

SEQUENCE LISTING

<110> Opko Biologics Ltd.
 <120> METHOD OF INCREASING THE HYDRODYNAMIC VOLUME OF POLYPEPTIDES BY
 ATTACHING TO GONADOTROPHIN CARBOXY TERMINAL PEPTIDES
 <130> SP103261SGB
 <150> 61/728,662
 <151> 2012-11-20
 <160> 73
 <170> PatentIn version 3.5
 <210> 1
 <211> 32
 <212> PRT
 <213> Artificial
 <220>
 <223> CTP sequence
 <400> 1
 Asp Pro Arg Phe Gln Asp Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser
 1 5 10 15
 Leu Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu
 20 25 30
 <210> 2
 <211> 28
 <212> PRT
 <213> Artificial
 <220>
 <223> CTP sequence
 <400> 2
 Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu Pro Ser Pro Ser Arg
 1 5 10 15
 Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
 20 25
 <210> 3
 <211> 12
 <212> PRT
 <213> artificial
 <220>
 <223> Truncated CTP sequence
 <400> 3
 Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu Pro
 1 5 10
 <210> 4
 <211> 26
 <212> PRT

<213> artificial

<220>

<223> hGH signal peptide

<400> 4

Met Ala Thr Gly Ser Arg Thr Ser Leu Leu Leu Ala Phe Gly Leu Leu
1 5 10 15

Cys Leu Pro Trp Leu Gln Glu Gly Ser Ala
20 25

<210> 5

<211> 217

<212> PRT

<213> Homo sapiens

<400> 5

Met Ala Thr Gly Ser Arg Thr Ser Leu Leu Leu Ala Phe Gly Leu Leu
1 5 10 15

Cys Leu Pro Trp Leu Gln Glu Gly Ser Ala Phe Pro Thr Ile Pro Leu
20 25 30

Ser Arg Leu Phe Asp Asn Ala Met Leu Arg Ala His Arg Leu His Gln
35 40 45

Leu Ala Phe Asp Thr Tyr Gln Glu Phe Glu Glu Ala Tyr Ile Pro Lys
50 55 60

Glu Gln Lys Tyr Ser Phe Leu Gln Asn Pro Gln Thr Ser Leu Cys Phe
65 70 75 80

Ser Glu Ser Ile Pro Thr Pro Ser Asn Arg Glu Glu Thr Gln Gln Lys
85 90 95

Ser Asn Leu Glu Leu Leu Arg Ile Ser Leu Leu Leu Ile Gln Ser Trp
100 105 110

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

Tyr Gly Ala Ser Asp Ser Asn Val Tyr Asp Leu Leu Lys Asp Leu Glu
130 135 140

Glu Gly Ile Gln Thr Leu Met Gly Arg Leu Glu Asp Gly Ser Pro Arg
145 150 155 160

Thr Gly Gln Ile Phe Lys Gln Thr Tyr Ser Lys Phe Asp Thr Asn Ser
165 170 175

His Asn Asp Asp Ala Leu Leu Lys Asn Tyr Gly Leu Leu Tyr Cys Phe
180 185 190

Arg Lys Asp Met Asp Lys Val Glu Thr Phe Leu Arg Ile Val Gln Cys
195 200 205

Arg Ser Val Glu Gly Ser Cys Gly Phe
210 215

<210> 6
<211> 192
<212> PRT
<213> Artificial

<220>
<223> hGH sequence

<400> 6

Met Phe Pro Thr Ile Pro Leu Ser Arg Leu Phe Asp Asn Ala Met Leu
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Arg Ala His Arg Leu His Gln Leu Ala Phe Asp Thr Tyr Gln Glu Phe
20 25 30

Glu Glu Ala Tyr Ile Pro Lys Glu Gln Lys Tyr Ser Phe Leu Gln Asn
35 40 45

Pro Gln Thr Ser Leu Cys Phe Ser Glu Ser Ile Pro Thr Pro Ser Asn
50 55 60

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

Leu Leu Leu Ile Gln Ser Trp Leu Glu Pro Val Gln Phe Leu Arg Ser
85 90 95

Val Phe Ala Asn Ser Leu Val Tyr Gly Ala Ser Asp Ser Asn Val Tyr
100 105 110

Asp Leu Leu Lys Asp Leu Glu Glu Gly Ile Gln Thr Leu Met Gly Arg
115 120 125

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

Ser Lys Phe Asp Thr Asn Ser His Asn Asp Asp Ala Leu Leu Lys Asn
145 150 155 160

Tyr Gly Leu Leu Tyr Cys Phe Arg Lys Asp Met Asp Lys Val Glu Thr
165 170 175

Phe Leu Arg Ile Val Gln Cys Arg Ser Val Glu Gly Ser Cys Gly Phe
180 185 190

<210> 7
<211> 25

<212> PRT
<213> Artificial

<220>
<223> hGH sequence

<400> 7

Met Phe Pro Thr Ile Pro Leu Ser Arg Leu Phe Asp Asn Ala Met Leu
1 5 10 15

Arg Ala His Arg Leu His Gln Leu Ala
20 25

<210> 8
<211> 217
<212> PRT
<213> Homo sapiens

<400> 8

Met Ala Thr Gly Ser Arg Thr Ser Leu Leu Leu Ala Phe Gly Leu Leu
1 5 10 15

Cys Leu Pro Trp Leu Gln Glu Gly Ser Ala Phe Pro Thr Ile Pro Leu
20 25 30

Ser Arg Leu Phe Asp Asn Ala Met Leu Arg Ala His Arg Leu His Gln
35 40 45

Leu Ala Phe Asp Thr Tyr Gln Glu Phe Glu Glu Ala Tyr Ile Pro Lys
50 55 60

Val Gln Lys Tyr Ser Phe Leu Gln Asn Pro Gln Thr Ser Leu Cys Phe
65 70 75 80

Ser Glu Ser Ile Pro Thr Pro Ser Asn Arg Glu Glu Thr Gln Gln Lys
85 90 95

Ser Asn Leu Glu Leu Leu Arg Ile Ser Leu Leu Leu Ile Gln Ser Trp
100 105 110

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

Tyr Gly Ala Ser Asp Ser Asn Val Tyr Asp Leu Leu Lys Asp Leu Glu
130 135 140

Glu Gly Ile Gln Thr Leu Met Gly Arg Leu Glu Asp Gly Ser Pro Arg
145 150 155 160

Thr Gly Gln Ile Phe Lys Gln Thr Tyr Ser Lys Phe Asp Thr Asn Ser
165 170 175

His Asn Asp Asp Ala Leu Leu Lys Asn Tyr Gly Leu Leu Tyr Cys Phe
180 185 190

Arg Lys Asp Met Asp Lys Val Glu Thr Phe Leu Arg Ile Val Gln Cys
195 200 205

Arg Ser Val Glu Gly Ser Cys Gly Phe
210 215

<210> 9
<211> 245
<212> PRT
<213> Artificial

<220>
<223> hGH-CTP

<400> 9

Met Ala Thr Gly Ser Arg Thr Ser Leu Leu Leu Ala Phe Gly Leu Leu
1 5 10 15

Cys Leu Pro Trp Leu Gln Glu Gly Ser Ala Phe Pro Thr Ile Pro Leu
20 25 30

Ser Arg Leu Phe Asp Asn Ala Met Leu Arg Ala His Arg Leu His Gln
35 40 45

Leu Ala Phe Asp Thr Tyr Gln Glu Phe Glu Glu Ala Tyr Ile Pro Lys
50 55 60

Glu Gln Lys Tyr Ser Phe Leu Gln Asn Pro Gln Thr Ser Leu Cys Phe
65 70 75 80

Ser Glu Ser Ile Pro Thr Pro Ser Asn Arg Glu Glu Thr Gln Gln Lys
85 90 95

Ser Asn Leu Glu Leu Leu Arg Ile Ser Leu Leu Leu Ile Gln Ser Trp
100 105 110

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

Tyr Gly Ala Ser Asp Ser Asn Val Tyr Asp Leu Leu Lys Asp Leu Glu
130 135 140

Glu Gly Ile Gln Thr Leu Met Gly Arg Leu Glu Asp Gly Ser Pro Arg
145 150 155 160

Thr Gly Gln Ile Phe Lys Gln Thr Tyr Ser Lys Phe Asp Thr Asn Ser
165 170 175

His Asn Asp Asp Ala Leu Leu Lys Asn Tyr Gly Leu Leu Tyr Cys Phe
180 185 190

Arg Lys Asp Met Asp Lys Val Glu Thr Phe Leu Arg Ile Val Gln Cys
Page 5

195 200 205
 Arg Ser Val Glu Gly Ser Cys Gly Phe Ser Ser Ser Ser Lys Ala Pro
 210 215 220
 Pro Pro Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr
 225 230 235 240
 Pro Ile Leu Pro Gln
 245

 <210> 10
 <211> 273
 <212> PRT
 <213> Artificial

 <220>
 <223> hGH-CTP-CTP

 <400> 10
 Met Ala Thr Gly Ser Arg Thr Ser Leu Leu Ala Phe Gly Leu Leu
 1 5 10 15
 Cys Leu Pro Trp Leu Gln Glu Gly Ser Ala Phe Pro Thr Ile Pro Leu
 20 25 30
 Ser Arg Leu Phe Asp Asn Ala Met Leu Arg Ala His Arg Leu His Gln
 35 40 45
 Leu Ala Phe Asp Thr Tyr Gln Glu Phe Glu Glu Ala Tyr Ile Pro Lys
 50 55 60
 Glu Gln Lys Tyr Ser Phe Leu Gln Asn Pro Gln Thr Ser Leu Cys Phe
 65 70 75 80
 Ser Glu Ser Ile Pro Thr Pro Ser Asn Arg Glu Glu Thr Gln Gln Lys
 85 90 95
 Ser Asn Leu Glu Leu Leu Arg Ile Ser Leu Leu Leu Ile Gln Ser Trp
 100 105 110
 Leu Glu Pro Val Gln Phe Leu Arg Ser Val Phe Ala Asn Ser Leu Val
 115 120 125
 Tyr Gly Ala Ser Asp Ser Asn Val Tyr Asp Leu Leu Lys Asp Leu Glu
 130 135 140
 Glu Gly Ile Gln Thr Leu Met Gly Arg Leu Glu Asp Gly Ser Pro Arg
 145 150 155 160
 Thr Gly Gln Ile Phe Lys Gln Thr Tyr Ser Lys Phe Asp Thr Asn Ser
 165 170 175

His Asn Asp Asp Ala Leu Leu Lys Asn Tyr Gly Leu Leu Tyr Cys Phe
 180 185 190
 Arg Lys Asp Met Asp Lys Val Glu Thr Phe Leu Arg Ile Val Gln Cys
 195 200 205
 Arg Ser Val Glu Gly Ser Cys Gly Phe Ser Ser Ser Ser Lys Ala Pro
 210 215 220
 Pro Pro Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr
 225 230 235 240
 Pro Ile Leu Pro Gln Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
 245 250 255
 Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro
 260 265 270

Gln

<210> 11
 <211> 301
 <212> PRT
 <213> Artificial

<220>
 <223> CTP-hGH-CTP-CTP

<400> 11

Met Ala Thr Gly Ser Arg Thr Ser Leu Leu Leu Ala Phe Gly Leu Leu
 1 5 10 15
 Cys Leu Pro Trp Leu Gln Glu Gly Ser Ala Ser Ser Ser Ser Lys Ala
 20 25 30
 Pro Pro Pro Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp
 35 40 45
 Thr Pro Ile Leu Pro Gln Phe Pro Thr Ile Pro Leu Ser Arg Leu Phe
 50 55 60
 Asp Asn Ala Met Leu Arg Ala His Arg Leu His Gln Leu Ala Phe Asp
 65 70 75 80
 Thr Tyr Gln Glu Phe Glu Glu Ala Tyr Ile Pro Lys Glu Gln Lys Tyr
 85 90 95
 Ser Phe Leu Gln Asn Pro Gln Thr Ser Leu Cys Phe Ser Glu Ser Ile
 100 105 110
 Pro Thr Pro Ser Asn Arg Glu Glu Thr Gln Gln Lys Ser Asn Leu Glu
 115 120 125

Leu 130 Arg Ile Ser Leu 135 Leu Ile Gln Ser Trp 140 Leu Glu Pro Val
 Gln 145 Phe Leu Arg Ser Val 150 Phe Ala Asn Ser Leu 155 Val Tyr Gly Ala Ser 160
 Asp Ser Asn Val Tyr 165 Asp Leu Leu Lys Asp 170 Leu Glu Glu Gly Ile Gln 175
 Thr Leu Met Gly 180 Arg Leu Glu Asp Gly 185 Ser Pro Arg Thr Gly Gln Ile 190
 Phe Lys Gln 195 Thr Tyr Ser Lys Phe 200 Asp Thr Asn Ser His 205 Asn Asp Asp
 Ala Leu 210 Leu Lys Asn Tyr Gly 215 Leu Leu Tyr Cys Phe 220 Arg Lys Asp Met
 Asp 225 Lys Val Glu Thr Phe 230 Leu Arg Ile Val Gln 235 Cys Arg Ser Val Glu 240
 Gly Ser Cys Gly Phe 245 Ser Ser Ser Ser Lys 250 Ala Pro Pro Pro Ser Leu 255
 Pro Ser Pro Ser 260 Arg Leu Pro Gly Pro 265 Ser Asp Thr Pro Ile Leu Pro 270
 Gln Ser Ser 275 Ser Ser Lys Ala Pro 280 Pro Pro Ser Leu Pro 285 Ser Pro Ser
 Arg Leu 290 Pro Gly Pro Ser Asp 295 Thr Pro Ile Leu Pro Gln 300

<210> 12
 <211> 285
 <212> PRT
 <213> Artificial

<220>
 <223> Truncated-CTP-hGH-CTP-CTP

<400> 12

Met 1 Ala Thr Gly Ser 5 Arg Thr Ser Leu 10 Leu Leu Ala Phe Gly Leu 15 Leu

Cys Leu Pro Trp 20 Leu Gln Glu Gly Ser 25 Ala Ser Ser Ser Ser Lys Ala 30

Pro Pro 35 Pro Ser Leu Pro Phe 40 Thr Ile Pro Leu Ser 45 Arg Leu Phe

Asp 50 Asn Ala Met Leu Arg 55 Ala His Arg Leu His 60 Gln Leu Ala Phe Asp

Thr Tyr Gln Glu Phe Glu Glu Ala Tyr Ile Pro Lys Glu Gln Lys Tyr
65 70 75 80

Ser Phe Leu Gln Asn Pro Gln Thr Ser Leu Cys Phe Ser Glu Ser Ile
85 90 95

Pro Thr Pro Ser Asn Arg Glu Glu Thr Gln Gln Lys Ser Asn Leu Glu
100 105 110

Leu Leu Arg Ile Ser Leu Leu Leu Ile Gln Ser Trp Leu Glu Pro Val
115 120 125

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

Asp Ser Asn Val Tyr Asp Leu Leu Lys Asp Leu Glu Glu Gly Ile Gln
145 150 155 160

Thr Leu Met Gly Arg Leu Glu Asp Gly Ser Pro Arg Thr Gly Gln Ile
165 170 175

Phe Lys Gln Thr Tyr Ser Lys Phe Asp Thr Asn Ser His Asn Asp Asp
180 185 190

Ala Leu Leu Lys Asn Tyr Gly Leu Leu Tyr Cys Phe Arg Lys Asp Met
195 200 205

Asp Lys Val Glu Thr Phe Leu Arg Ile Val Gln Cys Arg Ser Val Glu
210 215 220

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

Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro
245 250 255

Gln Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu Pro Ser Pro Ser
260 265 270

Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
275 280 285

<210> 13
<211> 273
<212> PRT
<213> Artificial

<220>
<223> CTP-hGH-CTP

<400> 13

Met Ala Thr Gly Ser Arg Thr Ser Leu Leu Leu Ala Phe Gly Leu Leu

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Cys	Leu	Pro	Trp
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		Glu	Gly
		Ser	25
		Ala	Ser
		Ser	Ser
		Ser	Ser
		Ser	30
		Lys	Ala
Pro	Pro	Pro	Ser
	35	Leu	Pro
		Ser	40
		Pro	Ser
		Arg	Leu
		Pro	Gly
		45	Pro
		Ser	Asp
Thr	Pro	Ile	Leu
	50	Pro	Gln
		Phe	55
		Pro	Thr
		Ile	Pro
		Leu	60
		Ser	Arg
		Leu	Phe
Asp	Asn	Ala	Met
65		Leu	Arg
		70	Ala
		His	Arg
		Leu	His
		75	Gln
		Leu	Ala
		Phe	80
Thr	Tyr	Gln	Glu
		85	Phe
		Glu	Glu
		Ala	Tyr
		Ile	90
		Pro	Lys
		Glu	Gln
		95	Lys
		Tyr	
Ser	Phe	Leu	Gln
		100	Asn
		Pro	Gln
		Thr	Ser
		105	Leu
		Cys	Phe
		Ser	Glu
		110	Ser
		Ile	
Pro	Thr	Pro	Ser
		115	Asn
		Arg	Glu
		Glu	120
		Thr	Gln
		Gln	Lys
		Ser	125
		Asn	Leu
		Glu	
Leu	Leu	Arg	Ile
	130	Ser	Leu
		Leu	135
		Leu	Ile
		Gln	Ser
		Trp	140
		Leu	Glu
		Pro	Val
Gln	Phe	Leu	Arg
145		Ser	Val
		150	Phe
		Ala	Asn
		Ser	Leu
		155	Val
		Tyr	Gly
		Ala	Ser
		160	
Asp	Ser	Asn	Val
		165	Tyr
		Asp	Leu
		Leu	Lys
		170	Asp
		Leu	Glu
		Glu	Gly
		Ile	175
		Gln	
Thr	Leu	Met	Gly
		180	Arg
		Leu	Glu
		Asp	Gly
		185	Ser
		Pro	Arg
		Thr	Gly
		190	Gln
		Ile	
Phe	Lys	Gln	Thr
		195	Tyr
		Ser	Lys
		200	Phe
		Asp	Thr
		Asn	Ser
		205	His
		Asn	Asp
		Asp	
Ala	Leu	Leu	Lys
	210	Asn	Tyr
		Gly	215
		Leu	Leu
		Tyr	Cys
		220	Phe
		Arg	Lys
		Asp	Met
Asp	Lys	Val	Glu
225		Thr	Phe
		230	Leu
		Arg	Ile
		Val	Gln
		235	Cys
		Arg	Ser
		Val	Glu
		240	
Gly	Ser	Cys	Gly
		245	Phe
		Ser	Ser
		Ser	Ser
		Ser	Lys
		250	Ala
		Pro	Pro
		Pro	Pro
		Ser	255
		Leu	
Pro	Ser	Pro	Ser
		260	Arg
		Leu	Pro
		Gly	Pro
		265	Ser
		Asp	Thr
		Pro	Ile
		270	Leu
		Pro	
Gln			

