

Sequence listing
SEQUENCE LISTING

<110> Erber Aktiengesellschaft
<120> Polypeptid zur hydrolytischen Spaltung von Zearalenon und / oder Zearalenon Derivaten
<130> P05341PCT
<160> 69
<170> PatentIn version 3.5
<210> 1
<211> 328
<212> PRT
<213> Rhodococcus erythropolis

<400> 1

Met Ala Glu Glu Gly Thr Arg Ser Glu Ala Ala Asp Ala Ala Thr Gln
1 5 10 15

Ala Arg Gln Leu Pro Asp Ser Arg Asn Ile Phe Val Ser His Arg Phe
20 25 30

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

Ala Gly Ser Pro Asp Asn Pro Ala Leu Leu Leu Leu Pro Glu Gln Thr
50 55 60

Gly Ser Trp Trp Ser Tyr Glu Pro Val Met Gly Leu Leu Ala Glu Asn
65 70 75 80

Phe His Val Phe Ala Val Asp Ile Arg Gly Gln Gly Arg Ser Thr Trp
85 90 95

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

Phe Ile Ala Leu Val Ile Lys Arg Pro Val Val Val Ala Gly Asn Ser
115 120 125

Ser Gly Gly Leu Leu Ala Ala Trp Leu Ser Ala Tyr Ala Met Pro Gly
130 135 140

Gln Ile Arg Ala Ala Leu Cys Glu Asp Ala Pro Phe Phe Ala Ser Glu
145 150 155 160

Leu Val Pro Ala Tyr Gly His Ser Val Leu Gln Ala Ala Gly Pro Ala
165 170 175

Phe Glu Leu Tyr Arg Asp Phe Leu Gly Asp Gln Trp Ser Ile Gly Asp
180 185 190

Sequence listing

Trp Lys Gly Phe Val Glu Ala Ala Lys Ala Ser Pro Ala Lys Ala Met
195 200 205

Gln Leu Phe Pro Thr Pro Asp Glu Ala Pro Gln Asn Leu Lys Glu Tyr
210 215 220

Asp Pro Glu Trp Gly Arg Ala Phe Phe Glu Gly Thr Val Ala Leu His
225 230 235 240

Cys Pro His Asp Arg Met Leu Ser Gln Val Lys Thr Pro Ile Leu Ile
245 250 255

Thr His His Ala Arg Thr Ile Asp Pro Glu Thr Gly Glu Leu Leu Gly
260 265 270

Ala Leu Ser Asp Leu Gln Ala Glu His Ala Gln Asp Ile Ile Arg Ser
275 280 285

Ala Gly Val Arg Val Asp Tyr Gln Ser His Pro Asp Ala Leu His Met
290 295 300

Met His Leu Phe Asp Pro Ala Arg Tyr Ala Glu Ile Leu Thr Ser Trp
305 310 315 320

Ser Ala Thr Leu Pro Ala Asn Asp
325

<210> 2
<211> 308
<212> PRT
<213> Streptomyces violaceusniger

<400> 2

Met Ala Asp Pro Ala Gln Arg Asp Val Tyr Val Pro His Ala Tyr Pro
1 5 10 15

Glu Lys Gln Ala Asp Leu Gly Glu Ile Thr Met Asn Tyr Ala Glu Ala
20 25 30

Gly Glu Pro Asp Met Pro Ala Val Leu Leu Ile Pro Glu Gln Thr Gly
35 40 45

Ser Trp Trp Gly Tyr Glu Glu Ala Met Gly Leu Leu Ala Glu Asn Phe
50 55 60

His Val Tyr Ala Val Asp Leu Arg Gly Gln Gly Arg Ser Ser Trp Ala
65 70 75 80

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

Ile Ala Leu Val Val Lys Arg Pro Val Ile Val Ala Gly Asn Ser Ser

Sequence listing

100 105 110

Gly Gly Val Leu Ala Ala Trp Leu Ser Ala Tyr Ser Met Pro Gly Gln
115 120 125

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

Val Thr Thr Cys Gly His Ser Ile Arg Gln Ala Ala Gly Pro Met Phe
145 150 155 160

Glu Leu Phe Arg Thr Tyr Leu Gly Asp Gln Trp Ser Val Gly Asp Trp
165 170 175

Thr Gly Tyr Cys Arg Ala Ala Asp Ala Ser Ser Ser Pro Met Ala Arg
180 185 190

Tyr Phe Val Ala Asp Glu Ile Pro Gln His Met Arg Glu Tyr Asp Pro
195 200 205

Glu Trp Ala Arg Ala Phe Trp Glu Gly Thr Val Ala Leu His Cys Pro
210 215 220

His Glu Gln Leu Leu Thr Gln Val Lys Thr Pro Val Leu Leu Thr His
225 230 235 240

His Met Arg Asp Ile Asp Pro Asp Thr Gly His Leu Val Gly Ala Leu
245 250 255

Ser Asp Glu Gln Ala Ala Arg Ala Arg Leu Leu Met Glu Ser Ala Gly
260 265 270

Val Lys Val Asp Tyr Ala Ser Val Pro Asp Ala Leu His Met Met His
275 280 285

Gln Phe Asp Pro Pro Arg Tyr Val Glu Ile Phe Thr Gln Trp Ala Ala
290 295 300

Thr Leu Ala Ala
305

<210> 3
<211> 309
<212> PRT
<213> Streptomyces coelicolor

<400> 3

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

Pro Glu Gln Gln Val Asp Leu Gly Glu Ile Thr Met Asn Tyr Ala Glu
20 25 30

Sequence listing

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

Gly Ser Trp Trp Ser Tyr Glu Glu Ala Met Gly Leu Leu Ala Glu His
50 55 60

Phe His Val Tyr Ala Val Asp Leu Arg Gly Gln Gly Arg Ser Ser Trp
65 70 75 80

Thr Pro Lys Arg Tyr Ser Leu Asp Asn Phe Gly Asn Asp Leu Val Arg
85 90 95

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

Ser Gly Gly Val Leu Ala Ala Trp Leu Ser Ala Tyr Ser Met Pro Gly
115 120 125

Gln Ile Arg Gly Val Leu Cys Glu Asp Pro Pro Phe Phe Ala Ser Glu
130 135 140

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

Phe Glu Leu Phe Arg Thr Tyr Leu Gly Asp Gln Trp Ser Val Gly Asp
165 170 175

Trp Glu Gly Phe Arg Ser Ala Ala Asp Ala Ser Ala Ser Pro Met Ala
180 185 190

Arg Ser Phe Val Ala Asp Thr Ile Pro Gln His Leu Lys Glu Tyr Asp
195 200 205

Pro Glu Trp Ala Arg Ala Phe Tyr Glu Gly Thr Val Gly Leu Asn Cys
210 215 220

Pro His Glu Arg Met Leu Asn Arg Val Asn Thr Pro Val Leu Leu Thr
225 230 235 240

His His Met Arg Gly Thr Asp Pro Glu Thr Gly Asn Leu Leu Gly Ala
245 250 255

Leu Ser Asp Glu Gln Ala Ala Gln Val Arg Arg Leu Met Glu Ser Ala
260 265 270

