glu Val Tyr Gln
115 120 125

Asn Arg Glu Ile Phe Phe Ile Ile Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Ala Ile
165 170 175

Asp Gly

<210> 72
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> antibody heavy chain CDR1

<400> 72

Gly Tyr Thr Phe Thr Asp Tyr Glu
1 5

<210> 73
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> antibody heavy chain CDR2

<400> 73

Leu Asp Pro Lys Thr Gly Asp Thr
1 5

<210> 74
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> antibody heavy chain CDR3

<400> 74

Thr Arg Phe Tyr Ser Tyr Thr Tyr
1 5

<210> 75
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> antibody light chain CDR1

<400> 75

Gln	Ser	Leu	Val	His	Ser	Asn	Arg	Asn	Thr	Tyr
1				5					10	

<210> 76
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> antibody light chain CDR1

<400> 76

Gln	Ser	Leu	Val	His	Ser	Asn	Arg	Asn	Thr	Tyr
1				5					10	

<210> 77
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> antibody light chain CDR3

<400> 77

Ser	Gln	Asn	Thr	His	Val	Pro	Pro	Thr
1				5				

<210> 78
<211> 116
<212> PRT
<213> Artificial Sequence

<220>
<223> antibody heavy chain variable region

<400> 78

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

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

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

Gly Ala Leu Asp Pro Lys Thr Gly Asp Thr Ala Tyr Ser Gln Lys Phe
50 55 60

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

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

Thr Arg Phe Tyr Ser Tyr Thr Tyr Trp Gly Gln Gly Thr Leu Val Thr
100 105 110

Leu Val Ser Ser
115

<210> 79
<211> 112
<212> PRT
<213> Artificial Sequence

<220>
<223> antibody light chain variable region

<400> 79

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

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

Asn Arg Asn Thr Tyr Leu His Trp Tyr Leu Gln Lys Pro Gly Gln Ser
35 40 45

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

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

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

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

<210> 80

<211> 445

<212> PRT

<213> Artificial Sequence

<220>

<223> antibody heavy chain

<400> 80

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

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

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

Gly Ala Leu Asp Pro Lys Thr Gly Asp Thr Ala Tyr Ser Gln Lys Phe
50 55 60

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

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

Thr Arg Phe Tyr Ser Tyr Thr Tyr Trp Gly Gln Gly Thr Leu Val Thr
100 105 110

Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala Pro
115 120 125

Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu Val
130 135 140

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

Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser Gly
165 170 175

Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu Gly
180 185 190

Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr Lys
195 200 205

Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr Cys
210 215 220

Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe Leu
225 230 235 240

Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu
245 250 255

Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val Lys
260 265 270

Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys
275 280 285

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

Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys
305 310 315 320

Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys
325 330 335

Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser
340 345 350

Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys
355 360 365

Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln
370 375 380

Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly
385 390 395 400

Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln
405 410 415

Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn
420 425 430

His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
435 440 445

<210> 81

<211> 442

<212> PRT

<213> Artificial Sequence

<220>

<223> antibody heavy chain

<400> 81

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

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

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

Gly Ala Leu Asp Pro Lys Thr Gly Asp Thr Ala Tyr Ser Gln Lys Phe
50 55 60

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

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

Thr Arg Phe Tyr Ser Tyr Thr Tyr Trp Gly Gln Gly Thr Leu Val Thr
100 105 110

Leu Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
115 120 125

Pro Cys Ser Arg Ser Thr Ser Glu Ser Thr Ala Ala Leu Gly Cys Leu
130 135 140

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
145 150 155 160

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
165 170 175

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
180 185 190

Gly Thr Lys Thr Tyr Thr Cys Asn Val Asp His Lys Pro Ser Asn Thr
195 200 205

Lys Val Asp Lys Arg Val Glu Ser Lys Tyr Gly Pro Pro Cys Pro Pro
210 215 220

Cys Pro Ala Pro Glu Ala Ala Gly Gly Pro Ser Val Phe Leu Phe Pro
225 230 235 240

Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr
245 250 255

Cys Val Val Val Asp Val Ser Gln Glu Asp Pro Glu Val Gln Phe Asn
260 265 270

Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg
275 280 285

Glu Glu Gln Phe Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val
290 295 300

Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser
305 310 315 320

Asn Lys Gly Leu Pro Ser Ser Ile Glu Lys Thr Ile Ser Lys Ala Lys
325 330 335

Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Gln Glu
340 345 350

Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe
355 360 365

Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu
370 375 380

Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe
385 390 395 400

Phe Leu Tyr Ser Arg Leu Thr Val Asp Lys Ser Arg Trp Gln Glu Gly
405 410 415

Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr
420 425 430

Thr Gln Lys Ser Leu Ser Leu Ser Leu Gly
435 440

<210> 82

<211> 219

<212> PRT

<213> Artificial Sequence

<220>

<223> antibody light chain

<400> 82

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

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

Asn Arg Asn Thr Tyr Leu His Trp Tyr Leu Gln Lys Pro Gly Gln Ser
35 40 45

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

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

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

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

Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu
115 120 125

Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe
130 135 140

Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln
145 150 155 160

Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser
165 170 175

Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu
180 185 190

Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser
195 200 205

Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
210 215

<210> 83
<211> 615
<212> PRT
<213> Artificial Sequence

<220>
<223> fusion protein

<400> 83

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe Gln Gly Lys Trp Tyr
20 25 30

Val Val Gly Arg Ala Gly Asn Val Gly Leu Arg Glu Asp Lys Asp Pro
35 40 45

Pro Lys Met Trp Ala Thr Ile Tyr Glu Leu Lys Glu Asp Lys Ser Tyr
50 55 60

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

Gly Thr Phe Val Pro Gly Ser Gln Pro Gly Glu Phe Thr Leu Gly Gln
85 90 95

Ile Lys Ser Glu Pro Gly Gly Thr Ala Asn Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Glu Val Tyr Gln
115 120 125

Asn Arg Glu Ile Phe Phe Ile Ile Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly
180 185 190

Ser Glu Ser Lys Tyr Gly Pro Pro Cys Pro Pro Cys Pro Ala Pro Glu
195 200 205

Ala Ala Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp
210 215 220

Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp
225 230 235 240

Val Ser Gln Glu Asp Pro Glu Val Gln Phe Asn Trp Tyr Val Asp Gly
245 250 255

Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Phe Asn
260 265 270

Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp
275 280 285

Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Gly Leu Pro
290 295 300

Ser Ser Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu
305 310 315 320

Pro Gln Val Tyr Thr Leu Pro Pro Ser Gln Glu Glu Met Thr Lys Asn
325 330 335

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

Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr
355 360 365

Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Arg
370 375 380

Leu Thr Val Asp Lys Ser Arg Trp Gln Glu Gly Asn Val Phe Ser Cys
385 390 395 400

Ser Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu
405 410 415

Ser Leu Ser Leu Gly Lys Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser
420 425 430

Gly Gly Gly Gly Ser Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro
435 440 445

Pro Leu Ser Lys Val Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe
450 455 460

His Gly Lys Trp Tyr Val Val Gly Gln Ala Gly Asn Ile Arg Leu Arg
465 470 475 480

Glu Asp Lys Asp Pro Ile Lys Met Met Ala Thr Ile Tyr Glu Leu Lys
485 490 495

Glu Asp Lys Ser Tyr Asp Val Thr Met Val Lys Phe Asp Asp Lys Lys
500 505 510

Cys Met Tyr Asp Ile Trp Thr Phe Val Pro Gly Ser Gln Pro Gly Glu
515 520 525

Phe Thr Leu Gly Lys Ile Lys Ser Phe Pro Gly His Thr Ser Ser Leu
530 535 540

Val Arg Val Val Ser Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe
545 550 555 560

Lys Phe Val Phe Gln Asn Arg Glu Glu Phe Tyr Ile Thr Leu Tyr Gly
565 570 575

Arg Thr Lys Glu Leu Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe
580 585 590

Ser Lys Ser Leu Gly Leu Pro Glu Asn His Ile Val Phe Pro Val Pro
595 600 605

Ile Asp Gln Cys Ile Asp Gly
610 615

<210> 84
<211> 610
<212> PRT
<213> Artificial Sequence

<220>
<223> fusion protein

<400> 84

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe Gln Gly Lys Trp Tyr
20 25 30

Val Val Gly Arg Ala Gly Asn Val Gly Leu Arg Glu Asp Lys Asp Pro
35 40 45

Pro Lys Met Trp Ala Thr Ile Tyr Glu Leu Lys Glu Asp Lys Ser Tyr
50 55 60

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

Gly Thr Phe Val Pro Gly Ser Gln Pro Gly Glu Phe Thr Leu Gly Gln
85 90 95

Ile Lys Ser Glu Pro Gly Gly Thr Ala Asn Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Glu Val Tyr Gln
115 120 125

Asn Arg Glu Ile Phe Phe Ile Ile Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gln Asp Ser Thr
180 185 190

Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val Pro Leu Gln Gln
195 200 205

Asn Phe Gln Asp Asn Gln Phe His Gly Lys Trp Tyr Val Val Gly Gln
210 215 220

Ala Gly Asn Ile Arg Leu Arg Glu Asp Lys Asp Pro Ile Lys Met Met
225 230 235 240

Ala Thr Ile Tyr Glu Leu Lys Glu Asp Lys Ser Tyr Asp Val Thr Met
245 250 255

Val Lys Phe Asp Asp Lys Lys Cys Met Tyr Asp Ile Trp Thr Phe Val
260 265 270

Pro Gly Ser Gln Pro Gly Glu Phe Thr Leu Gly Lys Ile Lys Ser Phe
275 280 285

Pro Gly His Thr Ser Ser Leu Val Arg Val Val Ser Thr Asn Tyr Asn
290 295 300

Gln His Ala Met Val Phe Phe Lys Phe Val Phe Gln Asn Arg Glu Glu
305 310 315 320

Phe Tyr Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu Thr Ser Glu Leu
325 330 335

Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly Leu Pro Glu Asn
340 345 350

His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile Asp Gly Gly Gly
355 360 365

Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Glu Ser Lys
370 375 380

Tyr Gly Pro Pro Cys Pro Pro Cys Pro Ala Pro Glu Ala Ala Gly Gly
385 390 395 400

Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile
405 410 415

Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser Gln Glu
420 425 430

Asp Pro Glu Val Gln Phe Asn Trp Tyr Val Asp Gly Val Glu Val His
435 440 445

Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Phe Asn Ser Thr Tyr Arg
450 455 460

Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys
465 470 475 480

Glu Tyr Lys Cys Lys Val Ser Asn Lys Gly Leu Pro Ser Ser Ile Glu
485 490 495

Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr
500 505 510

Thr Leu Pro Pro Ser Gln Glu Glu Met Thr Lys Asn Gln Val Ser Leu
515 520 525

Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp
530 535 540

Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val
545 550 555 560

Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Arg Leu Thr Val Asp
565 570 575

Lys Ser Arg Trp Gln Glu Gly Asn Val Phe Ser Cys Ser Val Met His
580 585 590

Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Leu
595 600 605

Gly Lys
610

<210> 85
<211> 366
<212> PRT
<213> Artificial Sequence

<220>
<223> fusion protein

<400> 85

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe Gln Gly Lys Trp Tyr
20 25 30

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

Leu Lys Met Arg Ala Thr Ile Tyr Glu Leu Lys Glu Asp Lys Ser Tyr
50 55 60

Asp Val Thr Ser Val Ala Phe Arg Asn Lys Lys Cys His Tyr Lys Ile
65 70 75 80

Gly Thr Phe Val Pro Gly Ser Gln Pro Gly Glu Phe Thr Leu Gly Gln
85 90 95

Ile Lys Ser Gly Pro Gly Glu Thr Ser Asn Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Glu Val Arg Gln
115 120 125

Asn Arg Glu Trp Phe Phe Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gln Asp Ser Thr
180 185 190

Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val Pro Leu Gln Gln
195 200 205

Asn Phe Gln Asp Asn Gln Phe His Gly Lys Trp Tyr Val Val Gly Gln
210 215 220

Ala Gly Asn Ile Arg Leu Arg Glu Asp Lys Asp Pro Ile Lys Met Met
225 230 235 240

Ala Thr Ile Tyr Glu Leu Lys Glu Asp Lys Ser Tyr Asp Val Thr Met
245 250 255

Val Lys Phe Asp Asp Lys Lys Cys Met Tyr Asp Ile Trp Thr Phe Val
260 265 270

Pro Gly Ser Gln Pro Gly Glu Phe Thr Leu Gly Lys Ile Lys Ser Phe
275 280 285

Pro Gly His Thr Ser Ser Leu Val Arg Val Val Ser Thr Asn Tyr Asn
290 295 300

Gln His Ala Met Val Phe Phe Lys Phe Val Phe Gln Asn Arg Glu Glu
305 310 315 320

Phe Tyr Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu Thr Ser Glu Leu
325 330 335

Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly Leu Pro Glu Asn
340 345 350

His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile Asp Gly
355 360 365

<210> 86
<211> 554
<212> PRT
<213> Artificial Sequence

<220>
<223> fusion protein

<400> 86

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe Gln Gly Lys Trp Tyr
20 25 30

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

Leu Lys Met Arg Ala Thr Ile Tyr Glu Leu Lys Glu Asp Lys Ser Tyr
50 55 60

Asp Val Thr Ser Val Ala Phe Arg Asn Lys Lys Cys His Tyr Lys Ile
65 70 75 80

Gly Thr Phe Val Pro Gly Ser Gln Pro Gly Glu Phe Thr Leu Gly Gln
85 90 95

Ile Lys Ser Gly Pro Gly Glu Thr Ser Asn Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Glu Val Arg Gln
115 120 125

Asn Arg Glu Trp Phe Phe Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gln Asp Ser Thr
180 185 190

Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val Pro Leu Gln Gln
195 200 205

Asn Phe Gln Asp Asn Gln Phe His Gly Lys Trp Tyr Val Val Gly Gln
210 215 220

Ala Gly Asn Ile Arg Leu Arg Glu Asp Lys Asp Pro Ile Lys Met Met
225 230 235 240

Ala Thr Ile Tyr Glu Leu Lys Glu Asp Lys Ser Tyr Asp Val Thr Met
245 250 255

Val Lys Phe Asp Asp Lys Lys Cys Met Tyr Asp Ile Trp Thr Phe Val
260 265 270

Pro Gly Ser Gln Pro Gly Glu Phe Thr Leu Gly Lys Ile Lys Ser Phe
275 280 285

Pro Gly His Thr Ser Ser Leu Val Arg Val Val Ser Thr Asn Tyr Asn
290 295 300

Gln His Ala Met Val Phe Phe Lys Phe Val Phe Gln Asn Arg Glu Glu
305 310 315 320

Phe Tyr Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu Thr Ser Glu Leu
325 330 335

Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly Leu Pro Glu Asn
340 345 350

His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile Asp Gly Gly Gly
355 360 365

Gly Gly Ser Gly Gly Gly Gly Ser Gln Asp Ser Thr Ser Asp Leu Ile
370 375 380

Pro Ala Pro Pro Leu Ser Lys Val Pro Leu Gln Gln Asn Phe Gln Asp
385 390 395 400

Asn Gln Phe His Gly Lys Trp Tyr Val Val Gly Gln Ala Gly Asn Ile
405 410 415

Arg Leu Arg Glu Asp Lys Asp Pro Ile Lys Met Met Ala Thr Ile Tyr
420 425 430

Glu Leu Lys Glu Asp Lys Ser Tyr Asp Val Thr Met Val Lys Phe Asp
435 440 445

Asp Lys Lys Cys Met Tyr Asp Ile Trp Thr Phe Val Pro Gly Ser Gln
450 455 460

Pro Gly Glu Phe Thr Leu Gly Lys Ile Lys Ser Phe Pro Gly His Thr
465 470 475 480

Ser Ser Leu Val Arg Val Val Ser Thr Asn Tyr Asn Gln His Ala Met
485 490 495

Val Phe Phe Lys Phe Val Phe Gln Asn Arg Glu Glu Phe Tyr Ile Thr
500 505 510

Leu Tyr Gly Arg Thr Lys Glu Leu Thr Ser Glu Leu Lys Glu Asn Phe
515 520 525

Ile Arg Phe Ser Lys Ser Leu Gly Leu Pro Glu Asn His Ile Val Phe
530 535 540

Pro Val Pro Ile Asp Gln Cys Ile Asp Gly
545 550

<210> 87
<211> 635
<212> PRT
<213> Artificial Sequence

<220>
<223> fusion protein

<400> 87

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

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

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

Gly Ala Leu Asp Pro Lys Thr Gly Asp Thr Ala Tyr Ser Gln Lys Phe
50 55 60

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

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

Thr Arg Phe Tyr Ser Tyr Thr Tyr Trp Gly Gln Gly Thr Leu Val Thr
100 105 110

Leu Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
115 120 125

Pro Cys Ser Arg Ser Thr Ser Glu Ser Thr Ala Ala Leu Gly Cys Leu
130 135 140

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
145 150 155 160

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
165 170 175

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
180 185 190

Gly Thr Lys Thr Tyr Thr Cys Asn Val Asp His Lys Pro Ser Asn Thr
195 200 205

Lys Val Asp Lys Arg Val Glu Ser Lys Tyr Gly Pro Pro Cys Pro Pro
210 215 220

Cys Pro Ala Pro Glu Ala Ala Gly Gly Pro Ser Val Phe Leu Phe Pro
225 230 235 240

Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr
245 250 255

Cys Val Val Val Asp Val Ser Gln Glu Asp Pro Glu Val Gln Phe Asn
260 265 270

Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg
275 280 285

Glu Glu Gln Phe Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val
290 295 300

Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser
305 310 315 320

Asn Lys Gly Leu Pro Ser Ser Ile Glu Lys Thr Ile Ser Lys Ala Lys
325 330 335

Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Gln Glu
340 345 350

Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe
355 360 365

Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu
370 375 380

Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe
385 390 395 400

Phe Leu Tyr Ser Arg Leu Thr Val Asp Lys Ser Arg Trp Gln Glu Gly
405 410 415

Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr
420 425 430

Thr Gln Lys Ser Leu Ser Leu Ser Leu Gly Gly Gly Gly Gly Ser Gly
435 440 445

Gly Gly Gly Ser Gly Gly Gly Gly Ser Gln Asp Ser Thr Ser Asp Leu
450 455 460

Ile Pro Ala Pro Pro Leu Ser Lys Val Pro Leu Gln Gln Asn Phe Gln
465 470 475 480

Asp Asn Gln Phe His Gly Lys Trp Tyr Val Val Gly Gln Ala Gly Asn
485 490 495

Ile Arg Leu Arg Glu Asp Lys Asp Pro Ile Lys Met Met Ala Thr Ile
500 505 510

Tyr Glu Leu Lys Glu Asp Lys Ser Tyr Asp Val Thr Met Val Lys Phe
515 520 525

Asp Asp Lys Lys Cys Met Tyr Asp Ile Trp Thr Phe Val Pro Gly Ser
530 535 540

Gln Pro Gly Glu Phe Thr Leu Gly Lys Ile Lys Ser Phe Pro Gly His
545 550 555 560

Thr Ser Ser Leu Val Arg Val Val Ser Thr Asn Tyr Asn Gln His Ala
565 570 575

Met Val Phe Phe Lys Phe Val Phe Gln Asn Arg Glu Glu Phe Tyr Ile
580 585 590

Thr Leu Tyr Gly Arg Thr Lys Glu Leu Thr Ser Glu Leu Lys Glu Asn
595 600 605

Phe Ile Arg Phe Ser Lys Ser Leu Gly Leu Pro Glu Asn His Ile Val
610 615 620

Phe Pro Val Pro Ile Asp Gln Cys Ile Asp Gly
625 630 635

<210> 88

<211> 828

<212> PRT
<213> Artificial Sequence

<220>
<223> fusion protein

<400> 88

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe His Gly Lys Trp Tyr
20 25 30

Val Val Gly Gln Ala Gly Asn Ile Arg Leu Arg Glu Asp Lys Asp Pro
35 40 45

Ile Lys Met Met Ala Thr Ile Tyr Glu Leu Lys Glu Asp Lys Ser Tyr
50 55 60

Asp Val Thr Met Val Lys Phe Asp Asp Lys Lys Cys Met Tyr Asp Ile
65 70 75 80

Trp Thr Phe Val Pro Gly Ser Gln Pro Gly Glu Phe Thr Leu Gly Lys
85 90 95

Ile Lys Ser Phe Pro Gly His Thr Ser Ser Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Phe Val Phe Gln
115 120 125

Asn Arg Glu Glu Phe Tyr Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly
180 185 190

Ser Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly
195 200 205

Ala Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Asp
210 215 220

Tyr Glu Met His Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp
225 230 235 240

Met Gly Ala Leu Asp Pro Lys Thr Gly Asp Thr Ala Tyr Ser Gln Lys
245 250 255

Phe Lys Gly Arg Val Thr Leu Thr Ala Asp Lys Ser Thr Ser Thr Ala
260 265 270

Tyr Met Glu Leu Ser Ser Leu Thr Ser Glu Asp Thr Ala Val Tyr Tyr
275 280 285

Cys Thr Arg Phe Tyr Ser Tyr Thr Tyr Trp Gly Gln Gly Thr Leu Val
290 295 300

Thr Leu Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu
305 310 315 320

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

Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser
340 345 350

Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser
355 360 365

Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser
370 375 380

Leu Gly Thr Lys Thr Tyr Thr Cys Asn Val Asp His Lys Pro Ser Asn
385 390 395 400

Thr Lys Val Asp Lys Arg Val Glu Ser Lys Tyr Gly Pro Pro Cys Pro
405 410 415

Pro Cys Pro Ala Pro Glu Ala Ala Gly Gly Pro Ser Val Phe Leu Phe
420 425 430

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

Thr Cys Val Val Val Asp Val Ser Gln Glu Asp Pro Glu Val Gln Phe
450 455 460

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

Arg Glu Glu Gln Phe Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr
485 490 495

Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val
500 505 510

Ser Asn Lys Gly Leu Pro Ser Ser Ile Glu Lys Thr Ile Ser Lys Ala
515 520 525

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

Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly
545 550 555 560

Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro
565 570 575

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

Phe Phe Leu Tyr Ser Arg Leu Thr Val Asp Lys Ser Arg Trp Gln Glu
595 600 605

Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn His
610 615 620

Tyr Thr Gln Lys Ser Leu Ser Leu Ser Leu Gly Gly Gly Gly Gly Ser
625 630 635 640

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gln Asp Ser Thr Ser Asp
645 650 655

Leu Ile Pro Ala Pro Pro Leu Ser Lys Val Pro Leu Gln Gln Asn Phe
660 665 670

Gln Asp Asn Gln Phe His Gly Lys Trp Tyr Val Val Gly Gln Ala Gly
675 680 685

Asn Ile Arg Leu Arg Glu Asp Lys Asp Pro Ile Lys Met Met Ala Thr
690 695 700

Ile Tyr Glu Leu Lys Glu Asp Lys Ser Tyr Asp Val Thr Met Val Lys
705 710 715 720

Phe Asp Asp Lys Lys Cys Met Tyr Asp Ile Trp Thr Phe Val Pro Gly
725 730 735

Ser Gln Pro Gly Glu Phe Thr Leu Gly Lys Ile Lys Ser Phe Pro Gly
740 745 750

His Thr Ser Ser Leu Val Arg Val Val Ser Thr Asn Tyr Asn Gln His
755 760 765

Ala Met Val Phe Phe Lys Phe Val Phe Gln Asn Arg Glu Glu Phe Tyr
770 775 780

Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu Thr Ser Glu Leu Lys Glu
785 790 795 800

Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly Leu Pro Glu Asn His Ile
805 810 815

Val Phe Pro Val Pro Ile Asp Gln Cys Ile Asp Gly
820 825

<210> 89
<211> 412
<212> PRT
<213> Artificial Sequence

<220>
<223> fusion protein

<400> 89

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

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

Asn Arg Asn Thr Tyr Leu His Trp Tyr Leu Gln Lys Pro Gly Gln Ser
35 40 45

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

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

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

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

Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu
115 120 125

Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe
130 135 140

Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln
145 150 155 160

Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser
165 170 175

Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu
180 185 190

Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser
195 200 205

Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys Gly Gly Gly Gly Ser
210 215 220

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gln Asp Ser Thr Ser Asp
225 230 235 240

Leu Ile Pro Ala Pro Pro Leu Ser Lys Val Pro Leu Gln Gln Asn Phe
245 250 255

Gln Asp Asn Gln Phe His Gly Lys Trp Tyr Val Val Gly Gln Ala Gly
260 265 270

Asn Ile Arg Leu Arg Glu Asp Lys Asp Pro Ile Lys Met Met Ala Thr
275 280 285

Ile Tyr Glu Leu Lys Glu Asp Lys Ser Tyr Asp Val Thr Met Val Lys
290 295 300

Phe Asp Asp Lys Lys Cys Met Tyr Asp Ile Trp Thr Phe Val Pro Gly
305 310 315 320

Ser Gln Pro Gly Glu Phe Thr Leu Gly Lys Ile Lys Ser Phe Pro Gly
325 330 335

His Thr Ser Ser Leu Val Arg Val Val Ser Thr Asn Tyr Asn Gln His
340 345 350

Ala Met Val Phe Phe Lys Phe Val Phe Gln Asn Arg Glu Glu Phe Tyr
355 360 365

Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu Thr Ser Glu Leu Lys Glu
370 375 380

Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly Leu Pro Glu Asn His Ile
385 390 395 400

Val Phe Pro Val Pro Ile Asp Gln Cys Ile Asp Gly
405 410

<210> 90
<211> 412
<212> PRT
<213> Artificial Sequence

<220>
<223> fusion protein

<400> 90

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe His Gly Lys Trp Tyr
20 25 30

Val Val Gly Gln Ala Gly Asn Ile Arg Leu Arg Glu Asp Lys Asp Pro
35 40 45

Ile Lys Met Met Ala Thr Ile Tyr Glu Leu Lys Glu Asp Lys Ser Tyr
50 55 60

Asp Val Thr Met Val Lys Phe Asp Asp Lys Lys Cys Met Tyr Asp Ile
65 70 75 80

Trp Thr Phe Val Pro Gly Ser Gln Pro Gly Glu Phe Thr Leu Gly Lys
85 90 95

Ile Lys Ser Phe Pro Gly His Thr Ser Ser Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Phe Val Phe Gln
115 120 125