<210> 14
<211> 245
<212> PRT
<213> Artificial

<220>
<223> GH-CTP

<400> 14

Met Ala Thr Gly Ser Arg Thr Ser Leu Leu Leu Ala Phe Gly Leu Leu
1 5 10 15

Cys Leu Pro Trp Leu Gln Glu Gly Ser Ala Ser Ser Ser Ser Lys Ala
20 25 30

Pro Pro Pro Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp
35 40 45

Thr Pro Ile Leu Pro Gln Phe Pro Thr Ile Pro Leu Ser Arg Leu Phe
50 55 60

Asp Asn Ala Met Leu Arg Ala His Arg Leu His Gln Leu Ala Phe Asp
65 70 75 80

Thr Tyr Gln Glu Phe Glu Glu Ala Tyr Ile Pro Lys Glu Gln Lys Tyr
85 90 95

Ser Phe Leu Gln Asn Pro Gln Thr Ser Leu Cys Phe Ser Glu Ser Ile
100 105 110

Pro Thr Pro Ser Asn Arg Glu Glu Thr Gln Gln Lys Ser Asn Leu Glu
115 120 125

Leu Leu Arg Ile Ser Leu Leu Leu Ile Gln Ser Trp Leu Glu Pro Val
130 135 140

Gln Phe Leu Arg Ser Val Phe Ala Asn Ser Leu Val Tyr Gly Ala Ser
145 150 155 160

Asp Ser Asn Val Tyr Asp Leu Leu Lys Asp Leu Glu Glu Gly Ile Gln
165 170 175

Thr Leu Met Gly Arg Leu Glu Asp Gly Ser Pro Arg Thr Gly Gln Ile
180 185 190

Phe Lys Gln Thr Tyr Ser Lys Phe Asp Thr Asn Ser His Asn Asp Asp
195 200 205

Ala Leu Leu Lys Asn Tyr Gly Leu Leu Tyr Cys Phe Arg Lys Asp Met
210 215 220

Asp Lys Val Glu Thr Phe Leu Arg Ile Val Gln Cys Arg Ser Val Glu
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225

230

235

240

Gly Ser Cys Gly Phe
245

<210> 15
<211> 853
<212> DNA
<213> Artificial

<220>
<223> CTP-hGH-CTP

<400> 15
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gccagcccc agcagactgc cgggccccag cgacacaccc attctgcccc agttccccac 180
catccccctg agcaggctgt tcgacaacgc catgctgagg gctcacaggc tgcaccagct 240
ggcctttgac acctaccagg agttcgagga agcctacatc cccaaggagc agaagtacag 300
cttcctgcag aacccccaga cctccctgtg cttcagcgag agcatcccca cccccagcaa 360
cagagaggag acccagcaga agagcaacct ggagctgctg aggatctccc tgctgctgat 420
ccagagctgg ctggagcccc tgcagttcct gagaagcgtg ttcgccaaca gcctggtgta 480
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cagcaagtgc gacaccaaca gccacaacga cgacgccctg ctgaagaact acgggctgct 660
gtactgcttc agaaaggaca tggacaaggt ggagacctc ctgaggatcg tgcagtgcag 720
aagcgtggag ggcagctgcg gcttcagctc cagcagcaag gccctcccc cgagcctgcc 780
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tggatgcggc cgc 853

<210> 16
<211> 937
<212> DNA
<213> Artificial

<220>
<223> CTP-hGH-CTP-CTP

<400> 16
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gccagcccc agcagactgc cgggccccag cgacacaccc attctgcccc agttccccac 180
catccccctg agcaggctgt tcgacaacgc catgctgagg gctcacaggc tgcaccagct 240
ggcctttgac acctaccagg agttcgagga agcctacatc cccaaggagc agaagtacag 300
cttcctgcag aacccccaga cctccctgtg cttcagcgag agcatcccca cccccagcaa 360
cagagaggag acccagcaga agagcaacct ggagctgctg aggatctccc tgctgctgat 420

ccagagctgg ctggagcccc tgcagttcct gagaagcgtg ttcgccaaca gcctggtgta	480
cggcgccagc gacagcaacg tgtacgacct gctgaaggac ctggaggagg gcatccagac	540
cctgatgggc cggctggagg acggcagccc caggaccggc cagatcttca agcagaccta	600
cagcaagttc gacaccaaca gccacaacga cgacgccctg ctgaagaact acgggctgct	660
gtactgcttc agaaaggaca tggacaaggt ggagaccttc ctgaggatcg tgcagtgcag	720
aagcgtggag ggcagctgcg gcttcagctc cagcagcaag gccctcccc cgagcctgcc	780
ctccccaagc aggctgcctg ggccctccga cacaccaatc ctgccacaga gcagctcctc	840
taaggccctt cctccatccc tgccatcccc ctccggctg cctggcccct ctgacacccc	900
tatcctgcct cagtgatgaa ggtctggatg cggccgc	937

<210> 17
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 <212> DNA
 <213> Artificial

<220>
 <223> CTP-hGH-CTP-CTP

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gcccttcccc accatcccc tgagcaggct gttcgacaac gccatgctga gggctcacag	180
gctgcaccag ctggcctttg acacctacca ggagttcgag gaagcctaca tccccaagga	240
gcagaagtac agcttctcgc agaaccccc gacctccctg tgcttcagcg agagcatccc	300
cacccccagc aacagagagg agaccagca gaagagcaac ctggagctgc tgaggatctc	360
cctgctgctg atccagagct ggctggagcc cgtgcagttc ctgagaagcg tgttcgccaa	420
cagcctgggtg tacggcgcca gcgacagcaa cgtgtacgac ctgctgaagg acctggagga	480
gggcatccag acctgatgg gccggctgga ggacggcagc cccaggaccg gccagatctt	540
caagcagacc tacagcaagt tcgacaccaa cagccacaac gacgacgcc tgctgaagaa	600
ctacgggctg ctgtactgct tcagaaagga catggacaag gtggagacct tcctgaggat	660
cgtgcagtgc agaagcgtgg agggcagctg cggcttcagc tccagcagca agggccctcc	720
cccgagcctg ccctcccaa gcaggctgcc tgggccctcc gacacaccaa tcctgccaca	780
gagcagctcc tctaaggccc ctctccatc cctgccatcc ccctccggc tgcttgccc	840
ctctgacacc cctatcctgc ctcagtgatg aaggctctgga tgcggccgc	889

<210> 18
 <211> 37
 <212> PRT
 <213> Artificial

<220>
 <223> Oxyntomodulin

<400> 18

His Ser Gln Gly Thr Phe Thr Ser Asp Tyr Ser Lys Tyr Leu Asp Ser
1 5 10 15

Arg Arg Ala Gln Asp Phe Val Gln Trp Leu Met Asn Thr Lys Arg Asn
20 25 30

Arg Asn Asn Ile Ala
35

<210> 19
<211> 221
<212> PRT
<213> Artificial

<220>
<223> EPO peptide

<400> 19

Met Gly Val His Glu Cys Pro Ala Trp Leu Trp Leu Leu Ser Leu
1 5 10 15

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

Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu Leu Glu Ala Lys Glu
35 40 45

Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His Cys Ser Leu Asn Glu
50 55 60

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

Met Glu Val Gly Gln Gln Ala Val Glu Val Trp Gln Gly Leu Ala Leu
85 90 95

Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu Leu Val Asn Ser Ser
100 105 110

Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp Lys Ala Val Ser Gly
115 120 125

Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu Gly Ala Gln Lys Glu
130 135 140

Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala Pro Leu Arg Thr Ile
145 150 155 160

Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val Tyr Ser Asn Phe Leu
165 170 175

Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala Cys Arg Thr Gly Asp
180 185 190

Arg Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu Pro Ser Pro Ser
195 200 205

Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
210 215 220

<210> 20
<211> 249
<212> PRT
<213> Artificial

<220>
<223> EPO-CTP-CTP

<400> 20

Met Gly Val His Glu Cys Pro Ala Trp Leu Trp Leu Leu Leu Ser Leu
1 5 10 15

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

Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu Leu Glu Ala Lys Glu
35 40 45

Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His Cys Ser Leu Asn Glu
50 55 60

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

Met Glu Val Gly Gln Gln Ala Val Glu Val Trp Gln Gly Leu Ala Leu
85 90 95

Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu Leu Val Asn Ser Ser
100 105 110

Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp Lys Ala Val Ser Gly
115 120 125

Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu Gly Ala Gln Lys Glu
130 135 140

Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala Pro Leu Arg Thr Ile
145 150 155 160

Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val Tyr Ser Asn Phe Leu
165 170 175

Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala Cys Arg Thr Gly Asp
180 185 190

Arg Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu Pro Ser Pro Ser
Page 15

195 200 205
 Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln Ser Ser Ser
 210 215 220
 Ser Lys Ala Pro Pro Pro Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly
 225 230 235 240
 Pro Ser Asp Thr Pro Ile Leu Pro Gln
 245
 <210> 21
 <211> 277
 <212> PRT
 <213> Artificial
 <220>
 <223> CTP-EPO-CTP-CTP
 <400> 21
 Met Gly Val His Glu Cys Pro Ala Trp Leu Trp Leu Leu Leu Ser Leu
 1 5 10 15
 Leu Ser Leu Pro Leu Gly Leu Pro Val Leu Gly Ser Ser Ser Ser Lys
 20 25 30
 Ala Pro Pro Pro Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser
 35 40 45
 Asp Thr Pro Ile Leu Pro Gln Ala Pro Pro Arg Leu Ile Cys Asp Ser
 50 55 60
 Arg Val Leu Glu Arg Tyr Leu Leu Glu Ala Lys Glu Ala Glu Asn Ile
 65 70 75 80
 Thr Thr Gly Cys Ala Glu His Cys Ser Leu Asn Glu Asn Ile Thr Val
 85 90 95
 Pro Asp Thr Lys Val Asn Phe Tyr Ala Trp Lys Arg Met Glu Val Gly
 100 105 110
 Gln Gln Ala Val Glu Val Trp Gln Gly Leu Ala Leu Leu Ser Glu Ala
 115 120 125
 Val Leu Arg Gly Gln Ala Leu Leu Val Asn Ser Ser Gln Pro Trp Glu
 130 135 140
 Pro Leu Gln Leu His Val Asp Lys Ala Val Ser Gly Leu Arg Ser Leu
 145 150 155 160
 Thr Thr Leu Leu Arg Ala Leu Gly Ala Gln Lys Glu Ala Ile Ser Pro
 165 170 175

Pro Asp Ala Ala Ser Ala Ala Pro Leu Arg Thr Ile Thr Ala Asp Thr
180 185 190

Phe Arg Lys Leu Phe Arg Val Tyr Ser Asn Phe Leu Arg Gly Lys Leu
195 200 205

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

Ser Lys Ala Pro Pro Pro Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly
225 230 235 240

Pro Ser Asp Thr Pro Ile Leu Pro Gln Ser Ser Ser Ser Lys Ala Pro
245 250 255

Pro Pro Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr
260 265 270

Pro Ile Leu Pro Gln
275

<210> 22
<211> 387
<212> PRT
<213> Artificial

<220>
<223> EPO-CTP

<400> 22

Met Gly Val His Glu Cys Pro Ala Trp Leu Trp Leu Leu Ser Leu
1 5 10 15

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

Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu Leu Glu Ala Lys Glu
35 40 45

Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His Cys Ser Leu Asn Glu
50 55 60

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

Met Glu Val Gly Gln Gln Ala Val Glu Val Trp Gln Gly Leu Ala Leu
85 90 95

Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu Leu Val Asn Ser Ser
100 105 110

Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp Lys Ala Val Ser Gly
115 120 125

Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu Gly Ala Gln Lys Glu
 130 135 140
 Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala Pro Leu Arg Thr Ile
 145 150 155 160
 Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val Tyr Ser Asn Phe Leu
 165 170 175
 Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala Cys Arg Thr Gly Asp
 180 185 190
 Arg Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu Pro Ser Pro Ser
 195 200 205
 Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln Ala Pro Pro
 210 215 220
 Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu Leu Glu Ala
 225 230 235 240
 Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His Cys Ser Leu
 245 250 255
 Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe Tyr Ala Trp
 260 265 270
 Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp Gln Gly Leu
 275 280 285
 Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu Leu Val Asn
 290 295 300
 Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp Lys Ala Val
 305 310 315 320
 Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu Gly Ala Gln
 325 330 335
 Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala Pro Leu Arg
 340 345 350
 Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val Tyr Ser Asn
 355 360 365
 Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala Cys Arg Thr
 370 375 380
 Gly Asp Arg
 385

<210> 23
 <211> 221
 <212> PRT
 <213> Artificial

<220>
 <223> CTP-EPO

<400> 23

Met Gly Val His Glu Cys Pro Ala Trp Leu Trp Leu Leu Leu Ser Leu
 1 5 10 15

Leu Ser Leu Pro Leu Gly Leu Pro Val Leu Gly Ser Ser Ser Ser Lys
 20 25 30

Ala Pro Pro Pro Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser
 35 40 45

Asp Thr Pro Ile Leu Pro Gln Ala Pro Pro Arg Leu Ile Cys Asp Ser
 50 55 60

Arg Val Leu Glu Arg Tyr Leu Leu Glu Ala Lys Glu Ala Glu Asn Ile
 65 70 75 80

Thr Thr Gly Cys Ala Glu His Cys Ser Leu Asn Glu Asn Ile Thr Val
 85 90 95

Pro Asp Thr Lys Val Asn Phe Tyr Ala Trp Lys Arg Met Glu Val Gly
 100 105 110

Gln Gln Ala Val Glu Val Trp Gln Gly Leu Ala Leu Leu Ser Glu Ala
 115 120 125

Val Leu Arg Gly Gln Ala Leu Leu Val Asn Ser Ser Gln Pro Trp Glu
 130 135 140

Pro Leu Gln Leu His Val Asp Lys Ala Val Ser Gly Leu Arg Ser Leu
 145 150 155 160

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

Pro Asp Ala Ala Ser Ala Ala Pro Leu Arg Thr Ile Thr Ala Asp Thr
 180 185 190

Phe Arg Lys Leu Phe Arg Val Tyr Ser Asn Phe Leu Arg Gly Lys Leu
 195 200 205

Lys Leu Tyr Thr Gly Glu Ala Cys Arg Thr Gly Asp Arg
 210 215 220

<210> 24
 <211> 249
 <212> PRT

<213> Artificial

<220>

<223> CTP-EPO-CTP

<400> 24

Met Gly Val His Glu Cys Pro Ala Trp Leu Trp Leu Leu Leu Ser Leu
1 5 10 15

Leu Ser Leu Pro Leu Gly Leu Pro Val Leu Gly Ser Ser Ser Ser Lys
20 25 30

Ala Pro Pro Pro Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser
35 40 45

Asp Thr Pro Ile Leu Pro Gln Ala Pro Pro Arg Leu Ile Cys Asp Ser
50 55 60

Arg Val Leu Glu Arg Tyr Leu Leu Glu Ala Lys Glu Ala Glu Asn Ile
65 70 75 80

Thr Thr Gly Cys Ala Glu His Cys Ser Leu Asn Glu Asn Ile Thr Val
85 90 95

Pro Asp Thr Lys Val Asn Phe Tyr Ala Trp Lys Arg Met Glu Val Gly
100 105 110

Gln Gln Ala Val Glu Val Trp Gln Gly Leu Ala Leu Leu Ser Glu Ala
115 120 125

Val Leu Arg Gly Gln Ala Leu Leu Val Asn Ser Ser Gln Pro Trp Glu
130 135 140

Pro Leu Gln Leu His Val Asp Lys Ala Val Ser Gly Leu Arg Ser Leu
145 150 155 160

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

Pro Asp Ala Ala Ser Ala Ala Pro Leu Arg Thr Ile Thr Ala Asp Thr
180 185 190

Phe Arg Lys Leu Phe Arg Val Tyr Ser Asn Phe Leu Arg Gly Lys Leu
195 200 205

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

Ser Lys Ala Pro Pro Pro Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly
225 230 235 240

Pro Ser Asp Thr Pro Ile Leu Pro Gln
245

<210> 25
 <211> 193
 <212> PRT
 <213> Artificial

<220>
 <223> EPO

<400> 25

Met Gly Val His Glu Cys Pro Ala Trp Leu Trp Leu Leu Leu Ser Leu
 1 5 10 15

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

Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu Leu Glu Ala Lys Glu
 35 40 45

Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His Cys Ser Leu Asn Glu
 50 55 60

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

Met Glu Val Gly Gln Gln Ala Val Glu Val Trp Gln Gly Leu Ala Leu
 85 90 95

Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu Leu Val Asn Ser Ser
 100 105 110

Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp Lys Ala Val Ser Gly
 115 120 125

Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu Gly Ala Gln Lys Glu
 130 135 140

Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala Pro Leu Arg Thr Ile
 145 150 155 160

Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val Tyr Ser Asn Phe Leu
 165 170 175

Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala Cys Arg Thr Gly Asp
 180 185 190

Arg

<210> 26
 <211> 873
 <212> DNA
 <213> Artificial

<220>
<223> EPO-CTP-CTP

<400> 26
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tctgtcgctc cctctgggcc tcccagtcct gggctcctct tcctcaaagg cccctccccc 120
gagccttcca agtccatccc gactcccggg gccctcggac accccaatat taccacaagc 180
cccaccacgc ctcatctgtg acagccgagt cctggagagg tacctcttgg aggccaagga 240
ggccgagaat atcacgacgg gctgtgctga acactgcagc ttgaatgaga atatcactgt 300
cccagacacc aaagttaatt tctatgcctg gaagaggatg gaggtcgggc agcaggccgt 360
agaagtctgg cagggcctgg ccctgctgtc ggaagctgtc ctgcggggcc aggccctgtt 420
gggtcaactct tcccagccgt gggagcccct gcagctgcat gtggataaag ccgtcagtgg 480
ccttcgcagc ctcaccactc tgcttcgggc tctgggagcc cagaaggaag ccatctcccc 540
tccagatgcg gcctcagctg ctccactccg aacaatcact gctgacactt tccgcaaact 600
cttccgagtc tactccaatt tcctccgggg aaagctgaag ctgtacacag gggaggcctg 660
caggacaggg gacagatcct cttcctcaaa ggccccctcc ccgagccttc caagtccatc 720
ccgactcccg gggccctccg acacaccaat cctgccacag agcagctcct ctaaggcccc 780
tcctccatcc ctgccatccc cctcccggct gcctggcccc tctgacaccc ctatctgccc 840
tcagtgatga aggtcttctg gatccgcggc cgc 873

<210> 27
<211> 187
<212> PRT
<213> Homo sapiens

<400> 27

Met Thr Asn Lys Cys Leu Leu Gln Ile Ala Leu Leu Leu Cys Phe Ser
1 5 10 15
Thr Thr Ala Leu Ser Met Ser Tyr Asn Leu Leu Gly Phe Leu Gln Arg
20 25 30
Ser Ser Asn Phe Gln Cys Gln Lys Leu Leu Trp Gln Leu Asn Gly Arg
35 40 45
Leu Glu Tyr Cys Leu Lys Asp Arg Met Asn Phe Asp Ile Pro Glu Glu
50 55 60
Ile Lys Gln Leu Gln Gln Phe Gln Lys Glu Asp Ala Ala Leu Thr Ile
65 70 75 80
Tyr Glu Met Leu Gln Asn Ile Phe Ala Ile Phe Arg Gln Asp Ser Ser
85 90 95
Ser Thr Gly Trp Asn Glu Thr Ile Val Glu Asn Leu Leu Ala Asn Val
100 105 110

