

9434-00-WO-OC_ST25_DD
SEQUENCE LISTING

<110> Colgate Palmolive
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<120> System Providing Perhydrolase Catalyzed Reaction

<130> 9434-00-WO-OC

<150> US 61/577,529

<151> 2011-12-19

<160> 197

<170> PatentIn version 3.5

<210> 1

<211> 325

<212> PRT

<213> Thermotoga maritima

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35 40 45

Ser His Leu Lys Thr Val Glu Ala Tyr Asp Val Thr Phe Ser Gly Tyr
50 55 60

Arg Gly Gln Arg Ile Lys Gly Trp Leu Leu Val Pro Lys Leu Glu Glu
65 70 75 80

Glu Lys Leu Pro Cys Val Val Gln Tyr Ile Gly Tyr Asn Gly Gly Arg
85 90 95

Gly Phe Pro His Asp Trp Leu Phe Trp Pro Ser Met Gly Tyr Ile Cys
100 105 110

Phe Val Met Asp Thr Arg Gly Gln Gly Ser Gly Trp Leu Lys Gly Asp
115 120 125

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Thr Pro Asp Tyr Pro Glu Gly Pro Val Asp Pro Gln Tyr Pro Gly Phe
130 135 140

Met Thr Arg Gly Ile Leu Asp Pro Arg Thr Tyr Tyr Tyr Arg Arg Val
145 150 155 160

Phe Thr Asp Ala Val Arg Ala Val Glu Ala Ala Ala Ser Phe Pro Gln
165 170 175

Val Asp Gln Glu Arg Ile Val Ile Ala Gly Gly Ser Gln Gly Gly Gly
180 185 190

Ile Ala Leu Ala Val Ser Ala Leu Ser Lys Lys Ala Lys Ala Leu Leu
195 200 205

Cys Asp Val Pro Phe Leu Cys His Phe Arg Arg Ala Val Gln Leu Val
210 215 220

Asp Thr His Pro Tyr Ala Glu Ile Thr Asn Phe Leu Lys Thr His Arg
225 230 235 240

Asp Lys Glu Glu Ile Val Phe Arg Thr Leu Ser Tyr Phe Asp Gly Val
245 250 255

Asn Phe Ala Ala Arg Ala Lys Ile Pro Ala Leu Phe Ser Val Gly Leu
260 265 270

Met Asp Asn Ile Ser Pro Pro Ser Thr Val Phe Ala Ala Tyr Asn Tyr
275 280 285

Tyr Ala Gly Pro Lys Glu Ile Arg Ile Tyr Pro Tyr Asn Asn His Glu
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Gly Gly Gly Ser Phe Gln Ala Val Glu Gln Val Lys Phe Leu Lys Lys
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Leu Phe Glu Lys Gly
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<213> artificial sequence

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<222> (1)..(325)

<223> *Thermotoma maritima* C277S variant perhydrolase

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<222> (326)..(375)

<223> Oral surface targeting domain

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Ala Glu Ser Glu Lys Phe Pro Leu Asp Pro Val Phe Glu Arg Met Glu
35 40 45

Ser His Leu Lys Thr Val Glu Ala Tyr Asp Val Thr Phe Ser Gly Tyr
50 55 60

Arg Gly Gln Arg Ile Lys Gly Trp Leu Leu Val Pro Lys Leu Glu Glu
65 70 75 80

Glu Lys Leu Pro Cys Val Val Gln Tyr Ile Gly Tyr Asn Gly Gly Arg
85 90 95

Gly Phe Pro His Asp Trp Leu Phe Trp Pro Ser Met Gly Tyr Ile Cys
100 105 110

Phe Val Met Asp Thr Arg Gly Gln Gly Ser Gly Trp Leu Lys Gly Asp
115 120 125

Thr Pro Asp Tyr Pro Glu Gly Pro Val Asp Pro Gln Tyr Pro Gly Phe
130 135 140

Met Thr Arg Gly Ile Leu Asp Pro Arg Thr Tyr Tyr Tyr Arg Arg Val
145 150 155 160

Phe Thr Asp Ala Val Arg Ala Val Glu Ala Ala Ala Ser Phe Pro Gln
165 170 175

Val Asp Gln Glu Arg Ile Val Ile Ala Gly Gly Ser Gln Gly Gly Gly
180 185 190

Ile Ala Leu Ala Val Ser Ala Leu Ser Lys Lys Ala Lys Ala Leu Leu
195 200 205

Cys Asp Val Pro Phe Leu Cys His Phe Arg Arg Ala Val Gln Leu Val
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210

215

Asp Thr His Pro Tyr Ala Glu Ile Thr Asn Phe Leu Lys Thr His Arg
225 230 235 240

Asp Lys Glu Glu Ile Val Phe Arg Thr Leu Ser Tyr Phe Asp Gly Val
245 250 255

Asn Phe Ala Ala Arg Ala Lys Ile Pro Ala Leu Phe Ser Val Gly Leu
260 265 270

Met Asp Asn Ile Ser Pro Pro Ser Thr Val Phe Ala Ala Tyr Asn Tyr
275 280 285

Tyr Ala Gly Pro Lys Glu Ile Arg Ile Tyr Pro Tyr Asn Asn His Glu
290 295 300

Gly Gly Gly Ser Phe Gln Ala Val Glu Gln Val Lys Phe Leu Lys Lys
305 310 315 320

Leu Phe Glu Lys Gly Gly Pro Gly Ser Gly Gly Ala Gly Ser Pro Gly
325 330 335

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gaa aaa aca gca ccg aaa gat ttt tct gag ttt tgg aaa ttg tct ttg	96
Glu Lys Thr Ala Pro Lys Asp Phe Ser Glu Phe Trp Lys Leu Ser Leu	
20 25 30	
gag gaa ctt gca aaa gtc caa gca gaa cct gat tta cag ccg gtt gac	144

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Glu	Glu	Leu 35	Ala	Lys	Val	Gln	Ala 40	Glu	Pro	Asp	Leu	Gln 45	Pro	Val	Asp	
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ccg Pro	cat His	ccg Pro	gcg Ala	atc Ile 85	gtg Val	aaa Lys	tat Tyr	cat His	ggc Gly 90	tac Tyr	aat Asn	gca Ala	agc Ser	tat Tyr 95	gat Asp	288
ggt Gly	gag Glu	att Ile	cat His 100	gaa Glu	atg Met	gta Val	aac Asn	tgg Trp 105	gca Ala	ctc Leu	cat His	ggc Gly 110	tac Tyr 110	gcc Ala	gca Ala	336
ttc Phe	ggc Gly	atg Met 115	ctt Leu	gtc Val	cgc Arg	ggc Gly	cag Gln 120	cag Gln	agc Ser	agc Ser	gag Glu	gat Asp 125	acg Thr	agt Ser	att Ile	384
tca Ser 130	ctg Leu	cac His	ggt Gly	cac His	gct Ala	tgg Leu 135	ggc Gly	tgg Trp	atg Met	acg Thr	aaa Lys 140	gga Gly	att Ile	ctt Leu	gat Asp	432
aaa Lys 145	gat Asp	aca Thr	tac Tyr	tat Tyr	tac Tyr 150	cgc Arg	ggt Gly	gtt Val	tat Tyr	ttg Leu 155	gac Asp	gcc Ala	gtc Val	cgc Arg	gcg Ala 160	480
ctt Leu	gag Glu	gtc Val	atc Ile	agc Ser 165	agc Ser	ttc Phe	gac Asp	gag Glu	gtt Val 170	gac Asp	gaa Glu	aca Thr	agg Arg	atc Ile 175	ggt Gly	528
gtg Val	aca Thr	gga Gly	gga Gly 180	agc Ser	caa Gln	ggc Gly	gga Gly	ggt Gly 185	tta Leu	acc Thr	att Ile	gcc Ala 190	gca Ala 190	gca Ala	gcg Ala	576
ctg Leu	tca Ser	gac Asp 195	att Ile	cca Pro	aaa Lys	gcc Ala	gcg Ala 200	gtt Val	gcc Ala	gat Asp	tat Tyr	cct Pro 205	tat Tyr	tta Leu	agc Ser	624
aac Asn	ttc Phe 210	gaa Glu	cgg Arg	gcc Ala	att Ile	gat Asp 215	gtg Val	gcg Ala	ctt Leu	gaa Glu	cag Gln 220	ccg Pro	tac Tyr	ctt Leu	gaa Glu	672
atc Ile 225	aat Asn	tcc Ser	ttc Phe	ttc Phe	aga Arg 230	aga Arg	aat Asn	ggc Gly	agc Ser	ccg Pro 235	gaa Glu	aca Thr	gaa Glu	gtg Val	cag Gln 240	720
gcg Ala	atg Met	aag Lys	aca Thr	ctt Leu 245	tca Ser	tat Tyr	ttc Phe	gat Asp	att Ile 250	atg Met	aat Asn	ctc Leu	gct Ala	gac Asp 255	cga Arg	768
gtg Val	aag Lys	gtg Val	cct Pro 260	gtc Val	ctg Leu	atg Met	tca Ser	atc Ile 265	ggc Gly	ctg Leu	att Ile	gac Asp	aag Lys 270	gtc Val	acg Thr	816
ccg Pro	ccg Pro	tcc Ser 275	acc Thr	gtg Val	ttt Phe	gcc Ala	gcc Ala 280	tac Tyr	aat Asn	cat His	ttg Leu	gaa Glu 285	aca Thr	gag Glu	aaa Lys	864

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gag ctg aag gtg tac cgc tac ttc gga cat gag tat atc cct gct ttt 912
Glu Leu Lys Val Tyr Arg Tyr Phe Gly His Glu Tyr Ile Pro Ala Phe
290 295 300

caa acg gaa aaa ctt gct ttc ttt aag cag cat ctt aaa ggc tga taa 960
Gln Thr Glu Lys Leu Ala Phe Phe Lys Gln His Leu Lys Gly
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Glu Glu Leu Ala Lys Val Gln Ala Glu Pro Asp Leu Gln Pro Val Asp
35 40 45

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

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

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

Gly Glu Ile His Glu Met Val Asn Trp Ala Leu His Gly Tyr Ala Ala
100 105 110

Phe Gly Met Leu Val Arg Gly Gln Gln Ser Ser Glu Asp Thr Ser Ile
115 120 125

Ser Leu His Gly His Ala Leu Gly Trp Met Thr Lys Gly Ile Leu Asp
130 135 140

Lys Asp Thr Tyr Tyr Tyr Arg Gly Val Tyr Leu Asp Ala Val Arg Ala
145 150 155 160

Leu Glu Val Ile Ser Ser Phe Asp Glu Val Asp Glu Thr Arg Ile Gly
165 170 175

Val Thr Gly Gly Ser Gln Gly Gly Gly Leu Thr Ile Ala Ala Ala Ala
180 185 190

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Leu Ser Asp Ile Pro Lys Ala Ala Val Ala Asp Tyr Pro Tyr Leu Ser
195 200 205

Asn Phe Glu Arg Ala Ile Asp Val Ala Leu Glu Gln Pro Tyr Leu Glu
210 215 220

Ile Asn Ser Phe Phe Arg Arg Asn Gly Ser Pro Glu Thr Glu Val Gln
225 230 235 240

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

Val Lys Val Pro Val Leu Met Ser Ile Gly Leu Ile Asp Lys Val Thr
260 265 270

Pro Pro Ser Thr Val Phe Ala Ala Tyr Asn His Leu Glu Thr Glu Lys
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Glu Leu Lys Val Tyr Arg Tyr Phe Gly His Glu Tyr Ile Pro Ala Phe
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Gln Thr Glu Lys Leu Ala Phe Phe Lys Gln His Leu Lys Gly
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<213> Bacillus subtilis

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Glu Glu Leu Ala Lys Val Gln Ala Glu Pro Asp Leu Gln Pro Val Asp
35 40 45

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

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

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

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Gly Glu Ile His Glu Met Val Asn Trp Ala Leu His Gly Tyr Ala Thr
100 105 110

Phe Gly Met Leu Val Arg Gly Gln Gln Ser Ser Glu Asp Thr Ser Ile
115 120 125

Ser Pro His Gly His Ala Leu Gly Trp Met Thr Lys Gly Ile Leu Asp
130 135 140

Lys Asp Thr Tyr Tyr Tyr Arg Gly Val Tyr Leu Asp Ala Val Arg Ala
145 150 155 160

Leu Glu Val Ile Ser Ser Phe Asp Glu Val Asp Glu Thr Arg Ile Gly
165 170 175

Val Thr Gly Gly Ser Gln Gly Gly Gly Leu Thr Ile Ala Ala Ala Ala
180 185 190

Leu Ser Asp Ile Pro Lys Ala Ala Val Ala Asp Tyr Pro Tyr Leu Ser
195 200 205

Asn Phe Glu Arg Ala Ile Asp Val Ala Leu Glu Gln Pro Tyr Leu Glu
210 215 220

Ile Asn Ser Phe Phe Arg Arg Asn Gly Ser Pro Glu Thr Glu Val Gln
225 230 235 240

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

Val Lys Val Pro Val Leu Met Ser Ile Gly Leu Ile Asp Lys Val Thr
260 265 270

Pro Pro Ser Thr Val Phe Ala Ala Tyr Asn His Leu Glu Thr Lys Lys
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Glu Leu Lys Val Tyr Arg Tyr Phe Gly His Glu Tyr Ile Pro Ala Phe
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Gln Thr Glu Lys Leu Ala Phe Phe Lys Gln His Leu Lys Gly
305 310 315

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<213> Bacillus subtilis
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Met Gln Leu Phe Asp Leu Pro Leu Asp Gln Leu Gln Thr Tyr Lys Pro
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Glu Lys Thr Thr Pro Asn Asp Phe Ser Glu Phe Trp Lys Ser Ser Leu
20 25 30

Asp Glu Leu Ala Lys Val Lys Ala Ala Pro Asp Leu Gln Leu Val Asp
35 40 45

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

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

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

Gly Glu Ile His Glu Met Val Asn Trp Ala Leu His Gly Tyr Ala Ala
100 105 110

Phe Gly Met Leu Val Arg Gly Gln Gln Ser Ser Glu Asp Thr Ser Ile
115 120 125

Ser Pro His Gly His Ala Leu Gly Trp Met Thr Lys Gly Ile Leu Asp
130 135 140

Lys Asp Thr Tyr Tyr Tyr Arg Gly Val Tyr Leu Asp Ala Val Arg Ala
145 150 155 160

Leu Glu Val Ile Ser Ser Phe Asp Glu Val Asp Glu Thr Arg Ile Gly
165 170 175

Val Thr Gly Gly Ser Gln Gly Gly Gly Leu Thr Ile Ala Ala Ala Ala
180 185 190

Leu Ser Asp Ile Pro Lys Ala Ala Val Ala Asp Tyr Pro Tyr Leu Ser
195 200 205

Asn Phe Glu Arg Ala Ile Asp Val Ala Leu Glu Gln Pro Tyr Leu Glu
210 215 220

Ile Asn Ser Phe Phe Arg Arg Asn Gly Ser Pro Glu Thr Glu Glu Lys
225 230 235 240

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

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Val Lys Val Pro Val Leu Met Ser Ile Gly Leu Ile Asp Lys Val Thr
260 265 270

Pro Pro Ser Thr Val Phe Ala Ala Tyr Asn His Leu Glu Thr Glu Lys
275 280 285

Glu Leu Lys Val Tyr Arg Tyr Phe Gly His Glu Tyr Ile Pro Ala Phe
290 295 300

Gln Thr Glu Lys Leu Ala Phe Phe Lys Gln His Leu Lys Gly
305 310 315

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<211> 318
<212> PRT
<213> Bacillus licheniformis

<400> 7

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Leu Glu Glu Leu Ala Asn Glu Lys Ala Gly Pro Gln Leu Glu Pro His
35 40 45

Glu Tyr Pro Ala Asp Gly Val Lys Val Tyr Trp Leu Thr Tyr Arg Ser
50 55 60

Ile Gly Gly Ala Arg Ile Lys Gly Trp Tyr Ala Val Pro Asp Arg Gln
65 70 75 80

Gly Pro His Pro Ala Ile Val Lys Tyr His Gly Tyr Asn Ala Ser Tyr
85 90 95

Asp Gly Asp Ile His Asp Ile Val Asn Trp Ala Leu His Gly Tyr Ala
100 105 110

Ala Phe Gly Met Leu Val Arg Gly Gln Asn Ser Ser Glu Asp Thr Glu
115 120 125

Ile Ser His His Gly His Val Pro Gly Trp Met Thr Lys Gly Ile Leu
130 135 140

Asp Pro Lys Thr Tyr Tyr Arg Gly Val Tyr Leu Asp Ala Val Arg
145 150 155 160

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Ala Val Glu Val Val Ser Gly Phe Ala Glu Val Asp Glu Lys Arg Ile
165 170 175

Gly Val Ile Gly Ala Ser Gln Gly Gly Gly Leu Ala Val Ala Val Ser
180 185 190

Ala Leu Ser Asp Ile Pro Lys Ala Ala Val Ser Glu Tyr Pro Tyr Leu
195 200 205

Ser Asn Phe Gln Arg Ala Ile Asp Thr Ala Ile Asp Gln Pro Tyr Leu
210 215 220

Glu Ile Asn Ser Phe Phe Arg Arg Asn Thr Ser Pro Asp Ile Glu Gln
225 230 235 240

Ala Ala Met His Thr Leu Ser Tyr Phe Asp Val Met Asn Leu Ala Gln
245 250 255

Leu Val Lys Ala Thr Val Leu Met Ser Ile Gly Leu Val Asp Thr Ile
260 265 270

Thr Pro Pro Ser Thr Val Phe Ala Ala Tyr Asn His Leu Glu Thr Asp
275 280 285

Lys Glu Ile Lys Val Tyr Arg Tyr Phe Gly His Glu Tyr Ile Pro Pro
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Phe Gln Thr Glu Lys Leu Ala Phe Leu Arg Lys His Leu Lys
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<211> 320

<212> PRT

<213> Bacillus pumilus

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Glu Glu Leu Arg Gln Val Glu Ala Glu Pro Thr Leu Glu Ser Tyr Asp
35 40 45

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

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Gly His Ser Lys Ile Glu Gly Phe Tyr Ala Val Pro Asp Gln Thr Gly
65 70 75 80

Pro His Pro Ala Leu Val Arg Phe His Gly Tyr Asn Ala Ser Tyr Asp
85 90 95

Gly Gly Ile His Asp Ile Val Asn Trp Ala Leu His Gly Tyr Ala Thr
100 105 110

Phe Gly Met Leu Val Arg Gly Gln Gly Gly Ser Glu Asp Thr Ser Val
115 120 125

Thr Pro Gly Gly His Ala Leu Gly Trp Met Thr Lys Gly Ile Leu Ser
130 135 140

Lys Asp Thr Tyr Tyr Tyr Arg Gly Val Tyr Leu Asp Ala Val Arg Ala
145 150 155 160

Leu Glu Val Ile Gln Ser Phe Pro Glu Val Asp Glu His Arg Ile Gly
165 170 175

Val Ile Gly Gly Ser Gln Gly Gly Ala Leu Ala Ile Ala Ala Ala Ala
180 185 190

Leu Ser Asp Ile Pro Lys Val Val Val Ala Asp Tyr Pro Tyr Leu Ser
195 200 205

Asn Phe Glu Arg Ala Val Asp Val Ala Leu Glu Gln Pro Tyr Leu Glu
210 215 220

Ile Asn Ser Tyr Phe Arg Arg Asn Ser Asp Pro Lys Val Glu Glu Lys
225 230 235 240

Ala Phe Glu Thr Leu Ser Tyr Phe Asp Leu Ile Asn Leu Ala Gly Trp
245 250 255

Val Lys Gln Pro Thr Leu Met Ala Ile Gly Leu Ile Asp Lys Ile Thr
260 265 270

Pro Pro Ser Thr Val Phe Ala Ala Tyr Asn His Leu Glu Thr Asp Lys
275 280 285

Asp Leu Lys Val Tyr Arg Tyr Phe Gly His Glu Phe Ile Pro Ala Phe
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Gln Thr Glu Lys Leu Ser Phe Leu Gln Lys His Leu Leu Leu Ser Thr
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310

320

<210> 9
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<212> PRT
<213> Clostridium thermocellum

