

SEQUENCE LISTING

<110> THE UNITED STATES OF AMERICA, AS REPRESENTED BY THE
SECRETARY, DEPARTMENT OF HEALTH AND HUMAN SERVICES
TENEOBIO, INC.

<120> ANTI-B-CELL MATURATION ANTIGEN CHIMERIC ANTIGEN RECEPTORS WITH
HUMAN DOMAINS

<130> 739534

<150> US 62/527,556

<151> 2017-06-30

<160> 42

<170> PatentIn version 3.5

<210> 1

<211> 8

<212> PRT

<213> Homo sapiens

<400> 1

Gly Phe Thr Phe Thr Asn His Ala
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Ile Ser Gly Asn Gly Arg Thr Thr
1 5

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<211> 11

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Ala Lys Asp Gly Gly Glu Thr Leu Val Asp Ser
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Gly Phe Thr Phe Ser Ser His Ala
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Ile Ser Gly Ser Gly Asp Phe Thr
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Ala Lys Asp Glu Asp Gly Gly Ser Leu Leu Gly Tyr
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Gly Phe Thr Phe Ser Ser Tyr Ala
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Ile Ser Gly Ser Gly Asp Tyr Ile
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<210> 9

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Ala Lys Glu Gly Thr Gly Ala Asn Ser Ser Leu Ala Asp Tyr
1 5 10

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Gly Phe Thr Phe Ser Ser His Ala
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Ile Ser Gly Ser Gly Asp Tyr Thr
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<210> 12
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<213> Homo sapiens

<400> 12

Ala Lys Asp Glu Asp Gly Gly Ser Leu Leu Gly His
1 5 10

<210> 13
<211> 118
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<213> Homo sapiens

<400> 13

Gln 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 Thr Asn His

20

25

30

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

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

Lys Gly Arg Phe Thr Ile Ser Arg Asp Ile Ser Lys Asn Thr Leu Asp
 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 Asp Gly Gly Glu Thr Leu Val Asp Ser Arg Gly Gln Gly Thr
 100 105 110

Leu Val Thr Val Ser Ser
 115

<210> 14
 <211> 119
 <212> PRT
 <213> Homo sapiens

<400> 14

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

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

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

Ala Ala Ile Ser Gly Ser Gly Asp Phe Thr His Tyr Ala Asp Ser Val
 50 55 60

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

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

Ala Lys Asp Glu Asp Gly Gly Ser Leu Leu Gly Tyr Arg Gly Gln Gly
100 105 110

Thr Leu Val Thr Val Ser Ser
115

<210> 15
<211> 121
<212> PRT
<213> Homo sapiens

<400> 15

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 Ser Ile Ser Gly Ser Gly Asp Tyr Ile Tyr Tyr Ala Asp Ser Val
50 55 60

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

Gln Gly Thr Leu Val Thr Val Ser Ser
115 120

<210> 16
<211> 119
<212> PRT

<213> Homo sapiens

<400> 16

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

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

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

Ser Ala Ile Ser Gly Ser Gly Asp Tyr Thr His Tyr Ala Asp Ser Val
50 55 60

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

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

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

Thr Leu Val Thr Val Ser Ser
115

<210> 17

<211> 375

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic

<400> 17

Met Ala Leu Pro Val Thr Ala Leu Leu Leu Pro Leu Ala Leu Leu Leu
1 5 10 15

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

Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe
35 40 45

Thr Phe Thr Asn His Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys
50 55 60

Gly Leu Glu Leu Val Ser Ser Ile Ser Gly Asn Gly Arg Thr Thr Tyr
65 70 75 80

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

Lys Asn Thr Leu Asp Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr
100 105 110

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

Arg Gly Gln Gly Thr Leu Val Thr Val Ser Ser Phe Val Pro Val Phe
130 135 140

Leu Pro Ala Lys Pro Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro
145 150 155 160

Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys
165 170 175

Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg Gly Leu Asp Phe Ala
180 185 190

Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val Leu
195 200 205

Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Asn His Arg Asn Arg Ser
210 215 220