Tyr His Gln Ile Asn His Leu Lys Thr Val Leu Glu Glu Lys Leu Glu
115 120 125

Lys Glu Asp Phe Thr Arg Gly Lys Leu Met Ser Ser Leu His Leu Lys
130 135 140

Arg Tyr Tyr Gly Arg Ile Leu His Tyr Leu Lys Ala Lys Glu Tyr Ser
145 150 155 160

His Cys Ala Trp Thr Ile Val Arg Val Glu Ile Leu Arg Asn Phe Tyr
165 170 175

Phe Ile Asn Arg Leu Thr Gly Tyr Leu Arg Asn
180 185

<210> 28
<211> 589
<212> DNA
<213> Homo sapiens

<400> 28	tctagaggac atgaccaaca agtgcctgct gcagatcgcc ctgctgctgt gcttcagcac	60
	caccgccctg agcatgagct acaacctgct gggcttcctg cagaggtcca gcaacttcca	120
	gtgccagaag ctgctgtggc agctgaacgg caggctggaa tactgcctga aggacaggat	180
	gaacttcgac atcccagagg aaatcaagca gctgcagcag ttccagaagg aggacgccgc	240
	cctgaccatc tacgagatgc tgcagaacat cttcgccatc ttcaggcagg acagcagcag	300
	caccggctgg aacgagacca tcgtggagaa cctgctggcc aacgtgtacc accagatcaa	360
	ccacctgaaa accgtgctgg aagagaagct ggaaaaggag gacttcacca ggggcaagct	420
	gatgagcagc ctgcacctga agaggtacta cggcagaatc ctgcactacc tgaaggccaa	480
	ggagtacagc cactgcgctt ggaccatcgt gaggggtggag atcctgagga acttctactt	540
	catcaacagg ctgaccggct acctgaggaa ctgatgagtc cgcggccgc	589

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

<220>
<223> Interferon

<400> 29

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

Gly Asp Thr Val Arg Val Val Asn Met Thr Asn Lys Cys Leu Leu Gln
20 25 30

Ile Ala Leu Leu Leu Cys Phe Ser Thr Thr Ala Leu Ser Met Ser Tyr
35 40 45

Asn Leu Leu Gly Phe Leu Gln Arg Ser Ser Asn Phe Gln Cys Gln Lys
 50 55 60
 Leu Leu Trp Gln Leu Asn Gly Arg Leu Glu Tyr Cys Leu Lys Asp Arg
 65 70 75 80
 Met Asn Phe Asp Ile Pro Glu Glu Ile Lys Gln Leu Gln Gln Phe Gln
 85 90 95
 Lys Glu Asp Ala Ala Leu Thr Ile Tyr Glu Met Leu Gln Asn Ile Phe
 100 105 110
 Ala Ile Phe Arg Gln Asp Ser Ser Ser Thr Gly Trp Asn Glu Thr Ile
 115 120 125
 Val Glu Asn Leu Leu Ala Asn Val Tyr His Gln Ile Asn His Leu Lys
 130 135 140
 Thr Val Leu Glu Glu Lys Leu Glu Lys Glu Asp Phe Thr Arg Gly Lys
 145 150 155 160
 Leu Met Ser Ser Leu His Leu Lys Arg Tyr Tyr Gly Arg Ile Leu His
 165 170 175
 Tyr Leu Lys Ala Lys Glu Tyr Ser His Cys Ala Trp Thr Ile Val Arg
 180 185 190
 Val Glu Ile Leu Arg Asn Phe Tyr Phe Ile Asn Arg Leu Thr Gly Tyr
 195 200 205
 Leu Arg Asn
 210

<210> 30
 <211> 639
 <212> DNA
 <213> Artificial

<220>
 <223> Interferon

<400> 30
 acattctaac tgcaaccttt cgaagccttt gctctggcac aacaggtagt aggcgacact 60
 gttcgtgttg tcaacatgac caacaagtgt ctctccaaa ttgctctcct gttgtgcttc 120
 tccactacag ctctttccat gagctacaac ttgcttgat tcctacaaag aagcagcaat 180
 tttcagtgtc agaagctcct gtggcaattg aatgggaggc ttgaatactg cctcaaggac 240
 aggatgaact ttgacatccc tgaggagatt aagcagctgc agcagttcca gaaggaggac 300
 gccgcattga ccatctatga gatgctccag aacatctttg ctattttcag acaagattca 360
 tctagcactg gctggaatga gactattgtt gagaacctcc tggctaattgt ctatcatcag 420
 ataaaccatc tgaagacagt cctggaagaa aaactggaga aagaagattt caccagggga 480

aaactcatga gcagtctgca cctgaaaaga tattatggga ggattctgca ttacctgaag 540
gccaaggagt acagtcaactg tgcctggacc atagtcagag tggaaatcct aaggaacttt 600
tacttcatta acagacttac aggttacctc cgaaactga 639

<210> 31
<211> 215
<212> PRT
<213> Artificial

<220>
<223> IFN-CTP

<400> 31

Met Thr Asn Lys Cys Leu Leu Gln Ile Ala Leu Leu Leu Cys Phe Ser
1 5 10 15
Thr Thr Ala Leu Ser Met Ser Tyr Asn Leu Leu Gly Phe Leu Gln Arg
20 25 30
Ser Ser Asn Phe Gln Cys Gln Lys Leu Leu Trp Gln Leu Asn Gly Arg
35 40 45
Leu Glu Tyr Cys Leu Lys Asp Arg Met Asn Phe Asp Ile Pro Glu Glu
50 55 60
Ile Lys Gln Leu Gln Gln Phe Gln Lys Glu Asp Ala Ala Leu Thr Ile
65 70 75 80
Tyr Glu Met Leu Gln Asn Ile Phe Ala Ile Phe Arg Gln Asp Ser Ser
85 90 95
Ser Thr Gly Trp Asn Glu Thr Ile Val Glu Asn Leu Leu Ala Asn Val
100 105 110
Tyr His Gln Ile Asn His Leu Lys Thr Val Leu Glu Glu Lys Leu Glu
115 120 125
Lys Glu Asp Phe Thr Arg Gly Lys Leu Met Ser Ser Leu His Leu Lys
130 135 140
Arg Tyr Tyr Gly Arg Ile Leu His Tyr Leu Lys Ala Lys Glu Tyr Ser
145 150 155 160
His Cys Ala Trp Thr Ile Val Arg Val Glu Ile Leu Arg Asn Phe Tyr
165 170 175
Phe Ile Asn Arg Leu Thr Gly Tyr Leu Arg Asn Ser Ser Ser Ser Lys
180 185 190
Ala Pro Pro Pro Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser
195 200 205

Asp Thr Pro Ile Leu Pro Gln
210 215

<210> 32
<211> 661
<212> DNA
<213> Artificial

<220>
<223> IFN-CTP

<400> 32
tctagaggac atgaccaaca agtgcctgct gcagatcgcc ctgctgctgt gcttcagcac 60
caccgccctg agcatgagct acaacctgct gggcttcctg cagaggtcca gcaacttcca 120
gtgccagaag ctgctgtggc agctgaacgg caggctggaa tactgcctga aggacaggat 180
gaacttcgac atcccagagg aaatcaagca gctgcagcag ttccagaagg aggacgccgc 240
cctgaccatc tacgagatgc tgcagaacat cttcgccatc ttcaggcagg acagcagcag 300
caccggctgg aacgagacca tcgtggagaa cctgctggcc aacgtgtacc accagatcaa 360
ccacctgaaa accgtgctgg aagagaagct ggaaaaggag gacttcacca ggggcaagct 420
gatgagcagc ctgcacctga agaggtacta cggcagaatc ctgcactacc tgaaggccaa 480
ggagtacagc cactgcgctt ggaccatcgt gaggggtggag atcctgagga acttctactt 540
catcaacagg ctgaccggct acctgaggaa cagctccagc agcaaggccc ctccaccttc 600
cctgcccagt ccaagccgac tcctggggcc ctccgataca ccaattctgc cacagtgatg 660
a 661

<210> 33
<211> 243
<212> PRT
<213> Artificial

<220>
<223> IFN-CTP-CTP

<400> 33

Met Thr Asn Lys Cys Leu Leu Gln Ile Ala Leu Leu Leu Cys Phe Ser
1 5 10 15

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

Ser Ser Asn Phe Gln Cys Gln Lys Leu Leu Trp Gln Leu Asn Gly Arg
35 40 45

Leu Glu Tyr Cys Leu Lys Asp Arg Met Asn Phe Asp Ile Pro Glu Glu
50 55 60

Ile Lys Gln Leu Gln Gln Phe Gln Lys Glu Asp Ala Ala Leu Thr Ile
65 70 75 80

Tyr Glu Met Leu Gln Asn Ile Phe Ala Ile Phe Arg Gln Asp Ser Ser
 85 90 95
 Ser Thr Gly Trp Asn Glu Thr Ile Val Glu Asn Leu Leu Ala Asn Val
 100 105 110
 Tyr His Gln Ile Asn His Leu Lys Thr Val Leu Glu Glu Lys Leu Glu
 115 120 125
 Lys Glu Asp Phe Thr Arg Gly Lys Leu Met Ser Ser Leu His Leu Lys
 130 135 140
 Arg Tyr Tyr Gly Arg Ile Leu His Tyr Leu Lys Ala Lys Glu Tyr Ser
 145 150 155 160
 His Cys Ala Trp Thr Ile Val Arg Val Glu Ile Leu Arg Asn Phe Tyr
 165 170 175
 Phe Ile Asn Arg Leu Thr Gly Tyr Leu Arg Asn Ser Ser Ser Ser Lys
 180 185 190
 Ala Pro Pro Pro Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser
 195 200 205
 Asp Thr Pro Ile Leu Pro Gln Ser Ser Ser Ser Lys Ala Pro Pro Pro
 210 215 220
 Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile
 225 230 235 240
 Leu Pro Gln

<210> 34
 <211> 765
 <212> DNA
 <213> Artificial

<220>
 <223> IFN-CTP-CTP

<400> 34
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 caccgccctg agcatgagct acaacctgct gggcttcctg cagaggtcca gcaacttcca 120
 gtgccagaag ctgctgtggc agctgaacgg caggctggaa tactgcctga aggacaggat 180
 gaacttcgac atcccagagg aaatcaagca gctgcagcag ttccagaagg aggacgccgc 240
 cctgaccatc tacgagatgc tgcagaacat cttcgccatc ttcaggcagg acagcagcag 300
 caccggctgg aacgagacca tcgtggagaa cctgctggcc aacgtgtacc accagatcaa 360
 ccacctgaaa accgtgctgg aagagaagct ggaaaaggag gacttcacca ggggcaagct 420
 gatgagcagc ctgcacctga agaggtacta cggcagaatc ctgcactacc tgaaggccaa 480

ggagtacagc cactgcgct ggaccatcgt gaggggtggag atcctgagga acttctactt	540
catcaacagg ctgaccggct acctgaggaa cagctccagc agcaaggccc ctccaccttc	600
cctgcccagt ccaagccgac tccctgggccc ctccgacaca ccaatcctgc cacagagcag	660
ctcctctaag gcccctcctc catccctgcc atccccctcc cggtgcctg gcccctctga	720
caccctatc ctgcctcagt gatgaaggtc tggatccgcg gccgc	765

<210> 35
 <211> 271
 <212> PRT
 <213> CTP-IFN-CTP-CTP

<400> 35

Met Thr Asn Lys Cys Leu Leu Gln Ile Ala Leu Leu Leu Cys Phe Ser	1 5 10 15
Thr Thr Ala Leu Ser Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu	20 25 30
Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro	35 40 45
Gln Met Ser Tyr Asn Leu Leu Gly Phe Leu Gln Arg Ser Ser Asn Phe	50 55 60
Gln Cys Gln Lys Leu Leu Trp Gln Leu Asn Gly Arg Leu Glu Tyr Cys	65 70 75 80
Leu Lys Asp Arg Met Asn Phe Asp Ile Pro Glu Glu Ile Lys Gln Leu	85 90 95
Gln Gln Phe Gln Lys Glu Asp Ala Ala Leu Thr Ile Tyr Glu Met Leu	100 105 110
Gln Asn Ile Phe Ala Ile Phe Arg Gln Asp Ser Ser Ser Thr Gly Trp	115 120 125
Asn Glu Thr Ile Val Glu Asn Leu Leu Ala Asn Val Tyr His Gln Ile	130 135 140
Asn His Leu Lys Thr Val Leu Glu Glu Lys Leu Glu Lys Glu Asp Phe	145 150 155 160
Thr Arg Gly Lys Leu Met Ser Ser Leu His Leu Lys Arg Tyr Tyr Gly	165 170 175
Arg Ile Leu His Tyr Leu Lys Ala Lys Glu Tyr Ser His Cys Ala Trp	180 185 190
Thr Ile Val Arg Val Glu Ile Leu Arg Asn Phe Tyr Phe Ile Asn Arg	195 200 205

Leu Thr Gly Tyr Leu Arg Asn Ser Ser Ser Ser Lys Ala Pro Pro Pro
 210 215 220

Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile
 225 230 235 240

Leu Pro Gln Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu Pro Ser
 245 250 255

Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
 260 265 270

<210> 36
 <211> 849
 <212> DNA
 <213> Artificial

<220>
 <223> CTP-IFN-CTP-CTP

<400> 36
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 actgccaggc cccagcgaca cccccatcct gccccagatg agctacaacc tgctgggctt 180
 cctgcagagg tccagcaact tccagtgcc gaagctgctg tggcagctga acggcaggct 240
 ggaatactgc ctgaaggaca ggatgaactt cgacatccca gaggaatca agcagctgca 300
 gcagttccag aaggaggacg ccgccctgac catctacgag atgctgcaga acatcttcgc 360
 catcttcagg caggacagca gcagcaccgg ctggaacgag accatcgtgg agaactgct 420
 ggccaacgtg taccaccaga tcaaccacct gaaaaccgtg ctggaagaga agctggaaaa 480
 ggaggacttc accaggggca agctgatgag cagcctgcac ctgaagaggt actacggcag 540
 aatcctgcac tacctgaagg ccaaggagta cagccactgc gcctggacca tcgtgagggt 600
 ggagatcctg aggaacttct acttcatcaa caggctgacc ggctacctga ggaacagctc 660
 cagcagcaag gccctccac cttccctgcc cagtccaagc cgactccctg ggccctccga 720
 cacaccaatc ctgccacaga gcagctctc taaggcccct cctccatccc tgccatcccc 780
 ctcccggtg cctggcccct ctgacacccc tatcctgcct cagtgatgaa ggtctggatc 840
 cgcggccgc 849

<210> 37
 <211> 409
 <212> PRT
 <213> Artificial

<220>
 <223> CTP-IFN(CTP)

<400> 37

Met Thr Asn Lys Cys Leu Leu Gln Ile Ala Leu Leu Leu Cys Phe Ser
 1 5 10 15

Thr Thr Ala Leu Ser Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
 20 25 30
 Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro
 35 40 45
 Gln Met Ser Tyr Asn Leu Leu Gly Phe Leu Gln Arg Ser Ser Asn Phe
 50 55 60
 Gln Cys Gln Lys Leu Leu Trp Gln Leu Asn Gly Arg Leu Glu Tyr Cys
 65 70 75 80
 Leu Lys Asp Arg Met Asn Phe Asp Ile Pro Glu Glu Ile Lys Gln Leu
 85 90 95
 Gln Gln Phe Gln Lys Glu Asp Ala Ala Leu Thr Ile Tyr Glu Met Leu
 100 105 110
 Gln Asn Ile Phe Ala Ile Phe Arg Gln Asp Ser Ser Ser Thr Gly Trp
 115 120 125
 Asn Glu Thr Ile Val Glu Asn Leu Leu Ala Asn Val Tyr His Gln Ile
 130 135 140
 Asn His Leu Lys Thr Val Leu Glu Glu Lys Leu Glu Lys Glu Asp Phe
 145 150 155 160
 Thr Arg Gly Lys Leu Met Ser Ser Leu His Leu Lys Arg Tyr Tyr Gly
 165 170 175
 Arg Ile Leu His Tyr Leu Lys Ala Lys Glu Tyr Ser His Cys Ala Trp
 180 185 190
 Thr Ile Val Arg Val Glu Ile Leu Arg Asn Phe Tyr Phe Ile Asn Arg
 195 200 205
 Leu Thr Gly Tyr Leu Arg Asn Ser Ser Ser Ser Lys Ala Pro Pro Pro
 210 215 220
 Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile
 225 230 235 240
 Leu Pro Gln Met Ser Tyr Asn Leu Leu Gly Phe Leu Gln Arg Ser Ser
 245 250 255
 Asn Phe Gln Cys Gln Lys Leu Leu Trp Gln Leu Asn Gly Arg Leu Glu
 260 265 270
 Tyr Cys Leu Lys Asp Arg Met Asn Phe Asp Ile Pro Glu Glu Ile Lys
 275 280 285

Gln Leu Gln Gln Phe Gln Lys Glu Asp Ala Ala Leu Thr Ile Tyr Glu
 290 295 300

Met Leu Gln Asn Ile Phe Ala Ile Phe Arg Gln Asp Ser Ser Ser Thr
 305 310 315 320

Gly Trp Asn Glu Thr Ile Val Glu Asn Leu Leu Ala Asn Val Tyr His
 325 330 335

Gln Ile Asn His Leu Lys Thr Val Leu Glu Glu Lys Leu Glu Lys Glu
 340 345 350

Asp Phe Thr Arg Gly Lys Leu Met Ser Ser Leu His Leu Lys Arg Tyr
 355 360 365

Tyr Gly Arg Ile Leu His Tyr Leu Lys Ala Lys Glu Tyr Ser His Cys
 370 375 380

Ala Trp Thr Ile Val Arg Val Glu Ile Leu Arg Asn Phe Tyr Phe Ile
 385 390 395 400

Asn Arg Leu Thr Gly Tyr Leu Arg Asn
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<210> 38
 <211> 1261
 <212> DNA
 <213> Artificial

<220>
 <223> CTP-IFN(CTP)