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

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

Phe Lys Gly Ala Asn Ile Glu Gly Trp Leu Ala Val Pro Glu Gly Glu
65 70 75 80

Gly Leu Tyr Pro Gly Leu Val Gln Phe His Gly Tyr Asn Trp Ala Met
85 90 95

Asp Gly Cys Val Pro Asp Val Val Asn Trp Ala Leu Asn Gly Tyr Ala
100 105 110

Ala Phe Leu Met Leu Val Arg Gly Gln Gln Gly Arg Ser Val Asp Asn
115 120 125

Ile Val Pro Gly Ser Gly His Ala Leu Gly Trp Met Ser Lys Gly Ile
130 135 140

Leu Ser Pro Glu Glu Tyr Tyr Tyr Arg Gly Val Tyr Met Asp Ala Val
145 150 155 160

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

Ile Gly Val Thr Gly Gly Ser Gln Gly Gly Gly Leu Ala Leu Ala Val
180 185 190

Ala Ala Leu Ser Gly Ile Pro Lys Val Ala Ala Val His Tyr Pro Phe
195 200 205

Leu Ala His Phe Glu Arg Ala Ile Asp Val Ala Pro Asp Gly Pro Tyr
Page 13

210

215

Leu Glu Ile Asn Glu Tyr Leu Arg Arg Asn Ser Gly Glu Glu Ile Glu
225 230 235 240

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

Pro Arg Ile Lys Cys Arg Thr Trp Ile Cys Thr Gly Leu Val Asp Glu
260 265 270

Ile Thr Pro Pro Ser Thr Val Phe Ala Val Tyr Asn His Leu Lys Cys
275 280 285

Pro Lys Glu Ile Ser Val Phe Arg Tyr Phe Gly His Glu His Met Pro
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Gly Ser Val Glu Ile Lys Leu Arg Ile Leu Met Asp Glu Leu Asn Pro
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<210> 10
<211> 325
<212> PRT
<213> Thermotoga neapolitana

<400> 10

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

Phe His Leu Lys Thr Val Glu Thr Tyr Asp Val Thr Phe Ser Gly Tyr
50 55 60

Arg Gly Gln Arg Ile Lys Gly Trp Leu Leu Val Pro Lys Leu Ala Glu
65 70 75 80

Glu Lys Leu Pro Cys Val Val Gln Tyr Ile Gly Tyr Asn Gly Gly Arg
85 90 95

Gly Phe Pro His Asp Trp Leu Phe Trp Pro Ser Met Gly Tyr Ile Cys
100 105 110

Phe Val Met Asp Thr Arg Gly Gln Gly Ser Gly Trp Met Lys Gly Asp
Page 14

115 120 9434-00-WO-OC_ST25_DD 125

Thr Pro Asp Tyr Pro Glu Gly Pro Val Asp Pro Gln Tyr Pro Gly Phe
130 135 140

Met Thr Arg Gly Ile Leu Asp Pro Gly Thr Tyr Tyr Tyr Arg Arg Val
145 150 155 160

Phe Val Asp Ala Val Arg Ala Val Glu Ala Ala Ile Ser Phe Pro Arg
165 170 175

Val Asp Ser Arg Lys Val Val Val Ala Gly Gly Ser Gln Gly Gly Gly
180 185 190

Ile Ala Leu Ala Val Ser Ala Leu Ser Asn Arg Val Lys Ala Leu Leu
195 200 205

Cys Asp Val Pro Phe Leu Cys His Phe Arg Arg Ala Val Gln Leu Val
210 215 220

Asp Thr His Pro Tyr Val Glu Ile Thr Asn Phe Leu Lys Thr His Arg
225 230 235 240

Asp Lys Glu Glu Ile Val Phe Arg Thr Leu Ser Tyr Phe Asp Gly Val
245 250 255

Asn Phe Ala Ala Arg Ala Lys Val Pro Ala Leu Phe Ser Val Gly Leu
260 265 270

Met Asp Thr Ile Cys Pro Pro Ser Thr Val Phe Ala Ala Tyr Asn His
275 280 285

Tyr Ala Gly Pro Lys Glu Ile Arg Ile Tyr Pro Tyr Asn Asn His Glu
290 295 300

Gly Gly Gly Ser Phe Gln Ala Ile Glu Gln Val Lys Phe Leu Lys Arg
305 310 315 320

Leu Phe Glu Glu Gly
325

<210> 11
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<212> PRT
<213> Thermotoga maritima

<400> 11

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Page 15

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Ala Glu Ser Glu Lys Phe Pro Leu Asp Pro Val Phe Glu Arg Met Glu
35 40 45

Ser His Leu Lys Thr Val Glu Ala Tyr Asp Val Thr Phe Ser Gly Tyr
50 55 60

Arg Gly Gln Arg Ile Lys Gly Trp Leu Leu Val Pro Lys Leu Glu Glu
65 70 75 80

Glu Lys Leu Pro Cys Val Val Gln Tyr Ile Gly Tyr Asn Gly Gly Arg
85 90 95

Gly Phe Pro His Asp Trp Leu Phe Trp Pro Ser Met Gly Tyr Ile Cys
100 105 110

Phe Val Met Asp Thr Arg Gly Gln Gly Ser Gly Trp Leu Lys Gly Asp
115 120 125

Thr Pro Asp Tyr Pro Glu Gly Pro Val Asp Pro Gln Tyr Pro Gly Phe
130 135 140

Met Thr Arg Gly Ile Leu Asp Pro Arg Thr Tyr Tyr Tyr Arg Arg Val
145 150 155 160

Phe Thr Asp Ala Val Arg Ala Val Glu Ala Ala Ala Ser Phe Pro Gln
165 170 175

Val Asp Gln Glu Arg Ile Val Ile Ala Gly Gly Ser Gln Gly Gly Gly
180 185 190

Ile Ala Leu Ala Val Ser Ala Leu Ser Lys Lys Ala Lys Ala Leu Leu
195 200 205

Cys Asp Val Pro Phe Leu Cys His Phe Arg Arg Ala Val Gln Leu Val
210 215 220

Asp Thr His Pro Tyr Ala Glu Ile Thr Asn Phe Leu Lys Thr His Arg
225 230 235 240

Asp Lys Glu Glu Ile Val Phe Arg Thr Leu Ser Tyr Phe Asp Gly Val
245 250 255

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Asn Phe Ala Ala Arg Ala Lys Ile Pro Ala Leu Phe Ser Val Gly Leu
260 265 270

Met Asp Asn Ile Cys Pro Pro Ser Thr Val Phe Ala Ala Tyr Asn Tyr
275 280 285

Tyr Ala Gly Pro Lys Glu Ile Arg Ile Tyr Pro Tyr Asn Asn His Glu
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Gly Gly Gly Ser Phe Gln Ala Val Glu Gln Val Lys Phe Leu Lys Lys
305 310 315 320

Leu Phe Glu Lys Gly
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<210> 12

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<212> PRT

<213> Thermoanaerobacterium sp.

<400> 12

Met Gly Leu Phe Asp Met Pro Leu Gln Lys Leu Arg Glu Tyr Thr Gly
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Asp Glu Met Arg Ser Val Asp Pro Lys Ile Glu Leu Lys Glu Ser Ser
35 40 45

Phe Gln Val Ser Phe Ala Glu Cys Tyr Asp Leu Tyr Phe Thr Gly Val
50 55 60

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

Lys His Pro Ala Leu Ile Arg Phe His Gly Tyr Ser Ser Asn Ser Gly
85 90 95

Asp Trp Asn Asp Lys Leu Asn Tyr Val Ala Ala Gly Phe Thr Val Val
100 105 110

Ala Met Asp Val Arg Gly Gln Gly Gly Gln Ser Gln Asp Val Gly Gly
115 120 125

Val Thr Gly Asn Thr Leu Asn Gly His Ile Ile Arg Gly Leu Asp Asp
130 135 140

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Asp Ala Asp Asn Met Leu Phe Arg His Ile Phe Leu Asp Thr Ala Gln
145 150 155 160

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

Gly Val Met Gly Pro Ser Gln Gly Gly Gly Leu Ser Leu Ala Cys Ala
180 185 190

Ala Leu Glu Pro Arg Val Arg Lys Val Val Ser Glu Tyr Pro Phe Leu
195 200 205

Ser Asp Tyr Lys Arg Val Trp Asp Leu Asp Leu Ala Lys Asn Ala Tyr
210 215 220

Gln Glu Ile Thr Asp Tyr Phe Arg Leu Phe Asp Pro Arg His Glu Arg
225 230 235 240

Glu Asn Glu Val Phe Thr Lys Leu Gly Tyr Ile Asp Val Lys Asn Leu
245 250 255

Ala Lys Arg Ile Lys Gly Asp Val Leu Met Cys Val Gly Leu Met Asp
260 265 270

Gln Val Cys Pro Pro Ser Thr Val Phe Ala Ala Tyr Asn Asn Ile Gln
275 280 285

Ser Lys Lys Asp Ile Lys Val Tyr Pro Asp Tyr Gly His Glu Pro Met
290 295 300

Arg Gly Phe Gly Asp Leu Ala Met Gln Phe Met Leu Glu Leu Tyr Ser
305 310 315 320

<210> 13

<211> 319

<212> PRT

<213> Bacillus halodurans

<400> 13

Met Pro Leu Ile Asp Met Pro Leu Thr Glu Leu Lys Glu Tyr Met Gly
1 5 10 15

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

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

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Phe Gln Thr Thr Tyr Ala Glu Cys Phe His Leu Tyr Phe Thr Gly Val
50 55 60

Arg Gly Ala Arg Ile His Ala Lys Tyr Val Arg Pro Arg His Thr Ser
65 70 75 80

Gly Thr His Pro Ala Val Ile His Phe His Gly Tyr Thr Met Asn Ala
85 90 95

Gly Glu Trp Thr Gly Leu Leu His Tyr Ala Ala Leu Gly Tyr Ser Val
100 105 110

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

Gly Val Lys Gly Asn Thr His Ser Gly His Ile Ile Arg Gly Leu Asp
130 135 140

Asp Asn Ala Asp Gln Leu Leu Phe Arg His Val Phe Leu Asp Thr Ala
145 150 155 160

Gln Leu Ala Asn Ile Val Met Asn Leu Pro Glu Val Asp Glu Glu Arg
165 170 175

Val Ala Val Thr Gly Trp Ser Gln Gly Gly Ala Leu Ala Ile Ala Cys
180 185 190

Ala Ala Leu Glu Pro Lys Ile Lys Lys Val Ala Pro Val Tyr Pro Phe
195 200 205

Leu Ser Asp Tyr Gln Arg Val Trp Glu Met Asp Leu Ala Glu Lys Ala
210 215 220

Tyr Asp Glu Leu Gln Thr Tyr Phe Arg Arg Phe Asp Pro Gln His Arg
225 230 235 240

Arg Glu Ala Glu Ile Phe Thr Lys Leu Gly Tyr Ile Asp Ile Gln His
245 250 255

Leu Ala Pro Leu Val Lys Gly Glu Val Leu Leu Ala Val Gly Leu Met
260 265 270

Asp Thr Val Cys Pro Pro Ser Thr Gln Phe Ala Met Tyr Asn Lys Leu
275 280 285

Thr Thr Thr Lys Ser Ile Glu Leu Tyr Pro Asp Phe Ala His Glu Asp
290 295 300

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Leu Pro Gly His Arg Asp Arg Ile Phe Gln Phe Leu Ser Asp Leu
305 310 315

<210> 14
<211> 317
<212> PRT
<213> Bacillus clausii
<400> 14

Met Pro Leu Val Asp Met Pro Leu Arg Glu Leu Leu Ala Tyr Glu Gly
1 5 10 15

Ile Asn Pro Lys Pro Ala Asp Phe Asp Gln Tyr Trp Asn Arg Ala Lys
20 25 30

Thr Glu Ile Glu Ala Ile Asp Pro Glu Val Thr Leu Val Glu Ser Ser
35 40 45

Phe Gln Cys Ser Phe Ala Asn Cys Tyr His Phe Tyr Tyr Arg Ser Ala
50 55 60

Gly Asn Ala Lys Ile His Ala Lys Tyr Val Gln Pro Lys Ala Gly Glu
65 70 75 80

Lys Thr Pro Ala Val Phe Met Phe His Gly Tyr Gly Gly Arg Ser Ala
85 90 95

Glu Trp Ser Ser Leu Leu Asn Tyr Val Ala Ala Gly Phe Ser Val Phe
100 105 110

Tyr Met Asp Val Arg Gly Gln Gly Gly Thr Ser Glu Asp Pro Gly Gly
115 120 125

Val Arg Gly Asn Thr Tyr Arg Gly His Ile Ile Arg Gly Leu Asp Ala
130 135 140

Gly Pro Asp Ala Leu Phe Tyr Arg Ser Val Phe Leu Asp Thr Val Gln
145 150 155 160

Leu Val Arg Ala Ala Lys Thr Leu Pro His Ile Asp Lys Thr Arg Leu
165 170 175

Met Ala Thr Gly Trp Ser Gln Gly Gly Ala Leu Thr Leu Ala Cys Ala
180 185 190

Ala Leu Val Pro Glu Ile Lys Arg Leu Ala Pro Val Tyr Pro Phe Leu
195 200 205

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Ser Asp Tyr Lys Arg Val Trp Gln Met Asp Leu Ala Val Arg Ser Tyr
210 215 220

Lys Glu Leu Ala Asp Tyr Phe Arg Ser Tyr Asp Pro Gln His Lys Arg
225 230 235 240

His Gly Glu Ile Phe Glu Arg Leu Gly Tyr Ile Asp Val Gln His Leu
245 250 255

Ala Asp Arg Ile Gln Gly Asp Val Leu Met Gly Val Gly Leu Met Asp
260 265 270

Thr Glu Cys Pro Pro Ser Thr Gln Phe Ala Ala Tyr Asn Lys Ile Lys
275 280 285

Ala Lys Lys Ser Tyr Glu Leu Tyr Pro Asp Phe Gly His Glu His Leu
290 295 300

Pro Gly Met Asn Asp His Ile Phe Arg Phe Phe Thr Ser
305 310 315

<210> 15
<211> 325
<212> PRT
<213> Thermotoga neapolitana

<220>
<221> MISC_FEATURE
<222> (277)..(277)
<223> Xaa is Ala, Val, Ser, or Thr.

<400> 15

Met Ala Phe Phe Asp Met Pro Leu Glu Glu Leu Lys Lys Tyr Arg Pro
1 5 10 15

Glu Arg Tyr Glu Glu Lys Asp Phe Asp Glu Phe Trp Arg Glu Thr Leu
20 25 30

Lys Glu Ser Glu Gly Phe Pro Leu Asp Pro Val Phe Glu Lys Val Asp
35 40 45

Phe His Leu Lys Thr Val Glu Thr Tyr Asp Val Thr Phe Ser Gly Tyr
50 55 60

Arg Gly Gln Arg Ile Lys Gly Trp Leu Leu Val Pro Lys Leu Ala Glu
65 70 75 80

Glu Lys Leu Pro Cys Val Val Gln Tyr Ile Gly Tyr Asn Gly Gly Arg
Page 21

Gly Phe Pro His Asp Trp Leu Phe Trp Pro Ser Met Gly Tyr Ile Cys
100 105 110

Phe Val Met Asp Thr Arg Gly Gln Gly Ser Gly Trp Met Lys Gly Asp
115 120 125

Thr Pro Asp Tyr Pro Glu Gly Pro Val Asp Pro Gln Tyr Pro Gly Phe
130 135 140

Met Thr Arg Gly Ile Leu Asp Pro Gly Thr Tyr Tyr Tyr Arg Arg Val
145 150 155 160

Phe Val Asp Ala Val Arg Ala Val Glu Ala Ala Ile Ser Phe Pro Arg
165 170 175

Val Asp Ser Arg Lys Val Val Val Ala Gly Gly Ser Gln Gly Gly Gly
180 185 190

Ile Ala Leu Ala Val Ser Ala Leu Ser Asn Arg Val Lys Ala Leu Leu
195 200 205

Cys Asp Val Pro Phe Leu Cys His Phe Arg Arg Ala Val Gln Leu Val
210 215 220

Asp Thr His Pro Tyr Val Glu Ile Thr Asn Phe Leu Lys Thr His Arg
225 230 235 240

Asp Lys Glu Glu Ile Val Phe Arg Thr Leu Ser Tyr Phe Asp Gly Val
245 250 255

Asn Phe Ala Ala Arg Ala Lys Val Pro Ala Leu Phe Ser Val Gly Leu
260 265 270

Met Asp Thr Ile Xaa Pro Pro Ser Thr Val Phe Ala Ala Tyr Asn His
275 280 285

Tyr Ala Gly Pro Lys Glu Ile Arg Ile Tyr Pro Tyr Asn Asn His Glu
290 295 300

Gly Gly Gly Ser Phe Gln Ala Ile Glu Gln Val Lys Phe Leu Lys Arg
305 310 315 320

Leu Phe Glu Glu Gly
325

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<210> 16
<211> 325
<212> PRT
<213> Thermotoga maritima

<220>
<221> MISC_FEATURE
<222> (277)..(277)
<223> Xaa is Ala, Val, Ser, or Thr.

<400> 16

Met Ala Phe Phe Asp Leu Pro Leu Glu Glu Leu Lys Lys Tyr Arg Pro
1 5 10 15

Glu Arg Tyr Glu Glu Lys Asp Phe Asp Glu Phe Trp Glu Glu Thr Leu
20 25 30

Ala Glu Ser Glu Lys Phe Pro Leu Asp Pro Val Phe Glu Arg Met Glu
35 40 45

Ser His Leu Lys Thr Val Glu Ala Tyr Asp Val Thr Phe Ser Gly Tyr
50 55 60

Arg Gly Gln Arg Ile Lys Gly Trp Leu Leu Val Pro Lys Leu Glu Glu
65 70 75 80

Glu Lys Leu Pro Cys Val Val Gln Tyr Ile Gly Tyr Asn Gly Gly Arg
85 90 95

Gly Phe Pro His Asp Trp Leu Phe Trp Pro Ser Met Gly Tyr Ile Cys
100 105 110

Phe Val Met Asp Thr Arg Gly Gln Gly Ser Gly Trp Leu Lys Gly Asp
115 120 125

Thr Pro Asp Tyr Pro Glu Gly Pro Val Asp Pro Gln Tyr Pro Gly Phe
130 135 140

Met Thr Arg Gly Ile Leu Asp Pro Arg Thr Tyr Tyr Tyr Arg Arg Val
145 150 155 160

Phe Thr Asp Ala Val Arg Ala Val Glu Ala Ala Ala Ser Phe Pro Gln
165 170 175

Val Asp Gln Glu Arg Ile Val Ile Ala Gly Gly Ser Gln Gly Gly Gly
180 185 190

Ile Ala Leu Ala Val Ser Ala Leu Ser Lys Lys Ala Lys Ala Leu Leu
195 200 205

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Cys Asp Val Pro Phe Leu Cys His Phe Arg Arg Ala Val Gln Leu Val
210 215 220

Asp Thr His Pro Tyr Ala Glu Ile Thr Asn Phe Leu Lys Thr His Arg
225 230 235 240

Asp Lys Glu Glu Ile Val Phe Arg Thr Leu Ser Tyr Phe Asp Gly Val
245 250 255

Asn Phe Ala Ala Arg Ala Lys Ile Pro Ala Leu Phe Ser Val Gly Leu
260 265 270

Met Asp Asn Ile Xaa Pro Pro Ser Thr Val Phe Ala Ala Tyr Asn Tyr
275 280 285

Tyr Ala Gly Pro Lys Glu Ile Arg Ile Tyr Pro Tyr Asn Asn His Glu
290 295 300

Gly Gly Gly Ser Phe Gln Ala Val Glu Gln Val Lys Phe Leu Lys Lys
305 310 315 320

Leu Phe Glu Lys Gly
325

<210> 17
<211> 326
<212> PRT
<213> Thermotoga lettingae

<220>
<221> MISC_FEATURE
<222> (277)..(277)
<223> Xaa is Ala, Val, Ser, or Thr.

<400> 17

Met Val Tyr Phe Asp Met Pro Leu Glu Asp Leu Arg Lys Tyr Leu Pro
1 5 10 15

Gln Arg Tyr Glu Glu Lys Asp Phe Asp Asp Phe Trp Lys Gln Thr Ile
20 25 30

His Glu Thr Arg Gly Tyr Phe Gln Glu Pro Ile Leu Lys Lys Val Asp
35 40 45

Phe Tyr Leu Gln Asn Val Glu Thr Phe Asp Val Thr Phe Ser Gly Tyr
50 55 60

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Arg Gly Gln Lys Ile Lys Gly Trp Leu Ile Leu Pro Lys Phe Arg Asn
65 70 75 80

Gly Lys Leu Pro Cys Val Val Glu Phe Val Gly Tyr Gly Gly Gly Arg
85 90 95

Gly Phe Pro Tyr Asp Trp Leu Leu Trp Ser Ala Ala Gly Tyr Ala His
100 105 110

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

Thr Pro Asp Tyr Glu Asp Asn Pro Ser Asp Pro Gln Tyr Pro Gly Phe
130 135 140

Leu Thr Lys Gly Val Leu Asn Pro Glu Thr Tyr Tyr Tyr Arg Arg Val
145 150 155 160

Phe Met Asp Ala Phe Met Ala Val Glu Thr Ile Ser Gln Leu Glu Gln
165 170 175

Ile Asp Ser Gln Thr Ile Ile Leu Ser Gly Ala Ser Gln Gly Gly Gly
180 185 190

Ile Ala Leu Ala Val Ser Ala Leu Ser Ser Lys Val Met Ala Leu Leu
195 200 205

Cys Asp Val Pro Phe Leu Cys His Tyr Lys Arg Ala Val Gln Ile Thr
210 215 220

Asp Ser Met Pro Tyr Ala Glu Ile Thr Arg Tyr Cys Lys Thr His Ile
225 230 235 240

Asp Lys Ile Gln Thr Val Phe Arg Thr Leu Ser Tyr Phe Asp Gly Val
245 250 255

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

Met Asp Asp Ile Xaa Pro Pro Ser Thr Val Phe Ala Ala Tyr Asn Tyr
275 280 285

Tyr Ala Gly Glu Lys Asp Ile Arg Ile Tyr Pro Tyr Asn Asn His Glu
290 295 300

Gly Gly Gly Ser Phe His Thr Leu Glu Lys Leu Lys Phe Val Lys Lys
305 310 315 320

Thr Ile Ser Met Arg Glu
325

<210> 18
<211> 325
<212> PRT
<213> Thermotoga petrophilia

<220>
<221> MISC_FEATURE
<222> (277)..(277)
<223> Xaa is Ala, Val, Ser, or Thr.