Lys Arg Ser Arg Leu Leu His Ser Asp Tyr Met Asn Met Thr Pro Arg
225 230 235 240

Arg Pro Gly Pro Thr Arg Lys His Tyr Gln Pro Tyr Ala Pro Pro Arg
245 250 255

Asp Phe Ala Ala Tyr Arg Ser Arg Val Lys Phe Ser Arg Ser Ala Asp
260 265 270

Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu Leu Asn
275 280 285

Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg Gly Arg
290 295 300

Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln Glu Gly
305 310 315 320

Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr Ser Glu
325 330 335

Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp Gly Leu
340 345 350

Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala Leu His
355 360 365

Met Gln Ala Leu Pro Pro Arg
370 375

<210> 18
<211> 376
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 18

Met Ala Leu Pro Val Thr Ala Leu Leu Leu Pro Leu Ala Leu Leu Leu
1 5 10 15

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

Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe
35 40 45

Thr Phe Ser Ser His Ala Met Thr Trp Val Arg Gln Ala Pro Gly Lys
50 55 60

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

Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser
85 90 95

Lys Asn Thr Val Ser Leu Gln Met Asn Asn Leu Arg Ala Glu Asp Thr
100 105 110

Ala Val Tyr Tyr Cys Ala Lys Asp Glu Asp Gly Gly Ser Leu Leu Gly
115 120 125

Tyr Arg Gly Gln Gly Thr Leu Val Thr Val Ser Ser Phe Val Pro Val
130 135 140

Phe Leu Pro Ala Lys Pro Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr
145 150 155 160

Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala
165 170 175

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

Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val
195 200 205

Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Asn His Arg Asn Arg
210 215 220

Ser Lys Arg Ser Arg Leu Leu His Ser Asp Tyr Met Asn Met Thr Pro
225 230 235 240

Arg Arg Pro Gly Pro Thr Arg Lys His Tyr Gln Pro Tyr Ala Pro Pro
245 250 255

Arg Asp Phe Ala Ala Tyr Arg Ser Arg Val Lys Phe Ser Arg Ser Ala
260 265 270

Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu Leu
275 280 285

Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg Gly
290 295 300

Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln Glu
305 310 315 320

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

Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp Gly
340 345 350

Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala Leu
355 360 365

His Met Gln Ala Leu Pro Pro Arg
370 375

<210> 19
<211> 378
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 19

Met Ala Leu Pro Val Thr Ala Leu Leu Leu Pro Leu Ala Leu Leu Leu
1 5 10 15

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

Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe
35 40 45

Thr Phe Ser Ser Tyr Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys
50 55 60

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

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

Lys Asn Thr Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr
100 105 110

Ala Val Tyr Tyr Cys Ala Lys Glu Gly Thr Gly Ala Asn Ser Ser Leu
115 120 125

Ala Asp Tyr Arg Gly Gln Gly Thr Leu Val Thr Val Ser Ser Phe Val
130 135 140

Pro Val Phe Leu Pro Ala Lys Pro Thr Thr Thr Pro Ala Pro Arg Pro
145 150 155 160

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

Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg Gly Leu
180 185 190

Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr Cys
195 200 205

Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Asn His Arg
210 215 220

Asn Arg Ser Lys Arg Ser Arg Leu Leu His Ser Asp Tyr Met Asn Met
225 230 235 240

Thr Pro Arg Arg Pro Gly Pro Thr Arg Lys His Tyr Gln Pro Tyr Ala
245 250 255

Pro Pro Arg Asp Phe Ala Ala Tyr Arg Ser Arg Val Lys Phe Ser Arg
260 265 270

Ser Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn
275 280 285

Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg
290 295 300

Arg Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro
305 310 315 320

Gln Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met Ala Glu Ala
325 330 335

Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His
340 345 350

Asp Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp
355 360 365

Ala Leu His Met Gln Ala Leu Pro Pro Arg
370 375

<210> 20
<211> 376
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 20

Met Ala Leu Pro Val Thr Ala Leu Leu Leu Pro Leu Ala Leu Leu Leu
1 5 10 15

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

Ile Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe
35 40 45

Thr Phe Ser Ser His Ala Met Thr Trp Val Arg Gln Ala Pro Gly Lys
50 55 60

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

Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser
85 90 95

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

Ala Val Tyr Tyr Cys Ala Lys Asp Glu Asp Gly Gly Ser Leu Leu Gly
115 120 125

His Arg Gly Gln Gly Thr Leu Val Thr Val Ser Ser Phe Val Pro Val
130 135 140

Phe Leu Pro Ala Lys Pro Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr
145 150 155 160

Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala
165 170 175

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

Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val
195 200 205

Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Asn His Arg Asn Arg
210 215 220