Gly Val Lys Val Asp Tyr Glu Ser Val Pro Asp Ala Ser His Met Met
275 280 285

His Gln Ser Asp Pro Ala Arg Tyr Ala Glu Ile Leu Thr Pro Trp Thr
290 295 300

Sequence listing

Ala Ala Leu Ala Pro
305

<210> 4
<211> 309
<212> PRT
<213> Streptomyces rapamycinicus
<400> 4

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

Pro Glu Gln Gln Val Asp Leu Gly Glu Ile Thr Met Asn Tyr Ala Glu
20 25 30

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

Gly Ser Trp Trp Ser Tyr Glu Glu Ala Met Gly Leu Leu Ala Glu His
50 55 60

Phe His Val Tyr Ala Val Asp Leu Arg Gly Gln Gly Arg Ser Ser Trp
65 70 75 80

Thr Pro Lys Arg Tyr Ser Leu Asp Asn Phe Gly Asn Asp Leu Val Arg
85 90 95

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

Ser Gly Gly Val Leu Ala Ala Trp Leu Ser Ala Tyr Ser Met Pro Gly
115 120 125

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

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

Phe Glu Leu Phe Arg Thr Tyr Leu Gly Asp Gln Trp Ser Val Ser Asp
165 170 175

Trp Glu Gly Phe Cys Arg Ala Ala Gly Ala Ser Ala Ser Pro Met Ala
180 185 190

Arg Ser Phe Val Ala Asp Gly Ile Pro Gln His Leu Lys Glu Tyr Asp
195 200 205

Pro Glu Trp Ala Arg Ala Phe His Glu Gly Thr Val Gly Leu Asn Cys
210 215 220

Sequence listing

Pro His Glu Arg Met Leu Gly Arg Val Asn Thr Pro Val Leu Leu Thr
225 230 235 240

His His Met Arg Gly Thr Asp Pro Glu Thr Gly Asn Leu Leu Gly Ala
245 250 255

Leu Ser Asp Glu Gln Ala Ala Gln Ala Arg Leu Leu Met Glu Ser Ala
260 265 270

Gly Val Arg Val Asp Tyr Glu Ser Val Pro Asp Ala Ser His Met Met
275 280 285

His Gln Ser Asp Pro Ala Arg Tyr Ala Glu Ile Phe Thr Arg Trp Ala
290 295 300

Ala Ala Leu Ala Pro
305

<210> 5
<211> 309
<212> PRT
<213> Streptomyces lividans

<400> 5

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

Pro Glu Gln Gln Val Asp Leu Gly Glu Ile Thr Met Asn Tyr Ala Glu
20 25 30

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

Gly Ser Trp Trp Ser Tyr Glu Glu Ala Met Gly Leu Leu Ala Glu His
50 55 60

Phe His Val Tyr Ala Val Asp Leu Arg Gly Gln Gly Arg Ser Ser Trp
65 70 75 80

Thr Pro Lys Arg Tyr Ser Leu Asp Asn Phe Gly Asn Asp Leu Val Arg
85 90 95

Phe Met Ala Leu Val Val Arg Arg Pro Val Val Val Ala Gly Asn Ser
100 105 110

Ser Gly Gly Val Leu Ala Ala Trp Leu Ser Ala Tyr Ser Met Pro Gly
115 120 125

Gln Ile Arg Gly Val Leu Cys Glu Asp Pro Pro Phe Phe Ala Ser Glu
130 135 140

Sequence listing

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

Phe Glu Leu Phe Arg Thr Tyr Leu Gly Asp Gln Trp Ser Val Gly Asp
165 170 175

Trp Glu Gly Phe Arg Ser Ala Ala Gly Ala Ser Ala Ser Pro Met Ala
180 185 190

Arg Ser Phe Val Ala Asp Thr Ile Pro Gln His Leu Lys Glu Tyr Asp
195 200 205

Pro Glu Trp Ala Arg Ala Phe Tyr Glu Gly Thr Val Gly Leu Asn Cys
210 215 220

Pro His Glu Arg Met Leu Asn Arg Val Asn Thr Pro Val Leu Leu Thr
225 230 235 240

His His Met Arg Gly Thr Asp Pro Glu Thr Gly Asn Leu Leu Gly Ala
245 250 255

Leu Ser Asp Glu Gln Ala Ala Gln Ala Arg Arg Leu Met Glu Ser Ala
260 265 270

Gly Val Lys Val Asp Tyr Glu Ser Val Pro Asp Ala Ser His Met Met
275 280 285

His Gln Ser Asp Pro Ala Arg Tyr Ala Glu Ile Leu Thr Pro Trp Ala
290 295 300

Ala Ala Leu Ala Pro
305

<210> 6
<211> 309
<212> PRT
<213> Streptomyces coelicoflavus

<400> 6

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

Pro Glu Gln Gln Val Asp Leu Gly Glu Ile Thr Met Asn Tyr Ala Glu
20 25 30

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

Gly Ser Trp Trp Ser Tyr Glu Glu Ala Met Gly Leu Leu Ser Glu His
50 55 60

Phe His Val Tyr Ala Val Asp Leu Arg Gly Gln Gly Arg Ser Ser Trp
Page 7

Sequence listing

65	70	75	80
Thr Pro Lys Arg Tyr Ser Leu Asp Asn Phe Gly Asn Asp Leu Val Arg	85	90	95
Phe Ile Ala Leu Val Val Lys Arg Pro Val Val Val Ala Gly Asn Ser	100	105	110
Ser Gly Gly Val Leu Ala Ala Trp Leu Ser Ala Tyr Ser Met Pro Gly	115	120	125
Gln Leu Arg Gly Val Leu Cys Glu Asp Pro Pro Phe Phe Ala Ser Glu	130	135	140
Leu Val Pro Ala His Gly His Ser Val Arg Gln Gly Ala Gly Pro Val	145	150	155
Phe Glu Leu Phe Arg Thr Tyr Leu Gly Asp Gln Trp Ser Val Gly Asp	165	170	175
Trp Glu Gly Phe Cys Arg Ala Ala Gly Ala Ser Ala Ser Pro Met Ala	180	185	190
Arg Ser Phe Val Ala Asp Gly Ile Pro Gln His Leu Gln Glu Tyr Asp	195	200	205
Pro Glu Trp Ala Arg Val Phe Tyr Glu Gly Thr Val Gly Leu Ser Cys	210	215	220
Pro His Glu Arg Met Leu Gly Gln Val Lys Thr Pro Val Leu Leu Thr	225	230	235
His His Met Arg Gly Ile Asp Pro Glu Thr Gly Asn Leu Leu Gly Ala	245	250	255
Leu Ser Asp Glu Gln Ala Leu Arg Ala Arg Arg Leu Met Asp Ser Ala	260	265	270
Gly Val Thr Val Asp Tyr Glu Ser Val Pro Asp Ala Ser His Met Met	275	280	285
His Gln Ser Ala Pro Ala Arg Tyr Val Glu Ile Phe Thr Arg Trp Ala	290	295	300
Ala Ala Leu Ala Pro			