<400> 38
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 cctgcagagg tccagcaact tccagtgcc gaaactgctg tggcagctga acggcaggct 240
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 catcttcagg caggacagca gcagaccgg ctggaacgag accatcgtgg agaactgct 420
 ggccaacgtg taccaccaga tcaaccacct gaaaaccgtg ctggaagaga agctggaaaa 480
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 aatcctgcac tacctgaagg ccaaagagta cagccactgc gcctggacca tcgtgagggt 600
 ggagatcctg cggaacttct acttcatcaa caggctgacc ggctacctga ggaacagctc 660
 cagcagcaag gccctccac cctccctgcc ctcccaagc agactgccg gaccctccga 720
 cacaccaatt ctgccacaga tgtcctacaa tctgctcgga tttctgcagc gtcctccaa 780
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cagaatgaat ttgacatcc cagaggaaat taaacagctc cagcagtttc agaaagaaga 900
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 ctctccacc gggtggaatg agacaattgt cgagaatctg ctcgccaatg tctatcatca 1020
 gatcaatcac ctcaagacag tcctcgaaga aaaactcgaa aaagaagatt tcacacgcgg 1080
 caaactgatg tcctccctgc atctgaagcg ctactatggg cgcctcctgc attatctgaa 1140
 agctaaagaa tactcccact gtgcttggac aattgtgcgc gtcgagatcc tgagaaactt 1200
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 c 1261

<210> 39
 <211> 215
 <212> PRT
 <213> Artificial

<220>
 <223> CTP-IFN

<400> 39

Met Thr Asn Lys Cys Leu Leu Gln Ile Ala Leu Leu Leu Cys Phe Ser
1 5 10 15

Thr Thr Ala Leu Ser Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
20 25 30

Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro
35 40 45

Gln Met Ser Tyr Asn Leu Leu Gly Phe Leu Gln Arg Ser Ser Asn Phe
50 55 60

Gln Cys Gln Lys Leu Leu Trp Gln Leu Asn Gly Arg Leu Glu Tyr Cys
65 70 75 80

Leu Lys Asp Arg Met Asn Phe Asp Ile Pro Glu Glu Ile Lys Gln Leu
85 90 95

Gln Gln Phe Gln Lys Glu Asp Ala Ala Leu Thr Ile Tyr Glu Met Leu
100 105 110

Gln Asn Ile Phe Ala Ile Phe Arg Gln Asp Ser Ser Ser Thr Gly Trp
115 120 125

Asn Glu Thr Ile Val Glu Asn Leu Leu Ala Asn Val Tyr His Gln Ile
130 135 140

Asn His Leu Lys Thr Val Leu Glu Glu Lys Leu Glu Lys Glu Asp Phe
145 150 155 160

Thr Arg Gly Lys Leu Met Ser Ser Leu His Leu Lys Arg Tyr Tyr Gly
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165

170

175

Arg Ile Leu His Tyr Leu Lys Ala Lys Glu Tyr Ser His Cys Ala Trp
 180 185 190

Thr Ile Val Arg Val Glu Ile Leu Arg Asn Phe Tyr Phe Ile Asn Arg
 195 200 205

Leu Thr Gly Tyr Leu Arg Asn
 210 215

<210> 40
 <211> 673
 <212> DNA
 <213> Artificial

<220>
 <223> CTP-IFN

<400> 40
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 gctgccaggc cccagcgaca cccccatcct gccccagatg agctacaacc tgctgggctt 180
 cctgcagagg tccagcaact tccagtgcc gaaactgctg tggcagctga acggcaggct 240
 ggaatactgc ctgaaggacc ggatgaactt cgacatcccc gaagagatca agcagctgca 300
 gcagttccag aaagaggacg ccgccctgac catctacgag atgctgcaga acatcttcgc 360
 catcttcagg caggacagca gcagcaccgg ctggaacgag accatcgtgg agaactgct 420
 ggccaacgtg taccaccaga tcaaccacct gaaaaccgtg ctggaagaga agctggaaaa 480
 agaggacttc accaggggca agctgatgag cagcctgcac ctgaagaggt actacggcag 540
 aatcctgcac tacctgaagg ccaaagagta cagccactgc gcctggacca tcgtgagggt 600
 ggagatcctg cggaacttct acttcatcaa caggctgacc ggctacctga ggaactgatg 660
 agtccgcggc cgc 673

<210> 41
 <211> 243
 <212> PRT
 <213> Artificial

<220>
 <223> CTP-IFN-CTP

<400> 41

Met Thr Asn Lys Cys Leu Leu Gln Ile Ala Leu Leu Leu Cys Phe Ser
 1 5 10 15

Thr Thr Ala Leu Ser Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
 20 25 30

Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro
 35 40 45

Gln Met Ser Tyr Asn Leu Leu Gly Phe Leu Gln Arg Ser Ser Asn Phe
 50 55 60
 Gln Cys Gln Lys Leu Leu Trp Gln Leu Asn Gly Arg Leu Glu Tyr Cys
 65 70 75 80
 Leu Lys Asp Arg Met Asn Phe Asp Ile Pro Glu Glu Ile Lys Gln Leu
 85 90 95
 Gln Gln Phe Gln Lys Glu Asp Ala Ala Leu Thr Ile Tyr Glu Met Leu
 100 105 110
 Gln Asn Ile Phe Ala Ile Phe Arg Gln Asp Ser Ser Ser Thr Gly Trp
 115 120 125
 Asn Glu Thr Ile Val Glu Asn Leu Leu Ala Asn Val Tyr His Gln Ile
 130 135 140
 Asn His Leu Lys Thr Val Leu Glu Glu Lys Leu Glu Lys Glu Asp Phe
 145 150 155 160
 Thr Arg Gly Lys Leu Met Ser Ser Leu His Leu Lys Arg Tyr Tyr Gly
 165 170 175
 Arg Ile Leu His Tyr Leu Lys Ala Lys Glu Tyr Ser His Cys Ala Trp
 180 185 190
 Thr Ile Val Arg Val Glu Ile Leu Arg Asn Phe Tyr Phe Ile Asn Arg
 195 200 205
 Leu Thr Gly Tyr Leu Arg Asn Ser Ser Ser Ser Lys Ala Pro Pro Pro
 210 215 220
 Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile
 225 230 235 240
 Leu Pro Gln

<210> 42
 <211> 763
 <212> DNA
 <213> Artificial

<220>
 <223> CTP-IFN-CTP

<400> 42
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 caccgccttg agcagcagca gctccaaggc cccaccccc agcctgcccc gccccagcag 120
 actgccaggc cccagcgaca ccccatcct gccccagatg agctacaacc tgctgggctt 180

cctgcagagg tccagcaact tccagtgcc	gaagctgctg tggcagctga acggcaggct	240
ggaataactgc ctgaaggaca ggatgaactt	cgacatccca gaggaatca agcagctgca	300
gcagttccag aaggaggacg ccgccctgac	catctacgag atgctgcaga acatcttcgc	360
catcttcagg caggacagca gcagcaccgg	ctggaacgag accatcgtgg agaacctgct	420
ggccaacgtg taccaccaga tcaaccacct	gaaaaccgtg ctggaagaga agctggaaaa	480
ggaggacttc accaggggca agctgatgag	cagcctgcac ctgaagaggt actacggcag	540
aatcctgcac tacctgaagg ccaaggagta	cagccactgc gcctggacca tcgtgagggt	600
ggagatcctg aggaacttct acttcatcaa	caggctgacc ggctacctga ggaacagctc	660
cagcagcaag gccctccac cttccctgcc	cagtccaagc cgactccctg ggccctccga	720
tacaccaatt ctgccacagt gatgaaggtc	tggatgcggc cgc	763

<210> 43
 <211> 166
 <212> PRT
 <213> Artificial

<220>
 <223> IFN-beta

<400> 43

Met Ser Tyr Asn Leu Leu Gly Phe Leu Gln Arg Ser Ser Asn Phe Gln
 1 5 10 15

Ser Gln Lys Leu Leu Trp Gln Leu Asn Gly Arg Leu Glu Tyr Cys Leu
 20 25 30

Lys Asp Arg Met Asn Phe Asp Ile Pro Glu Glu Ile Lys Gln Leu Gln
 35 40 45

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

Asn Ile Phe Ala Ile Phe Arg Gln Asp Ser Ser Ser Thr Gly Trp Asn
 65 70 75 80

Glu Thr Ile Val Glu Asn Leu Leu Ala Asn Val Tyr His Gln Ile Asn
 85 90 95

His Leu Lys Thr Val Leu Glu Glu Lys Leu Glu Lys Glu Asp Phe Thr
 100 105 110

Arg Gly Lys Leu Met Ser Ser Leu His Leu Lys Arg Tyr Tyr Gly Arg
 115 120 125

Ile Leu His Tyr Leu Lys Ala Lys Glu Tyr Ser His Cys Ala Trp Thr
 130 135 140

Ile Val Arg Val Glu Ile Leu Arg Asn Phe Tyr Phe Ile Asn Arg Leu
 145 150 155 160

Thr Gly Tyr Leu Arg Asn
165

<210> 44
<211> 242
<212> PRT
<213> Artificial

<220>
<223> APO-A1

<400> 44

Asp Glu Pro Pro Gln Ser Pro Trp Asp Arg Val Lys Asp Lys Ala Thr
1 5 10 15

Val Tyr Val Asp Val Leu Lys Asp Ser Gly Arg Asp Tyr Val Ser Gln
20 25 30

Phe Glu Gly Ser Ala Gly Lys Gly Leu Asn Leu Lys Leu Leu Asp Asn
35 40 45

Trp Asp Ser Val Thr Ser Thr Phe Ser Lys Leu Arg Glu Gln Leu Gly
50 55 60

Pro Val Thr Gln Glu Phe Trp Asp Asn Leu Glu Lys Glu Thr Glu Gly
65 70 75 80

Leu Arg Gly Glu Met Ser Lys Asp Leu Glu Glu Val Lys Ala Lys Val
85 90 95

Gln Pro Tyr Leu Asp Asp Phe Gln Lys Lys Trp Gln Glu Glu Met Glu
100 105 110

Leu Tyr Arg Gln Lys Val Glu Pro Leu Arg Ala Glu Leu Gln Glu Gly
115 120 125

Ala Arg Gln Lys Leu His Glu Leu Gln Glu Lys Leu Ser Pro Leu Gly
130 135 140

Glu Glu Met Arg Asp Arg Ala Arg Ala His Val Asp Ala Leu Arg Thr
145 150 155 160

His Leu Ala Pro Tyr Ser Asp Glu Leu Arg Gln Arg Leu Ala Ala Arg
165 170 175

Leu Glu Ala Leu Lys Glu Asn Gly Gly Ala Arg Leu Ala Glu Tyr His
180 185 190

Ala Lys Ala Thr Glu His Leu Ser Thr Leu Ser Glu Lys Ala Lys Pro
195 200 205

Ala Leu Glu Asp Leu Arg Gln Gly Leu Leu Pro Val Leu Glu Ser Phe
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210 215 220
 Lys Val Ser Phe Leu Ser Ala Leu Glu Glu Tyr Thr Lys Lys Leu Asn
 225 230 235 240

 Thr Gln

 <210> 45
 <211> 444
 <212> PRT
 <213> Homo sapiens

 <400> 45
 Met Val Ser Gln Ala Leu Arg Leu Leu Cys Leu Leu Leu Gly Leu Gln
 1 5 10 15

 Gly Cys Leu Ala Ala Val Phe Val Thr Gln Glu Glu Ala His Gly Val
 20 25 30

 Leu His Arg Arg Arg Arg Ala Asn Ala Phe Leu Glu Glu Leu Arg Pro
 35 40 45

 Gly Ser Leu Glu Arg Glu Cys Lys Glu Glu Gln Cys Ser Phe Glu Glu
 50 55 60

 Ala Arg Glu Ile Phe Lys Asp Ala Glu Arg Thr Lys Leu Phe Trp Ile
 65 70 75 80

 Ser Tyr Ser Asp Gly Asp Gln Cys Ala Ser Ser Pro Cys Gln Asn Gly
 85 90 95

 Gly Ser Cys Lys Asp Gln Leu Gln Ser Tyr Ile Cys Phe Cys Leu Pro
 100 105 110

 Ala Phe Glu Gly Arg Asn Cys Glu Thr His Lys Asp Asp Gln Leu Ile
 115 120 125

 Cys Val Asn Glu Asn Gly Gly Cys Glu Gln Tyr Cys Ser Asp His Thr
 130 135 140

 Gly Thr Lys Arg Ser Cys Arg Cys His Glu Gly Tyr Ser Leu Leu Ala
 145 150 155 160

 Asp Gly Val Ser Cys Thr Pro Thr Val Glu Tyr Pro Cys Gly Lys Ile
 165 170 175

 Pro Ile Leu Glu Lys Arg Asn Ala Ser Lys Pro Gln Gly Arg Ile Val
 180 185 190

 Gly Gly Lys Val Cys Pro Lys Gly Glu Cys Pro Trp Gln Val Leu Leu
 195 200 205

Leu Val Asn Gly Ala Gln Leu Cys Gly Gly Thr Leu Ile Asn Thr Ile
210 215 220

Trp Val Val Ser Ala Ala His Cys Phe Asp Lys Ile Lys Asn Trp Arg
225 230 235 240

Asn Leu Ile Ala Val Leu Gly Glu His Asp Leu Ser Glu His Asp Gly
245 250 255

Asp Glu Gln Ser Arg Arg Val Ala Gln Val Ile Ile Pro Ser Thr Tyr
260 265 270

Val Pro Gly Thr Thr Asn His Asp Ile Ala Leu Leu Arg Leu His Gln
275 280 285

Pro Val Val Leu Thr Asp His Val Val Pro Leu Cys Leu Pro Glu Arg
290 295 300

Thr Phe Ser Glu Arg Thr Leu Ala Phe Val Arg Phe Ser Leu Val Ser
305 310 315 320

Gly Trp Gly Gln Leu Leu Asp Arg Gly Ala Thr Ala Leu Glu Leu Met
325 330 335

Val Leu Asn Val Pro Arg Leu Met Thr Gln Asp Cys Leu Gln Gln Ser
340 345 350

Arg Lys Val Gly Asp Ser Pro Asn Ile Thr Glu Tyr Met Phe Cys Ala
355 360 365

Gly Tyr Ser Asp Gly Ser Lys Asp Ser Cys Lys Gly Asp Ser Gly Gly
370 375 380

Pro His Ala Thr His Tyr Arg Gly Thr Trp Tyr Leu Thr Gly Ile Val
385 390 395 400

Ser Trp Gly Gln Gly Cys Ala Thr Val Gly His Phe Gly Val Tyr Thr
405 410 415

Arg Val Ser Gln Tyr Ile Glu Trp Leu Gln Lys Leu Met Arg Ser Glu
420 425 430

Pro Arg Pro Gly Val Leu Leu Arg Ala Pro Phe Pro
435 440

<210> 46
<211> 448
<212> PRT
<213> Homo sapiens

<400> 46

Met Val Ser Gln Ala Leu Arg Leu Leu Cys Leu Leu Leu Gly Leu Gln

1	5	10	15
Gly Cys Leu	Ala Val Phe Val	Thr Gln Glu Glu	Ala His Gly Val
	20	25	30
Leu His	Arg Arg Arg Ala	Asn Ala Phe Leu	Glu Glu Leu Arg Pro
	35	40	45
Gly Ser	Leu Glu Arg Glu	Cys Lys Glu Glu Gln	Cys Ser Phe Glu Glu
	50	55	60
Ala Arg Glu Ile Phe	Lys Asp Ala Glu Arg	Thr Lys Leu Phe Trp	Ile
65	70	75	80
Ser Tyr Ser Asp	Gly Asp Gln Cys Ala	Ser Ser Pro Cys Gln	Asn Gly
	85	90	95
Gly Ser Cys	Lys Asp Gln Leu Gln	Ser Tyr Ile Cys Phe	Cys Leu Pro
	100	105	110
Ala Phe	Glu Gly Arg Asn Cys	Glu Thr His Lys Asp	Asp Gln Leu Ile
	115	120	125
Cys Val	Asn Glu Asn Gly	Gly Cys Glu Gln Tyr	Cys Ser Asp His Thr
	130	135	140
Gly Thr Lys Arg Ser	Cys Arg Cys His Glu	Gly Tyr Ser Leu Leu	Ala
145	150	155	160
Asp Gly Val Ser	Cys Thr Pro Thr Val	Glu Tyr Pro Cys Gly	Lys Ile
	165	170	175
Pro Ile Leu	Glu Lys Arg Asn Ala	Ser Lys Pro Gln Gly	Arg Ile Val
	180	185	190
Gly Gly	Lys Val Cys Pro Lys	Gly Glu Cys Pro Trp	Gln Val Leu Leu
	195	200	205
Leu Val	Asn Gly Ala Gln	Leu Cys Gly Gly Thr	Leu Ile Asn Thr Ile
	210	215	220
Trp Val Val Ser Ala	Ala His Cys Phe Asp	Lys Ile Lys Asn Trp	Arg
225	230	235	240
Asn Leu Ile Ala	Val Leu Gly Glu His	Asp Leu Ser Glu His	Asp Gly
	245	250	255
Asp Glu Gln Ser Arg Arg Val	Ala Gln Val Ile Ile Pro	Ser Thr Tyr	
	260	265	270
Val Pro	Gly Thr Thr Asn His	Asp Ile Ala Leu Leu	Arg Leu His Gln
	275	280	285

Pro Val Val Leu Thr Asp His Val Val Pro Leu Cys Leu Pro Glu Arg
 290 295 300
 Thr Phe Ser Glu Arg Thr Leu Ala Phe Val Arg Phe Ser Leu Val Ser
 305 310 315 320
 Gly Trp Gly Gln Leu Leu Asp Arg Gly Ala Thr Ala Leu Glu Leu Met
 325 330 335
 Val Leu Asn Val Pro Arg Leu Met Thr Gln Asp Cys Leu Gln Gln Ser
 340 345 350
 Arg Lys Val Gly Asp Ser Pro Asn Ile Thr Glu Tyr Met Phe Cys Ala
 355 360 365
 Gly Tyr Ser Asp Gly Ser Lys Asp Ser Cys Lys Gly Asp Ser Gly Gly
 370 375 380
 Pro His Ala Thr His Tyr Arg Gly Thr Trp Tyr Leu Thr Gly Ile Val
 385 390 395 400
 Ser Trp Gly Gln Gly Cys Ala Thr Val Gly His Phe Gly Val Tyr Thr
 405 410 415
 Arg Val Ser Gln Tyr Ile Glu Trp Leu Gln Lys Leu Met Arg Ser Glu
 420 425 430
 Pro Arg Pro Gly Val Leu Leu Arg Ala Pro Phe Pro Gly Cys Gly Arg
 435 440 445