Ser Lys Arg Ser Arg Leu Leu His Ser Asp Tyr Met Asn Met Thr Pro
225 230 235 240

Arg Arg Pro Gly Pro Thr Arg Lys His Tyr Gln Pro Tyr Ala Pro Pro
245 250 255

Arg Asp Phe Ala Ala Tyr Arg Ser Arg Val Lys Phe Ser Arg Ser Ala
260 265 270

Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu Leu
275 280 285

Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg Gly
290 295 300

Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln Glu
305 310 315 320

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

Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp Gly
340 345 350

Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala Leu
355 360 365

His Met Gln Ala Leu Pro Pro Arg
370 375

<210> 21
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<213> Artificial Sequence

<220>
<223> Synthetic

<400> 21

Met Ala Leu Pro Val Thr Ala Leu Leu Leu Pro Leu Ala Leu Leu Leu
1 5 10 15

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

Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe
35 40 45

Thr Phe Thr Asn His Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys
50 55 60

Gly Leu Glu Leu Val Ser Ser Ile Ser Gly Asn Gly Arg Thr Thr Tyr
65 70 75 80

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

Lys Asn Thr Leu Asp Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr
100 105 110

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

Arg Gly Gln Gly Thr Leu Val Thr Val Ser Ser Phe Val Pro Val Phe
130 135 140

Leu Pro Ala Lys Pro Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro
145 150 155 160

Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys
165 170 175

Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg Gly Leu Asp Phe Ala
180 185 190

Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val Leu
195 200 205

Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Asn His Arg Asn Lys Arg
210 215 220

Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg Pro
225 230 235 240

Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro Glu
245 250 255

Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys Phe Ser Arg Ser Ala
260 265 270

Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu Leu
275 280 285

Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg Gly
290 295 300

Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln Glu
305 310 315 320

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

Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp Gly
340 345 350

Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala Leu
355 360 365

His Met Gln Ala Leu Pro Pro Arg
370 375

<210> 22
<211> 377
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 22

Met Ala Leu Pro Val Thr Ala Leu Leu Leu Pro Leu Ala Leu Leu Leu
1 5 10 15

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

Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe
35 40 45

Thr Phe Ser Ser His Ala Met Thr Trp Val Arg Gln Ala Pro Gly Lys
50 55 60

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

Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser
85 90 95

Lys Asn Thr Val Ser Leu Gln Met Asn Asn Leu Arg Ala Glu Asp Thr
100 105 110

Ala Val Tyr Tyr Cys Ala Lys Asp Glu Asp Gly Gly Ser Leu Leu Gly
115 120 125

Tyr Arg Gly Gln Gly Thr Leu Val Thr Val Ser Ser Phe Val Pro Val
130 135 140

Phe Leu Pro Ala Lys Pro Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr
145 150 155 160

Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala
165 170 175

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

Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val
195 200 205

Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Asn His Arg Asn Lys
210 215 220

Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg
225 230 235 240

Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro
245 250 255

Glu Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys Phe Ser Arg Ser
260 265 270

Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu
275 280 285

Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg
290 295 300

Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln
305 310 315 320

Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr
325 330 335

Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp
340 345 350

Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala
355 360 365

Leu His Met Gln Ala Leu Pro Pro Arg
370 375

<210> 23
<211> 379
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 23

Met Ala Leu Pro Val Thr Ala Leu Leu Leu Pro Leu Ala Leu Leu Leu
1 5 10 15

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

Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe
35 40 45

Thr Phe Ser Ser Tyr Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys
50 55 60

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

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

Lys Asn Thr Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr
100 105 110

Ala Val Tyr Tyr Cys Ala Lys Glu Gly Thr Gly Ala Asn Ser Ser Leu
115 120 125

Ala Asp Tyr Arg Gly Gln Gly Thr Leu Val Thr Val Ser Ser Phe Val
130 135 140

Pro Val Phe Leu Pro Ala Lys Pro Thr Thr Thr Pro Ala Pro Arg Pro
145 150 155 160

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

Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg Gly Leu
180 185 190

Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr Cys
195 200 205

Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Asn His Arg
210 215 220

Asn Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe
225 230 235 240

Met Arg Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser Cys Arg
245 250 255