<210> 7
 <211> 300
 <212> PRT
 <213> Rhodococcus triatome

Sequence Listing

<400> 7

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

Leu Asn Tyr Ala Glu Ala Gly Ser Pro Asp Lys Pro Ala Leu Leu Leu
20 25 30

Ile Pro Ser Gln Ser Glu Ser Trp Trp Gly Tyr Glu Glu Ala Met Gly
35 40 45

Leu Leu Ala Glu Asp Tyr His Val Phe Ala Val Asp Met Arg Gly Gln
50 55 60

Gly Arg Ser Thr Trp Thr Pro Gly Arg Tyr Ser Leu Asp Asn Phe Gly
65 70 75 80

Asn Asp Leu Val Arg Phe Ile Asp Leu Val Ile Gly Arg Thr Val Ile
85 90 95

Val Ser Gly Asn Ser Ser Gly Gly Val Val Ala Ala Trp Leu Ala Ala
100 105 110

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

Phe Phe Ala Ser Glu Leu Asp Pro Lys Val Gly His Thr Ile Arg Gln
130 135 140

Ala Ala Gly His Ile Phe Val Asn Trp Arg Asp Tyr Leu Gly Asp Gln
145 150 155 160

Trp Ser Val Gly Asp Tyr Ala Gly Phe Leu Lys Ala Met Lys Ser Ser
165 170 175

Glu Val Pro Met Leu Arg Gln Val Pro Leu Pro Glu Thr Ala Pro Gln
180 185 190

Asn Leu Leu Glu Tyr Asp Pro Glu Trp Ala Arg Ala Phe Tyr Glu Gly
195 200 205

Thr Val Ala Gln Thr Cys Pro His Asp Tyr Met Leu Ser Gln Val Lys
210 215 220

Val Pro Met Leu Val Thr His His Ala Arg Met Ile Asp Glu Ala Thr
225 230 235 240

Ser Gly Leu Val Gly Ala Met Ser Asp Leu Gln Val Gln Lys Ala Ala
245 250 255

Glu Ile Ile Arg Gly Thr Gly Val Gln Val Asp Val Val Asp Leu Pro
260 265 270

Sequence listing

Glu Ala Pro His Ile Leu His Gln Leu Ala Pro Lys Glu Tyr Val Glu
275 280 285

Ile Leu Asn Asn Trp Val Glu Lys Leu Pro Pro Val
290 295 300

<210> 8

<211> 307

<212> PRT

<213> Hirschia baltica

<400> 8

Met Ile Gln Asn Asn Lys Thr Ala Pro Tyr Lys Tyr Lys Glu Lys Leu
1 5 10 15

Val Asp Leu Gly Glu Ile Lys Met Asn Tyr Ile Val Ala Gly Ala Asp
20 25 30

Val Ser Pro Ala Leu Leu Leu Ile Pro Gly Gln Thr Glu Ser Trp Trp
35 40 45

Gly Phe Glu Ala Ala Ile Glu Lys Leu Glu Ser Asn Phe Gln Val Phe
50 55 60

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

Tyr Ser Leu Asn Leu Met Gly Asn Asp Leu Val Arg Phe Ile Ser Leu
85 90 95

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

Leu Ala Ala Trp Leu Ser Ala Tyr Ala Met Pro Asn Gln Ile Arg Ala
115 120 125

Ile His Cys Glu Asp Ala Pro Phe Phe Thr Ala Glu Lys Ala Pro Leu
130 135 140

Tyr Gly His Ala Ile Gln Gln Ala Ala Gly Pro Ile Phe Ser Leu Met
145 150 155 160

Ser Lys Phe Leu Gly Asp Gln Trp Ser Ile Asn Asn Trp Glu Gly Leu
165 170 175

Lys Ala Ala Gln Ala Lys Asp Thr His Pro Ala Asn Lys Met Ile Ser
180 185 190

Gln Val Glu Gln Pro Pro Gln His Leu Lys Glu Tyr Asp Pro Glu Trp
195 200 205

Sequence listing

Gly Arg Ala Phe Ile Glu Gly Lys Phe Asn Leu Asn Ser Pro His His
210 215 220

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

Arg Phe Glu Asp Pro Gln Thr Gly Leu Leu Ile Gly Ala Thr Ser Asp
245 250 255

Phe Gln Ala Ser Lys Ile Lys Glu Ile Ala Leu Lys Thr Gly Asn Ser
260 265 270

Phe Glu Leu Ile Asp Ala Pro Asp Ala Phe His Ser Met His Glu Ala
275 280 285

Asp Pro Gln Arg Phe Val Asp Ile Leu Thr Ser Trp Ile Glu Arg Leu
290 295 300

Asn Leu Gln
305

<210> 9
<211> 321
<212> PRT
<213> Nocardia brasiliensis

<400> 9

Met Gly Ile Ser Glu Ala Ala Asp Arg Ala Asp Thr Phe Val Ala His
1 5 10 15

Lys Phe Glu Glu Gln Leu Val Asp Leu Gly Glu Ile Arg Met Asn Tyr
20 25 30

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

Gln Gly Glu Ser Trp Trp Gly Tyr Glu Asn Ala Ile Thr Leu Leu Ala
50 55 60

Asn Asp Phe Arg Val Phe Ala Ile Asp Leu Arg Gly Gln Gly Arg Ser
65 70 75 80

Thr Trp Thr Pro Gly Arg Tyr Asn Leu Asn Thr Trp Gly Asn Asp Val
85 90 95

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

Asn Ser Ser Gly Gly Val Ile Ala Ala Trp Leu Ala Ala Tyr Ala Lys
115 120 125

Sequence listing

Pro Gly Gln Ile Arg Gly Ala Met Leu Glu Asp Pro Pro Leu Phe Ala