<210> 47
 <211> 1356
 <212> DNA
 <213> Homo sapiens

<400> 47
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 cgcgccaacg cgttcctgga ggagctgcgg ccgggctccc tggagagggg gtgcaaggag 180
 gagcagtgct ctttcgagga ggcccgggag atcttcaagg acgcggagag gacgaagctg 240
 ttctggattt cttacagtga tggggaccag tgtgcctcaa gtccatgcca gaatgggggc 300
 tcctgcaagg accagctcca gtcctatata tgcttctgcc tccctgcctt cgagggccgg 360
 aactgtgaga cgcacaagga tgaccagctg atctgtgtga acgagaacgg cggctgtgag 420
 cagtactgca gtgaccacac gggcaccaag cgctcctgtc ggtgccacga ggggtactct 480
 ctgctggcag acgggggtgc ctgcacaccc acagttgaat atccatgtgg aaaaatacct 540
 attctagaaa aaagaaatgc cagcaaacc caaggccgaa ttgtgggggg caaggtgtgc 600
 cccaaagggg agtgtccatg gcaggtcctg ttgttggtga atggagctca gttgtgtggg 660

gggaccctga tcaacacccat ctgggtgggc tccgcggccc actgtttcga caaaatcaag	720
aactggagga acctgatcgc ggtgctgggc gagcacgacc tcagcgagca cgacggggat	780
gagcagagcc ggcgggtggc gcaggtcatc atccccagca cgtacgtccc gggcaccacc	840
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cccctctgcc tgcccgaacg gacgttctct gagaggacgc tggccttcgt gcgcttctca	960
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tccccaaata tcacggagta catgttctgt gccggctact cggatggcag caaggactcc	1140
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ggcatcgtca gctggggcca gggctgcgca accgtgggcc actttggggt gtacaccagg	1260
gtctcccagt acatcgagtg gctgcaaaaag ctcatgcgct cagagccacg cccaggagtc	1320
ctcctgcgag ccccatcttc ctgaggatgc ggccgc	1356

<210> 48
 <211> 1442
 <212> DNA
 <213> Artificial

<220>
 <223> Factor VII-CTP

<400> 48	
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tgcctggctg cagtcttcgt aaccaggag gaagcccacg gcgtcctgca ccggcgccgg	120
cgcgccaacg cgttcctgga ggagctgcgg ccgggtccc tggagaggga gtgcaaggag	180
gagcagtgtc ctttcgagga ggcccgggag atcttcaagg acgcggagag gacgaagctg	240
ttctggattt cttacagtga tggggaccag tgtgcctcaa gtccatgcca gaatgggggc	300
tcctgcaagg accagctcca gtcctatc tgcttctgcc tccctgcctt cgagggccgg	360
aactgtgaga cgacaagga tgaccagctg atctgtgtga acgagaacgg cggctgtgag	420
cagtactgca gtgaccacac gggcaccaag cgctcctgtc ggtgccacga ggggtactct	480
ctgctggcag acggggtgtc ctgcacaccc acagtgaat atccatgtgg aaaaatacct	540
attctagaaa aaagaaatgc cagcaaaccc caaggccgaa ttgtgggggg caagggtgtc	600
cccaaagggg agtgtccatg gcaggtcctg ttgttggtga atggagctca gttgtgtggg	660
gggaccctga tcaacacccat ctgggtgggc tccgcggccc actgtttcga caaaatcaag	720
aactggagga acctgatcgc ggtgctgggc gagcacgacc tcagcgagca cgacggggat	780
gagcagagcc ggcgggtggc gcaggtcatc atccccagca cgtacgtccc gggcaccacc	840
aaccacgaca tcgcgctgct ccgcctgcac cagcccgtgg tcctcactga ccatgtggtg	900
cccctctgcc tgcccgaacg gacgttctct gagaggacgc tggccttcgt gcgcttctca	960
ttggtcagcg gctggggcca gctgctggac cgtggcgcca cggccctgga gctcatggtc	1020

ctcaacgtgc cccggctgat gaccaggac tgcctgcagc agtcacggaa ggtgggagac	1080
tccccaata tcacggagta catgttctgt gccggctact cggatggcag caaggactcc	1140
tgcaaggggg acagtggagg ccacatgcc acccactacc ggggcacgtg gtacctgacc	1200
ggcatcgtga gctggggcca gggctgcgcc accgtgggcc acttcggcgt gtaccagg	1260
gtgtcccagt acatcgagt gctgcagaaa ctgatgagaa gcgagcccag acccggcgtg	1320
ctgctgagag ccccttccc cagcagcagc tccaaggccc ctccccctag cctgcccagc	1380
cctagcagac tgcctgggcc cagcgacacc cccatcctgc cccagtgagg atccgcggcc	1440
gc	1442

<210> 49
 <211> 472
 <212> PRT
 <213> Artificial

<220>
 <223> Factor VII-CTP

<400> 49

Met Val Ser Gln Ala Leu Arg Leu Leu Cys Leu Leu Leu Gly Leu Gln
 1 5 10 15

Gly Cys Leu Ala Ala Val Phe Val Thr Gln Glu Glu Ala His Gly Val
 20 25 30

Leu His Arg Arg Arg Arg Ala Asn Ala Phe Leu Glu Glu Leu Arg Pro
 35 40 45

Gly Ser Leu Glu Arg Glu Cys Lys Glu Glu Gln Cys Ser Phe Glu Glu
 50 55 60

Ala Arg Glu Ile Phe Lys Asp Ala Glu Arg Thr Lys Leu Phe Trp Ile
 65 70 75 80

Ser Tyr Ser Asp Gly Asp Gln Cys Ala Ser Ser Pro Cys Gln Asn Gly
 85 90 95

Gly Ser Cys Lys Asp Gln Leu Gln Ser Tyr Ile Cys Phe Cys Leu Pro
 100 105 110

Ala Phe Glu Gly Arg Asn Cys Glu Thr His Lys Asp Asp Gln Leu Ile
 115 120 125

Cys Val Asn Glu Asn Gly Gly Cys Glu Gln Tyr Cys Ser Asp His Thr
 130 135 140

Gly Thr Lys Arg Ser Cys Arg Cys His Glu Gly Tyr Ser Leu Leu Ala
 145 150 155 160

Asp Gly Val Ser Cys Thr Pro Thr Val Glu Tyr Pro Cys Gly Lys Ile
 165 170 175

Pro Ile Leu Glu Lys Arg Asn Ala Ser Lys Pro Gln Gly Arg Ile Val
 180 185 190
 Gly Gly Lys Val Cys Pro Lys Gly Glu Cys Pro Trp Gln Val Leu Leu
 195 200 205
 Leu Val Asn Gly Ala Gln Leu Cys Gly Gly Thr Leu Ile Asn Thr Ile
 210 215 220
 Trp Val Val Ser Ala Ala His Cys Phe Asp Lys Ile Lys Asn Trp Arg
 225 230 235 240
 Asn Leu Ile Ala Val Leu Gly Glu His Asp Leu Ser Glu His Asp Gly
 245 250 255
 Asp Glu Gln Ser Arg Arg Val Ala Gln Val Ile Ile Pro Ser Thr Tyr
 260 265 270
 Val Pro Gly Thr Thr Asn His Asp Ile Ala Leu Leu Arg Leu His Gln
 275 280 285
 Pro Val Val Leu Thr Asp His Val Val Pro Leu Cys Leu Pro Glu Arg
 290 295 300
 Thr Phe Ser Glu Arg Thr Leu Ala Phe Val Arg Phe Ser Leu Val Ser
 305 310 315 320
 Gly Trp Gly Gln Leu Leu Asp Arg Gly Ala Thr Ala Leu Glu Leu Met
 325 330 335
 Val Leu Asn Val Pro Arg Leu Met Thr Gln Asp Cys Leu Gln Gln Ser
 340 345 350
 Arg Lys Val Gly Asp Ser Pro Asn Ile Thr Glu Tyr Met Phe Cys Ala
 355 360 365
 Gly Tyr Ser Asp Gly Ser Lys Asp Ser Cys Lys Gly Asp Ser Gly Gly
 370 375 380
 Pro His Ala Thr His Tyr Arg Gly Thr Trp Tyr Leu Thr Gly Ile Val
 385 390 395 400
 Ser Trp Gly Gln Gly Cys Ala Thr Val Gly His Phe Gly Val Tyr Thr
 405 410 415
 Arg Val Ser Gln Tyr Ile Glu Trp Leu Gln Lys Leu Met Arg Ser Glu
 420 425 430
 Pro Arg Pro Gly Val Leu Leu Arg Ala Pro Phe Pro Ser Ser Ser Ser
 435 440 445

Lys Ala Pro Pro Pro Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly Pro
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Ser Asp Thr Pro Ile Leu Pro Gln
 465 470

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 <213> Artificial

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 aactgtgaga cgcacaagga tgaccagctg atctgtgtga acgagaacgg cggctgtgag 420
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 cccaaagggg agtgtccatg gcaggtcctg ttgttgggtga atggagctca gttgtgtggg 660
 gggaccctga tcaacaccat ctgggtgtgc tccgcggccc actgtttcga caaatcaag 720
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 cctagcagac tgcttgggcc ctccgacaca ccaatcctgc cacagagcag ctctctaag 1440
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<400> 51

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Gly Cys Leu Ala Ala Val Phe Val Thr Gln Glu Glu Ala His Gly Val
20 25 30

Leu His Arg Arg Arg Arg Ala Asn Ala Phe Leu Glu Glu Leu Arg Pro
35 40 45

Gly Ser Leu Glu Arg Glu Cys Lys Glu Glu Gln Cys Ser Phe Glu Glu
50 55 60

Ala Arg Glu Ile Phe Lys Asp Ala Glu Arg Thr Lys Leu Phe Trp Ile
65 70 75 80

Ser Tyr Ser Asp Gly Asp Gln Cys Ala Ser Ser Pro Cys Gln Asn Gly
85 90 95

Gly Ser Cys Lys Asp Gln Leu Gln Ser Tyr Ile Cys Phe Cys Leu Pro
100 105 110

Ala Phe Glu Gly Arg Asn Cys Glu Thr His Lys Asp Asp Gln Leu Ile
115 120 125

Cys Val Asn Glu Asn Gly Gly Cys Glu Gln Tyr Cys Ser Asp His Thr
130 135 140

Gly Thr Lys Arg Ser Cys Arg Cys His Glu Gly Tyr Ser Leu Leu Ala
145 150 155 160

Asp Gly Val Ser Cys Thr Pro Thr Val Glu Tyr Pro Cys Gly Lys Ile
165 170 175

Pro Ile Leu Glu Lys Arg Asn Ala Ser Lys Pro Gln Gly Arg Ile Val
180 185 190

Gly Gly Lys Val Cys Pro Lys Gly Glu Cys Pro Trp Gln Val Leu Leu
195 200 205

Leu Val Asn Gly Ala Gln Leu Cys Gly Gly Thr Leu Ile Asn Thr Ile
210 215 220

Trp Val Val Ser Ala Ala His Cys Phe Asp Lys Ile Lys Asn Trp Arg
Page 45

225		230		235		240
Asn	Leu	Ile	Ala	Val	Leu	Gly
				245		
				Glu	His	Asp
				250		
				Leu	Ser	Glu
						His
						255
						Gly
Asp	Glu	Gln	Ser	Arg	Arg	Val
			260			
				Ala	Gln	Val
				265		
				Ile	Ile	Pro
						Ser
						270
						Thr
						Tyr
Val	Pro	Gly	Thr	Thr	Asn	His
		275				
				Asp	Ile	Ala
				280		
				Leu	Leu	Arg
						285
						Leu
						His
						Gln
Pro	Val	Val	Leu	Thr	Asp	His
					295	
				Val	Val	Pro
						Leu
						Cys
						300
						Leu
						Pro
						Glu
						Arg
Thr	Phe	Ser	Glu	Arg	Thr	Leu
					310	
					Ala	Phe
						Val
					Arg	Phe
					315	
						Ser
						Leu
						Val
						Ser
						320
Gly	Trp	Gly	Gln	Leu	Leu	Asp
				325		
					Arg	Gly
						Ala
						Thr
						Ala
						Leu
						Glu
						Leu
						335
						Met
Val	Leu	Asn	Val	Pro	Arg	Leu
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						Met
						Thr
						Gln
						345
						Asp
						Cys
						Leu
						Gln
						350
						Gln
						Ser
Arg	Lys	Val	Gly	Asp	Ser	Pro
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						Asn
						360
						Ile
						Thr
						Glu
						Tyr
						Met
						365
						Phe
						Cys
						Ala
Gly	Tyr	Ser	Asp	Gly	Ser	Lys
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						Asp
						Ser
						Gly
						380
						Asp
						Ser
						Gly
						Gly
Pro	His	Ala	Thr	His	Tyr	Arg
					390	
						Gly
						Thr
						Trp
						Tyr
						395
						Leu
						Thr
						Gly
						Ile
						Val
						400
Ser	Trp	Gly	Gln	Gly	Cys	Ala
				405		
						Thr
						Val
						Gly
						His
						Phe
						Gly
						Val
						Tyr
						415
						Thr
Arg	Val	Ser	Gln	Tyr	Ile	Glu
			420			
						Trp
						Leu
						Gln
						Lys
						Leu
						Met
						Arg
						430
						Ser
						Glu
Pro	Arg	Pro	Gly	Val	Leu	Leu
						Arg
						440
						Ala
						Pro
						Phe
						Pro
						Ser
						445
						Ser
						Ser
						Ser
Lys	Ala	Pro	Pro	Pro	Ser	Leu
	450					
						Pro
						Ser
						Pro
						Ser
						Arg
						460
						Leu
						Pro
						Gly
						Pro
Ser	Asp	Thr	Pro	Ile	Leu	Pro
					470	
						Gln
						Ser
						Ser
						Ser
						475
						Lys
						Ala
						Pro
						Pro
						480
Pro	Ser	Leu	Pro	Ser	Pro	Ser
						Arg
						Leu
						Pro
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						Pro
Ile	Leu	Pro	Gln			
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<223> factor VII-CTP-CTP-CTP

<400> 52

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

Leu His Arg Arg Arg Arg Ala Asn Ala Phe Leu Glu Glu Leu Arg Pro
35 40 45

Gly Ser Leu Glu Arg Glu Cys Lys Glu Glu Gln Cys Ser Phe Glu Glu
50 55 60

Ala Arg Glu Ile Phe Lys Asp Ala Glu Arg Thr Lys Leu Phe Trp Ile
65 70 75 80

Ser Tyr Ser Asp Gly Asp Gln Cys Ala Ser Ser Pro Cys Gln Asn Gly
85 90 95

Gly Ser Cys Lys Asp Gln Leu Gln Ser Tyr Ile Cys Phe Cys Leu Pro
100 105 110

Ala Phe Glu Gly Arg Asn Cys Glu Thr His Lys Asp Asp Gln Leu Ile
115 120 125

Cys Val Asn Glu Asn Gly Gly Cys Glu Gln Tyr Cys Ser Asp His Thr
130 135 140

Gly Thr Lys Arg Ser Cys Arg Cys His Glu Gly Tyr Ser Leu Leu Ala
145 150 155 160

Asp Gly Val Ser Cys Thr Pro Thr Val Glu Tyr Pro Cys Gly Lys Ile
165 170 175

Pro Ile Leu Glu Lys Arg Asn Ala Ser Lys Pro Gln Gly Arg Ile Val
180 185 190

Gly Gly Lys Val Cys Pro Lys Gly Glu Cys Pro Trp Gln Val Leu Leu
195 200 205

Leu Val Asn Gly Ala Gln Leu Cys Gly Gly Thr Leu Ile Asn Thr Ile
210 215 220

Trp Val Val Ser Ala Ala His Cys Phe Asp Lys Ile Lys Asn Trp Arg
Page 47

225		230		235		240
Asn	Leu	Ile	Ala	Val	Leu	Gly
				245	Glu	His
				250	Asp	Leu
					Ser	Glu
					His	Asp
					255	Gly
Asp	Glu	Gln	Ser	Arg	Arg	Val
			260			Ala
					265	Gln
					Val	Ile
					Ile	Pro
					270	Ser
						Thr
						Tyr
Val	Pro	Gly	Thr	Thr	Asn	His
		275			280	Asp
					Ile	Ala
					Leu	Leu
					285	Arg
						Leu
						His
						Gln
Pro	Val	Val	Leu	Thr	Asp	His
	290				295	Val
					Val	Pro
					Leu	Cys
					300	Leu
						Pro
						Glu
						Arg
Thr	Phe	Ser	Glu	Arg	Thr	Leu
305					310	Ala
						Phe
						Val
					315	Arg
						Phe
						Ser
						Leu
						Val
						Ser
Gly	Trp	Gly	Gln	Leu	Leu	Asp
			325			Arg
						Gly
						Ala
						330
						Thr
						Ala
						Leu
						Glu
						Leu
						335
Val	Leu	Asn	Val	Pro	Arg	Leu
			340			Met
						Thr
						345
						Gln
						Asp
						Cys
						Leu
						350
						Gln
						Gln
						Ser
Arg	Lys	Val	Gly	Asp	Ser	Pro
		355				Asn
						360
						Ile
						Thr
						Glu
						Tyr
						365
						Met
						Phe
						Cys
						Ala
Gly	Tyr	Ser	Asp	Gly	Ser	Lys
	370					375
						Asp
						Ser
						Cys
						Lys
						380
						Gly
						Asp
						Ser
						Gly
						Gly
Pro	His	Ala	Thr	His	Tyr	Arg
385					390	Gly
						Thr
						Trp
						Tyr
						395
						Leu
						Thr
						Gly
						Ile
						Val
						400
Ser	Trp	Gly	Gln	Gly	Cys	Ala
				405		Thr
						Val
						Gly
						410
						His
						Phe
						Gly
						Val
						415
						Tyr
						Thr
Arg	Val	Ser	Gln	Tyr	Ile	Glu
			420			Trp
						Leu
						425
						Gln
						Lys
						Leu
						Met
						430
						Arg
						Ser
						Glu
Pro	Arg	Pro	Gly	Val	Leu	Leu
		435				Arg
						440
						Ala
						Pro
						Phe
						Pro
						445
						Ser
						Ser
						Ser
						Ser
Lys	Ala	Pro	Pro	Pro	Ser	Leu
	450					455
						Pro
						Ser
						Pro
						Ser
						460
						Arg
						Leu
						Pro
						Gly
						Pro
Ser	Asp	Thr	Pro	Ile	Leu	Pro
465					470	Gln
						Ser
						Ser
						475
						Ser
						Ser
						Lys
						Ala
						Pro
						480
Pro	Ser	Leu	Pro	Ser	Pro	Ser
			485			Arg
						Leu
						Pro
						490
						Gly
						Pro
						Ser
						Asp
						Thr
						495
						Pro
Ile	Leu	Pro	Gln	Ser	Ser	Ser
			500			Ser
						Lys
						505
						Ala
						Pro
						Pro
						Pro
						Ser
						Leu
						Pro
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Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
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<400> 53

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Gly Cys Leu Ala Ala Val Phe Val Thr Gln Glu Glu Ala His Gly Val
20 25 30