Phe Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys Phe Ser
260 265 270

Arg Ser Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr
275 280 285

Asn Glu Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys
290 295 300

Arg Arg Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn
305 310 315 320

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

Ala Tyr Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly
340 345 350

His Asp Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr
355 360 365

Asp Ala Leu His Met Gln Ala Leu Pro Pro Arg
370 375

<210> 24
<211> 377
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 24

Met Ala Leu Pro Val Thr Ala Leu Leu Leu Pro Leu Ala Leu Leu Leu
1 5 10 15

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

Ile Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe
35 40 45

Thr Phe Ser Ser His Ala Met Thr Trp Val Arg Gln Ala Pro Gly Lys
50 55 60

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

Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser
85 90 95

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

Ala Val Tyr Tyr Cys Ala Lys Asp Glu Asp Gly Gly Ser Leu Leu Gly
115 120 125

His Arg Gly Gln Gly Thr Leu Val Thr Val Ser Ser Phe Val Pro Val
130 135 140

Phe Leu Pro Ala Lys Pro Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr
145 150 155 160

Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala
165 170 175

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

Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val
195 200 205

Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Asn His Arg Asn Lys
210 215 220

Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe Lys Gln Pro Phe Met Arg
225 230 235 240

Pro Val Gln Thr Thr Gln Glu Glu Asp Gly Cys Ser Cys Arg Phe Pro
245 250 255

Glu Glu Glu Glu Gly Gly Cys Glu Leu Arg Val Lys Phe Ser Arg Ser
260 265 270

Ala Asp Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu
275 280 285

Leu Asn Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg
290 295 300

Gly Arg Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln
305 310 315 320

Glu Gly Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr
325 330 335

Ser Glu Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp
340 345 350

Gly Leu Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala
355 360 365

Leu His Met Gln Ala Leu Pro Pro Arg
370 375

<210> 25
<211> 372
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 25

Met Ala Leu Pro Val Thr Ala Leu Leu Leu Pro Leu Ala Leu Leu Leu
1 5 10 15

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

Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe
35 40 45

Thr Phe Thr Asn His Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys
50 55 60

Gly Leu Glu Leu Val Ser Ser Ile Ser Gly Asn Gly Arg Thr Thr Tyr
65 70 75 80

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

Lys Asn Thr Leu Asp Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr
100 105 110

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

Arg Gly Gln Gly Thr Leu Val Thr Val Ser Ser Phe Val Pro Val Phe
130 135 140

Leu Pro Ala Lys Pro Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro
145 150 155 160

Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys
165 170 175

Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg Gly Leu Asp Phe Ala
180 185 190

Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val Leu
195 200 205

Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Asn His Arg Asn Cys Trp
210 215 220

Leu Thr Lys Lys Lys Tyr Ser Ser Ser Val His Asp Pro Asn Gly Glu
225 230 235 240

Tyr Met Phe Met Arg Ala Val Asn Thr Ala Lys Lys Ser Arg Leu Thr
245 250 255

Asp Val Thr Leu Arg Val Lys Phe Ser Arg Ser Ala Asp Ala Pro Ala
260 265 270

Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly Arg
275 280 285

Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg Gly Arg Asp Pro Glu
290 295 300

Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr Asn
305 310 315 320

Glu Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly Met
325 330 335

Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln Gly
340 345 350

Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala Leu His Met Gln Ala
355 360 365

Leu Pro Pro Arg
370

<210> 26

<211> 373

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic

<400> 26

Met Ala Leu Pro Val Thr Ala Leu Leu Leu Pro Leu Ala Leu Leu Leu
1 5 10 15

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

Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe
35 40 45

Thr Phe Ser Ser His Ala Met Thr Trp Val Arg Gln Ala Pro Gly Lys
50 55 60

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

Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser
85 90 95

Lys Asn Thr Val Ser Leu Gln Met Asn Asn Leu Arg Ala Glu Asp Thr
100 105 110

Ala Val Tyr Tyr Cys Ala Lys Asp Glu Asp Gly Gly Ser Leu Leu Gly
115 120 125

Tyr Arg Gly Gln Gly Thr Leu Val Thr Val Ser Ser Phe Val Pro Val
130 135 140

Phe Leu Pro Ala Lys Pro Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr
145 150 155 160

Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala
165 170 175

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

Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val
195 200 205

Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Asn His Arg Asn Cys
210 215 220