Asn Arg Glu Glu Phe Tyr Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly
180 185 190

Ser Asp Val Val Met Thr Gln Ser Pro Leu Ser Leu Pro Val Thr Pro
195 200 205

Gly Glu Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser Leu Val His
210 215 220

Ser Asn Arg Asn Thr Tyr Leu His Trp Tyr Leu Gln Lys Pro Gly Gln
225 230 235 240

Ser Pro Gln Leu Leu Ile Tyr Lys Val Ser Asn Arg Phe Ser Gly Val
245 250 255

Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys
260 265 270

Ile Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr Cys Ser Gln
275 280 285

Asn Thr His Val Pro Pro Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile
290 295 300

Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro Ser Asp
305 310 315 320

Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu Asn Asn
325 330 335

Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn Ala Leu
340 345 350

Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser Lys Asp
355 360 365

Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr
370 375 380

Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly Leu Ser
385 390 395 400

Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
405 410

<210> 91
<211> 635
<212> PRT
<213> Artificial Sequence

<220>
<223> fusion protein

<400> 91

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

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

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

Gly Ala Leu Asp Pro Lys Thr Gly Asp Thr Ala Tyr Ser Gln Lys Phe
50 55 60

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

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

Thr Arg Phe Tyr Ser Tyr Thr Tyr Trp Gly Gln Gly Thr Leu Val Thr
100 105 110

Leu Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
115 120 125

Pro Cys Ser Arg Ser Thr Ser Glu Ser Thr Ala Ala Leu Gly Cys Leu
130 135 140

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
145 150 155 160

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
165 170 175

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
180 185 190

Gly Thr Lys Thr Tyr Thr Cys Asn Val Asp His Lys Pro Ser Asn Thr
195 200 205

Lys Val Asp Lys Arg Val Glu Ser Lys Tyr Gly Pro Pro Cys Pro Pro
210 215 220

Cys Pro Ala Pro Glu Ala Ala Gly Gly Pro Ser Val Phe Leu Phe Pro
225 230 235 240

Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr
245 250 255

Cys Val Val Val Asp Val Ser Gln Glu Asp Pro Glu Val Gln Phe Asn
260 265 270

Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg
275 280 285

Glu Glu Gln Phe Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val
290 295 300

Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser
305 310 315 320

Asn Lys Gly Leu Pro Ser Ser Ile Glu Lys Thr Ile Ser Lys Ala Lys
325 330 335

Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Gln Glu
340 345 350

Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe
355 360 365

Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu
370 375 380

Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe
385 390 395 400

Phe Leu Tyr Ser Arg Leu Thr Val Asp Lys Ser Arg Trp Gln Glu Gly
405 410 415

Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr
420 425 430

Thr Gln Lys Ser Leu Ser Leu Ser Leu Gly Gly Gly Gly Ser Gly
435 440 445

Gly Gly Gly Ser Gly Gly Gly Gly Ser Gln Asp Ser Thr Ser Asp Leu
450 455 460

Ile Pro Ala Pro Pro Leu Ser Lys Val Pro Leu Gln Gln Asn Phe Gln
465 470 475 480

Asp Asn Gln Phe Gln Gly Lys Trp Tyr Val Val Gly Met Ala Gly Asn
485 490 495

Asn Leu Leu Arg Glu Asp Lys Asp Pro His Lys Met Ser Ala Thr Ile
500 505 510

Tyr Glu Leu Lys Glu Asp Lys Ser Tyr Asn Val Thr Asp Val Met Phe
515 520 525

Leu Asp Lys Lys Cys Gln Tyr Ile Ile Trp Thr Phe Val Pro Gly Ser
530 535 540

Gln Pro Gly Glu Leu Thr Leu Gly Phe Ile Arg Ser Asp Leu Gly His
545 550 555 560

Thr Ser Tyr Leu Val Arg Val Val Ser Thr Asn Tyr Asn Gln His Ala
565 570 575

Met Val Phe Phe Lys Ser Val Ile Gln Asn Arg Glu Trp Phe Gly Ile
580 585 590

Thr Leu Tyr Gly Arg Thr Lys Glu Leu Thr Ser Glu Leu Lys Glu Asn
595 600 605

Phe Ile Arg Phe Ser Lys Ser Leu Gly Leu Pro Glu Asn His Ile Val
610 615 620

Phe Pro Val Pro Ile Asp Gln Cys Ile Asp Gly
625 630 635

<210> 92
<211> 635
<212> PRT
<213> Artificial Sequence

<220>
<223> fusion protein

<400> 92

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe Gln Gly Lys Trp Tyr
20 25 30

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

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

Asn Val Thr Asp Val Met Phe Leu Asp Lys Lys Cys Gln Tyr Ile Ile
65 70 75 80

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

Ile Arg Ser Asp Leu Gly His Thr Ser Tyr Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Ser Val Ile Gln
115 120 125

Asn Arg Glu Trp Phe Gly Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly
180 185 190

Ser Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly
195 200 205

Ala Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Asp
210 215 220

Tyr Glu Met His Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp
225 230 235 240

Met Gly Ala Leu Asp Pro Lys Thr Gly Asp Thr Ala Tyr Ser Gln Lys
245 250 255

Phe Lys Gly Arg Val Thr Leu Thr Ala Asp Lys Ser Thr Ser Thr Ala
260 265 270

Tyr Met Glu Leu Ser Ser Leu Thr Ser Glu Asp Thr Ala Val Tyr Tyr
275 280 285

Cys Thr Arg Phe Tyr Ser Tyr Thr Tyr Trp Gly Gln Gly Thr Leu Val
290 295 300

Thr Leu Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu
305 310 315 320

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

Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser
340 345 350

Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser
355 360 365

Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser
370 375 380

Leu Gly Thr Lys Thr Tyr Thr Cys Asn Val Asp His Lys Pro Ser Asn
385 390 395 400

Thr Lys Val Asp Lys Arg Val Glu Ser Lys Tyr Gly Pro Pro Cys Pro
405 410 415

Pro Cys Pro Ala Pro Glu Ala Ala Gly Gly Pro Ser Val Phe Leu Phe
420 425 430

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

Thr Cys Val Val Val Asp Val Ser Gln Glu Asp Pro Glu Val Gln Phe
450 455 460

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

Arg Glu Glu Gln Phe Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr
485 490 495

Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val
500 505 510

Ser Asn Lys Gly Leu Pro Ser Ser Ile Glu Lys Thr Ile Ser Lys Ala
515 520 525

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

Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly
545 550 555 560

Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro
565 570 575

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

Phe Phe Leu Tyr Ser Arg Leu Thr Val Asp Lys Ser Arg Trp Gln Glu
595 600 605

Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn His
610 615 620

Tyr Thr Gln Lys Ser Leu Ser Leu Ser Leu Gly
625 630 635

<210> 93
<211> 412
<212> PRT
<213> Artificial Sequence

<220>
<223> fusion protein

<400> 93

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

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

Asn Arg Asn Thr Tyr Leu His Trp Tyr Leu Gln Lys Pro Gly Gln Ser
35 40 45

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

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

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

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

Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu
115 120 125

Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe
130 135 140

Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln
145 150 155 160

Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser
165 170 175

Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu
180 185 190

Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser
195 200 205

Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys Gly Gly Gly Gly Ser
210 215 220

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gln Asp Ser Thr Ser Asp
225 230 235 240

Leu Ile Pro Ala Pro Pro Leu Ser Lys Val Pro Leu Gln Gln Asn Phe
245 250 255

Gln Asp Asn Gln Phe Gln Gly Lys Trp Tyr Val Val Gly Met Ala Gly
260 265 270

Asn Asn Leu Leu Arg Glu Asp Lys Asp Pro His Lys Met Ser Ala Thr
275 280 285

Ile Tyr Glu Leu Lys Glu Asp Lys Ser Tyr Asn Val Thr Asp Val Met
290 295 300

Phe Leu Asp Lys Lys Cys Gln Tyr Ile Ile Trp Thr Phe Val Pro Gly
305 310 315 320

Ser Gln Pro Gly Glu Leu Thr Leu Gly Phe Ile Arg Ser Asp Leu Gly
325 330 335

His Thr Ser Tyr Leu Val Arg Val Val Ser Thr Asn Tyr Asn Gln His
340 345 350

Ala Met Val Phe Phe Lys Ser Val Ile Gln Asn Arg Glu Trp Phe Gly
355 360 365

Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu Thr Ser Glu Leu Lys Glu
370 375 380

Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly Leu Pro Glu Asn His Ile
385 390 395 400