<400> 18

Met Ala Phe Phe Asp Leu Pro Leu Glu Glu Leu Lys Lys Tyr Arg Pro
1 5 10 15

Glu Arg Tyr Glu Glu Lys Asp Phe Asp Glu Phe Trp Glu Gly Thr Leu
20 25 30

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

Ser His Leu Lys Thr Val Glu Ala Tyr Asp Val Thr Phe Ser Gly Tyr
50 55 60

Met Gly Gln Arg Ile Lys Gly Trp Leu Leu Val Pro Lys Leu Glu Glu
65 70 75 80

Glu Lys Leu Pro Cys Val Val Gln Tyr Ile Gly Tyr Asn Gly Gly Arg
85 90 95

Gly Phe Pro His Asp Trp Leu Phe Trp Pro Ser Met Gly Tyr Ile Cys
100 105 110

Phe Val Met Asp Thr Arg Gly Gln Gly Ser Gly Trp Met Lys Gly Asp
115 120 125

Thr Pro Asp Tyr Pro Glu Asp Pro Val Asp Pro Gln Tyr Pro Gly Phe
130 135 140

Met Thr Arg Gly Ile Leu Asp Pro Arg Thr Tyr Tyr Tyr Arg Arg Val
145 150 155 160

Phe Thr Asp Ala Val Arg Ala Val Glu Ala Ala Ala Ser Phe Pro Arg
165 170 175

Val Asp His Glu Arg Ile Val Ile Ala Gly Gly Ser Gln Gly Gly Gly
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180 9434-00-WO-OC_ST25_DD 185 190

Ile Ala Leu Ala Val Ser Ala Leu Ser Lys Lys Ala Lys Ala Leu Leu
195 200 205

Cys Asp Val Pro Phe Leu Cys His Phe Arg Arg Ala Val Gln Leu Val
210 215 220

Asp Thr His Pro Tyr Ala Glu Ile Thr Asn Phe Leu Lys Thr His Arg
225 230 235 240

Asp Lys Glu Glu Ile Val Phe Arg Thr Leu Ser Tyr Phe Asp Gly Val
245 250 255

Asn Phe Ala Val Arg Ala Lys Ile Pro Ala Leu Phe Ser Val Gly Leu
260 265 270

Met Asp Asn Ile Xaa Pro Pro Ser Thr Val Phe Ala Ala Tyr Asn His
275 280 285

Tyr Ala Gly Pro Lys Glu Ile Arg Ile Tyr Pro Tyr Asn Asn His Glu
290 295 300

Gly Gly Gly Ser Phe Gln Ala Ile Glu Gln Val Lys Phe Leu Lys Arg
305 310 315 320

Leu Phe Glu Lys Gly
325

<210> 19
<211> 325
<212> PRT
<213> Thermotoga sp. RQ2a

<220>
<221> MISC_FEATURE
<222> (277)..(277)
<223> Xaa is Ala, Val, Ser, or Thr.

<400> 19

Met Ala Phe Phe Asp Leu Pro Leu Glu Glu Leu Lys Lys Tyr Arg Pro
1 5 10 15

Glu Arg Tyr Glu Glu Lys Asp Phe Asp Glu Phe Trp Lys Glu Thr Leu
20 25 30

Ala Glu Ser Glu Lys Phe Pro Leu Asp Pro Val Phe Glu Arg Met Glu
35 40 45

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Ser His Leu Lys Thr Val Glu Val Tyr Asp Val Thr Phe Ser Gly Tyr
50 55 60

Arg Gly Gln Arg Ile Lys Gly Trp Leu Leu Val Pro Lys Leu Glu Glu
65 70 75 80

Glu Lys Leu Pro Cys Val Val Gln Tyr Ile Gly Tyr Asn Gly Gly Arg
85 90 95

Gly Phe Pro His Asp Trp Leu Phe Trp Pro Ser Met Gly Tyr Ile Cys
100 105 110

Phe Val Met Asp Thr Arg Gly Gln Gly Ser Gly Trp Leu Lys Gly Asp
115 120 125

Thr Pro Asp Tyr Pro Glu Asp Pro Val Asp Pro Gln Tyr Pro Gly Phe
130 135 140

Met Thr Arg Gly Ile Leu Asp Pro Arg Thr Tyr Tyr Tyr Arg Arg Val
145 150 155 160

Phe Thr Asp Ala Val Arg Ala Val Glu Ala Ala Ala Ser Phe Pro Arg
165 170 175

Val Asp His Glu Arg Ile Val Ile Ala Gly Gly Ser Gln Gly Gly Gly
180 185 190

Ile Ala Leu Ala Val Ser Ala Leu Ser Lys Lys Ala Lys Ala Leu Leu
195 200 205

Cys Asp Val Pro Phe Leu Cys His Phe Arg Arg Ala Val Gln Leu Val
210 215 220

Asp Thr His Pro Tyr Ala Glu Ile Thr Asn Phe Leu Lys Thr His Arg
225 230 235 240

Asp Lys Glu Glu Ile Val Phe Arg Thr Leu Ser Tyr Phe Asp Gly Val
245 250 255

Asn Phe Ala Val Arg Ala Lys Ile Pro Ala Leu Phe Ser Val Gly Leu
260 265 270

Met Asp Asn Ile Xaa Pro Pro Ser Thr Val Phe Ala Ala Tyr Asn His
275 280 285

Tyr Ala Gly Pro Lys Glu Ile Arg Ile Tyr Pro Tyr Asn Asn His Glu
290 295 300

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Gly Gly Gly Ser Phe Gln Ala Ile Glu Gln Val Lys Phe Leu Lys Arg
305 310 315 320

Leu Phe Glu Lys Gly
325

<210> 20
<211> 329
<212> PRT
<213> Thermotoga sp. RQ2b

<220>
<221> MISC_FEATURE
<222> (278)..(278)
<223> Xaa is Ala, Val, Ser, or Thr.

<400> 20

Met Ala Leu Phe Asp Met Pro Leu Glu Lys Leu Arg Ser Tyr Leu Pro
1 5 10 15

Asp Arg Tyr Glu Glu Glu Asp Phe Asp Leu Phe Trp Lys Glu Thr Leu
20 25 30

Glu Glu Ser Arg Lys Phe Pro Leu Asp Pro Ile Phe Glu Arg Val Asp
35 40 45

Tyr Leu Leu Glu Asn Val Glu Val Tyr Asp Val Thr Phe Ser Gly Tyr
50 55 60

Arg Gly Gln Arg Ile Lys Ala Trp Leu Ile Leu Pro Val Val Lys Lys
65 70 75 80

Glu Glu Arg Leu Pro Cys Ile Val Glu Phe Ile Gly Tyr Arg Gly Gly
85 90 95

Arg Gly Phe Pro Phe Asp Trp Leu Phe Trp Ser Ser Ala Gly Tyr Ala
100 105 110

His Phe Val Met Asp Thr Arg Gly Gln Gly Thr Ser Arg Val Lys Gly
115 120 125

Asp Thr Pro Asp Tyr Cys Asp Glu Pro Ile Asn Pro Gln Phe Pro Gly
130 135 140

Phe Met Thr Arg Gly Ile Leu Asp Pro Arg Thr Tyr Tyr Tyr Arg Arg
145 150 155 160

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Val Phe Thr Asp Ala Val Arg Ala Val Glu Thr Ala Ser Ser Phe Pro
165 170 175

Gly Ile Asp Pro Glu Arg Ile Ala Val Val Gly Thr Ser Gln Gly Gly
180 185 190

Gly Ile Ala Leu Ala Val Ala Ala Leu Ser Glu Ile Pro Lys Ala Leu
195 200 205

Val Ser Asn Val Pro Phe Leu Cys His Phe Arg Arg Ala Val Gln Ile
210 215 220

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

Arg Asp Lys Glu Glu Ile Val Phe Arg Thr Leu Ser Tyr Phe Asp Gly
245 250 255

Val Asn Phe Ala Ala Arg Ala Lys Ile Pro Ala Leu Phe Ser Val Ala
260 265 270

Leu Met Asp Lys Thr Xaa Pro Pro Ser Thr Val Phe Ala Ala Tyr Asn
275 280 285

His Tyr Ala Gly Pro Lys Glu Ile Lys Val Tyr Pro Phe Asn Glu His
290 295 300

Glu Gly Gly Glu Ser Phe Gln Arg Met Glu Glu Leu Arg Phe Met Lys
305 310 315 320

Arg Ile Leu Lys Gly Glu Phe Lys Ala
325

<210> 21

<211> 326

<212> PRT

<213> Thermotoga lettingae

<400> 21

Met Val Tyr Phe Asp Met Pro Leu Glu Asp Leu Arg Lys Tyr Leu Pro
1 5 10 15

Gln Arg Tyr Glu Glu Lys Asp Phe Asp Asp Phe Trp Lys Gln Thr Ile
20 25 30

His Glu Thr Arg Gly Tyr Phe Gln Glu Pro Ile Leu Lys Lys Val Asp
35 40 45

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Phe Tyr Leu Gln Asn Val Glu Thr Phe Asp Val Thr Phe Ser Gly Tyr
50 55 60

Arg Gly Gln Lys Ile Lys Gly Trp Leu Ile Leu Pro Lys Phe Arg Asn
65 70 75 80

Gly Lys Leu Pro Cys Val Val Glu Phe Val Gly Tyr Gly Gly Gly Arg
85 90 95

Gly Phe Pro Tyr Asp Trp Leu Leu Trp Ser Ala Ala Gly Tyr Ala His
100 105 110

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

Thr Pro Asp Tyr Glu Asp Asn Pro Ser Asp Pro Gln Tyr Pro Gly Phe
130 135 140

Leu Thr Lys Gly Val Leu Asn Pro Glu Thr Tyr Tyr Tyr Arg Arg Val
145 150 155 160

Phe Met Asp Ala Phe Met Ala Val Glu Thr Ile Ser Gln Leu Glu Gln
165 170 175

Ile Asp Ser Gln Thr Ile Ile Leu Ser Gly Ala Ser Gln Gly Gly Gly
180 185 190

Ile Ala Leu Ala Val Ser Ala Leu Ser Ser Lys Val Met Ala Leu Leu
195 200 205

Cys Asp Val Pro Phe Leu Cys His Tyr Lys Arg Ala Val Gln Ile Thr
210 215 220

Asp Ser Met Pro Tyr Ala Glu Ile Thr Arg Tyr Cys Lys Thr His Ile
225 230 235 240

Asp Lys Ile Gln Thr Val Phe Arg Thr Leu Ser Tyr Phe Asp Gly Val
245 250 255

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

Met Asp Asp Ile Cys Pro Pro Ser Thr Val Phe Ala Ala Tyr Asn Tyr
275 280 285

Tyr Ala Gly Glu Lys Asp Ile Arg Ile Tyr Pro Tyr Asn Asn His Glu
290 295 300

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Gly Gly Gly Ser Phe His Thr Leu Glu Lys Leu Lys Phe Val Lys Lys
305 310 315 320

Thr Ile Ser Met Arg Glu
325

<210> 22
<211> 325
<212> PRT
<213> Thermotoga petrophilia

<400> 22

Met Ala Phe Phe Asp Leu Pro Leu Glu Glu Leu Lys Lys Tyr Arg Pro
1 5 10 15

Glu Arg Tyr Glu Glu Lys Asp Phe Asp Glu Phe Trp Glu Gly Thr Leu
20 25 30

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

Ser His Leu Lys Thr Val Glu Ala Tyr Asp Val Thr Phe Ser Gly Tyr
50 55 60

Met Gly Gln Arg Ile Lys Gly Trp Leu Leu Val Pro Lys Leu Glu Glu
65 70 75 80

Glu Lys Leu Pro Cys Val Val Gln Tyr Ile Gly Tyr Asn Gly Gly Arg
85 90 95

Gly Phe Pro His Asp Trp Leu Phe Trp Pro Ser Met Gly Tyr Ile Cys
100 105 110

Phe Val Met Asp Thr Arg Gly Gln Gly Ser Gly Trp Met Lys Gly Asp
115 120 125

Thr Pro Asp Tyr Pro Glu Asp Pro Val Asp Pro Gln Tyr Pro Gly Phe
130 135 140

Met Thr Arg Gly Ile Leu Asp Pro Arg Thr Tyr Tyr Tyr Arg Arg Val
145 150 155 160

Phe Thr Asp Ala Val Arg Ala Val Glu Ala Ala Ala Ser Phe Pro Arg
165 170 175

Val Asp His Glu Arg Ile Val Ile Ala Gly Gly Ser Gln Gly Gly Gly
180 185 190

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Ile Ala Leu Ala Val Ser Ala Leu Ser Lys Lys Ala Lys Ala Leu Leu
195 200 205

Cys Asp Val Pro Phe Leu Cys His Phe Arg Arg Ala Val Gln Leu Val
210 215 220

Asp Thr His Pro Tyr Ala Glu Ile Thr Asn Phe Leu Lys Thr His Arg
225 230 235 240

Asp Lys Glu Glu Ile Val Phe Arg Thr Leu Ser Tyr Phe Asp Gly Val
245 250 255

Asn Phe Ala Val Arg Ala Lys Ile Pro Ala Leu Phe Ser Val Gly Leu
260 265 270

Met Asp Asn Ile Cys Pro Pro Ser Thr Val Phe Ala Ala Tyr Asn His
275 280 285

Tyr Ala Gly Pro Lys Glu Ile Arg Ile Tyr Pro Tyr Asn Asn His Glu
290 295 300

Gly Gly Gly Ser Phe Gln Ala Ile Glu Gln Val Lys Phe Leu Lys Arg
305 310 315 320

Leu Phe Glu Lys Gly
325

<210> 23
<211> 325
<212> PRT
<213> Thermotoga sp. RQ2

<400> 23

Met Ala Phe Phe Asp Leu Pro Leu Glu Glu Leu Lys Lys Tyr Arg Pro
1 5 10 15

Glu Arg Tyr Glu Glu Lys Asp Phe Asp Glu Phe Trp Lys Glu Thr Leu
20 25 30

Ala Glu Ser Glu Lys Phe Pro Leu Asp Pro Val Phe Glu Arg Met Glu
35 40 45

Ser His Leu Lys Thr Val Glu Val Tyr Asp Val Thr Phe Ser Gly Tyr
50 55 60

Arg Gly Gln Arg Ile Lys Gly Trp Leu Leu Val Pro Lys Leu Glu Glu
65 70 75 80

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Glu Lys Leu Pro Cys₈₅ Val Val Gln Tyr Ile₉₀ Gly Tyr Asn Gly Gly₉₅ Arg
 Gly Phe Pro His₁₀₀ Asp Trp Leu Phe Trp₁₀₅ Pro Ser Met Gly Tyr₁₁₀ Ile Cys
 Phe Val Met₁₁₅ Asp Thr Arg Gly Gln₁₂₀ Gly Ser Gly Trp Leu₁₂₅ Lys Gly Asp
 Thr Pro₁₃₀ Asp Tyr Pro Glu Asp₁₃₅ Pro Val Asp Pro Gln₁₄₀ Tyr Pro Gly Phe
 Met₁₄₅ Thr Arg Gly Ile Leu₁₅₀ Asp Pro Arg Thr Tyr₁₅₅ Tyr Tyr Arg Arg Val₁₆₀
 Phe Thr Asp Ala Val₁₆₅ Arg Ala Val Glu Ala₁₇₀ Ala Ala Ser Phe Pro₁₇₅ Arg
 Val Asp His Glu₁₈₀ Arg Ile Val Ile Ala₁₈₅ Gly Gly Ser Gln Gly₁₉₀ Gly Gly
 Ile Ala Leu₁₉₅ Ala Val Ser Ala Leu₂₀₀ Ser Lys Lys Ala Lys₂₀₅ Ala Leu Leu
 Cys Asp₂₁₀ Val Pro Phe Leu Cys₂₁₅ His Phe Arg Arg Ala₂₂₀ Val Gln Leu Val
 Asp₂₂₅ Thr His Pro Tyr Ala₂₃₀ Glu Ile Thr Asn Phe₂₃₅ Leu Lys Thr His Arg₂₄₀
 Asp Lys Glu Glu Ile₂₄₅ Val Phe Arg Thr Leu₂₅₀ Ser Tyr Phe Asp Gly₂₅₅ Val
 Asn Phe Ala Val₂₆₀ Arg Ala Lys Ile Pro Ala Leu Phe Ser Val₂₇₀ Gly Leu
 Met Asp Asn₂₇₅ Ile Cys Pro Pro Ser₂₈₀ Thr Val Phe Ala Ala₂₈₅ Tyr Asn His
 Tyr Ala₂₉₀ Gly Pro Lys Glu Ile₂₉₅ Arg Ile Tyr Pro Tyr₃₀₀ Asn Asn His Glu
 Gly Gly Gly Ser Phe Gln₃₁₀ Ala Ile Glu Gln Val₃₁₅ Lys Phe Leu Lys Arg₃₂₀
 Leu Phe Glu Lys Gly₃₂₅

<210> 24
 <211> 329
 <212> PRT
 <213> Thermotoga sp. RQ2

<400> 24

Met Ala Leu Phe Asp Met Pro Leu Glu Lys Leu Arg Ser Tyr Leu Pro
 1 5 10 15

Asp Arg Tyr Glu Glu Glu Asp Phe Asp Leu Phe Trp Lys Glu Thr Leu
 20 25 30

Glu Glu Ser Arg Lys Phe Pro Leu Asp Pro Ile Phe Glu Arg Val Asp
 35 40 45

Tyr Leu Leu Glu Asn Val Glu Val Tyr Asp Val Thr Phe Ser Gly Tyr
 50 55 60

Arg Gly Gln Arg Ile Lys Ala Trp Leu Ile Leu Pro Val Val Lys Lys
 65 70 75 80

Glu Glu Arg Leu Pro Cys Ile Val Glu Phe Ile Gly Tyr Arg Gly Gly
 85 90 95

Arg Gly Phe Pro Phe Asp Trp Leu Phe Trp Ser Ser Ala Gly Tyr Ala
 100 105 110

His Phe Val Met Asp Thr Arg Gly Gln Gly Thr Ser Arg Val Lys Gly
 115 120 125

Asp Thr Pro Asp Tyr Cys Asp Glu Pro Ile Asn Pro Gln Phe Pro Gly
 130 135 140

Phe Met Thr Arg Gly Ile Leu Asp Pro Arg Thr Tyr Tyr Tyr Arg Arg
 145 150 155 160

Val Phe Thr Asp Ala Val Arg Ala Val Glu Thr Ala Ser Ser Phe Pro
 165 170 175

Gly Ile Asp Pro Glu Arg Ile Ala Val Val Gly Thr Ser Gln Gly Gly
 180 185 190

Gly Ile Ala Leu Ala Val Ala Ala Leu Ser Glu Ile Pro Lys Ala Leu
 195 200 205

Val Ser Asn Val Pro Phe Leu Cys His Phe Arg Arg Ala Val Gln Ile
 210 215 220

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

Arg Asp Lys Glu Glu Ile Val Phe Arg Thr Leu Ser Tyr Phe Asp Gly
245 250 255

Val Asn Phe Ala Ala Arg Ala Lys Ile Pro Ala Leu Phe Ser Val Ala
260 265 270

Leu Met Asp Lys Thr Cys Pro Pro Ser Thr Val Phe Ala Ala Tyr Asn
275 280 285

His Tyr Ala Gly Pro Lys Glu Ile Lys Val Tyr Pro Phe Asn Glu His
290 295 300

Glu Gly Gly Glu Ser Phe Gln Arg Met Glu Glu Leu Arg Phe Met Lys
305 310 315 320

Arg Ile Leu Lys Gly Glu Phe Lys Ala
325

<210> 25
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<212> PRT
<213> Thermoanaerobacterium saccharolyticum
<400> 25