Leu His Arg Arg Arg Arg Ala Asn Ala Phe Leu Glu Glu Leu Arg Pro
35 40 45

Gly Ser Leu Glu Arg Glu Cys Lys Glu Glu Gln Cys Ser Phe Glu Glu
50 55 60

Ala Arg Glu Ile Phe Lys Asp Ala Glu Arg Thr Lys Leu Phe Trp Ile
65 70 75 80

Ser Tyr Ser Asp Gly Asp Gln Cys Ala Ser Ser Pro Cys Gln Asn Gly
85 90 95

Gly Ser Cys Lys Asp Gln Leu Gln Ser Tyr Ile Cys Phe Cys Leu Pro
100 105 110

Ala Phe Glu Gly Arg Asn Cys Glu Thr His Lys Asp Asp Gln Leu Ile
115 120 125

Cys Val Asn Glu Asn Gly Gly Cys Glu Gln Tyr Cys Ser Asp His Thr
130 135 140

Gly Thr Lys Arg Ser Cys Arg Cys His Glu Gly Tyr Ser Leu Leu Ala
145 150 155 160

Asp Gly Val Ser Cys Thr Pro Thr Val Glu Tyr Pro Cys Gly Lys Ile
165 170 175

Pro Ile Leu Glu Lys Arg Asn Ala Ser Lys Pro Gln Gly Arg Ile Val
180 185 190

Gly Gly Lys Val Cys Pro Lys Gly Glu Cys Pro Trp Gln Val Leu Leu
195 200 205

Leu Val Asn Gly Ala Gln Leu Cys Gly Gly Thr Leu Ile Asn Thr Ile
Page 49

210	215	220
Trp Val Val Ser Ala	Ala His Cys Phe Asp	Lys Ile Lys Asn Trp Arg
225	230	235 240
Asn Leu Ile Ala Val	Leu Gly Glu His Asp	Leu Ser Glu His Asp Gly
	245	250 255
Asp Glu Gln Ser Arg Arg Val Ala	Gln Val Ile Ile Pro Ser Thr Tyr	
	260	265 270
Val Pro Gly Thr Thr Asn His Asp	Ile Ala Leu Leu Arg Leu His Gln	
	275	280 285
Pro Val Val Leu Thr Asp His Val Val Pro Leu Cys Leu Pro Glu Arg		
	290	295 300
Thr Phe Ser Glu Arg Thr Leu Ala Phe Val Arg Phe Ser Leu Val Ser		
	305	310 315 320
Gly Trp Gly Gln Leu Leu Asp Arg Gly Ala Thr Ala Leu Glu Leu Met		
	325	330 335
Val Leu Asn Val Pro Arg Leu Met Thr Gln Asp Cys Leu Gln Gln Ser		
	340	345 350
Arg Lys Val Gly Asp Ser Pro Asn Ile Thr Glu Tyr Met Phe Cys Ala		
	355	360 365
Gly Tyr Ser Asp Gly Ser Lys Asp Ser Cys Lys Gly Asp Ser Gly Gly		
	370	375 380
Pro His Ala Thr His Tyr Arg Gly Thr Trp Tyr Leu Thr Gly Ile Val		
	385	390 395 400
Ser Trp Gly Gln Gly Cys Ala Thr Val Gly His Phe Gly Val Tyr Thr		
	405	410 415
Arg Val Ser Gln Tyr Ile Glu Trp Leu Gln Lys Leu Met Arg Ser Glu		
	420	425 430
Pro Arg Pro Gly Val Leu Leu Arg Ala Pro Phe Pro Ser Ser Ser Ser		
	435	440 445
Lys Ala Pro Pro Pro Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly Pro		
	450	455 460
Ser Asp Thr Pro Ile Leu Pro Gln Ser Ser Ser Ser Lys Ala Pro Pro		
	465	470 475 480
Pro Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro		
	485	490 495

Ile Leu Pro Gln Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu Pro
500 505 510

Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
515 520 525

Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu Pro Ser Pro Ser Arg
530 535 540

Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
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20 25 30

Leu His Arg Arg Arg Arg Ala Asn Ala Phe Leu Glu Glu Leu Arg Pro
35 40 45

Gly Ser Leu Glu Arg Glu Cys Lys Glu Glu Gln Cys Ser Phe Glu Glu
50 55 60

Ala Arg Glu Ile Phe Lys Asp Ala Glu Arg Thr Lys Leu Phe Trp Ile
65 70 75 80

Ser Tyr Ser Asp Gly Asp Gln Cys Ala Ser Ser Pro Cys Gln Asn Gly
85 90 95

Gly Ser Cys Lys Asp Gln Leu Gln Ser Tyr Ile Cys Phe Cys Leu Pro
100 105 110

Ala Phe Glu Gly Arg Asn Cys Glu Thr His Lys Asp Asp Gln Leu Ile
115 120 125

Cys Val Asn Glu Asn Gly Gly Cys Glu Gln Tyr Cys Ser Asp His Thr
130 135 140

Gly Thr Lys Arg Ser Cys Arg Cys His Glu Gly Tyr Ser Leu Leu Ala
145 150 155 160

Asp Gly Val Ser Cys Thr Pro Thr Val Glu Tyr Pro Cys Gly Lys Ile
Page 51

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Lys Ala Pro Pro Pro Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly Pro
 450 455 460

Ser Asp Thr Pro Ile Leu Pro Gln Ser Ser Ser Ser Lys Ala Pro Pro
 465 470 475 480

Pro Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro
 485 490 495

Ile Leu Pro Gln Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu Pro
 500 505 510

Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
 515 520 525

Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu Pro Ser Pro Ser Arg
 530 535 540

Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln Ser Ser Ser Ser
 545 550 555 560

Lys Ala Pro Pro Pro Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly Pro
 565 570 575

Ser Asp Thr Pro Ile Leu Pro Gln
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 <212> DNA
 <213> Homo sapiens

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 cccaatcatt taatgacttc actcgagttg ttggtggaga agatgccaaa ccaggtcaat 720
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 <213> Homo sapiens

<400> 56

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	20					25					30	
Asp His	Glu	Asn	Ala	Asn	Lys	Ile	Leu	Asn	Arg	Pro	Lys	Arg Tyr Asn
	35					40					45	
Ser Gly	Lys	Leu	Glu	Glu	Phe	Val	Gln	Gly	Asn	Leu	Glu	Arg Glu Cys
	50				55					60		
Met Glu Glu	Lys	Cys	Ser	Phe	Glu	Glu	Ala	Arg	Glu	Val	Phe	Glu Asn
65			70					75				80
Thr Glu Arg	Thr	Thr	Glu	Phe	Trp	Lys	Gln	Tyr	Val	Asp	Gly	Asp Gln
		85					90					95
Cys Glu Ser	Asn	Pro	Cys	Leu	Asn	Gly	Gly	Ser	Cys	Lys	Asp	Asp Ile
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Asn Ser	Tyr	Glu	Cys	Trp	Cys	Pro	Phe	Gly	Phe	Glu	Gly	Lys Asn Cys
	115					120					125	
Glu Leu Asp	Val	Thr	Cys	Asn	Ile	Lys	Asn	Gly	Arg	Cys	Glu	Gln Phe
	130			135					140			
Cys Lys Asn	Ser	Ala	Asp	Asn	Lys	Val	Val	Cys	Ser	Cys	Thr	Glu Gly
145			150					155				160

Tyr Arg Leu Ala Glu Asn Gln Lys Ser Cys Glu Pro Ala Val Pro Phe
 165 170 175
 Pro Cys Gly Arg Val Ser Val Ser Gln Thr Ser Lys Leu Thr Arg Ala
 180 185 190
 Glu Thr Val Phe Pro Asp Val Asp Tyr Val Asn Ser Thr Glu Ala Glu
 195 200 205
 Thr Ile Leu Asp Asn Ile Thr Gln Ser Thr Gln Ser Phe Asn Asp Phe
 210 215 220
 Thr Arg Val Val Gly Gly Glu Asp Ala Lys Pro Gly Gln Phe Pro Trp
 225 230 235 240
 Gln Val Val Leu Asn Gly Lys Val Asp Ala Phe Cys Gly Gly Ser Ile
 245 250 255
 Val Asn Glu Lys Trp Ile Val Thr Ala Ala His Cys Val Glu Thr Gly
 260 265 270
 Val Lys Ile Thr Val Val Ala Gly Glu His Asn Ile Glu Glu Thr Glu
 275 280 285
 His Thr Glu Gln Lys Arg Asn Val Ile Arg Ile Ile Pro His His Asn
 290 295 300
 Tyr Asn Ala Ala Ile Asn Lys Tyr Asn His Asp Ile Ala Leu Leu Glu
 305 310 315 320
 Leu Asp Glu Pro Leu Val Leu Asn Ser Tyr Val Thr Pro Ile Cys Ile
 325 330 335
 Ala Asp Lys Glu Tyr Thr Asn Ile Phe Leu Lys Phe Gly Ser Gly Tyr
 340 345 350
 Val Ser Gly Trp Gly Arg Val Phe His Lys Gly Arg Ser Ala Leu Val
 355 360 365
 Leu Gln Tyr Leu Arg Val Pro Leu Val Asp Arg Ala Thr Cys Leu Arg
 370 375 380
 Ser Thr Lys Phe Thr Ile Tyr Asn Asn Met Phe Cys Ala Gly Phe His
 385 390 395 400
 Glu Gly Gly Arg Asp Ser Cys Gln Gly Asp Ser Gly Gly Pro His Val
 405 410 415
 Thr Glu Val Glu Gly Thr Ser Phe Leu Thr Gly Ile Ile Ser Trp Gly
 420 425 430

Glu Glu Cys Ala Met Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Ser
 435 440 445

Arg Tyr Val Asn Trp Ile Lys Glu Lys Thr Lys Leu Thr
 450 455 460

<210> 57
 <211> 1502
 <212> DNA
 <213> artificial

<220>
 <223> factor IX-CTP

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 aacaaaattc tgaatcggcc aaagaggtat aattcaggtta aattggaaga gtttgttcaa 180
 gggaaccttg agagagaatg tatggaagaa aagtgtagtt ttgaagaagc acgagaagtt 240
 ttgaaaaaca ctgaaagaac aactgaattt tggaagcagt atgttgatgg agatcagtgt 300
 gagtccaatc catgttttaa tggcggcagt tgcaaggatg acattaattc ctatgaatgt 360
 tgggtgtccct ttggatttga aggaaagaac tgtgaattag atgtaacatg taacattaag 420
 aatggcagat gcgagcagtt ttgtaaaaat agtgtctgata acaagggtgg ttgctcctgt 480
 actgagggat atcgacttgc agaaaaccag aagtcctgtg aaccagcagt gccatttcca 540
 tgtggaagag tttctgtttc acaaacttct aagctcaccg gtgctgagac tgtttttcct 600
 gatgtggact atgtaaattc tactgaagct gaaaccattt tggataacat cactcaaagc 660
 acccaatcat ttaatgactt cactcgagtt gttggtggag aagatgccaa accaggtcaa 720
 ttcccttggc aggttgtttt gaatggtaaa gttgatgcat tctgtggagg ctctatcggt 780
 aatgaaaaat ggattgtaac tgctgccac tgtgttgaaa ctggtgttaa aattacagtt 840
 gtcgcagggtg aacataatat tgaggagaca gaacatacag agcaaaagcg aaatgtgatt 900
 cgaattattc ctcaccacaa ctacaatgca gctattaata agtacaacca tgacattgcc 960
 cttctggaac tggacgaacc cttagtgtta aacagctacg ttacacctat ttgcattgct 1020
 gacaaggaat acacgaacat cttcctcaaa tttggatctg gctatgtaag tggctgggga 1080
 agagtcttcc acaaaggagg atcagcttta gttcttcagt accttagagt tccacttggt 1140
 gaccgagcca catgtcttcg atctacaaag ttcaccatct ataacaacat gttctgtgct 1200
 ggcttccatg aaggaggtag agattcatgt caaggagata gtgggggacc ccatgttact 1260
 gaagtggaag ggaccagttt cttaactgga attattagct ggggtgaaga gtgtgcaatg 1320
 aaaggcaaat atggaatata taccaaggta tcccggtatg tcaactggat taaggaaaaa 1380
 acaaagctca ctagctccag cagcaaggcc cctccccga gcctgccctc cccaagcagg 1440
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 gc 1502

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<211> 489
<212> PRT
<213> artificial

<220>
<223> factor IX-CTP

<400> 58

Met Gln Arg Val Asn Met Ile Met Ala Glu Ser Pro Gly Leu Ile Thr
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Ile Cys Leu Leu Gly Tyr Leu Leu Ser Ala Glu Cys Thr Val Phe Leu
20 25 30

Asp His Glu Asn Ala Asn Lys Ile Leu Asn Arg Pro Lys Arg Tyr Asn
35 40 45

Ser Gly Lys Leu Glu Glu Phe Val Gln Gly Asn Leu Glu Arg Glu Cys
50 55 60

Met Glu Glu Lys Cys Ser Phe Glu Glu Ala Arg Glu Val Phe Glu Asn
65 70 75 80

Thr Glu Arg Thr Thr Glu Phe Trp Lys Gln Tyr Val Asp Gly Asp Gln
85 90 95

Cys Glu Ser Asn Pro Cys Leu Asn Gly Gly Ser Cys Lys Asp Asp Ile
100 105 110

Asn Ser Tyr Glu Cys Trp Cys Pro Phe Gly Phe Glu Gly Lys Asn Cys
115 120 125

Glu Leu Asp Val Thr Cys Asn Ile Lys Asn Gly Arg Cys Glu Gln Phe
130 135 140

Cys Lys Asn Ser Ala Asp Asn Lys Val Val Cys Ser Cys Thr Glu Gly
145 150 155 160

Tyr Arg Leu Ala Glu Asn Gln Lys Ser Cys Glu Pro Ala Val Pro Phe
165 170 175

Pro Cys Gly Arg Val Ser Val Ser Gln Thr Ser Lys Leu Thr Arg Ala
180 185 190

Glu Thr Val Phe Pro Asp Val Asp Tyr Val Asn Ser Thr Glu Ala Glu
195 200 205

Thr Ile Leu Asp Asn Ile Thr Gln Ser Thr Gln Ser Phe Asn Asp Phe
210 215 220

Thr Arg Val Val Gly Gly Glu Asp Ala Lys Pro Gly Gln Phe Pro Trp
Page 57

225		230		235		240
Gln Val Val	Leu	Asn Gly Lys Val	Asp	Ala Phe Cys Gly Gly	Ser	Ile
		245		250	255	
Val Asn Glu	Lys	Trp Ile Val Thr	Ala	Ala His Cys Val	Glu	Thr Gly
	260		265		270	
Val Lys Ile	Thr Val Val	Ala Gly	Glu His Asn Ile	Glu	Glu Thr Glu	
	275		280	285		
His Thr Glu	Gln Lys Arg	Asn Val Ile Arg	Ile	Pro His His Asn		
	290	295	300			
Tyr Asn Ala	Ala Ile	Asn Lys Tyr Asn His	Asp	Ile Ala Leu Leu	Glu	
305		310	315		320	
Leu Asp Glu	Pro	Leu Val Leu Asn Ser	Tyr	Val Thr Pro Ile	Cys	Ile
		325	330		335	
Ala Asp Lys	Glu Tyr Thr	Asn Ile	Phe	Leu Lys Phe Gly	Ser	Gly Tyr
	340		345		350	
Val Ser Gly	Trp Gly Arg	Val	Phe	His Lys Gly Arg	Ser	Ala Leu Val
	355		360		365	
Leu Gln Tyr	Leu Arg Val	Pro	Leu Val Asp Arg	Ala Thr Cys Leu Arg		
	370	375		380		
Ser Thr Lys	Phe Thr	Ile Tyr Asn Asn Met	Phe	Cys Ala Gly Phe	His	
385		390	395		400	
Glu Gly Gly	Arg	Asp Ser Cys Gln Gly	Asp	Ser Gly Gly Pro	His	Val
		405	410		415	
Thr Glu Val	Glu Gly Thr Ser	Phe	Leu Thr Gly Ile Ile	Ser Trp Gly		
	420		425	430		
Glu Glu Cys	Ala Met Lys Gly	Lys Tyr Gly Ile Tyr	Thr	Lys Val Ser		
	435	440	445			
Arg Tyr Val	Asn Trp Ile	Lys Glu Lys Thr Lys	Leu	Thr Ser Ser Ser		
	450	455	460			
Ser Lys Ala	Pro Pro	Pro Ser Leu Pro Ser	Pro	Ser Arg Leu Pro	Gly	
465		470	475		480	
Pro Ser Asp	Thr	Pro Ile Leu Pro Gln				
	485					

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 <211> 1585

<212> DNA
<213> artificial

<220>
<223> factor IX-CTP-CTP

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aacaaaattc tgaatcggcc aaagaggtat aattcaggta aattggaaga gtttgttcaa 180
gggaaccttg agagagaatg tatggaagaa aagtgtagtt ttgaagaagc acgagaagtt 240
tttgaaaaca ctgaaagaac aactgaattt tggaagcagt atgttgatgg agatcagtgt 300
gagtccaatc catgttttaa tggcggcagt tgcaaggatg acattaattc ctatgaatgt 360
tggtgtccct ttggatttga aggaaagaac tgtgaattag atgtaacatg taacattaag 420
aatggcagat gcgagcagtt ttgtaaaaat agtgctgata acaagggtgtt ttgctcctgt 480
actgagggat atcgacttgc agaaaaccag aagtcctgtg aaccagcagt gccatttcca 540
tgtggaagag tttctgtttc acaaacttct aagctcaccg gtgctgagac tgtttttcct 600
gatgtggact atgtaaattc tactgaagct gaaaccattt tggataacat cactcaaagc 660
accaatcat ttaatgactt cactcgagtt gttggtggag aagatgcca accagggtcaa 720
ttcccttggc aggttgtttt gaatggtaaa gttgatgcat tctgtggagg ctctatcggt 780
aatgaaaaat ggattgtaac tgctgcccac tgtgttgaaa ctggtgttaa aattacagtt 840
gtcgcagggtg aacataatat tgaggagaca gaacatacag agcaaaagcg aaatgtgatt 900
cgaattattc ctaccacaa ctacaatgca gctattaata agtacaacca tgacattgcc 960
cttctggaac tggacgaacc cttagtgcta aacagctacg ttacacctat ttgcattgct 1020
acaaggaata cacgaacatc ttctcaaat ttggatctgg ctatgtaagt ggctggggaa 1080
gagtcttcca caaagggaga tcagctttag ttcttcagta ccttagagtt ccactgtgtg 1140
accgagccac atgtcttcga tctacaaagt tcaccatcta taacaacatg ttctgtgctg 1200
gcttccatga aggaggtaga gattcatgtc aaggagatag tgggggaccc catgttactg 1260
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aaggcaaata tggaatatat accaaggtat cccggtatgt caactggatt aaggaaaaaa 1380
caaagtcac tagctccagc agcaaggccc ctccccgag cctgccctcc ccaagcaggc 1440
tgcctgggcc ctccgacaca ccaatcctgc cacagagcag ctctctaag gccctcctc 1500
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gatgaaggtc tggatccgcg gccgc 1585

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<212> PRT
<213> artificial

<220>
<223> factor IX-CTP-CTP

<400> 60

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Ile Cys Leu Leu Gly Tyr Leu Leu Ser Ala Glu Cys Thr Val Phe Leu
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Asp His Glu Asn Ala Asn Lys Ile Leu Asn Arg Pro Lys Arg Tyr Asn
35 40 45