Val Phe Pro Val Pro Ile Asp Gln Cys Ile Asp Gly
405 410

<210> 94
<211> 412
<212> PRT
<213> Artificial Sequence

<220>
<223> fusion protein

<400> 94

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe Gln Gly Lys Trp Tyr
20 25 30

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

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

Asn Val Thr Asp Val Met Phe Leu Asp Lys Lys Cys Gln Tyr Ile Ile
65 70 75 80

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

Ile Arg Ser Asp Leu Gly His Thr Ser Tyr Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Ser Val Ile Gln
115 120 125

Asn Arg Glu Trp Phe Gly Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly
180 185 190

Ser Asp Val Val Met Thr Gln Ser Pro Leu Ser Leu Pro Val Thr Pro
195 200 205

Gly Glu Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser Leu Val His
210 215 220

Ser Asn Arg Asn Thr Tyr Leu His Trp Tyr Leu Gln Lys Pro Gly Gln
225 230 235 240

Ser Pro Gln Leu Leu Ile Tyr Lys Val Ser Asn Arg Phe Ser Gly Val
245 250 255

Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys
260 265 270

Ile Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr Cys Ser Gln
275 280 285

Asn Thr His Val Pro Pro Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile
290 295 300

Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro Ser Asp
305 310 315 320

Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu Asn Asn
325 330 335

Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn Ala Leu
340 345 350

Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser Lys Asp
355 360 365

Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr
370 375 380

Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly Leu Ser
385 390 395 400

Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
405 410

<210> 95

<211> 640

<212> PRT

<213> Artificial Sequence

<220>

<223> fusion protein

<400> 95

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

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

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

Gly Ala Leu Asp Pro Lys Thr Gly Asp Thr Ala Tyr Ser Gln Lys Phe
50 55 60

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

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

Thr Arg Phe Tyr Ser Tyr Thr Tyr Trp Gly Gln Gly Thr Leu Val Thr
100 105 110

Leu Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
115 120 125

Pro Cys Ser Arg Ser Thr Ser Glu Ser Thr Ala Ala Leu Gly Cys Leu
130 135 140

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
145 150 155 160

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
165 170 175

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
180 185 190

Gly Thr Lys Thr Tyr Thr Cys Asn Val Asp His Lys Pro Ser Asn Thr
195 200 205

Lys Val Asp Lys Arg Val Glu Ser Lys Tyr Gly Pro Pro Cys Pro Pro
210 215 220

Cys Pro Ala Pro Glu Ala Ala Gly Gly Pro Ser Val Phe Leu Phe Pro
225 230 235 240

Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr
245 250 255

Cys Val Val Val Asp Val Ser Gln Glu Asp Pro Glu Val Gln Phe Asn
260 265 270

Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg
275 280 285

Glu Glu Gln Phe Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val
290 295 300

Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser
305 310 315 320

Asn Lys Gly Leu Pro Ser Ser Ile Glu Lys Thr Ile Ser Lys Ala Lys
325 330 335

Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Gln Glu
340 345 350

Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe
355 360 365

Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu
370 375 380

Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe
385 390 395 400

Phe Leu Tyr Ser Arg Leu Thr Val Asp Lys Ser Arg Trp Gln Glu Gly
405 410 415

Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr
420 425 430

Thr Gln Lys Ser Leu Ser Leu Ser Leu Gly Gly Gly Gly Gly Ser Gly
435 440 445

Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gln Asp
450 455 460

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

Gln Gln Asn Phe Gln Asp Asn Gln Phe Gln Gly Lys Trp Tyr Val Val
485 490 495

Gly Met Ala Gly Asn Asn Leu Leu Arg Glu Asp Lys Asp Pro His Lys
500 505 510

Met Ser Ala Thr Ile Tyr Glu Leu Lys Glu Asp Lys Ser Tyr Asn Val
515 520 525

Thr Asp Val Met Phe Leu Asp Lys Lys Cys Gln Tyr Ile Ile Trp Thr
530 535 540

Phe Val Pro Gly Ser Gln Pro Gly Glu Leu Thr Leu Gly Phe Ile Arg
545 550 555 560

Ser Asp Leu Gly His Thr Ser Tyr Leu Val Arg Val Val Ser Thr Asn
565 570 575

Tyr Asn Gln His Ala Met Val Phe Phe Lys Ser Val Ile Gln Asn Arg
580 585 590

Glu Trp Phe Gly Ile Thr Leu Tyr Gly Arg Thr Lys Glu Leu Thr Ser
595 600 605

Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly Leu Pro
610 615 620

Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile Asp Gly
625 630 635 640

<210> 96

<211> 645

<212> PRT

<213> Artificial Sequence

<220>

<223> fusion protein

<400> 96

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

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

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

Gly Ala Leu Asp Pro Lys Thr Gly Asp Thr Ala Tyr Ser Gln Lys Phe
50 55 60

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

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

Thr Arg Phe Tyr Ser Tyr Thr Tyr Trp Gly Gln Gly Thr Leu Val Thr
100 105 110

Leu Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
115 120 125

Pro Cys Ser Arg Ser Thr Ser Glu Ser Thr Ala Ala Leu Gly Cys Leu
130 135 140

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
145 150 155 160

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
165 170 175

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
180 185 190

Gly Thr Lys Thr Tyr Thr Cys Asn Val Asp His Lys Pro Ser Asn Thr
195 200 205

Lys Val Asp Lys Arg Val Glu Ser Lys Tyr Gly Pro Pro Cys Pro Pro
210 215 220

Cys Pro Ala Pro Glu Ala Ala Gly Gly Pro Ser Val Phe Leu Phe Pro
225 230 235 240

Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr
245 250 255

Cys Val Val Val Asp Val Ser Gln Glu Asp Pro Glu Val Gln Phe Asn
260 265 270

Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg
275 280 285

Glu Glu Gln Phe Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val
290 295 300

Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser
305 310 315 320

Asn Lys Gly Leu Pro Ser Ser Ile Glu Lys Thr Ile Ser Lys Ala Lys
325 330 335

Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Gln Glu
340 345 350

Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe
355 360 365

Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu
370 375 380

Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe
385 390 395 400

Phe Leu Tyr Ser Arg Leu Thr Val Asp Lys Ser Arg Trp Gln Glu Gly
405 410 415

Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr
420 425 430

Thr Gln Lys Ser Leu Ser Leu Ser Leu Gly Gly Gly Gly Gly Ser Gly
435 440 445

Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly
450 455 460

Gly Gly Ser Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu
465 470 475 480

Ser Lys Val Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe Gln Gly
485 490 495

Lys Trp Tyr Val Val Gly Met Ala Gly Asn Asn Leu Leu Arg Glu Asp
500 505 510

Lys Asp Pro His Lys Met Ser Ala Thr Ile Tyr Glu Leu Lys Glu Asp
515 520 525

Lys Ser Tyr Asn Val Thr Asp Val Met Phe Leu Asp Lys Lys Cys Gln
530 535 540

Tyr Ile Ile Trp Thr Phe Val Pro Gly Ser Gln Pro Gly Glu Leu Thr
545 550 555 560

Leu Gly Phe Ile Arg Ser Asp Leu Gly His Thr Ser Tyr Leu Val Arg
565 570 575

Val Val Ser Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Ser
580 585 590

Val Ile Gln Asn Arg Glu Trp Phe Gly Ile Thr Leu Tyr Gly Arg Thr
595 600 605

Lys Glu Leu Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys
610 615 620

Ser Leu Gly Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp
625 630 635 640

Gln Cys Ile Asp Gly
645

<210> 97
<211> 421
<212> PRT
<213> Artificial Sequence

<220>
<223> fusion protein

<400> 97

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe Gln Gly Lys Trp Tyr
20 25 30

Val Val Gly Arg Ala Gly Asn Val Gly Leu Arg Glu Asp Lys Asp Pro
35 40 45

Pro Lys Met Trp Ala Thr Ile Tyr Glu Leu Lys Glu Asp Lys Ser Tyr
50 55 60

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

Gly Thr Phe Val Pro Gly Ser Gln Pro Gly Glu Phe Thr Leu Gly Gln
85 90 95

Ile Lys Ser Glu Pro Gly Gly Thr Ala Asn Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Glu Val Tyr Gln
115 120 125

Asn Arg Glu Ile Phe Phe Ile Ile Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly
180 185 190