Met Gly Leu Phe Asp Met Pro Leu Gln Lys Leu Arg Glu Tyr Thr Gly
1 5 10 15

Thr Asn Pro Cys Pro Glu Asp Phe Asp Glu Tyr Trp Asp Arg Ala Leu
20 25 30

Asp Glu Met Arg Ser Val Asp Pro Lys Ile Lys Met Lys Lys Ser Ser
35 40 45

Phe Gln Val Pro Phe Ala Glu Cys Tyr Asp Leu Tyr Phe Thr Gly Val
50 55 60

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

Lys His Pro Ala Leu Ile Arg Phe His Gly Tyr Ser Ser Asn Ser Gly
85 90 95

Asp Trp Asn Asp Lys Leu Asn Tyr Val Ala Ala Gly Phe Thr Val Val
100 105 110

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Ala Met Asp Ala Arg Gly Gln Gly Gly Gln Ser Gln Asp Val Gly Gly
115 120 125

Val Asn Gly Asn Thr Leu Asn Gly His Ile Ile Arg Gly Leu Asp Asp
130 135 140

Asp Ala Asp Asn Met Leu Phe Arg His Ile Phe Leu Asp Thr Ala Gln
145 150 155 160

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

Ala Val Met Gly Pro Ser Gln Gly Gly Gly Leu Ser Leu Ala Cys Ala
180 185 190

Ala Leu Glu Pro Lys Ile Arg Lys Val Val Ser Glu Tyr Pro Phe Leu
195 200 205

Ser Asp Tyr Lys Arg Val Trp Asp Leu Asp Leu Ala Lys Asn Ala Tyr
210 215 220

Gln Glu Ile Thr Asp Tyr Phe Arg Leu Phe Asp Pro Arg His Glu Arg
225 230 235 240

Glu Asn Glu Val Phe Thr Lys Leu Gly Tyr Ile Asp Val Lys Asn Leu
245 250 255

Ala Lys Arg Ile Lys Gly Asp Val Leu Met Cys Val Gly Leu Met Asp
260 265 270

Gln Val Cys Pro Pro Ser Thr Val Phe Ala Ala Tyr Asn Asn Ile Gln
275 280 285

Ser Lys Lys Asp Ile Lys Val Tyr Pro Asp Tyr Gly His Glu Pro Met
290 295 300

Arg Gly Phe Gly Asp Leu Ala Met Gln Phe Met Leu Glu Leu Tyr Ser
305 310 315 320

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<211> 312

<212> PRT

<213> Lactococcus lactis

<400> 26

Met Thr Lys Ile Asn Asn Trp Gln Asp Tyr Gln Gly Ser Ser Leu Lys
1 5 10 15

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Pro Glu Asp Phe Asp Lys Phe Trp Asp Glu Lys Ile Asn Leu Val Ser
20 25 30

Asn His Gln Phe Glu Phe Glu Leu Ile Glu Lys Asn Leu Ser Ser Lys
35 40 45

Val Val Asn Phe Tyr His Leu Trp Phe Thr Ala Ile Asp Gly Ala Lys
50 55 60

Ile His Ala Gln Leu Ile Val Pro Lys Asn Leu Lys Glu Lys Tyr Pro
65 70 75 80

Ala Ile Leu Gln Phe His Gly Tyr His Cys Asp Ser Gly Asp Trp Val
85 90 95

Asp Lys Ile Gly Ile Val Ala Glu Gly Asn Val Val Leu Ala Leu Asp
100 105 110

Cys Arg Gly Gln Gly Gly Leu Ser Gln Asp Asn Ile Gln Thr Met Gly
115 120 125

Met Thr Met Lys Gly Leu Ile Val Arg Gly Ile Asp Glu Gly Tyr Glu
130 135 140

Asn Leu Tyr Tyr Val Arg Gln Phe Met Asp Leu Ile Thr Ala Thr Lys
145 150 155 160

Ile Leu Ser Glu Phe Asp Phe Val Asp Glu Thr Asn Ile Ser Ala Gln
165 170 175

Gly Ala Ser Gln Gly Gly Ala Leu Ala Val Ala Cys Ala Ala Leu Ser
180 185 190

Pro Leu Ile Lys Lys Val Thr Ala Thr Tyr Pro Phe Leu Ser Asp Tyr
195 200 205

Arg Lys Ala Tyr Glu Leu Gly Ala Glu Glu Ser Ala Phe Glu Glu Leu
210 215 220

Pro Tyr Trp Phe Gln Phe Lys Asp Pro Leu His Leu Arg Glu Asp Trp
225 230 235 240

Phe Phe Asn Gln Leu Glu Tyr Ile Asp Ile Gln Asn Leu Ala Pro Arg
245 250 255

Ile Lys Ala Glu Val Ile Trp Ile Leu Gly Gly Lys Asp Thr Val Val

260

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265 270Pro Pro Ile Thr Gln Met Ala Ala Tyr Asn Lys Ile Gln Ser Lys Lys
275 280 285Ser Leu Tyr Val Leu Pro Glu Tyr Gly His Glu Tyr Leu Pro Lys Ile
290 295 300Ser Asp Trp Leu Arg Glu Asn Gln
305 310

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<211> 323

<212> PRT

<213> Mesorhizobium loti

<400> 27

Met Pro Phe Pro Asp Leu Ile Gln Pro Glu Leu Gly Ala Tyr Val Ser
1 5 10 15Ser Val Gly Met Pro Asp Asp Phe Ala Gln Phe Trp Thr Ser Thr Ile
20 25 30Ala Glu Ala Arg Gln Ala Gly Gly Glu Val Ser Ile Val Gln Ala Gln
35 40 45Thr Thr Leu Lys Ala Val Gln Ser Phe Asp Val Thr Phe Pro Gly Tyr
50 55 60Gly Gly His Pro Ile Lys Gly Trp Leu Ile Leu Pro Thr His His Lys
65 70 75 80Gly Arg Leu Pro Leu Val Val Gln Tyr Ile Gly Tyr Gly Gly Gly Arg
85 90 95Gly Leu Ala His Glu Gln Leu His Trp Ala Ala Ser Gly Phe Ala Tyr
100 105 110Phe Arg Met Asp Thr Arg Gly Gln Gly Ser Asp Trp Ser Val Gly Glu
115 120 125Thr Ala Asp Pro Val Gly Ser Thr Ser Ser Ile Pro Gly Phe Met Thr
130 135 140Arg Gly Val Leu Asp Lys Asn Asp Tyr Tyr Tyr Arg Arg Leu Phe Thr
145 150 155 160Asp Ala Val Arg Ala Ile Asp Ala Leu Leu Gly Leu Asp Phe Val Asp
Page 39

Pro Glu Arg Ile Ala Val Cys Gly Asp Ser Gln Gly Gly Gly Ile Ser
180 185 190

Leu Ala Val Gly Gly Ile Asp Pro Arg Val Lys Ala Val Met Pro Asp
195 200 205

Val Pro Phe Leu Cys Asp Phe Pro Arg Ala Val Gln Thr Ala Val Arg
210 215 220

Asp Pro Tyr Leu Glu Ile Val Arg Phe Leu Ala Gln His Arg Glu Lys
225 230 235 240

Lys Ala Ala Val Phe Glu Thr Leu Asn Tyr Phe Asp Cys Val Asn Phe
245 250 255

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

Glu Val Cys Pro Pro Ser Thr Val Tyr Gly Ala Phe Asn Ala Tyr Ala
275 280 285

Gly Glu Lys Thr Ile Thr Glu Tyr Glu Phe Asn Asn His Glu Gly Gly
290 295 300

Gln Gly Tyr Gln Glu Arg Gln Gln Met Thr Trp Leu Ser Arg Leu Phe
305 310 315 320

Gly Val Gly

<210> 28
<211> 329
<212> PRT
<213> Geobacillus stearothermophilus

<400> 28

Met Phe Asp Met Pro Leu Ala Gln Leu Gln Lys Tyr Met Gly Thr Asn
1 5 10 15

Pro Lys Pro Ala Asp Phe Ala Asp Phe Trp Ser Arg Ala Leu Glu Glu
20 25 30

Leu Ser Ala Gln Ser Leu His Tyr Glu Leu Ile Pro Ala Thr Phe Gln
35 40 45

Thr Thr Val Ala Ser Cys Tyr His Leu Tyr Phe Thr Gly Val Gly Gly
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50

55

Ala Arg Val His Cys Gln Leu Val Lys Pro Arg Glu Gln Lys Gln Lys
65 70 75 80

Gly Pro Gly Leu Val Trp Phe His Gly Tyr His Thr Asn Ser Gly Asp
85 90 95

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

Met Asp Cys Arg Gly Gln Gly Gly Lys Ser Glu Asp Asn Leu Gln Val
115 120 125

Lys Gly Pro Thr Leu Lys Gly His Ile Ile Arg Gly Ile Glu Asp Pro
130 135 140

Asn Pro His His Leu Tyr Tyr Arg Asn Val Phe Leu Asp Thr Val Gln
145 150 155 160

Ala Val Arg Ile Leu Cys Ser Met Asp His Ile Asp Arg Glu Arg Ile
165 170 175

Gly Val Tyr Gly Ala Ser Gln Gly Gly Ala Leu Ala Leu Ala Cys Ala
180 185 190

Ala Leu Glu Pro Ser Val Val Lys Lys Ala Val Val Leu Tyr Pro Phe
195 200 205

Leu Ser Asp Tyr Lys Arg Ala Gln Glu Leu Asp Met Lys Asn Thr Ala
210 215 220

Tyr Glu Glu Ile His Tyr Tyr Phe Arg Phe Leu Asp Pro Thr His Glu
225 230 235 240

Arg Glu Glu Glu Val Phe Tyr Lys Leu Gly Tyr Ile Asp Ile Gln Leu
245 250 255

Leu Ala Asp Arg Ile Cys Ala Asp Val Leu Trp Ala Val Ala Leu Glu
260 265 270

Asp His Ile Cys Pro Pro Ser Thr Gln Phe Ala Val Tyr Asn Lys Ile
275 280 285

Lys Ser Lys Lys Asp Met Val Leu Phe Tyr Glu Tyr Gly His Glu Tyr
290 295 300

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Leu Pro Thr Met Gly Asp Arg Ala Tyr Leu Phe Phe Cys Pro Ile Phe
305 310 315 320

Phe Pro Ile Gln Lys Arg Asn Val Lys
325

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<212> PRT
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<400> 29

Ala His Pro Glu Ser Leu Gly Ile Lys Tyr Ala Leu Asp Gly Asn Ser
1 5 10 15

Asp Pro His Ala
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<210> 30
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<220>
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<400> 30

Ala Ser Val Ser Asn Tyr Pro Pro Ile His His Leu Ala Thr Ser Asn
1 5 10 15

Thr Thr Val Asn
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<210> 31
<211> 14
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<220>
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<400> 31

Asp Glu Cys Met Glu Pro Leu Asn Ala Ala His Cys Trp Arg
1 5 10

<210> 32
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<220>

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<400> 32

Asp Glu Cys Met His Gly Ser Asp Val Glu Phe Cys Thr Ser
1 5 10

<210> 33

<211> 14

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<220>

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<400> 33

Asp Leu Cys Ser Met Gln Met Met Asn Thr Gly Cys His Tyr
1 5 10

<210> 34

<211> 14

<212> PRT

<213> artificial sequence

<220>

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<400> 34

Asp Leu Cys Ser Ser Pro Ser Thr Trp Gly Ser Cys Ile Arg
1 5 10

<210> 35

<211> 20

<212> PRT

<213> artificial sequence

<220>

<223> Synthetic construct

<400> 35

Asp Pro Asn Glu Ser Asn Tyr Glu Asn Ala Thr Thr Val Ser Gln Pro
1 5 10 15

Thr Arg His Leu
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<210> 36

<211> 20

<212> PRT

<213> artificial sequence

<220>

<223> Synthetic construct

9434-00-WO-OC_ST25_DD

<400> 36

Glu Pro Thr His Pro Thr Met Arg Ala Gln Met His Gln Ser Leu Arg
1 5 10 15

Ser Ser Ser Pro
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<210> 37

<211> 20

<212> PRT

<213> artificial sequence

<220>

<223> Synthetic construct

<400> 37

Gly Asn Thr Asp Thr Thr Pro Pro Asn Ala Val Met Glu Pro Thr Val
1 5 10 15

Gln His Lys Trp
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<210> 38

<211> 15

<212> PRT

<213> artificial sequence

<220>

<223> Synthetic construct

<400> 38

Asn Gly Pro Asp Met Val Gln Ser Val Gly Lys His Lys Asn Ser
1 5 10 15

<210> 39

<211> 15

<212> PRT

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<220>

<223> Synthetic construct

<400> 39

Asn Gly Pro Glu Val Arg Gln Ile Pro Ala Asn Phe Glu Lys Leu
1 5 10 15

<210> 40

<211> 20

<212> PRT

<213> artificial sequence

<220>

<223> Synthetic construct

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<400> 40

Asn Asn Thr Ser Ala Asp Asn Pro Pro Glu Thr Asp Ser Lys His His
1 5 10 15

Leu Ser Met Ser
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<210> 41

<211> 20

<212> PRT

<213> artificial sequence

<220>

<223> Synthetic construct

<400> 41

Asn Asn Thr Trp Pro Glu Gly Ala Gly His Thr Met Pro Ser Thr Asn
1 5 10 15

Ile Arg Gln Ala
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<210> 42

<211> 20

<212> PRT

<213> artificial sequence

<220>

<223> Synthetic construct

<400> 42

Asn Pro Thr Ala Thr Pro His Met Lys Asp Pro Met His Ser Asn Ala
1 5 10 15

His Ser Ser Ala
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<210> 43

<211> 20

<212> PRT

<213> artificial sequence

<220>

<223> Synthetic construct

<400> 43

Asn Pro Thr Asp His Ile Pro Ala Asn Ser Thr Asn Ser Arg Val Ser
1 5 10 15

Lys Gly Asn Thr
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<210> 44
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<220>
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<400> 44

Asn Pro Thr Asp Ser Thr His Met Met His Ala Arg Asn His Glu
 1 5 10 15

<210> 45
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<400> 45

Gln His Cys Ile Thr Glu Arg Leu His Pro Pro Cys Thr Lys
 1 5 10

<210> 46
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<400> 46

Thr Pro Cys Ala Pro Ala Ser Phe Asn Pro His Cys Ser Arg
 1 5 10

<210> 47
 <211> 14
 <212> PRT
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<400> 47

Thr Pro Cys Ala Thr Tyr Pro His Phe Ser Gly Cys Arg Ala
 1 5 10

<210> 48
 <211> 20
 <212> PRT
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<220>

<223> Synthetic construct

<400> 48

Trp Cys Thr Asp Phe Cys Thr Arg Ser Thr Pro Thr Ser Thr Ser Arg
1 5 10 15

Ser Thr Thr Ser
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<210> 49

<211> 20

<212> PRT

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<220>

<223> Synthetic construct

<400> 49

Ala Pro Pro Leu Lys Thr Tyr Met Gln Glu Arg Glu Leu Thr Met Ser
1 5 10 15

Gln Asn Lys Asp
20

<210> 50

<211> 20

<212> PRT

<213> artificial sequence

<220>

<223> Synthetic construct

<400> 50

Glu Pro Pro Thr Arg Thr Arg Val Asn Asn His Thr Val Thr Val Gln
1 5 10 15

Ala Gln Gln His
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<210> 51

<211> 14

<212> PRT

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<220>

<223> Synthetic construct

<400> 51

Gly Tyr Cys Leu Arg Gly Asp Glu Pro Ala Val Cys Ser Gly
1 5 10

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<210> 52
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<220>
<223> Synthetic construct

<400> 52

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

Asp Tyr Thr Thr
20

<210> 53
<211> 14
<212> PRT
<213> artificial sequence

<220>
<223> Synthetic construct

<400> 53

Asn Phe Cys Glu Thr Gln Leu Asp Leu Ser Val Cys Thr Val
1 5 10

<210> 54
<211> 14
<212> PRT
<213> artificial sequence

<220>
<223> Synthetic construct

<400> 54

Asn Thr Cys Gln Pro Thr Lys Asn Ala Thr Pro Cys Ser Ala
1 5 10

<210> 55
<211> 20
<212> PRT
<213> artificial sequence

<220>
<223> Synthetic construct

<400> 55

Pro Ser Glu Pro Glu Arg Arg Asp Arg Asn Ile Ala Ala Asn Ala Gly
1 5 10 15

Arg Phe Asn Thr
20

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<210> 56
<211> 18
<212> PRT
<213> artificial sequence

<220>
<223> Synthetic construct

<400> 56

Thr His Asn Met Ser His Phe Pro Pro Ser Gly His Pro Lys Arg Thr
1 5 10 15

Ala Thr

<210> 57
<211> 14
<212> PRT
<213> artificial sequence

<220>
<223> Synthetic construct

<400> 57

Thr Thr Cys Pro Thr Met Gly Thr Tyr His Val Cys Trp Leu
1 5 10

<210> 58
<211> 20
<212> PRT
<213> artificial sequence

<220>
<223> Synthetic construct

<400> 58

Tyr Cys Ala Asp His Thr Pro Asp Pro Ala Asn Pro Asn Lys Ile Cys
1 5 10 15

Gly Tyr Ser His
20

<210> 59
<211> 20
<212> PRT
<213> artificial sequence

<220>
<223> Synthetic construct

<400> 59

Ala Ala Asn Pro His Thr Glu Trp Asp Arg Asp Ala Phe Gln Leu Ala
1 5 10 15

Met Pro Pro Lys
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<210> 60
<211> 20
<212> PRT
<213> artificial sequence

<220>
<223> Synthetic construct

<400> 60

Asp Leu His Pro Met Asp Pro Ser Asn Lys Arg Pro Asp Asn Pro Ser
1 5 10 15

Asp Leu His Thr
20

<210> 61
<211> 14
<212> PRT
<213> artificial sequence

<220>
<223> Synthetic construct

<400> 61

Glu Ser Cys Val Ser Asn Ala Leu Met Asn Gln Cys Ile Tyr
1 5 10

<210> 62
<211> 20
<212> PRT
<213> artificial sequence

<220>
<223> Synthetic construct

<400> 62

His Asn Lys Ala Asp Ser Trp Asp Pro Asp Leu Pro Pro His Ala Gly
1 5 10 15

Met Ser Leu Gly
20

<210> 63
<211> 20
<212> PRT
<213> artificial sequence

<220>
<223> Synthetic construct

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<400> 63

Leu Asn Asp Gln Arg Lys Pro Gly Pro Pro Thr Met Pro Thr His Ser
1 5 10 15

Pro Ala Val Gly
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<210> 64

<211> 14

<212> PRT

<213> artificial sequence

<220>

<223> Synthetic construct

<400> 64

Asn Thr Cys Ala Thr Ser Pro Asn Ser Tyr Thr Cys Ser Asn
1 5 10

<210> 65

<211> 14

<212> PRT

<213> artificial sequence

<220>

<223> Synthetic construct

<400> 65

Ser Asp Cys Thr Ala Gly Leu Val Pro Pro Leu Cys Ala Thr
1 5 10

<210> 66

<211> 20

<212> PRT

<213> artificial sequence

<220>

<223> Synthetic construct

<400> 66

Thr Ile Glu Ser Ser Gln His Ser Arg Thr His Gln Gln Asn Tyr Gly
1 5 10 15

Ser Thr Lys Thr
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<210> 67

<211> 20

<212> PRT

<213> artificial sequence

<220>

9434-00-WO-OC_ST25_DD

<223> Synthetic construct

<400> 67

Val Gly Thr Met Lys Gln His Pro Thr Thr Thr Gln Pro Pro Arg Val
1 5 10 15

Ser Ala Thr Asn
20

<210> 68

<211> 20

<212> PRT

<213> artificial sequence

<220>

<223> Synthetic construct

<400> 68

Tyr Ser Glu Thr Pro Asn Asp Gln Lys Pro Asn Pro His Tyr Lys Val
1 5 10 15

Ser Gly Thr Lys
20

<210> 69

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic oral-surface binding peptide

<400> 69

Asn Gly Asn Asn His Thr Asp Ile Pro Asn Arg Ser Ser Tyr Thr Gly
1 5 10 15

Gly Ser Phe Ala
20

<210> 70

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic oral-surface binding peptide

<400> 70

Thr Met Thr Asn His Val Tyr Asn Ser Tyr Thr Glu Lys His Ser Ser
1 5 10 15

Thr His Arg Ser

20

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<220>
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Thr Thr Tyr His Tyr Lys Asn Ile Tyr Gln Glu Ser Tyr Gln Gln Arg
 1 5 10 15

Asn Pro Ala Val
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<210> 72
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<220>
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Val Glu Pro Ala Thr Lys Asn Met Arg Glu Ala Arg Ser Ser Thr Gln
 1 5 10 15