130 135 140

Ser Gln Ala Ala Pro Pro Tyr Gly Pro Gly Ile Met Gln Thr Leu Gly
145 150 155 160

Pro Ile Phe Val Leu Trp Ala Lys Trp Leu Gly Pro Gln Trp Ser Val
165 170 175

Gly Asp Trp Asp Gly Met Val Ala Ala Ala Pro Arg Glu Leu Pro Glu
180 185 190

Phe Leu His Pro Gly Ile Ala Phe Leu Phe Gly Asp Gly Thr Gly Glu
195 200 205

Gly Ala Ala Ala Thr Pro Pro Gln His Leu Lys Glu Tyr Asp Pro Glu
210 215 220

Trp Ala Gln Ala Trp Ala Thr Asp Val Ala Asn Ala Gly Cys Asp His
225 230 235 240

Ala Thr Met Leu Ala Gln Asn Arg Val Pro Val Leu Leu Thr His His
245 250 255

Phe His Leu Thr Asp Pro Asp Thr Gly Gln Leu Met Gly Ala Met Thr
260 265 270

Asp Ile Gln Ala Gln Gln Ala Arg Arg Leu Leu Ala Ala Thr Gly Gln
275 280 285

Pro Val Thr Phe Thr Ala Leu Asp Ala Pro His Thr Met His Asp Pro
290 295 300

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

Asp

<210> 10
<211> 319
<212> PRT
<213> Mycobacterium vaccae

<400> 10

Met Gly Arg Tyr Ala Gly Val Phe Gly Pro His Ala Pro Glu Ser Thr
1 5 10 15

Tyr Val Gly His Ala Tyr Pro Glu Gln Leu Phe Asp Thr Gly Glu Val
20 25 30

Arg Leu Asn Tyr Ala Val Ala Gly Asp Ala Ser Ala Ser Pro Leu Leu

Sequence listing

35

40

45

Leu Ile Pro Gly Gln Thr Glu Ser Trp Trp Gly Tyr Glu Pro Ala Met
 50 55 60

Gly Leu Leu Ala Glu His Phe His Val His Ala Val Asp Leu Arg Gly
 65 70 75 80

Gln Gly Arg Ser Thr Arg Thr Pro Arg Arg Tyr Thr Leu Asp Asn Ile
 85 90 95

Gly Asn Asp Leu Val Arg Phe Leu Asp Gly Val Ile Gly Arg Pro Ala
 100 105 110

Phe Val Ser Gly Leu Ser Ser Gly Gly Leu Leu Ser Ala Trp Leu Ser
 115 120 125

Ala Phe Ala Glu Pro Gly Gln Val Leu Ala Ala Cys Tyr Glu Asp Pro
 130 135 140

Pro Phe Phe Ser Ser Glu Leu Asp Pro Val Ile Gly Pro Gly Leu Met
 145 150 155 160

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

Gln Trp Ser Ile Gly Asp Trp Asp Gly Phe Val Ala Gly Ala Pro Gln
 180 185 190

Glu Leu Ala Gly Trp Gln Ala His Val Ala Leu Ala Gly Gly Thr Ala
 195 200 205

Glu Pro Pro Gln His Leu Lys Glu Tyr Asp Pro Glu Trp Gly Arg Ala
 210 215 220

Phe Val Gly Gly Thr Phe Thr Thr Gly Cys Pro His Gln Val Met Leu
 225 230 235 240

Ser Gln Val Lys Val Pro Val Leu Phe Thr His His Phe Arg Met Leu
 245 250 255

Asp Asp Glu Ser Gly Ser Leu Ile Gly Ala Ala Thr Asp Asp Gln Ala
 260 265 270

Ala Arg Val Val Glu Leu Val Glu Asn Ser Gly Ala Pro Leu Thr Tyr
 275 280 285

Arg Ser Phe Pro Met Met Gly His Ser Met His Ala Gln Asp Pro Ala
 290 295 300

Leu Phe Ala Gly Thr Leu Val Asp Trp Phe Thr Ala Ala Arg Ser

Sequence listing

305

310

315

<210> 11
 <211> 319
 <212> PRT
 <213> Mycobacterium gilvum

<400> 11

Met Gly Arg Tyr Ala Gly Val Phe Gly Pro His Ala Pro Glu Ala Thr
 1 5 10 15

Tyr Val Glu His Gly Tyr Pro Glu Arg Leu Phe Asp Thr Gly Glu Val
 20 25 30

Gln Leu Asn Tyr Val Val Ala Gly Asp Ala Ala Ala Pro Pro Leu Leu
 35 40 45

Leu Ile Pro Gly Gln Ser Glu Ser Trp Trp Gly Tyr Glu Ala Ala Ile
 50 55 60

Pro Leu Leu Ala Arg His Phe His Val His Ala Val Asp Leu Arg Gly
 65 70 75 80

Gln Gly Arg Ser Thr Arg Thr Pro Gly Arg Tyr Thr Leu Asp Asn Val
 85 90 95

Gly Asn Asp Leu Val Arg Phe Leu Asp Gly Val Ile Gly Arg Pro Ala
 100 105 110

Phe Val Ser Gly Leu Ser Ser Gly Gly Leu Ala Ser Ala Trp Leu Ser
 115 120 125

Ala Phe Ala Lys Pro Gly Gln Val Val Ala Ala Cys Trp Glu Asp Pro
 130 135 140

Pro Phe Phe Ser Ser Glu Thr Ala Pro Ile Val Gly Pro Pro Ile Thr
 145 150 155 160

Asp Ser Ile Gly Pro Leu Phe Gly Met Trp Ala Arg Tyr Leu Gly Asp
 165 170 175

Gln Trp Ser Val Gly Asp Trp Asp Gly Phe Val Ala Ala Val Pro Thr
 180 185 190

Glu Leu Ala Asp Trp Gln Ala His Val Ala Leu Val Val Gly Thr Ala
 195 200 205

Asp Pro Pro Gln Asn Leu Arg Glu Tyr Asp Pro Glu Trp Gly Lys Ala
 210 215 220

Phe Ile Thr Gly Thr Phe Ala Ala Ser Cys Pro His His Val Met Leu