Ser Glu Ser Lys Tyr Gly Pro Pro Cys Pro Pro Cys Pro Ala Pro Glu
195 200 205

Ala Ala Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp
210 215 220

Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp
225 230 235 240

Val Ser Gln Glu Asp Pro Glu Val Gln Phe Asn Trp Tyr Val Asp Gly
245 250 255

Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Phe Asn
260 265 270

Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp
275 280 285

Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Gly Leu Pro
290 295 300

Ser Ser Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu
305 310 315 320

Pro Gln Val Tyr Thr Leu Pro Pro Ser Gln Glu Glu Met Thr Lys Asn
325 330 335

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

Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr
355 360 365

Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Arg
370 375 380

Leu Thr Val Asp Lys Ser Arg Trp Gln Glu Gly Asn Val Phe Ser Cys
385 390 395 400

Ser Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu
405 410 415

Ser Leu Ser Leu Gly
420

<210> 98
<211> 422
<212> PRT
<213> Artificial Sequence

<220>
<223> fusion protein

<400> 98

Glu Ser Lys Tyr Gly Pro Pro Cys Pro Pro Cys Pro Ala Pro Glu Ala
1 5 10 15

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

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
35 40 45

Ser Gln Glu Asp Pro Glu Val Gln Phe Asn Trp Tyr Val Asp Gly Val
50 55 60

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Phe Asn Ser
65 70 75 80

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
85 90 95

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Gly Leu Pro Ser
100 105 110

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

Gln Val Tyr Thr Leu Pro Pro Ser Gln Glu Glu Met Thr Lys Asn Gln
130 135 140

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
145 150 155 160

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

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Arg Leu
180 185 190

Thr Val Asp Lys Ser Arg Trp Gln Glu Gly Asn Val Phe Ser Cys Ser
195 200 205

Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser
210 215 220

Leu Ser Leu Gly Lys Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly
225 230 235 240

Gly Gly Gly Ser Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro
245 250 255

Leu Ser Lys Val Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe His
260 265 270

Gly Lys Trp Tyr Val Val Gly Gln Ala Gly Asn Ile Arg Leu Arg Glu
275 280 285

Asp Lys Asp Pro Ile Lys Met Met Ala Thr Ile Tyr Glu Leu Lys Glu
290 295 300

Asp Lys Ser Tyr Asp Val Thr Met Val Lys Phe Asp Asp Lys Lys Cys
305 310 315 320

Met Tyr Asp Ile Trp Thr Phe Val Pro Gly Ser Gln Pro Gly Glu Phe
325 330 335

Thr Leu Gly Lys Ile Lys Ser Phe Pro Gly His Thr Ser Ser Leu Val
340 345 350

Arg Val Val Ser Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys
355 360 365

Phe Val Phe Gln Asn Arg Glu Glu Phe Tyr Ile Thr Leu Tyr Gly Arg
370 375 380

Thr Lys Glu Leu Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser
385 390 395 400

Lys Ser Leu Gly Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile
405 410 415

Asp Gln Cys Ile Asp Gly
420

<210> 99
<211> 641
<212> PRT
<213> Artificial Sequence

<220>
<223> fusion protein

<400> 99

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

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

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

Gly Glu Ile Asn His Gly Gly Tyr Val Thr Tyr Asn Pro Ser Leu Glu
50 55 60

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

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

Arg Asp Tyr Gly Pro Gly Asn Tyr Asp Trp Tyr Phe Asp Leu Trp Gly
100 105 110

Arg Gly Thr Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser
115 120 125

Val Phe Pro Leu Ala Pro Cys Ser Arg Ser Thr Ser Glu Ser Thr Ala
130 135 140

Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val
145 150 155 160

Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala
165 170 175

Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val
180 185 190

Pro Ser Ser Ser Leu Gly Thr Lys Thr Tyr Thr Cys Asn Val Asp His
195 200 205

Lys Pro Ser Asn Thr Lys Val Asp Lys Arg Val Glu Ser Lys Tyr Gly
210 215 220

Pro Pro Cys Pro Pro Cys Pro Ala Pro Glu Phe Leu Gly Gly Pro Ser
225 230 235 240

Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg
245 250 255

Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser Gln Glu Asp Pro
260 265 270

Glu Val Gln Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala
275 280 285

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

Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr
305 310 315 320

Lys Cys Lys Val Ser Asn Lys Gly Leu Pro Ser Ser Ile Glu Lys Thr
325 330 335

Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu
340 345 350

Pro Pro Ser Gln Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys
355 360 365

Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser
370 375 380

Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp
385 390 395 400

Ser Asp Gly Ser Phe Phe Leu Tyr Ser Arg Leu Thr Val Asp Lys Ser
405 410 415

Arg Trp Gln Glu Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala
420 425 430

Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Leu Gly Lys
435 440 445

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gln
450 455 460

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

Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe Gln Gly Lys Trp Tyr Val
485 490 495

Val Gly Arg Ala Gly Asn Val Gly Leu Arg Glu Asp Lys Asp Pro Pro
500 505 510

Lys Met Trp Ala Thr Ile Tyr Glu Leu Lys Glu Asp Lys Ser Tyr Asp
515 520 525

Val Thr Asn Val Arg Phe Ala Arg Lys Lys Cys Thr Tyr Ser Ile Gly
530 535 540

Thr Phe Val Pro Gly Ser Gln Pro Gly Glu Phe Thr Leu Gly Gln Ile
545 550 555 560

Lys Ser Glu Pro Gly Gly Thr Ala Asn Leu Val Arg Val Val Ser Thr
565 570 575

Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Glu Val Tyr Gln Asn
580 585 590

Arg Glu Ile Phe Phe Ile Ile Leu Tyr Gly Arg Thr Lys Glu Leu Thr
595 600 605

Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly Leu
610 615 620

Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile Asp
625 630 635 640

Gly

<210> 100
<211> 641
<212> PRT
<213> Artificial Sequence

<220>
<223> fusion protein

<400> 100

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe Gln Gly Lys Trp Tyr
20 25 30

Val Val Gly Arg Ala Gly Asn Val Gly Leu Arg Glu Asp Lys Asp Pro
35 40 45

Pro Lys Met Trp Ala Thr Ile Tyr Glu Leu Lys Glu Asp Lys Ser Tyr
50 55 60

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

Gly Thr Phe Val Pro Gly Ser Gln Pro Gly Glu Phe Thr Leu Gly Gln
85 90 95

Ile Lys Ser Glu Pro Gly Gly Thr Ala Asn Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Glu Val Tyr Gln
115 120 125

Asn Arg Glu Ile Phe Phe Ile Ile Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly
180 185 190

Ser Gln Val Gln Leu Gln Gln Trp Gly Ala Gly Leu Leu Lys Pro Ser
195 200 205

Glu Thr Leu Ser Leu Thr Cys Ala Val Tyr Gly Gly Ser Phe Ser Gly
210 215 220

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

Ile Gly Glu Ile Asn His Gly Gly Tyr Val Thr Tyr Asn Pro Ser Leu
245 250 255

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

Leu Lys Leu Ser Ser Val Thr Ala Ala Asp Thr Ala Val Tyr Tyr Cys
275 280 285

Ala Arg Asp Tyr Gly Pro Gly Asn Tyr Asp Trp Tyr Phe Asp Leu Trp
290 295 300

Gly Arg Gly Thr Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro
305 310 315 320

Ser Val Phe Pro Leu Ala Pro Cys Ser Arg Ser Thr Ser Glu Ser Thr
325 330 335

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

Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro
355 360 365

Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr
370 375 380

Val Pro Ser Ser Ser Leu Gly Thr Lys Thr Tyr Thr Cys Asn Val Asp
385 390 395 400

His Lys Pro Ser Asn Thr Lys Val Asp Lys Arg Val Glu Ser Lys Tyr
405 410 415

Gly Pro Pro Cys Pro Pro Cys Pro Ala Pro Glu Phe Leu Gly Gly Pro
420 425 430

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

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

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

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

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

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

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

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

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

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

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

Ser Arg Trp Gln Glu Gly Asn Val Phe Ser Cys Ser Val Met His Glu
610 615 620

Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Leu Gly
625 630 635 640

Lys

<210> 101
<211> 409
<212> PRT
<213> Artificial Sequence

<220>

<223> fusion protein

<400> 101

Gln Asp Ser Thr Ser Asp Leu Ile Pro Ala Pro Pro Leu Ser Lys Val
1 5 10 15

Pro Leu Gln Gln Asn Phe Gln Asp Asn Gln Phe Gln Gly Lys Trp Tyr
20 25 30

Val Val Gly Arg Ala Gly Asn Val Gly Leu Arg Glu Asp Lys Asp Pro
35 40 45

Pro Lys Met Trp Ala Thr Ile Tyr Glu Leu Lys Glu Asp Lys Ser Tyr
50 55 60

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

Gly Thr Phe Val Pro Gly Ser Gln Pro Gly Glu Phe Thr Leu Gly Gln
85 90 95

Ile Lys Ser Glu Pro Gly Gly Thr Ala Asn Leu Val Arg Val Val Ser
100 105 110

Thr Asn Tyr Asn Gln His Ala Met Val Phe Phe Lys Glu Val Tyr Gln
115 120 125

Asn Arg Glu Ile Phe Phe Ile Ile Leu Tyr Gly Arg Thr Lys Glu Leu
130 135 140

Thr Ser Glu Leu Lys Glu Asn Phe Ile Arg Phe Ser Lys Ser Leu Gly
145 150 155 160

Leu Pro Glu Asn His Ile Val Phe Pro Val Pro Ile Asp Gln Cys Ile
165 170 175

Asp Gly Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly
180 185 190

Ser Glu Ile Val Leu Thr Gln Ser Pro Ala Thr Leu Ser Leu Ser Pro
195 200 205

Gly Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln Ser Val Ser Ser
210 215 220