Met Arg Arg Ile
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<210> 73
 <211> 20
 <212> PRT
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<220>
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 <400> 73

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

Val Gln His Lys
 20

<210> 74
 <211> 18
 <212> PRT
 <213> Artificial Sequence

<220>

9434-00-WO-OC_ST25_DD

<223> Synthetic oral-surface binding peptide

<400> 74

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

Cys Thr

<210> 75

<211> 18

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic oral-surface binding peptide

<400> 75

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

Leu Arg

<210> 76

<211> 18

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic oral-surface binding peptide

<400> 76

Gly Met Pro Thr Arg Tyr Tyr His Asn Thr Pro Pro His Leu Thr Pro
1 5 10 15

Lys Phe

<210> 77

<211> 18

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic oral-surface binding peptide

<400> 77

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

Thr Met

<210> 78
 <211> 15
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic oral-surface binding peptide

<400> 78

Ala Val Val Pro Ala Asp Leu Asn Asp His Ala Asn His Leu Ser
 1 5 10 15

<210> 79
 <211> 15
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic oral-surface binding peptide

<400> 79

Asp Leu Gly Thr Phe Pro Asn Arg Thr Leu Lys Met Ala Ala His
 1 5 10 15

<210> 80
 <211> 15
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic oral-surface binding peptide

<400> 80

Phe Asp Gly Ile Gly Leu Gly Thr Ala Thr Arg His Gln Asn Arg
 1 5 10 15

<210> 81
 <211> 15
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic oral-surface binding peptide

<400> 81

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

<210> 82
 <211> 18
 <212> PRT
 <213> Artificial Sequence

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<220>

<223> Synthetic oral-surface binding peptide

<400> 82

Ser Glu Ala Arg Ala Arg Thr Phe Asn Asp His Thr Thr Pro Met Pro
1 5 10 15

Ile Ile

<210> 83

<211> 18

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic oral-surface binding peptide

<400> 83

Glu Leu Asp His Asp Ser Arg His Tyr Met Asn Gly Leu Gln Arg Lys
1 5 10 15

Val Thr

<210> 84

<211> 18

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic oral-surface binding peptide

<400> 84

Gly Pro Gln His Val Leu Met Gln Asp Thr His Gln Gly Tyr Ala Phe
1 5 10 15

Asp Asn

<210> 85

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic oral-surface binding peptide

<400> 85

Thr Thr Gly Ser Ser Ser Gln Ala Asp Thr Ser Ala Ser Met Ser Ile
1 5 10 15

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Val Pro Ala His
20

<210> 86
<211> 18
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<213> Artificial Sequence

<220>
<223> Synthetic oral-surface binding peptide

<400> 86

Lys Ala Pro Ile Ala Asn Met Leu Gln Pro His Ser Tyr Gln Tyr Ser
1 5 10 15

Val Ala

<210> 87
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic oral-surface binding peptide

<400> 87

Thr Tyr Gln Gly Val Pro Ser Trp Pro Ala Val Ile Asp Asp Ala Ile
1 5 10 15

Arg Arg

<210> 88
<211> 18
<212> PRT
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<220>
<223> Synthetic oral-surface binding peptide

<400> 88

Val Asn Pro Asn Trp Val Glu Thr Gln Ala Leu His Gln Pro Pro Gly
1 5 10 15

Asn Thr

<210> 89
<211> 20
<212> PRT
<213> Artificial Sequence

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<220>

<223> Synthetic oral-surface binding peptide

<400> 89

Asp His Asn Asn Arg Gln His Ala Val Glu Val Arg Glu Asn Lys Thr
1 5 10 15

His Thr Ala Arg
20

<210> 90

<211> 18

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic oral-surface binding peptide

<400> 90

Ile Tyr Pro Asn Glu Ser Met Ser Thr Ser Asn Val Arg Gly Pro Tyr
1 5 10 15

His Pro

<210> 91

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic oral-surface binding peptide

<400> 91

His Asp Pro Asn His Leu Thr His Gln Ala Arg Thr Ile Tyr Arg Asn
1 5 10 15

Ala Asn His Thr
20

<210> 92

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic oral-surface binding peptide

<400> 92

Ser Asn Ala Thr Met Tyr Asn Ile Gln Ser His Ser His His Gln
1 5 10 15

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<210> 93
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic oral-surface binding peptide

<400> 93

Ala Asn Glu Leu Ser Thr Tyr Ala Gln Thr Asn Pro Gly Ser Gly
1 5 10 15

<210> 94
<211> 15
<212> PRT
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<220>
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<400> 94

Asp Thr Ile His Pro Asn Lys Met Lys Ser Pro Ser Ser Pro Leu
1 5 10 15

<210> 95
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
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<400> 95

Ala Pro Pro Thr Tyr Gln Thr Ala Ser Tyr Pro His Asn Leu Pro Ser
1 5 10 15

Lys Arg Lys Met
20

<210> 96
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic oral-surface binding peptide

<400> 96

Gln Val Pro Asp Tyr Leu Ser Pro Thr His Gln Lys Lys Ala Phe Leu
1 5 10 15

Glu Ile Pro Thr
20

<210> 97
 <211> 20
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic oral-surface binding peptide

<400> 97

Thr Asn Asp Leu His Ala Asn Pro Phe Thr Gly Thr Tyr Ile Ala Pro
 1 5 10 15

Asp Pro Thr Ser
 20

<210> 98
 <211> 20
 <212> PRT
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<220>
 <223> Synthetic oral-surface binding peptide

<400> 98

His Lys Asn Glu Asn Ile Met Gln Tyr Asn Val Asn Asp Arg Trp His
 1 5 10 15

Ile Thr Pro Ala
 20

<210> 99
 <211> 18
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic oral-surface binding peptide

<400> 99

Ile Asp Gly Pro His His Ser Pro Val His Arg Tyr His Thr Pro Ser
 1 5 10 15

Ile Thr

<210> 100
 <211> 20
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic oral-surface binding peptide

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<400> 100

Ala Ile Glu Tyr Gln His Ser Ala Thr Thr Pro Trp Thr Met Arg Thr
1 5 10 15

Arg Leu Pro Pro
20

<210> 101

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic oral-surface binding peptide

<400> 101

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

Arg Gln Val Phe
20

<210> 102

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic oral-surface binding peptide

<400> 102

Gly Val His Gln Tyr Ser Arg Pro Thr Val Pro Ser Tyr Leu Trp Thr
1 5 10 15

Ser Gly Gln His
20

<210> 103

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic oral-surface binding peptide

<400> 103

Gly Tyr Gln Pro His Tyr Val Asp His Thr Ile Gly Trp Gln Pro Met
1 5 10 15

Ile Arg Pro Asn
20

<210> 104
 <211> 20
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic oral-surface binding peptide

<400> 104

Gln Phe Asn Gln Thr Ser His Ser Phe Met His Gly Thr Ser Gly Tyr
 1 5 10 15

Val Pro Gly Lys
 20

<210> 105
 <211> 20
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic oral-surface binding peptide

<400> 105

Ser Phe Ser Trp His Arg Gly Asp Trp Glu Leu Gly His Gln Ser Lys
 1 5 10 15

Thr Met Gly Met
 20

<210> 106
 <211> 20
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic oral-surface binding peptide

<400> 106

Ser Met Trp His Asp Ile Thr Lys Arg Tyr Arg Asn Pro Ser Glu Met
 1 5 10 15

Val Ser Ala Tyr
 20

<210> 107
 <211> 20
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic oral-surface binding peptide
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<400> 107

Thr His Gly Asn Lys His Gln Ser Trp Thr Tyr Pro Ser Glu Ile Asn
1 5 10 15

His Lys Asn Tyr
20

<210> 108

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic oral-surface binding peptide

<400> 108

Trp His Glu Pro His Gln Phe Ser Gly Glu Asn Thr Asp Tyr Ser Ser
1 5 10 15

Ser Met Gly Thr
20

<210> 109

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic oral-surface binding peptide

<400> 109

Thr His Gly Asn Lys His Gln Ser Trp Thr Tyr Pro Ser Glu Ile Asn
1 5 10 15

His Lys Asn Tyr
20

<210> 110

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic oral-surface binding peptide

<400> 110

Asp Gly Tyr Lys Leu Gln Thr Ser Leu Asp Trp Gln Met Trp Asn Pro
1 5 10 15

<210> 111

<211> 16

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<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic oral-surface binding peptide

<400> 111

Phe Pro Ser Lys Trp Tyr Asn His His Arg His Ile Thr Gly His Val
1 5 10 15

<210> 112

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic oral-surface binding peptide

<400> 112

Gly Gly Met Gly Ala Leu Glu Ser Tyr Arg Gln Trp Asn His Leu Ala
1 5 10 15

<210> 113

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic oral-surface binding peptide

<400> 113

Gly Ile Asn Lys Gly Gln Arg Pro Pro Trp Glu Ser Trp His Glu Asn
1 5 10 15

<210> 114

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic oral-surface binding peptide

<400> 114

Gly Tyr Gly Gln Tyr Val Ser Gln Gln Thr Trp Ala His Ser Asn Lys
1 5 10 15

<210> 115

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic oral-surface binding peptide

<400> 115

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His Asp His Leu Ser Trp Trp Gly Gln Phe Asp Arg Gln Asn Leu Leu
1 5 10 15

<210> 116
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic oral-surface binding peptide

<400> 116

Met Pro Gly His Gln Glu Ser Ile Lys Val Gln Asn Trp Asn Arg Val
1 5 10 15

<210> 117
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic oral-surface binding peptide

<400> 117

Asn Leu His Ser Pro Trp Pro Ser His Ala Ala His His Trp Ser Thr
1 5 10 15

<210> 118
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic oral-surface binding peptide

<400> 118

Asn Gln Gln Met Lys Leu Val Pro Gln His Trp His Arg Ala Gln Pro
1 5 10 15

<210> 119
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic oral-surface binding peptide

<400> 119

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

<210> 120
<211> 25

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<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic construct

<400> 120

Ser Ser Arg Pro Asn Gly Asn Asn His Thr Asp Ile Pro Asn Arg Ser
1 5 10 15

Ser Tyr Thr Gly Gly Ser Phe Ala Lys
20 25

<210> 121
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic construct

<400> 121

Ser Ser Arg Pro Thr Met Thr Asn His Val Tyr Asn Ser Tyr Thr Glu
1 5 10 15

Lys His Ser Ser Thr His Arg Ser Lys
20 25

<210> 122
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic construct

<400> 122

Ser Ser Arg Pro Thr Thr Tyr His Tyr Lys Asn Ile Tyr Gln Glu Ser
1 5 10 15

Tyr Gln Gln Arg Asn Pro Ala Val Lys
20 25

<210> 123
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic construct

<400> 123

Ser Ser Arg Pro Val Glu Pro Ala Thr Lys Asn Met Arg Glu Ala Arg
Page 66

1 5 15

Ser Ser Thr Gln Met Arg Arg Ile Lys
20 25

<210> 124
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic construct

<400> 124

Ser Ser Arg Pro Tyr Leu Leu Pro Lys Asp Gln Thr Thr Ala Pro Gln
1 5 10 15

Val Thr Pro Ile Val Gln His Lys Lys
20 25

<210> 125
<211> 23
<212> PRT
<213> Artificial Sequence

<220>
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<400> 125

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

Glu Arg His Thr Leu Arg Lys
20

<210> 126
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic construct

<400> 126

Ser Ser Arg Pro Asp Leu Gly Thr Phe Pro Asn Arg Thr Leu Lys Met
1 5 10 15

Ala Ala His Lys
20

<210> 127
<211> 20

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<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic construct

<400> 127

Ser Ser Arg Pro Phe Asp Gly Ile Gly Leu Gly Thr Ala Thr Arg His
1 5 10 15

Gln Asn Arg Lys
20

<210> 128
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic construct

<400> 128

Ser Ser Arg Pro Gln Ala Ala Gln Val His Met Met Gln His Ser Arg
1 5 10 15

Pro Thr Thr Lys
20

<210> 129
<211> 23
<212> PRT
<213> Artificial Sequence

<220>
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<400> 129

Ser Ser Arg Pro Ser Glu Ala Arg Ala Arg Thr Phe Asn Asp His Thr
1 5 10 15

Thr Pro Met Pro Ile Ile Lys
20

<210> 130
<211> 23
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic construct

<400> 130

Ser Ser Arg Pro Glu Leu Asp His Asp Ser Arg His Tyr Met Asn Gly
Page 68

1 5 15

Leu Gln Arg Lys Val Thr Lys
20

<210> 131
<211> 23
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic construct

<400> 131

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

Gly Tyr Ala Phe Asp Asn Lys
20

<210> 132
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic construct

<400> 132

Ser Ser Arg Pro Thr Thr Gly Ser Ser Ser Gln Ala Asp Thr Ser Ala
1 5 10 15

Ser Met Ser Ile Val Pro Ala His Lys
20 25

<210> 133
<211> 23
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic construct

<400> 133

Ser Ser Arg Pro Thr Tyr Gln Gly Val Pro Ser Trp Pro Ala Val Ile
1 5 10 15

Asp Asp Ala Ile Arg Arg Lys
20

<210> 134
<211> 23

<212> PRT
 <213> Artificial Sequence

<220>
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<400> 134

Ser Ser Arg Pro Val Asn Pro Asn Trp Val Glu Thr Gln Ala Leu His
 1 5 10 15

Gln Pro Pro Gly Asn Thr Lys
 20

<210> 135
 <211> 23
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> synthetic construct

<400> 135

Ser Ser Arg Pro Ile Tyr Pro Asn Glu Ser Met Ser Thr Ser Asn Val
 1 5 10 15

Arg Gly Pro Tyr His Pro Lys
 20

<210> 136
 <211> 25
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> synthetic construct

<400> 136

Ser Ser Arg Pro His Asp Pro Asn His Leu Thr His Gln Ala Arg Thr
 1 5 10 15

Ile Tyr Arg Asn Ala Asn His Thr Lys
 20 25

<210> 137
 <211> 25
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> synthetic construct

<400> 137

Ser Ser Arg Pro Ala Pro Pro Thr Tyr Gln Thr Ala Ser Tyr Pro His
 Page 70

1 5 15

Asn Leu Pro Ser Lys Arg Lys Met Lys
20 25

<210> 138
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic construct

<400> 138

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

Lys Ala Phe Leu Glu Ile Pro Thr Lys
20 25

<210> 139
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic construct

<400> 139

Ser Ser Arg Pro His Lys Asn Glu Asn Ile Met Gln Tyr Asn Val Asn
1 5 10 15

Asp Arg Trp His Ile Thr Pro Ala Lys
20 25

<210> 140
<211> 15
<212> PRT
<213> artificial sequence

<220>
<223> synthetic construct

<400> 140

Ser Asn Ala Thr Met Tyr Asn Ile Gln Ser His Ser His His Gln
1 5 10 15

<210> 141
<211> 15
<212> PRT
<213> artificial sequence

<220>

<223> synthetic construct

<400> 141

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

<210> 142

<211> 15

<212> PRT

<213> artificial sequence

<220>

<223> synthetic construct

<400> 142

His	Asp	Pro	Tyr	Thr	Met	Lys	Ser	Ala	Leu	Arg	Gln	Ser	Thr	Ser
1				5					10					15

<210> 143

<211> 15

<212> PRT

<213> artificial sequence

<220>

<223> synthetic construct

<400> 143

Asp	Leu	Gly	Thr	Phe	Pro	Asn	Arg	Thr	Leu	Lys	Met	Ala	Ala	His
1				5					10					15

<210> 144

<211> 15

<212> PRT

<213> artificial sequence

<220>

<223> synthetic construct

<400> 144

Asp	Thr	Ile	His	Pro	Asn	Lys	Met	Lys	Ser	Pro	Ser	Ser	Pro	Leu
1				5					10					15

<210> 145

<211> 15

<212> PRT

<213> artificial sequence

<220>

<223> synthetic construct

<400> 145

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

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<210> 146
<211> 18
<212> PRT
<213> artificial sequence

<220>
<223> synthetic construct

<400> 146

Ser Asn Pro Ile Pro Asn Phe Ala His Asp Leu Arg His Ser Lys Tyr
1 5 10 15

Asn Ser

<210> 147
<211> 18
<212> PRT
<213> artificial sequence

<220>
<223> synthetic construct

<400> 147

Thr Lys Pro Pro Arg Thr Pro Thr Ala Asn Thr Ser Arg Pro His His
1 5 10 15

Asn Phe

<210> 148
<211> 20
<212> PRT
<213> artificial sequence

<220>
<223> synthetic construct

<400> 148

Ala Asn Ser Gly Phe Pro Ile Trp Leu Gln Lys Tyr Pro Trp Ser Glu
1 5 10 15

Val Gln Gln Glu
20

<210> 149
<211> 19
<212> PRT
<213> artificial sequence

<220>
<223> synthetic construct

9434-00-WO-OC_ST25_DD

<400> 149

Ala Thr Pro Arg Leu Thr Pro Glu Ala His His Lys Ala Gly Asn Trp
1 5 10 15

Tyr Ala Ser

<210> 150

<211> 20

<212> PRT

<213> artificial sequence

<220>

<223> synthetic construct

<400> 150

Ala Thr Pro Ser Gln His Arg Tyr Gly Leu Met Gln Asn His Ala Pro
1 5 10 15

Asn Gly Ile Glu
20

<210> 151

<211> 16

<212> PRT

<213> artificial sequence

<220>

<223> synthetic construct

<400> 151

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

<210> 152

<211> 21

<212> PRT

<213> artificial sequence

<220>

<223> synthetic construct

<400> 152

Thr Thr Tyr His Tyr Lys Asn Ile Tyr Gln Glu Ser Tyr Gln Gln Arg
1 5 10 15

Asn Pro Ala Val Lys
20

<210> 153

<211> 16

<212> PRT

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<213> artificial sequence

<220>

<223> synthetic construct

<400> 153

Ser Asn Ala Thr Met Tyr Asn Ile Gln Ser His Ser His His Gln Lys
1 5 10 15

<210> 154

<211> 16

<212> PRT

<213> artificial sequence

<220>

<223> synthetic construct

<400> 154

Gln Ala Ala Gln Val His Met Met Gln His Ser Arg Pro Thr Thr Lys
1 5 10 15

<210> 155

<211> 16

<212> PRT

<213> artificial sequence

<220>

<223> synthetic construct

<400> 155

His Asp Pro Tyr Thr Met Lys Ser Ala Leu Arg Gln Ser Thr Ser Lys
1 5 10 15

<210> 156

<211> 16

<212> PRT

<213> artificial sequence

<220>

<223> synthetic construct

<400> 156

Asp Leu Gly Thr Phe Pro Asn Arg Thr Leu Lys Met Ala Ala His Lys
1 5 10 15

<210> 157

<211> 16

<212> PRT

<213> artificial sequence

<220>

<223> synthetic construct

<400> 157

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Asp Thr Ile His Pro Asn Lys Met Lys Ser Pro Ser Ser Pro Leu Lys
1 5 10 15

<210> 158
<211> 16
<212> PRT
<213> artificial sequence

<220>
<223> synthetic construct

<400> 158

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

<210> 159
<211> 19
<212> PRT
<213> artificial sequence

<220>
<223> synthetic construct

<400> 159

Ser Asn Pro Ile Pro Asn Phe Ala His Asp Leu Arg His Ser Lys Tyr
1 5 10 15

Asn Ser Lys

<210> 160
<211> 19
<212> PRT
<213> artificial sequence

<220>
<223> synthetic construct

<400> 160

Thr Lys Pro Pro Arg Thr Pro Thr Ala Asn Thr Ser Arg Pro His His
1 5 10 15

Asn Phe Lys

<210> 161
<211> 21
<212> PRT
<213> artificial sequence

<220>
<223> synthetic construct

<400> 161

9434-00-WO-OC_ST25_DD

Ala Asn Ser Gly Phe Pro Ile Trp Leu Gln Lys Tyr Pro Trp Ser Glu
1 5 10 15

Val Gln Gln Glu Lys
20

<210> 162
<211> 21
<212> PRT
<213> artificial sequence

<220>
<223> synthetic construct

<400> 162

Ala Thr Pro Ser Gln His Arg Tyr Gly Leu Met Gln Asn His Ala Pro
1 5 10 15

Asn Gly Ile Glu Lys
20

<210> 163
<211> 17
<212> PRT
<213> artificial sequence

<220>
<223> synthetic construct

<400> 163

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

Lys

<210> 164
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic construct - caspase 3 cleavable linker