 225 230 235 240

Sequence listing

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

Asp Glu Gly Ser Gly Gly Leu Ile Gly Ala Cys Ser Asp Ile Gln Ala
260 265 270

Gly Arg Val Thr Gln Leu Ala Lys Ser Gly Gly Arg Ser Val Thr Tyr
275 280 285

Arg Ser Phe Pro Met Met Ala His Ser Met His Gly Gln Asp Pro Ala
290 295 300

Leu Phe Ser Glu Thr Leu Val Glu Trp Phe Ser Arg Phe Thr Gly
305 310 315

<210> 12
<211> 322
<212> PRT
<213> Gordononia effusa

<400> 12

Met Pro Lys Ser Glu Ala Ala Asp Arg Ala Asp Ser Phe Val Ser His
1 5 10 15

Asp Phe Lys Glu Asn Ile Val Asp Leu Gly Glu Ile Arg Met Asn Tyr
20 25 30

Val Val Gln Gly Asn Lys Lys Ser Pro Ala Leu Leu Leu Ile Pro Ala
35 40 45

Gln Gly Glu Ser Trp Trp Gly Tyr Glu Ala Ala Ile Pro Leu Leu Ala
50 55 60

Lys His Phe Gln Val Phe Ala Ile Asp Leu Arg Gly Gln Gly Arg Thr
65 70 75 80

Thr Trp Thr Pro Gly Arg Tyr Thr Leu Asp Ile Phe Gly Asn Asp Val
85 90 95

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

Asn Ser Ser Gly Gly Leu Ile Gly Ala Trp Leu Ala Ala Phe Ala Lys
115 120 125

Pro Gly Gln Val Arg Ala Val Met Leu Glu Asp Pro Pro Leu Phe Ala
130 135 140

Ser Glu Ile Arg Pro Pro Tyr Gly Pro Gly Ile Trp Gln Gly Leu Gly
145 150 155 160

Sequence listing

Pro Met Phe Ala Ala Trp Ala Lys Trp Leu Gly Pro Gln Trp Ser Ile
165 170 175

Gly Asp Trp Asp Gly Met Val Lys Ala Leu Pro Asp Glu Leu Pro Glu
180 185 190

Asp Leu Leu Pro Gly Ile Gly Phe Met Leu Gly Asp Gly Glu Ser Asp
195 200 205

Gly Ala Ala Pro Thr Pro Pro Gln His Leu Lys Glu Tyr Asp Pro Glu
210 215 220

Trp Gly Ala Ser Trp Ala Ser Gly Phe Ala Asn Thr Gly Cys Glu His
225 230 235 240

Glu Ala Val Ile Ser Gln Val Arg Val Pro Val Leu Leu Thr His His
245 250 255

Phe Arg Gln Ile Asn Glu Glu Thr Gly His Leu Met Gly Ala Leu Ser
260 265 270

Asp Leu Gln Ala Ala Gln Val Arg His Ile Ile Glu Glu Val Ala Gly
275 280 285

Gln Glu Val Thr Tyr Val Ser Leu Asp Ala Pro His Thr Met His Glu
290 295 300

Pro Gln Pro Glu Arg Tyr Thr Asp Val Leu Leu Asp Trp Val Lys Lys
305 310 315 320

Leu Gly

<210> 13
<211> 328
<212> PRT
<213> Togninia minima

<400> 13

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

Val Pro Gly Gln Ser Glu Ser Trp Trp Gly Tyr Glu Met Ala Met Trp
20 25 30

Leu Leu Lys Asp Asp Tyr Gln Val Phe Ala Val Asp Met Arg Gly Gln
35 40 45

Gly Gln Ser Thr Trp Thr Pro Gly Arg Tyr Ser Leu Asp Thr Phe Gly
50 55 60

Sequence listing

Asn Asp Leu Val Lys Phe Ile Asp Ile Val Ile Lys Arg Pro Val Val
 65 70 75 80
 Val Ser Gly Leu Ser Ser Gly Gly Val Val Ser Ala Trp Leu Ser Ala
 85 90 95
 Phe Ala Lys Pro Gly Gln Ile Arg Ala Ala Val Tyr Glu Asp Pro Pro
 100 105 110
 Leu Phe Ala Ser Gln Ser Lys Pro Ala Ile Gly Gln Ser Val Met Gln
 115 120 125
 Thr Val Ala Gly Pro Phe Phe Asn Leu Trp Tyr Lys Trp Leu Gly Ala
 130 135 140
 Gln Trp Thr Ile Gly Asp Gln Ala Gly Met Val Ala Ala Met Pro Lys
 145 150 155 160
 Glu Ile Pro Ala Trp Ile Leu Gln Tyr Leu Gly Asn Thr Thr Ser Gly
 165 170 175
 Pro Thr Gly Leu Asp Leu Thr Leu Asn Glu Tyr Asp Pro Glu Trp Gly
 180 185 190
 His Gly Phe Val Ser Gly Thr Val Asp Ala Thr Cys Asp His Glu Ala
 195 200 205
 Met Leu Thr His Val Lys Val Pro Val Leu Phe Thr His His Ser Arg
 210 215 220
 Ala Ile Asp Pro Tyr Thr Gly Asn Leu Ile Gly Ser Val Ser Asp Thr
 225 230 235 240
 Gln Val Ser Tyr Ala Gln Gly Leu Ile Thr Thr Asn Gly Asn Gln Ser
 245 250 255
 Phe Thr Leu Lys Asn Phe Pro Leu Ala Ser His Asp Met His Asn Ser
 260 265 270
 Asp Pro Ala Thr Tyr Val Ser Ala Ile Thr Thr Trp Met Ala Ser Leu
 275 280 285
 Gly Ile Gly Ser Ala Val Ile Pro Gly Pro Val Lys Val Ala Ser Ala
 290 295 300
 Ser Ala Gln Val Ser Ala Ala Ser Thr Ala Pro Pro Ser Cys Thr Ser
 305 310 315 320
 Thr Ser Ala Pro Ser Thr Gly His
 325