Ser Gly Lys Leu Glu Glu Phe Val Gln Gly Asn Leu Glu Arg Glu Cys
50 55 60

Met Glu Glu Lys Cys Ser Phe Glu Glu Ala Arg Glu Val Phe Glu Asn
65 70 75 80

Thr Glu Arg Thr Thr Glu Phe Trp Lys Gln Tyr Val Asp Gly Asp Gln
85 90 95

Cys Glu Ser Asn Pro Cys Leu Asn Gly Gly Ser Cys Lys Asp Asp Ile
100 105 110

Asn Ser Tyr Glu Cys Trp Cys Pro Phe Gly Phe Glu Gly Lys Asn Cys
115 120 125

Glu Leu Asp Val Thr Cys Asn Ile Lys Asn Gly Arg Cys Glu Gln Phe
130 135 140

Cys Lys Asn Ser Ala Asp Asn Lys Val Val Cys Ser Cys Thr Glu Gly
145 150 155 160

Tyr Arg Leu Ala Glu Asn Gln Lys Ser Cys Glu Pro Ala Val Pro Phe
165 170 175

Pro Cys Gly Arg Val Ser Val Ser Gln Thr Ser Lys Leu Thr Arg Ala
180 185 190

Glu Thr Val Phe Pro Asp Val Asp Tyr Val Asn Ser Thr Glu Ala Glu
195 200 205

Thr Ile Leu Asp Asn Ile Thr Gln Ser Thr Gln Ser Phe Asn Asp Phe
210 215 220

Thr Arg Val Val Gly Gly Glu Asp Ala Lys Pro Gly Gln Phe Pro Trp
225 230 235 240

Gln Val Val Leu Asn Gly Lys Val Asp Ala Phe Cys Gly Gly Ser Ile
245 250 255

Val Asn Glu Lys Trp Ile Val Thr Ala Ala His Cys Val Glu Thr Gly
260 265 270

Val Lys Ile Thr Val Val Ala Gly Glu His Asn Ile Glu Glu Thr Glu
275 280 285

His Thr Glu Gln Lys Arg Asn Val Ile Arg Ile Ile Pro His His Asn
290 295 300

Tyr Asn Ala Ala Ile Asn Lys Tyr Asn His Asp Ile Ala Leu Leu Glu
305 310 315 320

Leu Asp Glu Pro Leu Val Leu Asn Ser Tyr Val Thr Pro Ile Cys Ile
325 330 335

Ala Asp Lys Glu Tyr Thr Asn Ile Phe Leu Lys Phe Gly Ser Gly Tyr
340 345 350

Val Ser Gly Trp Gly Arg Val Phe His Lys Gly Arg Ser Ala Leu Val
355 360 365

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

Ser Thr Lys Phe Thr Ile Tyr Asn Asn Met Phe Cys Ala Gly Phe His
385 390 395 400

Glu Gly Gly Arg Asp Ser Cys Gln Gly Asp Ser Gly Gly Pro His Val
405 410 415

Thr Glu Val Glu Gly Thr Ser Phe Leu Thr Gly Ile Ile Ser Trp Gly
420 425 430

Glu Glu Cys Ala Met Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Ser
435 440 445

Arg Tyr Val Asn Trp Ile Lys Glu Lys Thr Lys Leu Thr Ser Ser Ser
450 455 460

Ser Lys Ala Pro Pro Pro Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly
465 470 475 480

Pro Ser Asp Thr Pro Ile Leu Pro Gln Ser Ser Ser Ser Lys Ala Pro
485 490 495

Pro Pro Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr
500 505 510

Pro Ile Leu Pro Gln
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<211> 545
<212> PRT

<213> artificial

<220>

<223> factor IX-CTP-CTP-CTP

<400> 61

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

Asp His Glu Asn Ala Asn Lys Ile Leu Asn Arg Pro Lys Arg Tyr Asn
35 40 45

Ser Gly Lys Leu Glu Glu Phe Val Gln Gly Asn Leu Glu Arg Glu Cys
50 55 60

Met Glu Glu Lys Cys Ser Phe Glu Glu Ala Arg Glu Val Phe Glu Asn
65 70 75 80

Thr Glu Arg Thr Thr Glu Phe Trp Lys Gln Tyr Val Asp Gly Asp Gln
85 90 95

Cys Glu Ser Asn Pro Cys Leu Asn Gly Gly Ser Cys Lys Asp Asp Ile
100 105 110

Asn Ser Tyr Glu Cys Trp Cys Pro Phe Gly Phe Glu Gly Lys Asn Cys
115 120 125

Glu Leu Asp Val Thr Cys Asn Ile Lys Asn Gly Arg Cys Glu Gln Phe
130 135 140

Cys Lys Asn Ser Ala Asp Asn Lys Val Val Cys Ser Cys Thr Glu Gly
145 150 155 160

Tyr Arg Leu Ala Glu Asn Gln Lys Ser Cys Glu Pro Ala Val Pro Phe
165 170 175

Pro Cys Gly Arg Val Ser Val Ser Gln Thr Ser Lys Leu Thr Arg Ala
180 185 190

Glu Thr Val Phe Pro Asp Val Asp Tyr Val Asn Ser Thr Glu Ala Glu
195 200 205

Thr Ile Leu Asp Asn Ile Thr Gln Ser Thr Gln Ser Phe Asn Asp Phe
210 215 220

Thr Arg Val Val Gly Gly Glu Asp Ala Lys Pro Gly Gln Phe Pro Trp
225 230 235 240

Gln Val Val Leu Asn Gly Lys Val Asp Ala Phe Cys Gly Gly Ser Ile
245 250 255

Val Asn Glu Lys Trp Ile Val Thr Ala Ala His Cys Val Glu Thr Gly
 260 265 270
 Val Lys Ile Thr Val Val Ala Gly Glu His Asn Ile Glu Glu Thr Glu
 275 280 285
 His Thr Glu Gln Lys Arg Asn Val Ile Arg Ile Ile Pro His His Asn
 290 295 300
 Tyr Asn Ala Ala Ile Asn Lys Tyr Asn His Asp Ile Ala Leu Leu Glu
 305 310 315 320
 Leu Asp Glu Pro Leu Val Leu Asn Ser Tyr Val Thr Pro Ile Cys Ile
 325 330 335
 Ala Asp Lys Glu Tyr Thr Asn Ile Phe Leu Lys Phe Gly Ser Gly Tyr
 340 345 350
 Val Ser Gly Trp Gly Arg Val Phe His Lys Gly Arg Ser Ala Leu Val
 355 360 365
 Leu Gln Tyr Leu Arg Val Pro Leu Val Asp Arg Ala Thr Cys Leu Arg
 370 375 380
 Ser Thr Lys Phe Thr Ile Tyr Asn Asn Met Phe Cys Ala Gly Phe His
 385 390 395 400
 Glu Gly Gly Arg Asp Ser Cys Gln Gly Asp Ser Gly Gly Pro His Val
 405 410 415
 Thr Glu Val Glu Gly Thr Ser Phe Leu Thr Gly Ile Ile Ser Trp Gly
 420 425 430
 Glu Glu Cys Ala Met Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Ser
 435 440 445
 Arg Tyr Val Asn Trp Ile Lys Glu Lys Thr Lys Leu Thr Ser Ser Ser
 450 455 460
 Ser Lys Ala Pro Pro Pro Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly
 465 470 475 480
 Pro Ser Asp Thr Pro Ile Leu Pro Gln Ser Ser Ser Ser Lys Ala Pro
 485 490 495
 Pro Pro Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr
 500 505 510
 Pro Ile Leu Pro Gln Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
 515 520 525

Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro
 530 535 540

Gln
 545

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 <212> PRT
 <213> artificial

<220>
 <223> factor IX-CTP-CTP-CTP-CTP

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

Asp His Glu Asn Ala Asn Lys Ile Leu Asn Arg Pro Lys Arg Tyr Asn
 35 40 45

Ser Gly Lys Leu Glu Glu Phe Val Gln Gly Asn Leu Glu Arg Glu Cys
 50 55 60

Met Glu Glu Lys Cys Ser Phe Glu Glu Ala Arg Glu Val Phe Glu Asn
 65 70 75 80

Thr Glu Arg Thr Thr Glu Phe Trp Lys Gln Tyr Val Asp Gly Asp Gln
 85 90 95

Cys Glu Ser Asn Pro Cys Leu Asn Gly Gly Ser Cys Lys Asp Asp Ile
 100 105 110

Asn Ser Tyr Glu Cys Trp Cys Pro Phe Gly Phe Glu Gly Lys Asn Cys
 115 120 125

Glu Leu Asp Val Thr Cys Asn Ile Lys Asn Gly Arg Cys Glu Gln Phe
 130 135 140

Cys Lys Asn Ser Ala Asp Asn Lys Val Val Cys Ser Cys Thr Glu Gly
 145 150 155 160

Tyr Arg Leu Ala Glu Asn Gln Lys Ser Cys Glu Pro Ala Val Pro Phe
 165 170 175

Pro Cys Gly Arg Val Ser Val Ser Gln Thr Ser Lys Leu Thr Arg Ala
 180 185 190

Glu Thr Val Phe Pro Asp Val Asp Tyr Val Asn Ser Thr Glu Ala Glu
 195 200 205

Thr Ile Leu Asp Asn Ile Thr Gln Ser Thr Gln Ser Phe Asn Asp Phe
 210 215 220
 Thr Arg Val Val Gly Gly Glu Asp Ala Lys Pro Gly Gln Phe Pro Trp
 225 230 235 240
 Gln Val Val Leu Asn Gly Lys Val Asp Ala Phe Cys Gly Gly Ser Ile
 245 250 255
 Val Asn Glu Lys Trp Ile Val Thr Ala Ala His Cys Val Glu Thr Gly
 260 265 270
 Val Lys Ile Thr Val Val Ala Gly Glu His Asn Ile Glu Glu Thr Glu
 275 280 285
 His Thr Glu Gln Lys Arg Asn Val Ile Arg Ile Ile Pro His His Asn
 290 295 300
 Tyr Asn Ala Ala Ile Asn Lys Tyr Asn His Asp Ile Ala Leu Leu Glu
 305 310 315 320
 Leu Asp Glu Pro Leu Val Leu Asn Ser Tyr Val Thr Pro Ile Cys Ile
 325 330 335
 Ala Asp Lys Glu Tyr Thr Asn Ile Phe Leu Lys Phe Gly Ser Gly Tyr
 340 345 350
 Val Ser Gly Trp Gly Arg Val Phe His Lys Gly Arg Ser Ala Leu Val
 355 360 365
 Leu Gln Tyr Leu Arg Val Pro Leu Val Asp Arg Ala Thr Cys Leu Arg
 370 375 380
 Ser Thr Lys Phe Thr Ile Tyr Asn Asn Met Phe Cys Ala Gly Phe His
 385 390 395 400
 Glu Gly Gly Arg Asp Ser Cys Gln Gly Asp Ser Gly Gly Pro His Val
 405 410 415
 Thr Glu Val Glu Gly Thr Ser Phe Leu Thr Gly Ile Ile Ser Trp Gly
 420 425 430
 Glu Glu Cys Ala Met Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Ser
 435 440 445
 Arg Tyr Val Asn Trp Ile Lys Glu Lys Thr Lys Leu Thr Ser Ser Ser
 450 455 460
 Ser Lys Ala Pro Pro Pro Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly
 465 470 475 480

Pro Ser Asp Thr Pro Ile Leu Pro Gln Ser Ser Ser Ser Lys Ala Pro
485 490 495

Pro Pro Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr
500 505 510

Pro Ile Leu Pro Gln Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
515 520 525

Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro
530 535 540

Gln Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu Pro Ser Pro Ser
545 550 555 560

Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
565 570

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<211> 601

<212> PRT

<213> artificial

<220>

<223> factor IX-CTP-CTP-CTP-CTP

<400> 63

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

Asp His Glu Asn Ala Asn Lys Ile Leu Asn Arg Pro Lys Arg Tyr Asn
35 40 45

Ser Gly Lys Leu Glu Glu Phe Val Gln Gly Asn Leu Glu Arg Glu Cys
50 55 60

Met Glu Glu Lys Cys Ser Phe Glu Glu Ala Arg Glu Val Phe Glu Asn
65 70 75 80

Thr Glu Arg Thr Thr Glu Phe Trp Lys Gln Tyr Val Asp Gly Asp Gln
85 90 95

Cys Glu Ser Asn Pro Cys Leu Asn Gly Gly Ser Cys Lys Asp Asp Ile
100 105 110

Asn Ser Tyr Glu Cys Trp Cys Pro Phe Gly Phe Glu Gly Lys Asn Cys
115 120 125

Glu Leu Asp Val Thr Cys Asn Ile Lys Asn Gly Arg Cys Glu Gln Phe
130 135 140

Cys Lys Asn Ser Ala Asp Asn Lys Val Val Cys Ser Cys Thr Glu Gly
 145 150 155 160
 Tyr Arg Leu Ala Glu Asn Gln Lys Ser Cys Glu Pro Ala Val Pro Phe
 165 170 175
 Pro Cys Gly Arg Val Ser Val Ser Gln Thr Ser Lys Leu Thr Arg Ala
 180 185 190
 Glu Thr Val Phe Pro Asp Val Asp Tyr Val Asn Ser Thr Glu Ala Glu
 195 200 205
 Thr Ile Leu Asp Asn Ile Thr Gln Ser Thr Gln Ser Phe Asn Asp Phe
 210 215 220
 Thr Arg Val Val Gly Gly Glu Asp Ala Lys Pro Gly Gln Phe Pro Trp
 225 230 235 240
 Gln Val Val Leu Asn Gly Lys Val Asp Ala Phe Cys Gly Gly Ser Ile
 245 250 255
 Val Asn Glu Lys Trp Ile Val Thr Ala Ala His Cys Val Glu Thr Gly
 260 265 270
 Val Lys Ile Thr Val Val Ala Gly Glu His Asn Ile Glu Glu Thr Glu
 275 280 285
 His Thr Glu Gln Lys Arg Asn Val Ile Arg Ile Ile Pro His His Asn
 290 295 300
 Tyr Asn Ala Ala Ile Asn Lys Tyr Asn His Asp Ile Ala Leu Leu Glu
 305 310 315 320
 Leu Asp Glu Pro Leu Val Leu Asn Ser Tyr Val Thr Pro Ile Cys Ile
 325 330 335
 Ala Asp Lys Glu Tyr Thr Asn Ile Phe Leu Lys Phe Gly Ser Gly Tyr
 340 345 350
 Val Ser Gly Trp Gly Arg Val Phe His Lys Gly Arg Ser Ala Leu Val
 355 360 365
 Leu Gln Tyr Leu Arg Val Pro Leu Val Asp Arg Ala Thr Cys Leu Arg
 370 375 380
 Ser Thr Lys Phe Thr Ile Tyr Asn Asn Met Phe Cys Ala Gly Phe His
 385 390 395 400
 Glu Gly Gly Arg Asp Ser Cys Gln Gly Asp Ser Gly Gly Pro His Val
 405 410 415

Thr Glu Val Glu Gly Thr Ser Phe Leu Thr Gly Ile Ile Ser Trp Gly
 420 425 430
 Glu Glu Cys Ala Met Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Ser
 435 440 445
 Arg Tyr Val Asn Trp Ile Lys Glu Lys Thr Lys Leu Thr Ser Ser Ser
 450 455 460
 Ser Lys Ala Pro Pro Pro Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly
 465 470 475 480
 Pro Ser Asp Thr Pro Ile Leu Pro Gln Ser Ser Ser Ser Lys Ala Pro
 485 490 495
 Pro Pro Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr
 500 505 510
 Pro Ile Leu Pro Gln Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
 515 520 525
 Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro
 530 535 540
 Gln Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu Pro Ser Pro Ser
 545 550 555 560
 Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln Ser Ser Ser
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 Ser Lys Ala Pro Pro Pro Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly
 580 585 590
 Pro Ser Asp Thr Pro Ile Leu Pro Gln
 595 600

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 <211> 2413
 <212> DNA
 <213> Homo sapiens

<400> 64
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 gctgtgcgca tcctggagg ccagcggtg gccaacagtg tggcacggaa gcatgggttc 180
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 cggtcctgt cgcctaccg cccgcggcac agccggctgc agagggagcc tcaagtacag 300
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aaggcggcct gggcgcaggg ctacacaggg cacggcattg tggctctccat tctggacgat	480
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gtcaatgacc aggaccctga cccccagcct cggtacacac agatgaatga caacaggcac	600
ggcacacggg gtgcggggga agtggctgcg gtggccaaca acggtgtctg tgggtgtaggt	660
gtggcctaca acgcccgcgt tggaggggtg cgcgtgctgg atggcgaggt gacagatgca	720
gtggaggcac gctcgtctgg cctgaacccc aaccacatcc acatctacag tgccagctgg	780
ggccccgagg atgacggcaa gacagtggat gggccagccc gcctcgccga ggaggccttc	840
ttccgtgggg ttagccaggg ccgagggggg ctgggctcca tctttgtctg ggcctcgggg	900
aacgggggccc gggaacatga cagctgcaac tgcgacggct acaccaacag tatctacag	960
ctgtccatca gcagcgccac gcagtttggc aacgtgccgt ggtacagcga ggcctgctcg	1020
tccacactgg ccacgacctg cagcagtggc aaccagaatg agaagcagat cgtgacgact	1080
gacttgccggc agaagtgcac ggagtctcac acgggcacct cagcctctgc ccccttagca	1140
gccggcatca ttgctctcac cctggaggcc aataagaacc tcacatggcg ggacatgcaa	1200
cacctggtgg tacagacctc gaagccagcc cacctcaatg ccaacgactg ggccaccaat	1260
ggtgtggggc ggaaagtgag ccactcatat ggctacgggc ttttggacgc aggcgccatg	1320
gtggccctgg cccagaattg gaccacagtg gccccccagc ggaagtgcac catcgacatc	1380
ctcaccgagc ccaaagacat cgggaaacgg ctcgaggtgc ggaagaccgt gaccgcgtgc	1440
ctgggcgagc ccaaccacat cactcggctg gagcacgctc aggcgcggct caccctgtcc	1500
tataatcgcc gtggcgacct ggccatccac ctgggtcagcc ccatgggcac ccgctccacc	1560
ctgctggcag ccaggccaca tgactactcc gcagatgggt ttaatgactg ggccttcatg	1620
acaactcatt cctgggatga ggatccctct ggcgagtggg tcctagagat tgaaaacacc	1680
agcgaagcca acaactatgg gacgctgacc aagttcacc tcgtactcta tggcaccgcc	1740
cctgaggggc tgcccgctacc tccagaaagc agtggctgca agaccctcac gtccagtcat	1800
gcctgtgtgg tgtgcgagga aggccttctc ctgcaccaga agagctgtgt ccagcactgc	1860
cctccaggct tcgccccca agtcctcgat acgcactata gcaccgagaa tgacgtggag	1920
accatccggg ccagcgtctg cgcacctgc cacgcctcat gtgccacatg ccaggggccg	1980
gccctgacag actgcctcag ctgccccagc cacgcctcct tggaccctgt ggagcagact	2040
tgctcccggc aaagccagag cagccgagag tccccgccac agcagcagcc acctcggctg	2100
cccccgagg tggaggcggg gcaacggctg cgggcagggc tgctgccctc acacctgcct	2160
gaggtggtgg ccggcctcag ctgcgccttc atcgtgctgg tcttcgtcac tgtcttctg	2220
gtcctgcagc tgcgtctggt ctttagtttt cgggggggtga aggtgtacac catggaccgt	2280
ggcctcatct cctacaaggg gctgccccct gaagcctggc aggaggagtg cccgtctgac	2340
tcagaagagg acgagggccg gggcgagagg accgccttta tcaaagacca gagcgccctc	2400
tgaacgcggc cgc	2413