<400> 164

Leu Glu Ser Gly Asp Glu Val Asp
1 5

<210> 165
<211> 37
<212> PRT
<213> Artificial Sequence

9434-00-WO-OC_ST25_DD

<220>

<223> synthetic construct

<400> 165

Thr Ser Thr Ser Lys Ala Ser Thr Thr Thr Thr Ser Ser Lys Thr Thr
1 5 10 15

Thr Thr Ser Ser Lys Thr Thr Thr Thr Thr Ser Lys Thr Ser Thr Thr
20 25 30

Ser Ser Ser Ser Thr
35

<210> 166

<211> 22

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic construct

<400> 166

Gly Gln Gly Gly Tyr Gly Gly Leu Gly Ser Gln Gly Ala Gly Arg Gly
1 5 10 15

Gly Leu Gly Gly Gln Gly
20

<210> 167

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic construct

<400> 167

Gly Pro Gly Gly Tyr Gly Pro Gly Gln Gln
1 5 10

<210> 168

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic construct

<400> 168

Gly Gly Ser Gly Pro Gly Ser Gly Gly
1 5

<210> 169
 <211> 5
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> synthetic construct
 <400> 169

Gly Gly Pro Lys Lys
 1 5

<210> 170
 <211> 5
 <212> PRT
 <213> Artificial Sequence

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 <400> 170

Gly Pro Gly Val Gly
 1 5

<210> 171
 <211> 7
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 <213> Artificial Sequence

<220>
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 <400> 171

Gly Gly Gly Cys Gly Gly Gly
 1 5

<210> 172
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 <213> Artificial Sequence

<220>
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 <400> 172

Gly Gly Gly Cys
 1

<210> 173
 <211> 14
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 <213> Artificial Sequence

<220>

9434-00-WO-OC_ST25_DD

<223> synthetic construct

<400> 173

Pro His Met Ala Ser Met Thr Gly Gly Gln Gln Met Gly Ser
1 5 10

<210> 174

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic construct

<400> 174

Gly Pro Glu Glu Ala Ala Lys Lys Glu Glu Ala Ala Lys Lys Pro Ala
1 5 10 15

<210> 175

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic construct

<400> 175

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

<210> 176

<211> 37

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic construct

<400> 176

Gly Pro Glu Pro Glu Pro Glu Pro Glu Pro Ile Pro Glu Pro Pro Lys
1 5 10 15

Glu Ala Pro Val Val Ile Glu Lys Pro Lys Pro Lys Pro Lys Pro Lys
20 25 30

Pro Lys Pro Pro Ala
35

<210> 177

<211> 18

<212> PRT

<213> artificial sequence

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<220>

<223> synthetic construct

<400> 177

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

Gly Ser

<210> 178

<211> 431

<212> PRT

<213> artificial sequence

<220>

<223> synthetic construct

<400> 178

Met Ala Phe Phe Asp Leu Pro Leu Glu Glu Leu Lys Lys Tyr Arg Pro
1 5 10 15

Glu Arg Tyr Glu Glu Lys Asp Phe Asp Glu Phe Trp Glu Glu Thr Leu
20 25 30

Ala Glu Ser Glu Lys Phe Pro Leu Asp Pro Val Phe Glu Arg Met Glu
35 40 45

Ser His Leu Lys Thr Val Glu Ala Tyr Asp Val Thr Phe Ser Gly Tyr
50 55 60

Arg Gly Gln Arg Ile Lys Gly Trp Leu Leu Val Pro Lys Leu Glu Glu
65 70 75 80

Glu Lys Leu Pro Cys Val Val Gln Tyr Ile Gly Tyr Asn Gly Gly Arg
85 90 95

Gly Phe Pro His Asp Trp Leu Phe Trp Pro Ser Met Gly Tyr Ile Cys
100 105 110

Phe Val Met Asp Thr Arg Gly Gln Gly Ser Gly Trp Leu Lys Gly Asp
115 120 125

Thr Pro Asp Tyr Pro Glu Gly Pro Val Asp Pro Gln Tyr Pro Gly Phe
130 135 140

Met Thr Arg Gly Ile Leu Asp Pro Arg Thr Tyr Tyr Tyr Arg Arg Val
145 150 155 160

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Phe Thr Asp Ala Val Arg Ala Val Glu Ala Ala Ala Ser Phe Pro Gln
165 170 175

Val Asp Gln Glu Arg Ile Val Ile Ala Gly Gly Ser Gln Gly Gly Gly
180 185 190

Ile Ala Leu Ala Val Ser Ala Leu Ser Lys Lys Ala Lys Ala Leu Leu
195 200 205

Cys Asp Val Pro Phe Leu Cys His Phe Arg Arg Ala Val Gln Leu Val
210 215 220

Asp Thr His Pro Tyr Ala Glu Ile Thr Asn Phe Leu Lys Thr His Arg
225 230 235 240

Asp Lys Glu Glu Ile Val Phe Arg Thr Leu Ser Tyr Phe Asp Gly Val
245 250 255

Asn Phe Ala Ala Arg Ala Lys Ile Pro Ala Leu Phe Ser Val Gly Leu
260 265 270

Met Asp Asn Ile Ser Pro Pro Ser Thr Val Phe Ala Ala Tyr Asn Tyr
275 280 285

Tyr Ala Gly Pro Lys Glu Ile Arg Ile Tyr Pro Tyr Asn Asn His Glu
290 295 300

Gly Gly Gly Ser Phe Gln Ala Val Glu Gln Val Lys Phe Leu Lys Lys
305 310 315 320

Leu Phe Glu Lys Gly Gly Pro Gly Ser Gly Gly Ala Gly Ser Pro Gly
325 330 335

Ser Ala Gly Gly Pro Gly Ser Pro Ser Ala Gln Ser Gln Leu Pro Asp
340 345 350

Lys His Ser Gly Leu His Glu Arg Ala Pro Gln Arg Tyr Gly Pro Glu
355 360 365

Pro Glu Pro Glu Pro Glu Pro Ile Pro Glu Pro Pro Lys Glu Ala Pro
370 375 380

Val Val Ile Glu Lys Pro Lys Pro Lys Pro Lys Pro Lys Pro Lys Pro
385 390 395 400

Pro Ala His Asp His Lys Asn Gln Lys Glu Thr His Gln Arg His Ala
405 410 415

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Ala Gly Ser Gly Gly Gly Gly Ser Pro His His His His His His
 420 425 430

<210> 179
 <211> 353
 <212> PRT
 <213> artificial sequence

<220>
 <223> synthetic construct

<400> 179

Met Ala Phe Phe Asp Leu Pro Leu Glu Glu Leu Lys Lys Tyr Arg Pro
 1 5 10 15

Glu Arg Tyr Glu Glu Lys Asp Phe Asp Glu Phe Trp Glu Glu Thr Leu
 20 25 30

Ala Glu Ser Glu Lys Phe Pro Leu Asp Pro Val Phe Glu Arg Met Glu
 35 40 45

Ser His Leu Lys Thr Val Glu Ala Tyr Asp Val Thr Phe Ser Gly Tyr
 50 55 60

Arg Gly Gln Arg Ile Lys Gly Trp Leu Leu Val Pro Lys Leu Glu Glu
 65 70 75 80

Glu Lys Leu Pro Cys Val Val Gln Tyr Ile Gly Tyr Asn Gly Gly Arg
 85 90 95

Gly Phe Pro His Asp Trp Leu Phe Trp Pro Ser Met Gly Tyr Ile Cys
 100 105 110

Phe Val Met Asp Thr Arg Gly Gln Gly Ser Gly Trp Leu Lys Gly Asp
 115 120 125

Thr Pro Asp Tyr Pro Glu Gly Pro Val Asp Pro Gln Tyr Pro Gly Phe
 130 135 140

Met Thr Arg Gly Ile Leu Asp Pro Arg Thr Tyr Tyr Tyr Arg Arg Val
 145 150 155 160

Phe Thr Asp Ala Val Arg Ala Val Glu Ala Ala Ala Ser Phe Pro Gln
 165 170 175

Val Asp Gln Glu Arg Ile Val Ile Ala Gly Gly Ser Gln Gly Gly Gly
 180 185 190

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Ile Ala Leu Ala Val Ser Ala Leu Ser Lys Lys Ala Lys Ala Leu Leu
195 200 205

Cys Asp Val Pro Phe Leu Cys His Phe Arg Arg Ala Val Gln Leu Val
210 215 220

Asp Thr His Pro Tyr Ala Glu Ile Thr Asn Phe Leu Lys Thr His Arg
225 230 235 240

Asp Lys Glu Glu Ile Val Phe Arg Thr Leu Ser Tyr Phe Asp Gly Val
245 250 255

Asn Phe Ala Ala Arg Ala Lys Ile Pro Ala Leu Phe Ser Val Gly Leu
260 265 270

Met Asp Asn Ile Ser Pro Pro Ser Thr Val Phe Ala Ala Tyr Asn Tyr
275 280 285

Tyr Ala Gly Pro Lys Glu Ile Arg Ile Tyr Pro Tyr Asn Asn His Glu
290 295 300

Gly Gly Gly Ser Phe Gln Ala Val Glu Gln Val Lys Phe Leu Lys Lys
305 310 315 320

Leu Phe Glu Lys Gly Gly Pro Gly Ser Gly Gly Ala Gly Ser Pro Gly
325 330 335

Ser Ala Gly Gly Pro Gly Ser Gly Lys Gly Lys Gly Lys Gly Lys Gly
340 345 350

Lys

<210> 180
<211> 359
<212> PRT
<213> artificial sequence

<220>
<223> synthetic construct

<400> 180

Met Ala Phe Phe Asp Leu Pro Leu Glu Glu Leu Lys Lys Tyr Arg Pro
1 5 10 15

Glu Arg Tyr Glu Glu Lys Asp Phe Asp Glu Phe Trp Glu Glu Thr Leu
20 25 30

Ala Glu Ser Glu Lys Phe Pro Leu Asp Pro Val Phe Glu Arg Met Glu
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Ser His Leu Lys Thr Val Glu Ala Tyr Asp Val Thr Phe Ser Gly Tyr
50 55 60

Arg Gly Gln Arg Ile Lys Gly Trp Leu Leu Val Pro Lys Leu Glu Glu
65 70 75 80

Glu Lys Leu Pro Cys Val Val Gln Tyr Ile Gly Tyr Asn Gly Gly Arg
85 90 95

Gly Phe Pro His Asp Trp Leu Phe Trp Pro Ser Met Gly Tyr Ile Cys
100 105 110

Phe Val Met Asp Thr Arg Gly Gln Gly Ser Gly Trp Leu Lys Gly Asp
115 120 125

Thr Pro Asp Tyr Pro Glu Gly Pro Val Asp Pro Gln Tyr Pro Gly Phe
130 135 140

Met Thr Arg Gly Ile Leu Asp Pro Arg Thr Tyr Tyr Tyr Arg Arg Val
145 150 155 160

Phe Thr Asp Ala Val Arg Ala Val Glu Ala Ala Ala Ser Phe Pro Gln
165 170 175

Val Asp Gln Glu Arg Ile Val Ile Ala Gly Gly Ser Gln Gly Gly Gly
180 185 190

Ile Ala Leu Ala Val Ser Ala Leu Ser Lys Lys Ala Lys Ala Leu Leu
195 200 205

Cys Asp Val Pro Phe Leu Cys His Phe Arg Arg Ala Val Gln Leu Val
210 215 220

Asp Thr His Pro Tyr Ala Glu Ile Thr Asn Phe Leu Lys Thr His Arg
225 230 235 240

Asp Lys Glu Glu Ile Val Phe Arg Thr Leu Ser Tyr Phe Asp Gly Val
245 250 255

Asn Phe Ala Ala Arg Ala Lys Ile Pro Ala Leu Phe Ser Val Gly Leu
260 265 270

Met Asp Asn Ile Ser Pro Pro Ser Thr Val Phe Ala Ala Tyr Asn Tyr
275 280 285

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Tyr Ala Gly Pro Lys Glu Ile Arg Ile Tyr Pro Tyr Asn Asn His Glu
290 295 300

Gly Gly Gly Ser Phe Gln Ala Val Glu Gln Val Lys Phe Leu Lys Lys
305 310 315 320

Leu Phe Glu Lys Gly Gly Pro Gly Ser Gly Gly Ala Gly Ser Pro Gly
325 330 335

Ser Ala Gly Gly Pro Gly Ser Gly Lys Gly Lys Gly Lys Gly Lys Gly
340 345 350

Lys His His His His His His
355

<210> 181

<211> 375

<212> PRT

<213> artificial sequence

<220>

<223> synthetic construct

<400> 181

Met Ala Phe Phe Asp Leu Pro Leu Glu Glu Leu Lys Lys Tyr Arg Pro
1 5 10 15

Glu Arg Tyr Glu Glu Lys Asp Phe Asp Glu Phe Trp Glu Glu Thr Leu
20 25 30

Ala Glu Ser Glu Lys Phe Pro Leu Asp Pro Val Phe Glu Arg Met Glu
35 40 45

Ser His Leu Lys Thr Val Glu Ala Tyr Asp Val Thr Phe Ser Gly Tyr
50 55 60

Arg Gly Gln Arg Ile Lys Gly Trp Leu Leu Val Pro Lys Leu Glu Glu
65 70 75 80

Glu Lys Leu Pro Cys Val Val Gln Tyr Ile Gly Tyr Asn Gly Gly Arg
85 90 95

Gly Phe Pro His Asp Trp Leu Phe Trp Pro Ser Met Gly Tyr Ile Cys
100 105 110

Phe Val Met Asp Thr Arg Gly Gln Gly Ser Gly Trp Leu Lys Gly Asp
115 120 125

Thr Pro Asp Tyr Pro Glu Gly Pro Val Asp Pro Gln Tyr Pro Gly Phe
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135

Met Thr Arg Gly Ile Leu Asp Pro Arg Thr Tyr Tyr Tyr Arg Arg Val
145 150 155 160

Phe Thr Asp Ala Val Arg Ala Val Glu Ala Ala Ala Ser Phe Pro Gln
165 170 175

Val Asp Gln Glu Arg Ile Val Ile Ala Gly Gly Ser Gln Gly Gly Gly
180 185 190

Ile Ala Leu Ala Val Ser Ala Leu Ser Lys Lys Ala Lys Ala Leu Leu
195 200 205

Cys Asp Val Pro Phe Leu Cys His Phe Arg Arg Ala Val Gln Leu Val
210 215 220

Asp Thr His Pro Tyr Ala Glu Ile Thr Asn Phe Leu Lys Thr His Arg
225 230 235 240

Asp Lys Glu Glu Ile Val Phe Arg Thr Leu Ser Tyr Phe Asp Gly Val
245 250 255

Asn Phe Ala Ala Arg Ala Lys Ile Pro Ala Leu Phe Ser Val Gly Leu
260 265 270

Met Asp Asn Ile Thr Pro Pro Ser Thr Val Phe Ala Ala Tyr Asn Tyr
275 280 285

Tyr Ala Gly Pro Lys Glu Ile Arg Ile Tyr Pro Tyr Asn Asn His Glu
290 295 300

Gly Gly Gly Ser Phe Gln Ala Val Glu Gln Val Lys Phe Leu Lys Lys
305 310 315 320

Leu Phe Glu Lys Gly Gly Pro Gly Ser Gly Gly Ala Gly Ser Pro Gly
325 330 335

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

Asn Thr Ser Arg Pro His His Asn Phe Gly Ser Gly Gly Gly Gly Ser
355 360 365

Pro His His His His His His
370 375

<210> 182
 <211> 431
 <212> PRT
 <213> artificial sequence

<220>
 <223> synthetic construct

<400> 182

Met Ala Phe Phe Asp Leu Pro Leu Glu Glu Leu Lys Lys Tyr Arg Pro
 1 5 10 15

Glu Arg Tyr Glu Glu Lys Asp Phe Asp Glu Phe Trp Glu Glu Thr Leu
 20 25 30

Ala Glu Ser Glu Lys Phe Pro Leu Asp Pro Val Phe Glu Arg Met Glu
 35 40 45

Ser His Leu Lys Thr Val Glu Ala Tyr Asp Val Thr Phe Ser Gly Tyr
 50 55 60

Arg Gly Gln Arg Ile Lys Gly Trp Leu Leu Val Pro Lys Leu Glu Glu
 65 70 75 80

Glu Lys Leu Pro Cys Val Val Gln Tyr Ile Gly Tyr Asn Gly Gly Arg
 85 90 95

Gly Phe Pro His Asp Trp Leu Phe Trp Pro Ser Met Gly Tyr Ile Cys
 100 105 110

Phe Val Met Asp Thr Arg Gly Gln Gly Ser Gly Trp Leu Lys Gly Asp
 115 120 125

Thr Pro Asp Tyr Pro Glu Gly Pro Val Asp Pro Gln Tyr Pro Gly Phe
 130 135 140

Met Thr Arg Gly Ile Leu Asp Pro Arg Thr Tyr Tyr Tyr Arg Arg Val
 145 150 155 160

Phe Thr Asp Ala Val Arg Ala Val Glu Ala Ala Ala Ser Phe Pro Gln
 165 170 175

Val Asp Gln Glu Arg Ile Val Ile Ala Gly Gly Ser Gln Gly Gly Gly
 180 185 190

Ile Ala Leu Ala Val Ser Ala Leu Ser Lys Lys Ala Lys Ala Leu Leu
 195 200 205

Cys Asp Val Pro Phe Leu Cys His Phe Arg Arg Ala Val Gln Leu Val
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215

Asp Thr His Pro Tyr Ala Glu Ile Thr Asn Phe Leu Lys Thr His Arg
225 230 235 240

Asp Lys Glu Glu Ile Val Phe Arg Thr Leu Ser Tyr Phe Asp Gly Val
245 250 255

Asn Phe Ala Ala Arg Ala Lys Ile Pro Ala Leu Phe Ser Val Gly Leu
260 265 270

Met Asp Asn Ile Thr Pro Pro Ser Thr Val Phe Ala Ala Tyr Asn Tyr
275 280 285

Tyr Ala Gly Pro Lys Glu Ile Arg Ile Tyr Pro Tyr Asn Asn His Glu
290 295 300

Gly Gly Gly Ser Phe Gln Ala Val Glu Gln Val Lys Phe Leu Lys Lys
305 310 315 320

Leu Phe Glu Lys Gly Gly Pro Gly Ser Gly Gly Ala Gly Ser Pro Gly
325 330 335

Ser Ala Gly Gly Pro Gly Ser Pro Ser Ala Gln Ser Gln Leu Pro Asp
340 345 350

Lys His Ser Gly Leu His Glu Arg Ala Pro Gln Arg Tyr Gly Pro Glu
355 360 365

Pro Glu Pro Glu Pro Glu Pro Ile Pro Glu Pro Pro Lys Glu Ala Pro
370 375 380

Val Val Ile Glu Lys Pro Lys Pro Lys Pro Lys Pro Lys Pro Lys Pro
385 390 395 400

Pro Ala His Asp His Lys Asn Gln Lys Glu Thr His Gln Arg His Ala
405 410 415

Ala Gly Ser Gly Gly Gly Gly Ser Pro His His His His His His
420 425 430

<210> 183
<211> 359
<212> PRT
<213> artificial sequence

<220>
<223> synthetic construct

<400> 183

Met Ala Phe Phe Asp Leu Pro Leu Glu Glu Leu Lys Lys Tyr Arg Pro
 1 5 10 15

Glu Arg Tyr Glu Glu Lys Asp Phe Asp Glu Phe Trp Glu Glu Thr Leu
 20 25 30

Ala Glu Ser Glu Lys Phe Pro Leu Asp Pro Val Phe Glu Arg Met Glu
 35 40 45

Ser His Leu Lys Thr Val Glu Ala Tyr Asp Val Thr Phe Ser Gly Tyr
 50 55 60

Arg Gly Gln Arg Ile Lys Gly Trp Leu Leu Val Pro Lys Leu Glu Glu
 65 70 75 80

Glu Lys Leu Pro Cys Val Val Gln Tyr Ile Gly Tyr Asn Gly Gly Arg
 85 90 95

Gly Phe Pro His Asp Trp Leu Phe Trp Pro Ser Met Gly Tyr Ile Cys
 100 105 110

Phe Val Met Asp Thr Arg Gly Gln Gly Ser Gly Trp Leu Lys Gly Asp
 115 120 125

Thr Pro Asp Tyr Pro Glu Gly Pro Val Asp Pro Gln Tyr Pro Gly Phe
 130 135 140

Met Thr Arg Gly Ile Leu Asp Pro Arg Thr Tyr Tyr Tyr Arg Arg Val
 145 150 155 160

Phe Thr Asp Ala Val Arg Ala Val Glu Ala Ala Ala Ser Phe Pro Gln
 165 170 175

Val Asp Gln Glu Arg Ile Val Ile Ala Gly Gly Ser Gln Gly Gly Gly
 180 185 190

Ile Ala Leu Ala Val Ser Ala Leu Ser Lys Lys Ala Lys Ala Leu Leu
 195 200 205

Cys Asp Val Pro Phe Leu Cys His Phe Arg Arg Ala Val Gln Leu Val
 210 215 220

Asp Thr His Pro Tyr Ala Glu Ile Thr Asn Phe Leu Lys Thr His Arg
 225 230 235 240

Asp Lys Glu Glu Ile Val Phe Arg Thr Leu Ser Tyr Phe Asp Gly Val
 Page 90

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255

Asn Phe Ala Ala Arg Ala Lys Ile Pro Ala Leu Phe Ser Val Gly Leu
260 265 270

Met Asp Asn Ile Thr Pro Pro Ser Thr Val Phe Ala Ala Tyr Asn Tyr
275 280 285

Tyr Ala Gly Pro Lys Glu Ile Arg Ile Tyr Pro Tyr Asn Asn His Glu
290 295 300

Gly Gly Gly Ser Phe Gln Ala Val Glu Gln Val Lys Phe Leu Lys Lys
305 310 315 320

Leu Phe Glu Lys Gly Gly Pro Gly Ser Gly Gly Ala Gly Ser Pro Gly
325 330 335

Ser Ala Gly Gly Pro Gly Ser Gly Lys Gly Lys Gly Lys Gly Lys Gly
340 345 350

Lys His His His His His His
355

<210> 184

<211> 386

<212> PRT

<213> artificial sequence

<220>

<223> synthetic construct

<400> 184

Met Ala Phe Phe Asp Leu Pro Leu Glu Glu Leu Lys Lys Tyr Arg Pro
1 5 10 15

Glu Arg Tyr Glu Glu Lys Asp Phe Asp Glu Phe Trp Glu Glu Thr Leu
20 25 30

Ala Glu Ser Glu Lys Phe Pro Leu Asp Pro Val Phe Glu Arg Met Glu
35 40 45

Ser His Leu Lys Thr Val Glu Ala Tyr Asp Val Thr Phe Ser Gly Tyr
50 55 60

Arg Gly Gln Arg Ile Lys Gly Trp Leu Leu Val Pro Lys Leu Glu Glu
65 70 75 80

Glu Lys Leu Pro Cys Val Val Gln Tyr Ile Gly Tyr Asn Gly Gly Arg
85 90 95

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Gly Phe Pro His Asp Trp Leu Phe Trp Pro Ser Met Gly Tyr Ile Cys
100 105 110