Sequence listing

<210> 14
 <211> 280
 <212> PRT
 <213> Actinosynnema mirum

<400> 14

Met Thr Val Val Asp Pro Pro Ala Pro Arg Asp Phe Pro Glu Leu Leu
 1 5 10 15

Val Asp Leu Gly Glu Val Val Leu Asn His Ala Glu Ala Gly Ser Pro
 20 25 30

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

Ser Tyr Glu Arg Val Met Pro Leu Pro Ala Arg Asp Phe His Val Phe
 50 55 60

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

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

Val Val Arg Arg Pro Ala Val Val Ala Gly Asn Ser Ser Gly Gly Val
 100 105 110

Leu Ala Ala Trp Ser Ser Ala Tyr Ala Met Pro Gly Gln Val Arg Ala
 115 120 125

Val Leu Leu Glu Asp Pro Pro Leu Phe Ser Ser Glu Leu Thr Pro Val
 130 135 140

Cys Gly Pro Gly Val Arg Gln Ala Ala Gly Pro Leu Phe Glu Leu Leu
 145 150 155 160

Ser Thr His Leu Gly Asp Gln Trp Gly Gly Gly Arg Pro Gly Arg Val
 165 170 175

His Gly Gly Val Pro Arg Leu Gly Leu Ala Ala Ala Ala Ala Val Arg
 180 185 190

Val Ala Arg Arg Ala Ala Ala Thr Asp Ala Arg Gly Arg Pro Gly Ala
 195 200 205

Ala Arg Gly Arg Pro Ala Gly Val Gly Gly Ala Ala Arg Arg Gly Arg
 210 215 220

Gly Gly Arg Glu Arg Thr Gly Thr Thr Thr Val Leu Ser Gly Leu Thr
 225 230 235 240

Gly Ser Arg Thr Ser Gly Thr Gly Arg Cys Arg Lys Pro Phe Arg Leu

Sequence listing

245

250

255

Arg Gln Trp Trp Ala Gly Gly Ala Arg Gly Pro Pro Pro Pro Arg Gln
 260 265 270

Ile Arg Ala Asp Val Arg Thr Arg
 275 280

<210> 15

<211> 326

<212> PRT

<213> Kutzneria albida

<400> 15

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

Ala Phe Pro Glu Lys Gln Ile Asp Leu Gly Glu Val Val Leu Asn Tyr
 20 25 30

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

Gln Thr Gly Ser Trp Trp Ser Tyr Glu Pro Ala Met Gly Leu Leu Ala
 50 55 60

Glu His Phe His Val Phe Ala Val Asp Leu Arg Gly Gln Gly Arg Ser
 65 70 75 80

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

Val Arg Phe Ile Ala Leu Ala Ile Arg Arg Pro Val Val Val Ala Gly
 100 105 110

Cys Ser Ser Gly Gly Val Leu Ala Ala Trp Leu Ser Ala Tyr Ala Leu
 115 120 125

Pro Gly Gln Ile Arg Gly Ala Leu Cys Glu Asp Ala Pro Leu Phe Ala
 130 135 140

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

Pro Val Phe Glu Leu Tyr Arg Asp Tyr Leu Gly Asp Gln Trp Ser Val
 165 170 175

Gly Asp Trp Ala Gly Leu Val Ala Ala Ala Gln Ala Ser Pro Ala Lys
 180 185 190

Met Met Ser Leu Phe Lys Met Pro Gly Glu Pro Pro Gln Asn Leu Arg
 195 200 205

Sequence listing

Glu Tyr Asp Pro Glu Trp Ala Arg Val Phe Phe Glu Gly Thr Val Gly
210 215 220

Leu His Cys Pro His Asp Arg Met Leu Ser Gln Val Lys Thr Pro Val
225 230 235 240

Leu Ile Thr His His Ala Arg Thr Thr Asp Pro Glu Thr Gly Glu Phe
245 250 255

Leu Gly Ala Leu Ser Glu Leu Gln Ala Glu Arg Ala Gln Ala Ile Ile
260 265 270

Arg Ala Ala Gly Val Pro Val Asp Tyr Gln Ser Phe Pro Asp Ala Ala
275 280 285

His Ala Met His Thr Thr Glu Pro Ala Arg Tyr Ala Ala Val Leu Thr
290 295 300

Ala Trp Ala Ala Lys Leu Pro Pro Val Ala Asp Thr Ser Pro Ser Ala
305 310 315 320

Ala Ala Ser Ala His Val
325

<210> 16
<211> 987
<212> DNA
<213> Rhodococcus erythropolis

<220>
<221> misc_feature
<223> Artificial DNA sequence encodes polypeptid with SEQ ID NO: 1

<400> 16
atggccgaag aaggaactag gtccgaagca gcggatgctg ccacacaagc gagacagcta 60
cccgatctcg ggaacatctt tgtctcgac cgatttccgg aaaggcagggt cgatctcggt 120
gaagtggtag tgaacttcgc ggaggcgggc tctccggaca acccggcact gtcctcctc 180
cccgagcaga ccgggtcgtg gtggagttac gagccagtga tgggtcttct ggagagaaac 240
tttcatgtct ttgccgtcga tatccgtggg caaggctcga gtacctggac gccacggcga 300
tacagcctgg acaacttcgc caatgatctg gtgcgtttca tcgctctggt catcaagcgc 360
cctgtcgtcg tggcagggaa ctctcgggg gggctgctgg ccgcctggct ctccggctac 420
gcgatgcccg gccagatccg tgcagcattg tgtgaggacg caccgttctt tgcgtcggag 480
ttggtccccg catacgggtca ctcggttctg caggcggcgg gtccggcatt cgagttgtac 540
cgggacttcc tcggggacca gtgggtcgatt ggggactgga aagggttcgt tgaggcagcc 600
aaagcgtcgc cggcaaaggc tatgcaatta tttccgaccc cggatgaggc gccgcagaat 660
ctcaaggaat acgacccgga atgggggcgc gcattcttcg aagggtactgt ggactgcac 720

Sequence Listing

```

tgccacacg acaggatgct ctcgcaagtc aagacaccaa ttctcatcac tcaccacgcg      780
cggacgatcg accccgagac gggcgagctg ttgggcgcgc tctccgacct tcaggcagag      840
catgcgcagg acatcattcg gtctgcgggc gttcgggtgg actatcagtc gcaccccgac      900
gcgcttcaca tgatgcatct gttcgatccc gctcgttacg cggagatctt gacatcctgg      960
tccgcaacac tgcctgcgaa cgactag                                           987

```

<210> 17
 <211> 987
 <212> DNA
 <213> Artificial sequence

<220>
 <223> ORF was codon optimized and thus differce from natural occuring DNA sequence.

```

<400> 17
atggcagaag aaggcaccgg tagcgaagca gcagatgcag caaccaggc acgtcagctg      60
ccggatagcc gtaacatttt tgtagccat cgttttccgg aacgtcaggt tgatctgggt      120
gaagttgtta tgaattttgc agaagcaggt agtccggata atccggcatt actgctgctg      180
ccggaacaga ccggtagttg gtggtcttat gaaccgggta tgggtctgct ggcagaaaac      240
tttcatgttt ttgcagttga tattcgtggt cagggtcgta gcacctggac accgcgtcgt      300
tatagcctgg ataattttgg taatgatctg gtgcgtttta ttgccctggg tattaacgt      360
ccggttggtt ttgcaggtaa tagcagcggg ggcctgctgg ctgcatggct gagcgcctat      420
gcaatgcctg gtcagattcg tgcagcactg tgtgaagatg caccgttttt tgcaagcgaa      480
ctggttcctg cctatgggtca tagcgttctg caggcagcag gtccggcatt tgaactgtat      540
cgtgattttc tgggtgatca gtggtcaatt ggtgattgga aaggttttgt tgaagcagca      600
aaagcaagtc cggctaaagc aatgcagctg tttccgacac cggatgaagc accgcagaat      660
ctgaaagaat atgatccgga atggggctcg gcattttttg aaggcaccgt tgcactgcac      720
tgtccgcacg atcgtatgct gagccagggt aaaacccccga ttctgattac ccatcatgca      780
cgtaccatcg atccggaaac cggtgaaact ctgggtgcac tgagtgatct gcaggccgaa      840
catgcacagg atattattcg tagtgccggg gttcgtgttg attatcagag ccatcctgat      900
gactgcaca tgatgcacct gtttgatccg gcacgttatg cagaaattct gaccagttgg      960
agcgcaaccc tgcctgcaaa tgattaa                                           987

```

<210> 18
 <211> 927
 <212> DNA
 <213> Artificial sequence

<220>
 <223> ORF was codon optimized and thus differce from natural occuring DNA sequence.