Trp Leu Thr Lys Lys Lys Tyr Ser Ser Ser Val His Asp Pro Asn Gly
225 230 235 240

Glu Tyr Met Phe Met Arg Ala Val Asn Thr Ala Lys Lys Ser Arg Leu
245 250 255

Thr Asp Val Thr Leu Arg Val Lys Phe Ser Arg Ser Ala Asp Ala Pro
260 265 270

Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly
275 280 285

Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg Gly Arg Asp Pro
290 295 300

Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr
305 310 315 320

Asn Glu Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly
325 330 335

Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln
340 345 350

Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala Leu His Met Gln
355 360 365

Ala Leu Pro Pro Arg
370

<210> 27

<211> 375

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic

<400> 27

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

Val Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe
35 40 45

Thr Phe Ser Ser Tyr Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys
50 55 60

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

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

Lys Asn Thr Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr
100 105 110

Ala Val Tyr Tyr Cys Ala Lys Glu Gly Thr Gly Ala Asn Ser Ser Leu
115 120 125

Ala Asp Tyr Arg Gly Gln Gly Thr Leu Val Thr Val Ser Ser Phe Val
130 135 140

Pro Val Phe Leu Pro Ala Lys Pro Thr Thr Thr Pro Ala Pro Arg Pro
145 150 155 160

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

Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg Gly Leu
180 185 190

Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr Cys
195 200 205

Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Asn His Arg
210 215 220

Asn Cys Trp Leu Thr Lys Lys Lys Tyr Ser Ser Ser Val His Asp Pro
225 230 235 240

Asn Gly Glu Tyr Met Phe Met Arg Ala Val Asn Thr Ala Lys Lys Ser
245 250 255

Arg Leu Thr Asp Val Thr Leu Arg Val Lys Phe Ser Arg Ser Ala Asp
260 265 270

Ala Pro Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu Leu Asn
275 280 285

Leu Gly Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg Gly Arg
290 295 300

Asp Pro Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln Glu Gly
305 310 315 320

Leu Tyr Asn Glu Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr Ser Glu
325 330 335

Ile Gly Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp Gly Leu
340 345 350

Tyr Gln Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala Leu His
355 360 365

Met Gln Ala Leu Pro Pro Arg
370 375

<210> 28
<211> 373
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 28

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

Ile Gln Pro Gly Gly Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe
35 40 45

Thr Phe Ser Ser His Ala Met Thr Trp Val Arg Gln Ala Pro Gly Lys
50 55 60

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

Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser
85 90 95

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

Ala Val Tyr Tyr Cys Ala Lys Asp Glu Asp Gly Gly Ser Leu Leu Gly
115 120 125

His Arg Gly Gln Gly Thr Leu Val Thr Val Ser Ser Phe Val Pro Val
130 135 140

Phe Leu Pro Ala Lys Pro Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr
145 150 155 160

Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala
165 170 175

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

Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly Thr Cys Gly Val
195 200 205

Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Asn His Arg Asn Cys
210 215 220