Phe Val Met Asp Thr Arg Gly Gln Gly Ser Gly Trp Leu Lys Gly Asp
115 120 125

Thr Pro Asp Tyr Pro Glu Gly Pro Val Asp Pro Gln Tyr Pro Gly Phe
130 135 140

Met Thr Arg Gly Ile Leu Asp Pro Arg Thr Tyr Tyr Tyr Arg Arg Val
145 150 155 160

Phe Thr Asp Ala Val Arg Ala Val Glu Ala Ala Ala Ser Phe Pro Gln
165 170 175

Val Asp Gln Glu Arg Ile Val Ile Ala Gly Gly Ser Gln Gly Gly Gly
180 185 190

Ile Ala Leu Ala Val Ser Ala Leu Ser Lys Lys Ala Lys Ala Leu Leu
195 200 205

Cys Asp Val Pro Phe Leu Cys His Phe Arg Arg Ala Val Gln Leu Val
210 215 220

Asp Thr His Pro Tyr Ala Glu Ile Thr Asn Phe Leu Lys Thr His Arg
225 230 235 240

Asp Lys Glu Glu Ile Val Phe Arg Thr Leu Ser Tyr Phe Asp Gly Val
245 250 255

Asn Phe Ala Ala Arg Ala Lys Ile Pro Ala Leu Phe Ser Val Gly Leu
260 265 270

Met Asp Asn Ile Ser Pro Pro Ser Thr Val Phe Ala Ala Tyr Asn Tyr
275 280 285

Tyr Ala Gly Pro Lys Glu Ile Arg Ile Tyr Pro Tyr Asn Asn His Glu
290 295 300

Gly Gly Gly Ser Phe Gln Ala Val Glu Gln Val Lys Phe Leu Lys Lys
305 310 315 320

Leu Phe Glu Lys Gly Glu Pro Glu Pro Glu Gly Pro Gly Ser Gly Gly
325 330 335

Ala Gly Ser Pro Gly Ser Ala Gly Gly Pro Gly Ser Glu Pro Glu Pro

340 9434-00-WO-OC_ST25_DD 345 350

Glu Trp Lys Thr Lys Lys Ile Leu Leu Ser Arg Thr Arg Arg Ile Met
355 360 365

Arg Gln Val Val Arg Ser Val Met His Lys Ile Trp His His His His
370 375 380

His His
385

<210> 185
<211> 387
<212> PRT
<213> artificial sequence

<220>
<223> synthetic construct

<400> 185

Met Ala Phe Phe Asp Leu Pro Leu Glu Glu Leu Lys Lys Tyr Arg Pro
1 5 10 15

Glu Arg Tyr Glu Glu Lys Asp Phe Asp Glu Phe Trp Glu Glu Thr Leu
20 25 30

Ala Glu Ser Glu Lys Phe Pro Leu Asp Pro Val Phe Glu Arg Met Glu
35 40 45

Ser His Leu Lys Thr Val Glu Ala Tyr Asp Val Thr Phe Ser Gly Tyr
50 55 60

Arg Gly Gln Arg Ile Lys Gly Trp Leu Leu Val Pro Lys Leu Glu Glu
65 70 75 80

Glu Lys Leu Pro Cys Val Val Gln Tyr Ile Gly Tyr Asn Gly Gly Arg
85 90 95

Gly Phe Pro His Asp Trp Leu Phe Trp Pro Ser Met Gly Tyr Ile Cys
100 105 110

Phe Val Met Asp Thr Arg Gly Gln Gly Ser Gly Trp Leu Lys Gly Asp
115 120 125

Thr Pro Asp Tyr Pro Glu Gly Pro Val Asp Pro Gln Tyr Pro Gly Phe
130 135 140

Met Thr Arg Gly Ile Leu Asp Pro Arg Thr Tyr Tyr Tyr Arg Arg Val
145 150 155 160

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Phe Thr Asp Ala Val Arg Ala Val Glu Ala Ala Ala Ser Phe Pro Gln
165 170 175

Val Asp Gln Glu Arg Ile Val Ile Ala Gly Gly Ser Gln Gly Gly Gly
180 185 190

Ile Ala Leu Ala Val Ser Ala Leu Ser Lys Lys Ala Lys Ala Leu Leu
195 200 205

Cys Asp Val Pro Phe Leu Cys His Phe Arg Arg Ala Val Gln Leu Val
210 215 220

Asp Thr His Pro Tyr Ala Glu Ile Thr Asn Phe Leu Lys Thr His Arg
225 230 235 240

Asp Lys Glu Glu Ile Val Phe Arg Thr Leu Ser Tyr Phe Asp Gly Val
245 250 255

Asn Phe Ala Ala Arg Ala Lys Ile Pro Ala Leu Phe Ser Val Gly Leu
260 265 270

Met Asp Asn Ile Ser Pro Pro Ser Thr Val Phe Ala Ala Tyr Asn Tyr
275 280 285

Tyr Ala Gly Pro Lys Glu Ile Arg Ile Tyr Pro Tyr Asn Asn His Glu
290 295 300

Gly Gly Gly Ser Phe Gln Ala Val Glu Gln Val Lys Phe Leu Lys Lys
305 310 315 320

Leu Phe Glu Lys Gly Glu Pro Glu Pro Glu Pro Glu Pro Glu Pro Glu
325 330 335

Gly Pro Gly Ser Gly Gly Ala Gly Ser Pro Gly Ser Ala Gly Gly Pro
340 345 350

Gly Ser Trp Lys Thr Lys Lys Ile Leu Leu Ser Arg Thr Arg Arg Ile
355 360 365

Met Arg Gln Val Val Arg Ser Val Met His Lys Ile Trp His His His
370 375 380

His His His
385

<210> 186

<211> 386
 <212> PRT
 <213> artificial sequence

<220>
 <223> synthetic construct

<400> 186

Met Ala Phe Phe Asp Leu Pro Leu Glu Glu Leu Lys Lys Tyr Arg Pro
 1 5 10 15

Glu Arg Tyr Glu Glu Lys Asp Phe Asp Glu Phe Trp Glu Glu Thr Leu
 20 25 30

Ala Glu Ser Glu Lys Phe Pro Leu Asp Pro Val Phe Glu Arg Met Glu
 35 40 45

Ser His Leu Lys Thr Val Glu Ala Tyr Asp Val Thr Phe Ser Gly Tyr
 50 55 60

Arg Gly Gln Arg Ile Lys Gly Trp Leu Leu Val Pro Lys Leu Glu Glu
 65 70 75 80

Glu Lys Leu Pro Cys Val Val Gln Tyr Ile Gly Tyr Asn Gly Gly Arg
 85 90 95

Gly Phe Pro His Asp Trp Leu Phe Trp Pro Ser Met Gly Tyr Ile Cys
 100 105 110

Phe Val Met Asp Thr Arg Gly Gln Gly Ser Gly Trp Leu Lys Gly Asp
 115 120 125

Thr Pro Asp Tyr Pro Glu Gly Pro Val Asp Pro Gln Tyr Pro Gly Phe
 130 135 140

Met Thr Arg Gly Ile Leu Asp Pro Arg Thr Tyr Tyr Tyr Arg Arg Val
 145 150 155 160

Phe Thr Asp Ala Val Arg Ala Val Glu Ala Ala Ala Ser Phe Pro Gln
 165 170 175

Val Asp Gln Glu Arg Ile Val Ile Ala Gly Gly Ser Gln Gly Gly Gly
 180 185 190

Ile Ala Leu Ala Val Ser Ala Leu Ser Lys Lys Ala Lys Ala Leu Leu
 195 200 205

Cys Asp Val Pro Phe Leu Cys His Phe Arg Arg Ala Val Gln Leu Val
 210 215 220

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Asp Thr His Pro Tyr Ala Glu Ile Thr Asn Phe Leu Lys Thr His Arg
225 230 235 240

Asp Lys Glu Glu Ile Val Phe Arg Thr Leu Ser Tyr Phe Asp Gly Val
245 250 255

Asn Phe Ala Ala Arg Ala Lys Ile Pro Ala Leu Phe Ser Val Gly Leu
260 265 270

Met Asp Asn Ile Ser Pro Pro Ser Thr Val Phe Ala Ala Tyr Asn Tyr
275 280 285

Tyr Ala Gly Pro Lys Glu Ile Arg Ile Tyr Pro Tyr Asn Asn His Glu
290 295 300

Gly Gly Gly Ser Phe Gln Ala Val Glu Gln Val Lys Phe Leu Lys Lys
305 310 315 320

Leu Phe Glu Lys Gly Glu Pro Glu Pro Glu Gly Pro Gly Ser Gly Gly
325 330 335

Ala Gly Ser Pro Gly Ser Ala Gly Gly Pro Gly Ser Glu Pro Glu Pro
340 345 350

Glu Pro Leu Trp Arg Arg Ile Thr Lys Arg Lys Leu Val Arg Pro Val
355 360 365

Ala Thr Leu Met Trp Tyr Trp Phe Thr Ser Lys Arg His His His His
370 375 380

His His
385

<210> 187

<211> 387

<212> PRT

<213> artificial sequence

<220>

<223> synthetic construct

<400> 187

Met Ala Phe Phe Asp Leu Pro Leu Glu Glu Leu Lys Lys Tyr Arg Pro
1 5 10 15

Glu Arg Tyr Glu Glu Lys Asp Phe Asp Glu Phe Trp Glu Glu Thr Leu
20 25 30

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Ala Glu Ser₃₅ Glu Lys Phe Pro Leu₄₀ Asp Pro Val Phe₄₅ Glu Arg Met Glu
Ser His₅₀ Leu Lys Thr Val Glu₅₅ Ala Tyr Asp Val Thr₆₀ Phe Ser Gly Tyr
Arg Gly Gln Arg Ile Lys₇₀ Gly Trp Leu Leu Val₇₅ Pro Lys Leu Glu₈₀ Glu
Glu Lys Leu Pro Cys₈₅ Val Val Gln Tyr Ile₉₀ Gly Tyr Asn Gly₉₅ Gly Arg
Gly Phe Pro His₁₀₀ Asp Trp Leu Phe Trp₁₀₅ Pro Ser Met Gly Tyr₁₁₀ Ile Cys
Phe Val Met₁₁₅ Asp Thr Arg Gly Gln₁₂₀ Gly Ser Gly Trp Leu₁₂₅ Lys Gly Asp
Thr Pro₁₃₀ Asp Tyr Pro Glu Gly₁₃₅ Pro Val Asp Pro Gln₁₄₀ Tyr Pro Gly Phe
Met₁₄₅ Thr Arg Gly Ile Leu₁₅₀ Asp Pro Arg Thr Tyr₁₅₅ Tyr Tyr Arg Arg Val₁₆₀
Phe Thr Asp Ala Val₁₆₅ Arg Ala Val Glu₁₇₀ Ala Ala Ala Ser Phe Pro₁₇₅ Gln
Val Asp Gln Glu₁₈₀ Arg Ile Val Ile Ala₁₈₅ Gly Gly Ser Gln Gly₁₉₀ Gly Gly
Ile Ala Leu₁₉₅ Ala Val Ser Ala Leu₂₀₀ Ser Lys Lys Ala Lys₂₀₅ Ala Leu Leu
Cys Asp₂₁₀ Val Pro Phe Leu Cys₂₁₅ His Phe Arg Arg Ala₂₂₀ Val Gln Leu Val
Asp₂₂₅ Thr His Pro Tyr Ala₂₃₀ Glu Ile Thr Asn Phe₂₃₅ Leu Lys Thr His Arg₂₄₀
Asp Lys Glu Glu Ile₂₄₅ Val Phe Arg Thr Leu₂₅₀ Ser Tyr Phe Asp Gly₂₅₅ Val
Asn Phe Ala Ala Arg Ala Lys Ile Pro Ala Leu Phe Ser Val₂₇₀ Gly Leu
Met Asp Asn₂₇₅ Ile Ser Pro Pro Ser₂₈₀ Thr Val Phe Ala Ala₂₈₅ Tyr Asn Tyr

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Tyr Ala Gly Pro Lys Glu Ile Arg Ile Tyr Pro Tyr Asn Asn His Glu
290 295 300

Gly Gly Gly Ser Phe Gln Ala Val Glu Gln Val Lys Phe Leu Lys Lys
305 310 315 320

Leu Phe Glu Lys Gly Glu Pro Glu Pro Glu Pro Glu Pro Glu Pro Glu
325 330 335

Gly Pro Gly Ser Gly Gly Ala Gly Ser Pro Gly Ser Ala Gly Gly Pro
340 345 350

Gly Ser Pro Leu Trp Arg Arg Ile Thr Lys Arg Lys Leu Val Arg Pro
355 360 365

Val Ala Thr Leu Met Trp Tyr Trp Phe Thr Ser Lys Arg His His His
370 375 380

His His His
385

<210> 188

<211> 382

<212> PRT

<213> artificial sequence

<220>

<223> synthetic construct

<400> 188

Met Ala Phe Phe Asp Leu Pro Leu Glu Glu Leu Lys Lys Tyr Arg Pro
1 5 10 15

Glu Arg Tyr Glu Glu Lys Asp Phe Asp Glu Phe Trp Glu Glu Thr Leu
20 25 30

Ala Glu Ser Glu Lys Phe Pro Leu Asp Pro Val Phe Glu Arg Met Glu
35 40 45

Ser His Leu Lys Thr Val Glu Ala Tyr Asp Val Thr Phe Ser Gly Tyr
50 55 60

Arg Gly Gln Arg Ile Lys Gly Trp Leu Leu Val Pro Lys Leu Glu Glu
65 70 75 80

Glu Lys Leu Pro Cys Val Val Gln Tyr Ile Gly Tyr Asn Gly Gly Arg
85 90 95

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Gly Phe Pro His Asp Trp Leu Phe Trp Pro Ser Met Gly Tyr Ile Cys
100 105 110

Phe Val Met Asp Thr Arg Gly Gln Gly Ser Gly Trp Leu Lys Gly Asp
115 120 125

Thr Pro Asp Tyr Pro Glu Gly Pro Val Asp Pro Gln Tyr Pro Gly Phe
130 135 140

Met Thr Arg Gly Ile Leu Asp Pro Arg Thr Tyr Tyr Tyr Arg Arg Val
145 150 155 160

Phe Thr Asp Ala Val Arg Ala Val Glu Ala Ala Ala Ser Phe Pro Gln
165 170 175

Val Asp Gln Glu Arg Ile Val Ile Ala Gly Gly Ser Gln Gly Gly Gly
180 185 190

Ile Ala Leu Ala Val Ser Ala Leu Ser Lys Lys Ala Lys Ala Leu Leu
195 200 205

Cys Asp Val Pro Phe Leu Cys His Phe Arg Arg Ala Val Gln Leu Val
210 215 220

Asp Thr His Pro Tyr Ala Glu Ile Thr Asn Phe Leu Lys Thr His Arg
225 230 235 240

Asp Lys Glu Glu Ile Val Phe Arg Thr Leu Ser Tyr Phe Asp Gly Val
245 250 255

Asn Phe Ala Ala Arg Ala Lys Ile Pro Ala Leu Phe Ser Val Gly Leu
260 265 270

Met Asp Asn Ile Ser Pro Pro Ser Thr Val Phe Ala Ala Tyr Asn Tyr
275 280 285

Tyr Ala Gly Pro Lys Glu Ile Arg Ile Tyr Pro Tyr Asn Asn His Glu
290 295 300

Gly Gly Gly Ser Phe Gln Ala Val Glu Gln Val Lys Phe Leu Lys Lys
305 310 315 320

Leu Phe Glu Lys Gly Glu Pro Glu Gly Pro Gly Ser Gly Gly Ala Gly
325 330 335

Ser Pro Gly Ser Ala Gly Gly Pro Gly Ser Glu Pro Glu Arg Met Leu
340 345 350

Ser Arg Ile Leu Arg Met Phe Val Arg Ile Leu Lys Arg Glu Arg Leu
 355 360 365

Ser Gln Val Arg Gly Leu Phe Val His His His His His His
 370 375 380

<210> 189

<211> 383

<212> PRT

<213> artificial sequence

<220>

<223> synthetic construct

<400> 189

Met Ala Phe Phe Asp Leu Pro Leu Glu Glu Leu Lys Lys Tyr Arg Pro
 1 5 10 15

Glu Arg Tyr Glu Glu Lys Asp Phe Asp Glu Phe Trp Glu Glu Thr Leu
 20 25 30

Ala Glu Ser Glu Lys Phe Pro Leu Asp Pro Val Phe Glu Arg Met Glu
 35 40 45

Ser His Leu Lys Thr Val Glu Ala Tyr Asp Val Thr Phe Ser Gly Tyr
 50 55 60

Arg Gly Gln Arg Ile Lys Gly Trp Leu Leu Val Pro Lys Leu Glu Glu
 65 70 75 80

Glu Lys Leu Pro Cys Val Val Gln Tyr Ile Gly Tyr Asn Gly Gly Arg
 85 90 95

Gly Phe Pro His Asp Trp Leu Phe Trp Pro Ser Met Gly Tyr Ile Cys
 100 105 110

Phe Val Met Asp Thr Arg Gly Gln Gly Ser Gly Trp Leu Lys Gly Asp
 115 120 125

Thr Pro Asp Tyr Pro Glu Gly Pro Val Asp Pro Gln Tyr Pro Gly Phe
 130 135 140

Met Thr Arg Gly Ile Leu Asp Pro Arg Thr Tyr Tyr Tyr Arg Arg Val
 145 150 155 160

Phe Thr Asp Ala Val Arg Ala Val Glu Ala Ala Ala Ser Phe Pro Gln
 165 170 175

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Val Asp Gln Glu Arg Ile Val Ile Ala Gly Gly Ser Gln Gly Gly Gly
180 185 190

Ile Ala Leu Ala Val Ser Ala Leu Ser Lys Lys Ala Lys Ala Leu Leu
195 200 205

Cys Asp Val Pro Phe Leu Cys His Phe Arg Arg Ala Val Gln Leu Val
210 215 220

Asp Thr His Pro Tyr Ala Glu Ile Thr Asn Phe Leu Lys Thr His Arg
225 230 235 240

Asp Lys Glu Glu Ile Val Phe Arg Thr Leu Ser Tyr Phe Asp Gly Val
245 250 255

Asn Phe Ala Ala Arg Ala Lys Ile Pro Ala Leu Phe Ser Val Gly Leu
260 265 270

Met Asp Asn Ile Ser Pro Pro Ser Thr Val Phe Ala Ala Tyr Asn Tyr
275 280 285

Tyr Ala Gly Pro Lys Glu Ile Arg Ile Tyr Pro Tyr Asn Asn His Glu
290 295 300

Gly Gly Gly Ser Phe Gln Ala Val Glu Gln Val Lys Phe Leu Lys Lys
305 310 315 320

Leu Phe Glu Lys Gly Glu Pro Glu Pro Glu Pro Glu Gly Pro Gly Ser
325 330 335

Gly Gly Ala Gly Ser Pro Gly Ser Ala Gly Gly Pro Gly Ser Arg Met
340 345 350

Leu Ser Arg Ile Leu Arg Met Phe Val Arg Ile Leu Lys Arg Glu Arg
355 360 365

Leu Ser Gln Val Arg Gly Leu Phe Val His His His His His His
370 375 380

<210> 190
<211> 390
<212> PRT
<213> artificial sequence
<220>
<223> synthetic construct
<400> 190