<220>

Sequence listing

<221> misc_feature

<223> Artificial DNA sequence encodes polypeptid with SEQ ID NO: 2

<400> 18

```
atggcagatc cggcacagcg tgatgtttat gttccgcatg catatccgga aaaacaggca      60
gatctgggtg aaattaccat gaattatgcc gaagccggtg aacctgatat gcctgcagtt      120
ctgctgattc cggaacagac cggtagttgg tggggttatg aagaagcaat gggctctgctg      180
gcagaaaact ttcattgttta tgcagttgat ctgctggtgc agggctcgtag cagctgggca      240
ccgaaacggt atagcctgga taattttggt aatgatctgg tgcgttttat tgccctgggt      300
gttaaacgct cggttattgt tgcaggtaat agcagcgggt gtgttctggc agcatggctg      360
agcgcatata gcatgcctgg tcagggtcgt ggtgcactgt gtgaagatgc accgtttttt      420
gcaagcgaac tggttaccac ctgtgggtcat agcattcgtc aggcagcagg tccgatgttt      480
gaactgtttc gtacctatct gggcgatcag tggtcagttg gtgattggac cggctattgt      540
cgtgcagcag atgcaagcag cagcccgatg gcacgttatt ttgttgacaga tgaaattccg      600
cagcacatgc gtgaatatga tccggaatgg gcacgtgcat tttgggaagg caccgttgca      660
ctgcattgtc cgcattgaaca gctgctgacc cagggttaaaa caccggtgct gctgacacat      720
cacatgcgcg atattgatcc tgataccggt catctgggtg gtgccctgag tgatgaacag      780
gcagcccgtg cacgtctgct gatggaaagt gccggtgtta aagttgatta tgcaagcgtt      840
ccggatgcac tgcacatgat gcaccagttt gatccgcctc gttatgttga aatctttacc      900
cagtgggcag caaccctggc agcataa      927
```

<210> 19

<211> 930

<212> DNA

<213> Artificial sequence

<220>

<223> ORF was codon optimized and thus difference from natural occurring DNA sequence.

<220>

<221> misc_feature

<223> Artificial DNA sequence encodes polypeptid with SEQ ID NO: 3

<400> 19

```
atggttacca gtccggcact gcgtgatgtt catgttccgc atgcatatcc ggaacagcag      60
gttgatctgg gtgaaattac catgaattat gccgaagccg gtgatccggg tcgtccggca      120
gttctgctga tcccgaaca gaccggtagt tgggtggtctt atgaagaagc aatgggtctg      180
ctggcagaac attttcatgt ttatgcagtt gatctgcgtg gtcagggctg tagcagctgg      240
accccgaac gttatagcct ggataatttt ggtaatgata tgggtgcgttt tattgccctg      300
gttgttcgtc gtccggttgt tgttgcaggt aatagcagcg gtggtgttct ggcagcatgg      360
ctgagcgcat atagcatgcc tggtcagatt cgtggtgtgc tgtgtgaaga tccgcctttt      420
tttgcaagcg aactggttcc ggcacatggt catagcgttc gtcaggggtg aggtccggtt      480
```

Sequence listing

```

tttgaactgt ttcgtaccta tctgggcat cagtggcag ttggtgattg ggaagggttt 540
cgtagcgag cagatgcaag cgcaagccc atggcacgta gctttgttgc agataccatt 600
ccgcagcatc tgaaagaata tgatccggaa tgggcacgtg cattttatga aggcaccgtt 660
ggctgaatt gtccgcatga acgtatgctg aatcgtgtta atacaccggt gctgctgacc 720
catcacatgc gtggcaccga tccggaaacc ggtaatctgc tgggtgact gagtgatgaa 780
caggcagcac aggtgcgtcg tctgatggaa agtgccggtg ttaaagtga ttatgaaagc 840
gttccgatg caagccacat gatgcaccag agcgatccgg cacgttatgc agaaattctg 900
acccgtgga ccgcagcact ggcaccgtaa 930

```

<210> 20

<211> 930

<212> DNA

<213> Artificial sequence

<220>

<223> ORF was codon optimized and thus differce from natural occuring DNA sequence.

<220>

<221> misc_feature

<223> Artificial DNA sequence encodes polypeptid with SEQ ID NO: 4

<400> 20

```

atggttacca gtccggcact gcgtgatgtt catgttccgc atgcatatcc ggaacagcag 60
gttgatctgg gtgaaattac catgaattat gccgaagccg gtgatcctga tcgtccggca 120
gttctgctga tcccgaaca gaccggtagt tgggtggtcat atgaagaagc aatgggtctg 180
ctggcagaac attttcatgt ttatgcagtt gatctgcgtg gtcagggctg tagcagctgg 240
accccgaac gttatagcct ggataatatt ggtaatgata tgggtgcgtt tattgccctg 300
gttgtaaac gtccggttgt tgttgcaggt aatagcagcg gtggtgttct ggcagcatgg 360
ctgagcgcat atagcatgcc tggtcagctg cgtggtgtgc tgtgtgaaga tccgcctttt 420
tttgcaagcg aactggttcc ggcacatggt catagcggtt gtcaggggtc aggtccggtt 480
tttgaactgt ttcgtaccta tctgggcat cagtggcag ttagcgattg ggaagggttt 540
tgtcgtgcag ccggtgcaag cgcaagccc atggcacgta gctttgttgc agatgggtatt 600
ccgcagcatc tgaaagaata tgatccggaa tgggcacgtg catttcatga aggcaccgtt 660
ggctgaatt gtccgcatga acgtatgctg ggtcgtgtta atacaccggt gctgctgacc 720
catcatatgc gtggcaccga tccggaaacc ggtaatctgc tgggtgact gagtgatgaa 780
caggcagcac aggcacgtct gctgatggaa agtgccggtg ttcgtgttga ttatgaaagc 840
gttccgatg caagccatat gatgcaccag agcgatccgg cacgttatgc agaaattctt 900
acccgttggg cagcagccct ggcaccgtaa 930

```

<210> 21

<211> 930

<212> DNA

Sequence listing

<213> Artificial sequence

<220>

<223> ORF was codon optimized and thus difference from natural occurring DNA sequence.