Trp Leu Thr Lys Lys Lys Tyr Ser Ser Ser Val His Asp Pro Asn Gly
225 230 235 240

Glu Tyr Met Phe Met Arg Ala Val Asn Thr Ala Lys Lys Ser Arg Leu
245 250 255

Thr Asp Val Thr Leu Arg Val Lys Phe Ser Arg Ser Ala Asp Ala Pro
260 265 270

Ala Tyr Gln Gln Gly Gln Asn Gln Leu Tyr Asn Glu Leu Asn Leu Gly
275 280 285

Arg Arg Glu Glu Tyr Asp Val Leu Asp Lys Arg Arg Gly Arg Asp Pro
290 295 300

Glu Met Gly Gly Lys Pro Arg Arg Lys Asn Pro Gln Glu Gly Leu Tyr
305 310 315 320

Asn Glu Leu Gln Lys Asp Lys Met Ala Glu Ala Tyr Ser Glu Ile Gly
325 330 335

Met Lys Gly Glu Arg Arg Arg Gly Lys Gly His Asp Gly Leu Tyr Gln
340 345 350

Gly Leu Ser Thr Ala Thr Lys Asp Thr Tyr Asp Ala Leu His Met Gln
355 360 365

Ala Leu Pro Pro Arg
370

<210> 29
<211> 1128
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 29
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ctctcctgtg cagcctctgg attcaccttt accaaccatg ccatgagttg ggtccgccag 180
gctccaggga aggggctgga gttggtctca agtattagt gtaatggctg taccacatac 240
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gatctgcaaa tgaacagcct gagagccgag gacacggccg tatattactg tgcgaaagat 360
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ggcgagcgcc ggaggggcaa ggggcacgat ggcctttacc agggctctcag tacagccacc	1080
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<210> 30
 <211> 1131
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 30	
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ctctcctgtg cagcctctgg attcaccttt agcagccatg ccatgacctg ggtccgccag	180
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tacgcagact ccgtgaaggg ccggttcacc atctccagag acaattccaa gaacacggtg	300
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gaggatggtg ggagcttgct tggctacaga ggccagggca ccctgggtcac cgtctcctca	420
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cctctggctg gaacatgtgg cgttttgctg ctgagcctcg tgatcacctt gtactgcaac	660
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<210> 31
<211> 1137
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 31
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gctccaggga aggggctgga gtgggtctca tctattagtg gtagtggtga ttacatatac 240
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caggaaggcc tgtacaatga actgcagaaa gataagatgg cggaggccta cagttagatt 1020
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<210> 32
<211> 1131
<212> DNA
<213> Artificial Sequence

<220>

<223> Synthetic

<400> 32

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ctctcctgtg cagcctctgg attcaccttt agcagccatg ccatgacctg ggtccgccag	180
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tacgcagact ccgtgaaggg tcggttcacc atctccagag acaattcaa gaacacggtg	300
tatctccaaa tgaacagtct gagagccgag gactcggccg tatattactg tgcgaaagat	360
gaggatggtg ggagcctcct ggggcacaga ggccagggca ccctggtcac cgtctcctca	420
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aaaggcgagc gccggagggg caaggggcac gatggccttt accagggtct cagtacagcc	1080
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<210> 33

<211> 1131

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic

<400> 33

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tacgcagact ccgtgaaggg ccggttcacc atctccagag acatttccaa gaacacgctg	300
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gtgcccgtgt tcctgcctgc caagcctaca acaaccctg ctcttagacc tcctacacca	480
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<210> 34
 <211> 1134
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 34	
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gctccgggga aggggctgga gtgggtcgca gctattagtg gcagtgggtga tttcacacac	240
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cctctggctg gaacatgtgg cgttttgctg ctgagcctcg tgatcacctt gtactgcaac	660
caccggaaca agcggggcag aaagaagctg ctgtacatct tcaagcagcc cttcatgcgg	720
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gaaggcctgt acaatgaact gcagaaagat aagatggcgg aggcctacag tgagattggg	1020
atgaaaggcg agcgccggag gggcaagggg cacgatggcc ttaccaggg tctcagtaca	1080
gccaccaagg acacctacga cgcccttcac atgcaggccc tgccccctcg ctaa	1134

<210> 35
 <211> 1140
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic

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attgggatga aaggcgagcg ccggaggggc aaggggcacg atggccttta ccagggtctc	1080
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<210> 36
 <211> 1134
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 36	
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atgaaaggcg agcgccggag gggcaagggg cacgatggcc ttaccaggg tctcagtaca	1080
gccaccaagg acacctacga cgcccttcac atgcaggccc tgccccctcg ctaa	1134

<210> 37
 <211> 1119
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 37	
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gatctgcaaa tgaacagcct gagagccgag gacacggccg tatattactg tgcgaaagat	360
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35 40 45

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

Ile Ile Ser Leu Ala Val Phe Val Leu Met Phe Leu Leu Arg Lys Ile
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Asn Ser Glu Pro Leu Lys Asp Glu Phe Lys Asn Thr Gly Ser Gly Leu
85 90 95

Leu Gly Met Ala Asn Ile Asp Leu Glu Lys Ser Arg Thr Gly Asp Glu
100 105 110

Ile Ile Leu Pro Arg Gly Leu Glu Tyr Thr Val Glu Glu Cys Thr Cys
115 120 125

Glu Asp Cys Ile Lys Ser Lys Pro Lys Val Asp Ser Asp His Cys Phe
130 135 140

Pro Leu Pro Ala Met Glu Glu Gly Ala Thr Ile Leu Val Thr Thr Lys
145 150 155 160

Thr Asn Asp Tyr Cys Lys Ser Leu Pro Ala Ala Leu Ser Ala Thr Glu

165

170

175

Ile Glu Lys Ser Ile Ser Ala Arg
180