Tyr Leu Ala Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Arg Leu Leu
225 230 235 240

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

Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Glu
260 265 270

Pro Glu Asp Phe Ala Val Tyr Tyr Cys Gln Gln Arg Ser Asn Trp Pro
275 280 285

Pro Ala Leu Thr Phe Gly Gly Gly Thr Lys Val Glu Ile Lys Arg Thr
290 295 300

Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu Gln Leu
305 310 315 320

Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe Tyr Pro
325 330 335

Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln Ser Gly
340 345 350

Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser Thr Tyr
355 360 365

Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu Lys His
370 375 380

Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser Pro Val
385 390 395 400

Thr Lys Ser Phe Asn Arg Gly Glu Cys
405

<210> 102
<211> 408
<212> PRT
<213> Artificial Sequence

<220>
<223> fusion protein

<400> 102

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

Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln Ser Val Ser Ser Tyr
20 25 30

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

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

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Glu Pro
65 70 75 80

Glu Asp Phe Ala Val Tyr Tyr Cys Gln Gln Arg Ser Asn Trp Pro Pro
85 90 95

Ala Leu Thr Phe Gly Gly Gly Thr Lys Val Glu Ile Lys Arg Thr Val
100 105 110

Ala Ala Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu Gln Leu Lys
115 120 125

Ser Gly Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe Tyr Pro Arg
130 135 140

Glu Ala Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln Ser Gly Asn
145 150 155 160

Ser Gln Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser Thr Tyr Ser
165 170 175

Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu Lys His Lys
180 185 190

Val Tyr Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser Pro Val Thr
195 200 205

Lys Ser Phe Asn Arg Gly Glu Cys Gly Gly Gly Gly Ser Gly Gly Gly
210 215 220

Gly Ser Gly Gly Gly Gly Ser Gln Asp Ser Thr Ser Asp Leu Ile Pro
225 230 235 240

Ala Pro Pro Leu Ser Lys Val Pro Leu Gln Gln Asn Phe Gln Asp Asn
245 250 255

Gln Phe Gln Gly Lys Trp Tyr Val Val Gly Arg Ala Gly Asn Val Gly
260 265 270

Leu Arg Glu Asp Lys Asp Pro Pro Lys Met Trp Ala Thr Ile Tyr Glu
275 280 285

Leu Lys Glu Asp Lys Ser Tyr Asp Val Thr Asn Val Arg Phe Ala Arg
290 295 300

Lys Lys Cys Thr Tyr Ser Ile Gly Thr Phe Val Pro Gly Ser Gln Pro
305 310 315 320

Gly Glu Phe Thr Leu Gly Gln Ile Lys Ser Glu Pro Gly Gly Thr Ala
325 330 335

Asn Leu Val Arg Val Val Ser Thr Asn Tyr Asn Gln His Ala Met Val
340 345 350

Phe Phe Lys Glu Val Tyr Gln Asn Arg Glu Ile Phe Phe Ile Ile Leu
355 360 365

Tyr Gly Arg Thr Lys Glu Leu Thr Ser Glu Leu Lys Glu Asn Phe Ile
370 375 380

Arg Phe Ser Lys Ser Leu Gly Leu Pro Glu Asn His Ile Val Phe Pro
385 390 395 400

Val Pro Ile Asp Gln Cys Ile Asp
405

<210> 103
<211> 635
<212> PRT
<213> Artificial Sequence

<220>
<223> fusion protein

<400> 103

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

Ser Leu Arg Ile Ser Cys Lys Gly Ser Gly Tyr Ser Phe Ser Thr Tyr
20 25 30

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

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

Gln Gly Gln Val Thr Ile Ser Ala Asp Lys Ser Ile Ser Thr Ala Tyr
65 70 75 80

Leu Gln Trp Ser Ser Leu Lys Ala Ser Asp Thr Ala Met Tyr Tyr Cys
85 90 95

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

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
115 120 125

Pro Cys Ser Arg Ser Thr Ser Glu Ser Thr Ala Ala Leu Gly Cys Leu
130 135 140

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
145 150 155 160

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
165 170 175

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Asn Phe
180 185 190

Gly Thr Gln Thr Tyr Thr Cys Asn Val Asp His Lys Pro Ser Asn Thr
195 200 205

Lys Val Asp Lys Thr Val Glu Arg Lys Cys Cys Val Glu Cys Pro Pro
210 215 220

Cys Pro Ala Pro Pro Val Ala Gly Pro Ser Val Phe Leu Phe Pro Pro
225 230 235 240

Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys
245 250 255

Val Val Val Asp Val Ser His Glu Asp Pro Glu Val Gln Phe Asn Trp
260 265 270

Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu
275 280 285

Glu Gln Phe Asn Ser Thr Phe Arg Val Val Ser Val Leu Thr Val Val
290 295 300

His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn
305 310 315 320

Lys Gly Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Thr Lys Gly
325 330 335

Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu
340 345 350

Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr
355 360 365

Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn
370 375 380

Asn Tyr Lys Thr Thr Pro Pro Met Leu Asp Ser Asp Gly Ser Phe Phe
385 390 395 400

Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn
405 410 415

Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr
420 425 430

Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys Gly Gly Gly Ser Gly
435 440 445

Gly Gly Gly Ser Gly Gly Gly Gly Ser Gln Asp Ser Thr Ser Asp Leu
450 455 460

Ile Pro Ala Pro Pro Leu Ser Lys Val Pro Leu Gln Gln Asn Phe Gln
465 470 475 480

Asp Asn Gln Phe Gln Gly Lys Trp Tyr Val Val Gly Arg Ala Gly Asn
485 490 495

Val Gly Leu Arg Glu Asp Lys Asp Pro Pro Lys Met Trp Ala Thr Ile
500 505 510

Tyr Glu Leu Lys Glu Asp Lys Ser Tyr Asp Val Thr Asn Val Arg Phe
515 520 525

Ala Arg Lys Lys Cys Thr Tyr Ser Ile Gly Thr Phe Val Pro Gly Ser
530 535 540

Gln Pro Gly Glu Phe Thr Leu Gly Gln Ile Lys Ser Glu Pro Gly Gly
545 550 555 560

Thr Ala Asn Leu Val Arg Val Val Ser Thr Asn Tyr Asn Gln His Ala
565 570 575

Met Val Phe Phe Lys Glu Val Tyr Gln Asn Arg Glu Ile Phe Phe Ile
580 585 590

Ile Leu Tyr Gly Arg Thr Lys Glu Leu Thr Ser Glu Leu Lys Glu Asn
595 600 605

Phe Ile Arg Phe Ser Lys Ser Leu Gly Leu Pro Glu Asn His Ile Val
610 615 620

Phe Pro Val Pro Ile Asp Gln Cys Ile Asp Gly
625 630 635

<210> 104
<211> 442
<212> PRT
<213> Artificial Sequence

<220>
<223> antibody heavy chain

<400> 104

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

Ser Leu Arg Ile Ser Cys Lys Gly Ser Gly Tyr Ser Phe Ser Thr Tyr
20 25 30

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

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

Gln Gly Gln Val Thr Ile Ser Ala Asp Lys Ser Ile Ser Thr Ala Tyr
65 70 75 80

Leu Gln Trp Ser Ser Leu Lys Ala Ser Asp Thr Ala Met Tyr Tyr Cys
85 90 95

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

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
115 120 125

Pro Cys Ser Arg Ser Thr Ser Glu Ser Thr Ala Ala Leu Gly Cys Leu
130 135 140

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
145 150 155 160

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
165 170 175

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Asn Phe
180 185 190

Gly Thr Gln Thr Tyr Thr Cys Asn Val Asp His Lys Pro Ser Asn Thr
195 200 205

Lys Val Asp Lys Thr Val Glu Arg Lys Cys Cys Val Glu Cys Pro Pro
210 215 220

Cys Pro Ala Pro Pro Val Ala Gly Pro Ser Val Phe Leu Phe Pro Pro
225 230 235 240

Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys
245 250 255

Val Val Val Asp Val Ser His Glu Asp Pro Glu Val Gln Phe Asn Trp
260 265 270

Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu
275 280 285

Glu Gln Phe Asn Ser Thr Phe Arg Val Val Ser Val Leu Thr Val Val
290 295 300

His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn
305 310 315 320

Lys Gly Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Thr Lys Gly
325 330 335

Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu
340 345 350

Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr
355 360 365

Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn
370 375 380

Asn Tyr Lys Thr Thr Pro Pro Met Leu Asp Ser Asp Gly Ser Phe Phe
385 390 395 400

Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn
405 410 415

Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr
420 425 430

Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
435 440

<210> 105
<211> 214
<212> PRT
<213> Artificial Sequence

<220>
<223> antibody light chain

<400> 105

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

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

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

Gln Asp Lys Asn Arg Pro Ser Gly Ile Pro Glu Arg Phe Ser Gly Ser
50 55 60

Asn Ser Gly Asn Thr Ala Thr Leu Thr Ile Ser Gly Thr Gln Ala Met
65 70 75 80

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

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

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

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

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

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

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

Tyr Ser Cys Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val
195 200 205

Ala Pro Thr Glu Cys Ser
210

<210> 106
<211> 439
<212> PRT
<213> Artificial Sequence

<220>
<223> antibody heavy chain

<400> 106

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

Ser Leu Arg Leu Asp Cys Lys Ala Ser Gly Ile Thr Phe Ser Asn Ser
20 25 30

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

Ala Val Ile Trp Tyr Asp Gly Ser Lys Arg Tyr Tyr Ala Asp Ser Val
50 55 60

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

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

Ala Thr Asn Asp Asp Tyr Trp Gly Gln Gly Thr Leu Val Thr Val Ser
100 105 110

Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala Pro Cys Ser
115 120 125

Arg Ser Thr Ser Glu Ser Thr Ala Ala Leu Gly Cys Leu Val Lys Asp
130 135 140

Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr
145 150 155 160

Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr
165 170 175

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

Thr Tyr Thr Cys Asn Val Asp His Lys Pro Ser Asn Thr Lys Val Asp
195 200 205

Lys Arg Val Glu Ser Lys Tyr Gly Pro Pro Cys Pro Pro Cys Pro Ala
210 215 220

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

Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val
245 250 255

Val Asp Val Ser Gln Glu Asp Pro Glu Val Gln Phe Asn Trp Tyr Val
260 265 270

Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln
275 280 285

Phe Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln
290 295 300

Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Gly
305 310 315 320

Leu Pro Ser Ser Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro
325 330 335

Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Gln Glu Glu Met Thr
340 345 350

Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser
355 360 365

Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr
370 375 380

Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr
385 390 395 400

Ser Arg Leu Thr Val Asp Lys Ser Arg Trp Gln Glu Gly Asn Val Phe
405 410 415

Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys
420 425 430

Ser Leu Ser Leu Ser Leu Gly
435

<210> 107
<211> 214
<212> PRT
<213> Artificial Sequence

<220>
<223> antibody light chain

<400> 107

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

Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln Ser Val Ser Ser Tyr
20 25 30

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

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

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Glu Pro
65 70 75 80

Glu Asp Phe Ala Val Tyr Tyr Cys Gln Gln Ser Ser Asn Trp Pro Arg
85 90 95

Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys Arg Thr Val Ala Ala
100 105 110

Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu Gln Leu Lys Ser Gly
115 120 125

Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe Tyr Pro Arg Glu Ala
130 135 140

Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln Ser Gly Asn Ser Gln
145 150 155 160

Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser Thr Tyr Ser Leu Ser
165 170 175

Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu Lys His Lys Val Tyr
180 185 190

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

Phe Asn Arg Gly Glu Cys
210

<210> 108
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> antibody heavy chain CDR1

<400> 108

Gly Phe Thr Phe Asn Lys Asn Ala
1 5

<210> 109
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> antibody heavy chain CDR2

<400> 109

Ile Arg Asn Lys Thr Asn Asn Tyr Ala Thr
1 5 10

<210> 110
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> antibody heavy chain CDR3

<400> 110

Val Ala Gly Asn Ser Phe Ala Tyr
1 5

<210> 111
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> antibody light chain CDR1

<400> 111

Gln Ser Leu Leu Tyr Ser Ser Asn Gln Lys Asn Tyr
1 5 10

<210> 112
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> antibody light chain CDR1

<400> 112

Gln Ser Leu Leu Tyr Ser Ser Asn Gln Lys Asn Tyr
1 5 10

<210> 113
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> antibody light chain CDR

<400> 113

Gln Gln Tyr Tyr Asn Tyr Pro Leu Thr
1 5

<210> 114
<211> 116
<212> PRT
<213> Artificial Sequence

<220>
<223> antibody heavy chain variable region

<400> 114

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

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

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

Gly Arg Ile Arg Asn Lys Thr Asn Asn Tyr Ala Thr Tyr Tyr Ala Asp
50 55 60

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

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

Tyr Cys Val Ala Gly Asn Ser Phe Ala Tyr Trp Gly Gln Gly Thr Leu
100 105 110

Val Thr Val Ser
115

<210> 115
<211> 113
<212> PRT
<213> Artificial Sequence

<220>
<223> antibody light chain variable region

<400> 115

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

Glu Arg Ala Thr Ile Asn Cys Lys Ser Ser Gln Ser Leu Leu Tyr Ser
20 25 30

Ser Asn Gln Lys Asn Tyr Leu Ala Trp Tyr Gln Gln Lys Pro Gly Gln
35 40 45

Pro Pro Lys Leu Leu Ile Tyr Trp Ala Ser Ser Arg Glu Ser Gly Val
50 55 60

Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr
65 70 75 80

Ile Ser Ser Leu Gln Ala Glu Asp Val Ala Val Tyr Tyr Cys Gln Gln
85 90 95

Tyr Tyr Asn Tyr Pro Leu Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile
100 105 110

Lys

<210> 116
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> antibody heavy chain CDR1

<400> 116

Tyr Phe Asp Phe Asp Ser Tyr Glu
1 5

<210> 117
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> antibody heavy chain CDR2

<400> 117

Ile Tyr His Ser Gly Ser Thr
1 5

<210> 118
<211> 10
<212> PRT
<213> Artificial Sequence

<220>

<223> antibody heavy chain CDR3

<400> 118

Ala Arg Val Asn Met Asp Arg Phe Asp Tyr
1 5 10

<210> 119

<211> 117

<212> PRT

<213> Artificial Sequence

<220>

<223> antibody heavy chain variable region

<400> 119

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

Ser Leu Arg Leu Ser Cys Ala Ala Ser Tyr Phe Asp Phe Asp Ser Tyr
20 25 30

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

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

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

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

Arg Val Asn Met Asp Arg Phe Asp Tyr Trp Gly Gln Gly Thr Leu Val
100 105 110

Thr Val Ser Ser Ser
115

<210> 120

<211> 8

<212> PRT

<213> Artificial Sequence

<220>
<223> antibody heavy chain CDR1

<400> 120

Gly Phe Thr Phe Ser Ser Tyr Ala
1 5

<210> 121
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> antibody heavy chain CDR2

<400> 121

Ile Gln Lys Gln Gly Leu Pro Thr
1 5

<210> 122
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> antibody heavy chain CDR3

<400> 122

Ala Lys Asn Arg Ala Lys Phe Asp Tyr
1 5

<210> 123
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> antibody light chain CDR1

<400> 123

Gln Ser Ile Ser Ser Tyr
1 5

<210> 124
<211> 6

<212> PRT
<213> Artificial Sequence

<220>
<223> antibody light chain CDR1

<400> 124

Gln Ser Ile Ser Ser Tyr
1 5

<210> 125
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> antibody light chain CDR3

<400> 125

Gln Gln Asn Arg Gly Phe Pro Leu Thr
1 5

<210> 126
<211> 116
<212> PRT
<213> Artificial Sequence

<220>
<223> antibody heavy chain variable region

<400> 126

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

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

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

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

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

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

Ala Lys Asn Arg Ala Lys Phe Asp Tyr Trp Gly Gln Gly Thr Leu Val
100 105 110

Thr Val Ser Ser
115

<210> 127
<211> 107
<212> PRT
<213> Artificial Sequence

<220>
<223> antibody light chain variable region

<400> 127

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

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

Leu Asn Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
35 40 45

Tyr Asn Ala Ser Met Leu Gln Ser Gly Val Pro Ser Arg Phe Ser Gly
50 55 60

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
65 70 75 80

Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln Asn Arg Gly Phe Pro Leu
85 90 95

Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys
100 105

<210> 128
<211> 107

<212> PRT
<213> Artificial Sequence

<220>
<223> antibody light chain variable region

<400> 128

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

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

Leu Asn Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
35 40 45

Tyr Ala Ala Ser Met Leu Gln Ser Gly Val Pro Ser Arg Phe Ser Gly
50 55 60

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
65 70 75 80

Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln Asn Arg Gly Phe Pro Leu
85 90 95

Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys
100 105

<210> 129
<211> 115
<212> PRT
<213> Artificial Sequence

<220>
<223> antibody heavy chain variable region

<400> 129

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

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

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

Gly Ala Leu Asp Pro Lys Thr Gly Asp Thr Ala Tyr Ser Gln Lys Phe
50 55 60

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

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

Thr Arg Phe Tyr Ser Tyr Thr Tyr Trp Gly Gln Gly Thr Leu Val Thr
100 105 110

Val Ser Ser
115