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

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Asn Phe Ala Ala Arg Ala Lys Ile Pro Ala Leu Phe Ser Val Gly Leu
260 265 270

Met Asp Asn Ile Ser Pro Pro Ser Thr Val Phe Ala Ala Tyr Asn Tyr
275 280 285

Tyr Ala Gly Pro Lys Glu Ile Arg Ile Tyr Pro Tyr Asn Asn His Glu
290 295 300

Gly Gly Gly Ser Phe Gln Ala Val Glu Gln Val Lys Phe Leu Lys Lys
305 310 315 320

Leu Phe Glu Lys Gly Glu Pro Glu Pro Glu Pro Glu Gly Pro Gly Ser
325 330 335

Gly Gly Ala Gly Ser Pro Gly Ser Ala Gly Gly Pro Gly Ser Glu Pro
340 345 350

Glu Pro Glu Pro Glu Leu Arg Phe Leu Ala Arg Arg Phe Leu Lys Leu
355 360 365

Arg Arg Ala Arg Lys Trp Trp Asn Ala Trp Lys Val Trp Val Thr Arg
370 375 380

His His His His His His
385 390

<210> 191
<211> 391
<212> PRT
<213> artificial sequence

<220>
<223> synthetic construct

<400> 191

Met Ala Phe Phe Asp Leu Pro Leu Glu Glu Leu Lys Lys Tyr Arg Pro
1 5 10 15

Glu Arg Tyr Glu Glu Lys Asp Phe Asp Glu Phe Trp Glu Glu Thr Leu
20 25 30

Ala Glu Ser Glu Lys Phe Pro Leu Asp Pro Val Phe Glu Arg Met Glu
35 40 45

Ser His Leu Lys Thr Val Glu Ala Tyr Asp Val Thr Phe Ser Gly Tyr
50 55 60

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Arg Gly Gln Arg Ile Lys Gly Trp Leu Leu Val Pro Lys Leu Glu Glu
65 70 75 80

Glu Lys Leu Pro Cys Val Val Gln Tyr Ile Gly Tyr Asn Gly Gly Arg
85 90 95

Gly Phe Pro His Asp Trp Leu Phe Trp Pro Ser Met Gly Tyr Ile Cys
100 105 110

Phe Val Met Asp Thr Arg Gly Gln Gly Ser Gly Trp Leu Lys Gly Asp
115 120 125

Thr Pro Asp Tyr Pro Glu Gly Pro Val Asp Pro Gln Tyr Pro Gly Phe
130 135 140

Met Thr Arg Gly Ile Leu Asp Pro Arg Thr Tyr Tyr Tyr Arg Arg Val
145 150 155 160

Phe Thr Asp Ala Val Arg Ala Val Glu Ala Ala Ala Ser Phe Pro Gln
165 170 175

Val Asp Gln Glu Arg Ile Val Ile Ala Gly Gly Ser Gln Gly Gly Gly
180 185 190

Ile Ala Leu Ala Val Ser Ala Leu Ser Lys Lys Ala Lys Ala Leu Leu
195 200 205

Cys Asp Val Pro Phe Leu Cys His Phe Arg Arg Ala Val Gln Leu Val
210 215 220

Asp Thr His Pro Tyr Ala Glu Ile Thr Asn Phe Leu Lys Thr His Arg
225 230 235 240

Asp Lys Glu Glu Ile Val Phe Arg Thr Leu Ser Tyr Phe Asp Gly Val
245 250 255

Asn Phe Ala Ala Arg Ala Lys Ile Pro Ala Leu Phe Ser Val Gly Leu
260 265 270

Met Asp Asn Ile Ser Pro Pro Ser Thr Val Phe Ala Ala Tyr Asn Tyr
275 280 285

Tyr Ala Gly Pro Lys Glu Ile Arg Ile Tyr Pro Tyr Asn Asn His Glu
290 295 300

Gly Gly Gly Ser Phe Gln Ala Val Glu Gln Val Lys Phe Leu Lys Lys
305 310 315 320

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Leu Phe Glu Lys Gly Glu Pro Glu Pro Glu Pro Glu Pro Glu
325 330 335

Pro Glu Pro Glu Gly Pro Gly Ser Gly Gly Ala Gly Ser Pro Gly Ser
340 345 350

Ala Gly Gly Pro Gly Ser Leu Arg Phe Leu Ala Arg Arg Phe Leu Lys
355 360 365

Leu Arg Arg Ala Arg Lys Trp Trp Asn Ala Trp Lys Val Trp Val Thr
370 375 380

Arg His His His His His His
385 390

<210> 192

<211> 426

<212> PRT

<213> artificial sequence

<220>

<223> synthetic construct

<400> 192

Met Gln Leu Phe Asp Leu Ser Leu Glu Glu Leu Lys Lys Tyr Lys Pro
1 5 10 15

Lys Lys Thr Ala Arg Pro Asp Phe Ser Asp Phe Trp Lys Lys Ser Leu
20 25 30

Glu Glu Leu Arg Gln Val Glu Ala Glu Pro Thr Leu Glu Ser Tyr Asp
35 40 45

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

Gly His Ser Lys Ile Glu Gly Phe Tyr Ala Val Pro Asp Gln Thr Gly
65 70 75 80

Pro His Pro Ala Leu Val Arg Phe His Gly Tyr Asn Ala Ser Tyr Asp
85 90 95

Gly Gly Ile His Asp Ile Val Asn Trp Ala Leu His Gly Tyr Ala Thr
100 105 110

Phe Gly Met Leu Val Arg Gly Gln Gly Gly Ser Glu Asp Thr Ser Val
115 120 125

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

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Pro Lys Pro Lys Pro Lys Pro Lys Pro Lys Pro Pro Ala His Asp His
385 390 395 400

Lys Asn Gln Lys Glu Thr His Gln Arg His Ala Ala Gly Ser Gly Gly
405 410 415

Gly Gly Ser Pro His His His His His His
420 425

<210> 193
<211> 372
<212> PRT
<213> artificial sequence

<220>
<223> synthetic construct

<400> 193

Met Gln Leu Phe Asp Leu Ser Leu Glu Glu Leu Lys Lys Tyr Lys Pro
1 5 10 15

Lys Lys Thr Ala Arg Pro Asp Phe Ser Asp Phe Trp Lys Lys Ser Leu
20 25 30

Glu Glu Leu Arg Gln Val Glu Ala Glu Pro Thr Leu Glu Ser Tyr Asp
35 40 45

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

Gly His Ser Lys Ile Glu Gly Phe Tyr Ala Val Pro Asp Gln Thr Gly
65 70 75 80

Pro His Pro Ala Leu Val Arg Phe His Gly Tyr Asn Ala Ser Tyr Asp
85 90 95

Gly Gly Ile His Asp Ile Val Asn Trp Ala Leu His Gly Tyr Ala Thr
100 105 110

Phe Gly Met Leu Val Arg Gly Gln Gly Gly Ser Glu Asp Thr Ser Val
115 120 125

Thr Pro Gly Gly His Ala Leu Gly Trp Met Thr Lys Gly Ile Leu Ser
130 135 140

Lys Asp Thr Tyr Tyr Tyr Arg Gly Val Tyr Leu Asp Ala Val Arg Ala
145 150 155 160

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Leu Glu Val Ile Gln Ser Phe Pro Glu Val Asp Glu His Arg Ile Gly
165 170 175

Val Ile Gly Gly Ser Gln Gly Gly Ala Leu Ala Ile Ala Ala Ala Ala
180 185 190

Leu Ser Asp Ile Pro Lys Val Val Val Ala Asp Tyr Pro Tyr Leu Ser
195 200 205

Asn Phe Glu Arg Ala Val Asp Val Ala Leu Glu Gln Pro Tyr Leu Glu
210 215 220

Ile Asn Ser Tyr Phe Arg Arg Asn Ser Asp Pro Lys Val Glu Glu Lys
225 230 235 240

Ala Phe Glu Thr Leu Ser Tyr Phe Asp Leu Ile Asn Leu Ala Gly Trp
245 250 255

Val Lys Gln Pro Thr Leu Met Ala Ile Gly Leu Ile Asp Lys Ile Thr
260 265 270

Pro Pro Ser Thr Val Phe Ala Ala Tyr Asn His Leu Glu Thr Asp Lys
275 280 285

Asp Leu Lys Val Tyr Arg Tyr Phe Gly His Glu Phe Ile Pro Ala Phe
290 295 300

Gln Thr Glu Lys Leu Ser Phe Leu Gln Lys His Leu Leu Leu Ser Thr
305 310 315 320

Gly Pro Gly Ser Gly Gly Ala Gly Ser Pro Gly Ser Ala Gly Gly Pro
325 330 335

Gly Ser Asp Pro Thr Lys Pro Pro Arg Thr Pro Thr Ala Asn Thr Ser
340 345 350

Arg Pro His His Asn Phe Gly Ser Gly Gly Gly Gly Ser Pro His His
355 360 365

His His His His
370

<210> 194
<211> 429
<212> PRT
<213> artificial sequence

<220>
<223> synthetic construct

<400> 194

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

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Lys Ala Ala Val Phe Glu Thr Leu Asn Tyr Phe Asp Cys Val Asn Phe
245 250 255

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

Glu Val Cys Pro Pro Ser Thr Val Tyr Gly Ala Phe Asn Ala Tyr Ala
275 280 285

Gly Glu Lys Thr Ile Thr Glu Tyr Glu Phe Asn Asn His Glu Gly Gly
290 295 300

Gln Gly Tyr Gln Glu Arg Gln Gln Met Thr Trp Leu Ser Arg Leu Phe
305 310 315 320

Gly Val Gly Gly Pro Gly Ser Gly Gly Ala Gly Ser Pro Gly Ser Ala
325 330 335

Gly Gly Pro Gly Ser Pro Ser Ala Gln Ser Gln Leu Pro Asp Lys His
340 345 350

Ser Gly Leu His Glu Arg Ala Pro Gln Arg Tyr Gly Pro Glu Pro Glu
355 360 365

Pro Glu Pro Glu Pro Ile Pro Glu Pro Pro Lys Glu Ala Pro Val Val
370 375 380

Ile Glu Lys Pro Lys Pro Lys Pro Lys Pro Lys Pro Lys Pro Pro Ala
385 390 395 400

His Asp His Lys Asn Gln Lys Glu Thr His Gln Arg His Ala Ala Gly
405 410 415

Ser Gly Gly Gly Gly Ser Pro His His His His His
420 425

<210> 195

<211> 375

<212> PRT

<213> artificial sequence

<220>

<223> synthetic construct

<400> 195

Met Pro Phe Pro Asp Leu Ile Gln Pro Glu Leu Gly Ala Tyr Val Ser
1 5 10 15

Ser Val Gly Met Pro Asp Asp Phe Ala Gln Phe Trp Thr Ser Thr Ile
Page 110

20

9434-00-WO-OC_ST25_DD
25 30Ala Glu Ala Arg Gln Ala Gly Gly Glu Val Ser Ile Val Gln Ala Gln
35 40 45Thr Thr Leu Lys Ala Val Gln Ser Phe Asp Val Thr Phe Pro Gly Tyr
50 55 60Gly Gly His Pro Ile Lys Gly Trp Leu Ile Leu Pro Thr His His Lys
65 70 75 80Gly Arg Leu Pro Leu Val Val Gln Tyr Ile Gly Tyr Gly Gly Gly Arg
85 90 95Gly Leu Ala His Glu Gln Leu His Trp Ala Ala Ser Gly Phe Ala Tyr
100 105 110Phe Arg Met Asp Thr Arg Gly Gln Gly Ser Asp Trp Ser Val Gly Glu
115 120 125Thr Ala Asp Pro Val Gly Ser Thr Ser Ser Ile Pro Gly Phe Met Thr
130 135 140Arg Gly Val Leu Asp Lys Asn Asp Tyr Tyr Tyr Arg Arg Leu Phe Thr
145 150 155 160Asp Ala Val Arg Ala Ile Asp Ala Leu Leu Gly Leu Asp Phe Val Asp
165 170 175Pro Glu Arg Ile Ala Val Cys Gly Asp Ser Gln Gly Gly Gly Ile Ser
180 185 190Leu Ala Val Gly Gly Ile Asp Pro Arg Val Lys Ala Val Met Pro Asp
195 200 205Val Pro Phe Leu Cys Asp Phe Pro Arg Ala Val Gln Thr Ala Val Arg
210 215 220Asp Pro Tyr Leu Glu Ile Val Arg Phe Leu Ala Gln His Arg Glu Lys
225 230 235 240Lys Ala Ala Val Phe Glu Thr Leu Asn Tyr Phe Asp Cys Val Asn Phe
245 250 255Ala Arg Arg Ser Lys Ala Pro Ala Leu Phe Ser Val Ala Leu Met Asp
260 265 270

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Glu Val Cys Pro Pro Ser Thr Val Tyr Gly Ala Phe Asn Ala Tyr Ala
275 280 285

Gly Glu Lys Thr Ile Thr Glu Tyr Glu Phe Asn Asn His Glu Gly Gly
290 295 300

Gln Gly Tyr Gln Glu Arg Gln Gln Met Thr Trp Leu Ser Arg Leu Phe
305 310 315 320

Gly Val Gly Gly Pro Gly Ser Gly Gly Ala Gly Ser Pro Gly Ser Ala
325 330 335

Gly Gly Pro Gly Ser Asp Pro Thr Lys Pro Pro Arg Thr Pro Thr Ala
340 345 350

Asn Thr Ser Arg Pro His His Asn Phe Gly Ser Gly Gly Gly Gly Ser
355 360 365

Pro His His His His His
370 375

<210> 196
<211> 418
<212> PRT
<213> artificial sequence

<220>
<223> synthetic construct

<400> 196

Met Thr Lys Ile Asn Asn Trp Gln Asp Tyr Gln Gly Ser Ser Leu Lys
1 5 10 15

Pro Glu Asp Phe Asp Lys Phe Trp Asp Glu Lys Ile Asn Leu Val Ser
20 25 30

Asn His Gln Phe Glu Phe Glu Leu Ile Glu Lys Asn Leu Ser Ser Lys
35 40 45

Val Val Asn Phe Tyr His Leu Trp Phe Thr Ala Ile Asp Gly Ala Lys
50 55 60

Ile His Ala Gln Leu Ile Val Pro Lys Asn Leu Lys Glu Lys Tyr Pro
65 70 75 80

Ala Ile Leu Gln Phe His Gly Tyr His Cys Asp Ser Gly Asp Trp Val
85 90 95

Asp Lys Ile Gly Ile Val Ala Glu Gly Asn Val Val Leu Ala Leu Asp
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Cys Arg Gly Gln Gly Gly Leu Ser Gln Asp Asn Ile Gln Thr Met Gly
 115 120 125
 Met Thr Met Lys Gly Leu Ile Val Arg Gly Ile Asp Glu Gly Tyr Glu
 130 135 140
 Asn Leu Tyr Tyr Val Arg Gln Phe Met Asp Leu Ile Thr Ala Thr Lys
 145 150 155 160
 Ile Leu Ser Glu Phe Asp Phe Val Asp Glu Thr Asn Ile Ser Ala Gln
 165 170 175
 Gly Ala Ser Gln Gly Gly Ala Leu Ala Val Ala Cys Ala Ala Leu Ser
 180 185 190
 Pro Leu Ile Lys Lys Val Thr Ala Thr Tyr Pro Phe Leu Ser Asp Tyr
 195 200 205
 Arg Lys Ala Tyr Glu Leu Gly Ala Glu Glu Ser Ala Phe Glu Glu Leu
 210 215 220
 Pro Tyr Trp Phe Gln Phe Lys Asp Pro Leu His Leu Arg Glu Asp Trp
 225 230 235 240
 Phe Phe Asn Gln Leu Glu Tyr Ile Asp Ile Gln Asn Leu Ala Pro Arg
 245 250 255
 Ile Lys Ala Glu Val Ile Trp Ile Leu Gly Gly Lys Asp Thr Val Val
 260 265 270
 Pro Pro Ile Thr Gln Met Ala Ala Tyr Asn Lys Ile Gln Ser Lys Lys
 275 280 285
 Ser Leu Tyr Val Leu Pro Glu Tyr Gly His Glu Tyr Leu Pro Lys Ile
 290 295 300
 Ser Asp Trp Leu Arg Glu Asn Gln Gly Pro Gly Ser Gly Gly Ala Gly
 305 310 315 320
 Ser Pro Gly Ser Ala Gly Gly Pro Gly Ser Pro Ser Ala Gln Ser Gln
 325 330 335
 Leu Pro Asp Lys His Ser Gly Leu His Glu Arg Ala Pro Gln Arg Tyr
 340 345 350

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Gly Pro Glu Pro Glu Pro Glu Pro Glu Pro Ile Pro Glu Pro Pro Lys
355 360 365

Glu Ala Pro Val Val Ile Glu Lys Pro Lys Pro Lys Pro Lys Pro Lys
370 375 380

Pro Lys Pro Pro Ala His Asp His Lys Asn Gln Lys Glu Thr His Gln
385 390 395 400

Arg His Ala Ala Gly Ser Gly Gly Gly Gly Ser Pro His His His His
405 410 415

His His

<210> 197

<211> 363

<212> PRT

<213> artificial sequence

<220>

<223> synthetic construct

<400> 197

Met Thr Lys Ile Asn Asn Trp Gln Asp Tyr Gln Gly Ser Ser Leu Lys
1 5 10 15

Pro Glu Asp Phe Asp Lys Phe Trp Asp Glu Lys Ile Asn Leu Val Ser
20 25 30

Asn His Gln Phe Glu Phe Glu Leu Ile Glu Lys Asn Leu Ser Ser Lys
35 40 45

Val Val Asn Phe Tyr His Leu Trp Phe Thr Ala Ile Asp Gly Ala Lys
50 55 60

Ile His Ala Gln Leu Ile Val Pro Lys Asn Leu Lys Glu Lys Tyr Pro
65 70 75 80

Ala Ile Leu Gln Phe His Gly Tyr His Cys Asp Ser Gly Asp Trp Val
85 90 95

Asp Lys Ile Gly Ile Val Ala Glu Gly Asn Val Val Leu Ala Leu Asp
100 105 110

Cys Arg Gly Gln Gly Gly Leu Ser Gln Asp Asn Ile Gln Thr Met Gly
115 120 125

Met Thr Met Lys Gly Leu Ile Val Arg Gly Ile Asp Glu Gly Tyr Glu
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135

Asn Leu Tyr Tyr Val Arg Gln Phe Met Asp Leu Ile Thr Ala Thr Lys
145 150 155 160

Ile Leu Ser Glu Phe Asp Phe Val Asp Glu Thr Asn Ile Ser Ala Gln
165 170 175

Gly Ala Ser Gln Gly Gly Ala Leu Ala Val Ala Cys Ala Ala Leu Ser
180 185 190

Pro Leu Ile Lys Lys Val Thr Ala Thr Tyr Pro Phe Leu Ser Asp Tyr
195 200 205

Arg Lys Ala Tyr Glu Leu Gly Ala Glu Glu Ser Ala Phe Glu Glu Leu
210 215 220

Pro Tyr Trp Phe Gln Phe Lys Asp Pro Leu His Leu Arg Glu Asp Trp
225 230 235 240

Phe Phe Asn Gln Leu Glu Tyr Ile Asp Ile Gln Asn Leu Ala Pro Arg
245 250 255

Ile Lys Ala Glu Val Ile Trp Ile Leu Gly Gly Lys Asp Thr Val Val
260 265 270

Pro Pro Ile Thr Gln Met Ala Ala Tyr Asn Lys Ile Gln Ser Lys Lys
275 280 285

Ser Leu Tyr Val Leu Pro Glu Tyr Gly His Glu Tyr Leu Pro Lys Ile
290 295 300

Ser Asp Trp Leu Arg Glu Asn Gln Gly Pro Gly Ser Gly Gly Ala Gly
305 310 315 320

Ser Pro Gly Ser Ala Gly Gly Pro Gly Ser Asp Pro Thr Lys Pro Pro
325 330 335

Arg Thr Pro Thr Ala Asn Thr Ser Arg Pro His His Asn Phe Gly Ser
340 345 350

Gly Gly Gly Gly Ser Pro His His His His
355 360