<210> 65
 <211> 794
 <212> PRT
 <213> Homo sapiens

<400> 65

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Met Glu Leu Arg Pro Trp Leu Leu Trp Val Val Ala Ala Thr Gly Thr
1      5      10     15

Leu Val Leu Leu Ala Ala Asp Ala Gln Gly Gln Lys Val Phe Thr Asn
      20     25     30

Thr Trp Ala Val Arg Ile Pro Gly Gly Pro Ala Val Ala Asn Ser Val
      35     40     45

Ala Arg Lys His Gly Phe Leu Asn Leu Gly Gln Ile Phe Gly Asp Tyr
      50     55     60

Tyr His Phe Trp His Arg Gly Val Thr Lys Arg Ser Leu Ser Pro His
      65     70     75     80

Arg Pro Arg His Ser Arg Leu Gln Arg Glu Pro Gln Val Gln Trp Leu
      85     90     95

Glu Gln Gln Val Ala Lys Arg Arg Thr Lys Arg Asp Val Tyr Gln Glu
      100    105

Pro Thr Asp Pro Lys Phe Pro Gln Gln Trp Tyr Leu Ser Gly Val Thr
      115    120    125

Gln Arg Asp Leu Asn Val Lys Ala Ala Trp Ala Gln Gly Tyr Thr Gly
      130    135    140

His Gly Ile Val Val Ser Ile Leu Asp Asp Gly Ile Glu Lys Asn His
      145    150    155    160

Pro Asp Leu Ala Gly Asn Tyr Asp Pro Gly Ala Ser Phe Asp Val Asn
      165    170    175

Asp Gln Asp Pro Asp Pro Gln Pro Arg Tyr Thr Gln Met Asn Asp Asn
      180    185    190

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

Gly Val Cys Gly Val Gly Val Ala Tyr Asn Ala Arg Ile Gly Gly Val
      210    215    220

Arg Met Leu Asp Gly Glu Val Thr Asp Ala Val Glu Ala Arg Ser Leu
      225    230    235    240

Gly Leu Asn Pro Asn His Ile His Ile Tyr Ser Ala Ser Trp Gly Pro
      245    250    255

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Glu Asp Asp Gly Lys Thr Val Asp Gly Pro Ala Arg Leu Ala Glu Glu
 260 265 270
 Ala Phe Phe Arg Gly Val Ser Gln Gly Arg Gly Gly Leu Gly Ser Ile
 275 280 285
 Phe Val Trp Ala Ser Gly Asn Gly Gly Arg Glu His Asp Ser Cys Asn
 290 295 300
 Cys Asp Gly Tyr Thr Asn Ser Ile Tyr Thr Leu Ser Ile Ser Ser Ala
 305 310 315 320
 Thr Gln Phe Gly Asn Val Pro Trp Tyr Ser Glu Ala Cys Ser Ser Thr
 325 330 335
 Leu Ala Thr Thr Tyr Ser Ser Gly Asn Gln Asn Glu Lys Gln Ile Val
 340 345 350
 Thr Thr Asp Leu Arg Gln Lys Cys Thr Glu Ser His Thr Gly Thr Ser
 355 360 365
 Ala Ser Ala Pro Leu Ala Ala Gly Ile Ile Ala Leu Thr Leu Glu Ala
 370 375 380
 Asn Lys Asn Leu Thr Trp Arg Asp Met Gln His Leu Val Val Gln Thr
 385 390 395 400
 Ser Lys Pro Ala His Leu Asn Ala Asn Asp Trp Ala Thr Asn Gly Val
 405 410 415
 Gly Arg Lys Val Ser His Ser Tyr Gly Tyr Gly Leu Leu Asp Ala Gly
 420 425 430
 Ala Met Val Ala Leu Ala Gln Asn Trp Thr Thr Val Ala Pro Gln Arg
 435 440 445
 Lys Cys Ile Ile Asp Ile Leu Thr Glu Pro Lys Asp Ile Gly Lys Arg
 450 455 460
 Leu Glu Val Arg Lys Thr Val Thr Ala Cys Leu Gly Glu Pro Asn His
 465 470 475 480
 Ile Thr Arg Leu Glu His Ala Gln Ala Arg Leu Thr Leu Ser Tyr Asn
 485 490 495
 Arg Arg Gly Asp Leu Ala Ile His Leu Val Ser Pro Met Gly Thr Arg
 500 505 510
 Ser Thr Leu Leu Ala Ala Arg Pro His Asp Tyr Ser Ala Asp Gly Phe
 515 520 525

Asn Asp Trp Ala Phe Met Thr Thr His Ser Trp Asp Glu Asp Pro Ser
 530 535 540
 Gly Glu Trp Val Leu Glu Ile Glu Asn Thr Ser Glu Ala Asn Asn Tyr
 545 550 555 560
 Gly Thr Leu Thr Lys Phe Thr Leu Val Leu Tyr Gly Thr Ala Pro Glu
 565 570 575
 Gly Leu Pro Val Pro Pro Glu Ser Ser Gly Cys Lys Thr Leu Thr Ser
 580 585 590
 Ser Gln Ala Cys Val Val Cys Glu Glu Gly Phe Ser Leu His Gln Lys
 595 600 605
 Ser Cys Val Gln His Cys Pro Pro Gly Phe Ala Pro Gln Val Leu Asp
 610 615 620
 Thr His Tyr Ser Thr Glu Asn Asp Val Glu Thr Ile Arg Ala Ser Val
 625 630 635 640
 Cys Ala Pro Cys His Ala Ser Cys Ala Thr Cys Gln Gly Pro Ala Leu
 645 650 655
 Thr Asp Cys Leu Ser Cys Pro Ser His Ala Ser Leu Asp Pro Val Glu
 660 665 670
 Gln Thr Cys Ser Arg Gln Ser Gln Ser Ser Arg Glu Ser Pro Pro Gln
 675 680 685
 Gln Gln Pro Pro Arg Leu Pro Pro Glu Val Glu Ala Gly Gln Arg Leu
 690 695 700
 Arg Ala Gly Leu Leu Pro Ser His Leu Pro Glu Val Val Ala Gly Leu
 705 710 715 720
 Ser Cys Ala Phe Ile Val Leu Val Phe Val Thr Val Phe Leu Val Leu
 725 730 735
 Gln Leu Arg Ser Gly Phe Ser Phe Arg Gly Val Lys Val Tyr Thr Met
 740 745 750
 Asp Arg Gly Leu Ile Ser Tyr Lys Gly Leu Pro Pro Glu Ala Trp Gln
 755 760 765
 Glu Glu Cys Pro Ser Asp Ser Glu Glu Asp Glu Gly Arg Gly Glu Arg
 770 775 780
 Thr Ala Phe Ile Lys Asp Gln Ser Ala Leu
 785 790

<210> 66
 <211> 249
 <212> PRT
 <213> Artificial

<220>
 <223> CTP-CTP-EPO

<400> 66

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Met Gly Val His Glu Cys Pro Ala Trp Leu Trp Leu Leu Leu Ser Leu
1          5          10          15

Leu Ser Leu Pro Leu Gly Leu Pro Val Leu Gly Ser Ser Ser Ser Lys
20          25          30

Ala Pro Pro Pro Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser
35          40          45

Asp Thr Pro Ile Leu Pro Gln Ser Ser Ser Ser Lys Ala Pro Pro Pro
50          55          60

Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile
65          70          75          80

Leu Pro Gln Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu
85          90          95

Arg Tyr Leu Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys
100         105         110

Ala Glu His Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys
115         120         125

Val Asn Phe Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val
130         135         140

Glu Val Trp Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly
145         150         155         160

Gln Ala Leu Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu
165         170         175

His Val Asp Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu
180         185         190

Arg Ala Leu Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala
195         200         205

Ser Ala Ala Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu
210         215         220

Phe Arg Val Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr
225         230         235         240

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Gly Glu Ala Cys Arg Thr Gly Asp Arg
245

<210> 67
<211> 762
<212> DNA
<213> Artificial

<220>
<223> CTP-CTP-EPO

<400> 67
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ccttctagac tgcctggccc cagcgacacc cccatcctgc ctgagagcag cagcagcaag 180
gccccaccac catccctgcc tagccccagc agactgccag gcccttccga taccctaacc 240
ctgccccagg cccctcccag actgatctgc gacagccggg tgctggaaag atacctgctg 300
gaagccaaag aggccgagaa catcaccacc ggctgctgag agcactgcag cctgaacgag 360
aatatcaccg tgcccagacac caaagtgaac ttctacgcct ggaagcggat ggaagtgggc 420
cagcaggccg tggaagtgtg gcagggactg gccctgctga gcgaggccgt gctgagagga 480
caggccctgc tgggtgaacag cagccagccc tgggagcccc tgcagctgca tgtggataag 540
gccgtgtccg gcctgctggag cctgaccaca ctgctgagag ccctgggctg tcagaaagag 600
gccatctctc cccctgatgc cgcctctgcc gccctctga gaaccatcac cgccgacacc 660
ttccggaagc tgttccgggt gtacagcaac ttctgcggg gcaagctgaa gctgtacacc 720
ggcgaggcct gccggaccgg cgatagataa gcttggtgctg cc 762

<210> 68
<211> 305
<212> PRT
<213> Artificial

<220>
<223> CTP-CTP-EPO-CTP-CTP

<400> 68

Met Gly Val His Glu Cys Pro Ala Trp Leu Trp Leu Leu Leu Ser Leu
1 5 10 15

Leu Ser Leu Pro Leu Gly Leu Pro Val Leu Gly Ser Ser Ser Ser Lys
20 25 30

Ala Pro Pro Pro Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser
35 40 45

Asp Thr Pro Ile Leu Pro Gln Ser Ser Ser Ser Lys Ala Pro Pro Pro
50 55 60

Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile
65 70 75 80

<400> 69
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 ccttctagac tgcttgccc cagcgacacc cccatcctgc ctgagagcag cagcagcaag 180
 gccccaccac catccctgcc tagccccagc agactgccag gcccttccga taccccaatc 240
 ctgccccagg cccctcccag actgatctgc gacagccggg tgctggaaag atacctgctg 300
 gaagccaaag aggccgagaa catcaccacc ggctgcgccg agcactgcag cctgaacgag 360
 aatatcaccg tgcccagacac caaagtgaac ttctacgcct ggaagcggat ggaagtgggc 420
 cagcaggccg tggaagtgtg gcagggactg gccctgctga gcgaggccgt gctgagagga 480
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 gccgtgtccg gcctgcggag cctgaccaca ctgctgagag ccctgggccc tcagaaagag 600
 gccatctctc cccctgatgc cgctctgcc gccctctga gaaccatcac cgccgacacc 660
 ttccggaagc tgttccgggt gtacagcaac ttctgcggg gcaagctgaa gctgtacacc 720
 ggcgaggcct gccggaccgg cgatagaagc agctccagca aggtccacc cccagcctg 780
 ccatcccaa gtagactgcc cgggccctct gacacaccta tcctgccaca gtccagcagc 840
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 ccaattctgc ctgagtaagc ttggcgccc 930

<210> 70
 <211> 295
 <212> PRT
 <213> Artificial

<220>
 <223> APO-A1-CTP

<400> 70

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

Gln Ala Arg His Phe Trp Gln Gln Asp Glu Pro Pro Gln Ser Pro Trp
20 25 30

Asp Arg Val Lys Asp Leu Ala Thr Val Tyr Val Asp Val Leu Lys Asp
35 40 45

Ser Gly Arg Asp Tyr Val Ser Gln Phe Glu Gly Ser Ala Leu Gly Lys
50 55 60

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

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

Asp Asn Leu Glu Lys Glu Thr Glu Gly Leu Arg Gln Glu Met Ser Lys
 100 105 110
 Asp Leu Glu Glu Val Lys Ala Lys Val Gln Pro Tyr Leu Asp Asp Phe
 115 120 125
 Gln Lys Lys Trp Gln Glu Glu Met Glu Leu Tyr Arg Gln Lys Val Glu
 130 135 140
 Pro Leu Arg Ala Glu Leu Gln Glu Gly Ala Arg Gln Lys Leu His Glu
 145 150 155 160
 Leu Gln Glu Lys Leu Ser Pro Leu Gly Glu Glu Met Arg Asp Arg Ala
 165 170 175
 Arg Ala His Val Asp Ala Leu Arg Thr His Leu Ala Pro Tyr Ser Asp
 180 185 190
 Glu Leu Arg Gln Arg Leu Ala Ala Arg Leu Glu Ala Leu Lys Glu Asn
 195 200 205
 Gly Gly Ala Arg Leu Ala Glu Tyr His Ala Lys Ala Thr Glu His Leu
 210 215 220
 Ser Thr Leu Ser Glu Lys Ala Lys Pro Ala Leu Glu Asp Leu Arg Gln
 225 230 235 240
 Gly Leu Leu Pro Val Leu Glu Ser Phe Lys Val Ser Phe Leu Ser Ala
 245 250 255
 Leu Glu Glu Tyr Thr Lys Lys Leu Asn Thr Gln Ser Ser Ser Ser Lys
 260 265 270
 Ala Pro Pro Pro Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser
 275 280 285
 Asp Thr Pro Ile Leu Pro Gln
 290 295

<210> 71
 <211> 911
 <212> DNA
 <213> Artificial

<220>
 <223> APO-A1-CTP

<400> 71	
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gtgtacgtgg acgtgctgaa ggactccggc agagactacg tgtcccagtt cgagggctct	180
gccctgggca agcagctgaa cctgaagctg ctggacaact gggactccgt gacctccacc	240

ttctccaagc tgcgcgaaca gctgggacct gtgacccagg aattctggga caacctggaa 300
 aaagagacag agggcctgag acaggaaatg tccaaggacc tggaagaggt caaagccaag 360
 gtgcagccct acctggacga cttccagaag aaatggcagg aagagatgga actgtaccgg 420
 cagaaggtgg aacccctgcg ggccgagctg caggaaggcg ctagacagaa gctgcacgaa 480
 ctgcagggaaa agctgtcccc cctgggagag gaaatgcggg acagagccag agcccacgtg 540
 gacgccctga gaaccacct ggccccctac tctgacgagc tgcggcagag gctggccgcc 600
 agactggaag ccctgaaaga gaacggcgga gcccggtg cagagtacca cgctaaggct 660
 accgagcacc tgtccacct gtccgagaag gccaaagccc ccctggaaga tctgcggcag 720
 ggccctgctgc ccgtgctgga atccttcaag gtgtccttcc tgtccgctct ggaagagtac 780
 accaagaagc tgaacaccca gtcctccagc tccaaggccc ctccaccctc cctgcctagc 840
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 gccgcgagct c 911

<210> 72
 <211> 323
 <212> PRT
 <213> Artificial

<220>
 <223> APO-A1-CTP-CTP

<400> 72

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

Gln Ala Arg His Phe Trp Gln Gln Asp Glu Pro Pro Gln Ser Pro Trp
20 25 30

Asp Arg Val Lys Asp Leu Ala Thr Val Tyr Val Asp Val Leu Lys Asp
35 40 45

Ser Gly Arg Asp Tyr Val Ser Gln Phe Glu Gly Ser Ala Leu Gly Lys
50 55 60

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

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

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

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

Gln Lys Lys Trp Gln Glu Glu Met Glu Leu Tyr Arg Gln Lys Val Glu
130 135 140

Pro Leu Arg Ala Glu Leu Gln Glu Gly Ala Arg Gln Lys Leu His Glu
 145 150 155 160
 Leu Gln Glu Lys Leu Ser Pro Leu Gly Glu Glu Met Arg Asp Arg Ala
 165 170 175
 Arg Ala His Val Asp Ala Leu Arg Thr His Leu Ala Pro Tyr Ser Asp
 180 185 190
 Glu Leu Arg Gln Arg Leu Ala Ala Arg Leu Glu Ala Leu Lys Glu Asn
 195 200 205
 Gly Gly Ala Arg Leu Ala Glu Tyr His Ala Lys Ala Thr Glu His Leu
 210 215 220
 Ser Thr Leu Ser Glu Lys Ala Lys Pro Ala Leu Glu Asp Leu Arg Gln
 225 230 235 240
 Gly Leu Leu Pro Val Leu Glu Ser Phe Lys Val Ser Phe Leu Ser Ala
 245 250 255
 Leu Glu Glu Tyr Thr Lys Lys Leu Asn Thr Gln Ser Ser Ser Ser Lys
 260 265 270
 Ala Pro Pro Pro Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser
 275 280 285
 Asp Thr Pro Ile Leu Pro Gln Ser Ser Ser Ser Lys Ala Pro Pro Pro
 290 295 300
 Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile
 305 310 315 320
 Leu Pro Gln

<210> 73
 <211> 995
 <212> DNA
 <213> Artificial

<220>
 <223> APO-A1-CTP-CTP

<400> 73	
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ttctggcagc aggacgagcc tccccagtcc ccctgggaca gagtgaagga cctggccacc	120
gtgtacgtgg acgtgctgaa ggactccggc agagactacg tgtcccagtt cgagggctct	180
gccctgggca agcagctgaa cctgaagctg ctggacaact gggactccgt gacctccacc	240
ttctccaagc tgcgcgaaca gctgggacct gtgaccagg aattctggga caacctggaa	300

aaagagacag agggcctgag acaggaaatg tccaaggacc tggaagaggt caaagccaag	360
gtgcagccct acctggacga cttccagaag aaatggcagg aagagatgga actgtaccgg	420
cagaagggtg aacccctgcg ggccgagctg caggaaggcg ctagacagaa gctgcacgaa	480
ctgcaggaaa agctgtcccc cctgggcgag gaaatgcggg acagagccag agcccacgtg	540
gacgccctga gaaccacct ggccccctac tctgacgagc tgcggcagag gctggccgcc	600
agactggaag ccctgaaaga gaacggcgga gcccggtgg ccgagtacca cgctaaggct	660
accgagcacc tgtccaccct gtccgagaag gccaagcccg ccctggaaga tctgcggcag	720
ggcctgctgc ccgtgctgga atccttcaag gtgtccttcc tgtccgctct ggaagagtac	780
accaagaagc tgaacacca gtcttcagc tccaaggccc ctccaccctc cctgcctagc	840
cctagtagac tgcctgggcc ctccgacaca ccaatcctgc cacagagcag ctctctaag	900
gccccctctc catccctgcc atccccctcc cggtgcctg gccccctga caccctatc	960
ctgcctcagt gatgaaggtc tggatccgcg gccgc	995