<220>

<221> misc_feature

<223> Artificial DNA sequence encodes polypeptid with SEQ ID NO: 5

<400> 21

atggttacca gtccggcact gcgtgatgtt catgttccgc atgcatatcc ggaacagcag	60
gttgatctgg gtgaaattac catgaattat gccgaagccg gtgatccggg tcgtccggca	120
gttctgctga tcccgaaca gaccggtagt tgggtgtctt atgaagaagc aatgggtctg	180
ctggcagaac attttcatgt ttatgcagtt gatctgcgtg gtcagggtcg tagcagctgg	240
accccgaac gttatagcct ggataatatt ggtaatgata tgggtgcgtt tatggcactg	300
gttggttcgtc gtccgggttg tgttcagagt aatagcagcg gtggtgttct ggcagcatgg	360
ctgagcgcac atagcatgcc tggtcagatt cgtgggtgtg tgtgtgaaga tccgcctttt	420
tttgcaagcg aactggttcc ggcacatggt catagcggtc gtcagggtcg aggtccgggt	480
tttgaactgt ttcgtacct tctgggcat cagtggtcag ttggtgattg ggaagggttt	540
cgtagcgcag ccggtgcaag cgcaagccc atggcacgta gctttgttgc agataccatt	600
ccgcagcatc tgaaagaata tgatccggaa tgggcacgtg cattttatga aggcaccgtt	660
ggtctgaatt gtccgcatga acgtatgctg aatcgtgtta atacaccggt gctgctgacc	720
catcacatgc gtggcaccga tccggaacc ggtaatctgc tgggtgcact gagtgatgaa	780
caggcagcac aggcacgtcg tctgatggaa agtgccggtg ttaaagttga ttatgaaagc	840
gttccggatg caagccacat gatgcaccag agcgatccgg cacgttatgc agaaattctg	900
accccgtggg cagcagccct ggcaccgtaa	930

<210> 22

<211> 930

<212> DNA

<213> Artificial sequence

<220>

<223> ORF was codon optimized and thus difference from natural occurring DNA sequence.

<220>

<221> misc_feature

<223> Artificial DNA sequence encodes polypeptid with SEQ ID NO: 6

<400> 22

atggttacca gtccggcact gcgtgatgtt catgttccgc atgcatatcc ggaacagcag	60
gttgatctgg gtgaaattac catgaattat gccgaagccg gtgatcctga tcgtccggca	120
gttctgctga tcccgaaca gaccggtagt tgggtgtctt atgaagaagc aatgggtctg	180
ctgagcgaac attttcatgt ttatgcagtt gatctgcgtg gtcagggtcg tagcagctgg	240

Sequence Listing

accccgaaac gttatagcct ggataat	300
ttt ggtaatgatc tggtagcgttt tattgcctg	
gttggttaa	360
ac gtcagggttggt tggtagcagc	
gtggtgttct ggcagcatgg	
ctgagcgc	420
atagcatgcc tggtagcagctg	
cgtgggtgtgc tgtgtgaaga	
tccgcctttt	480
tttgaagc	
g aactgggttcc ggcacatgg	
catagcgttc gtcagggtgc	
aggtccgggt	540
tttgaactgt ttcgtacct	
tctggg	
cgat cagtggtcag	
ttggtgattg ggaagg	600
gtt	
ccggtgcaag cgcaagcccg	
atggcacgta gctttgttgc	
agatgggtatt	660
ccgcagcatc tgcaagaata	
tgatccggaa tgggcacgtg	
tttttatga aggcaccgtt	720
gggtctgagct gtcgcagatga	
acgtatgctg ggtaggtta	
aaacaccgggt gctgctgacc	
catcacatgc gtgggtatcga	780
tccggaaacc ggtaatctgc	
tgggtgcact gagtgatgaa	
caggccctgc gtgcacgtcg	840
tctgatggat agtgccgggtg	
ttaccgttga ttatgaaagc	
gttccggatg caagccacat	900
gatgcaccag agcgcaccgg	
cacgttatgt tgaaatcttt	
acccgttggg cagcagccct	930
ggcaccgtaa	

<210> 23
 <211> 903
 <212> DNA
 <213> Artificial sequence

<220>
 <223> ORF was codon optimized and thus differce from natural occuring DNA sequence.

<220>
 <221> misc_feature
 <223> Artificial DNA sequence encodes polypeptid with SEQ ID NO: 7

<400> 23	
atgccgcacg attatgaaga aaaactgggt	60
gatctggg	
cg aaatcgatct gaattatgca	
gaagcaggta gtccggataa accggcactg	120
ctgctgattc cgagccagag	
cgaaagttgg	
tggggctatg aagaagcaat ggggtctgctg	180
gccgaagatt atcatgtttt	
tgcagttgat	
atgcgtggtc aggggtcgtag	240
cacctggaca ccgggtcggt	
atagcctgga taattttgggt	
aatgatctgg tgcgctttat	300
cgatctgggt attggtcgta	
ccgttattgt tagcggtaat	
agcagcgggtg gtgttgttgc	360
agcatggctg gcagcattta	
gcctgcctgg tcaggttcgt	
gcagcactgg cagaagatgc	420
accgtttttt gcaagcgaac	
tggacccgaa agtgggtcat	
accattcgtc aggcagcagg	480
tcatattttt gttaactggc	
gtgattatct gggtagtcag	
tggtagctg gtgattatgc	540
agggttttctg aaagcaatga	
aaagcagcga agttccgatg	
ctgcgtcagg ttccgctgcc	600
ggaaaccgca ccgcagaatc	
tgctggaata tgatccggaa	
tgggcacgtg cattttatga	660
aggcaccgtt gcacagacct	
gtccgcatga ttatatgctg	
agccagggtta aagtgcctat	720
gctgggttacc catcatgcac	
gtatgattga tgaagcaacc	
agcgggtctgg ttgggtgcaat	780
gagcagctctg cagggttcaga	
aagcagcaga aattattcgt	
ggcaccgggtg ttcagggttga	840
tggtgttgat ctgccggaag	
caccgcatat tctgcatcag	

Sequence listing

ctggcaccga aagaatatgt ggaaattctg aataactggg tggaaaaact gcctccggtt	900
taa	903

<210> 24
 <211> 924
 <212> DNA
 <213> Artificial sequence

<220>
 <223> ORF was codon optimized and thus differce from natural occuring DNA sequence.

<220>
 <221> misc_feature
 <223> Artificial DNA sequence encodes polypeptid with SEQ ID NO: 8

<400> 24 atgatccaga acaataaaac cgcaccgtat aaatacaaag aaaaactggt tgatctgggc	60
gaaatcaaaa tgaactatat tgttgccggt gcagatgtta gtccggcact gctgctgatt	120
ccgggtcaga ccgaaagttg gtggggtttt gaagcagcaa ttgagaaaact ggaaagcaac	180
tttcaggtgt ttgcaattga tctgcgtggt cagggtaaaa gcaccagac accgggtcgt	240
tatagcctga atctgatggg taatgatctg gttcgtttta ttagcctggt tattaacgt	300
ccggttattg ttagcggtaa tagcagcggg ggtctgctgg cagcatggct gagcgcctat	360
gcaatgccga atcagattcg tgcaattcat tgtgaagatg caccgttttt taccgcagaa	420
aaagcaccgc tgtatgggtca tgcaattcag caggcagcag gtccgatttt tagcctgatg	480
agcaaatttc tgggtgatca gtggtcaatt aacaattggg aagggtctgaa agcagcacag	540
gcaaaagata cccatccggc aaacaaaatg attagccagg ttgaacagcc tccgcagcat	600
ctgaaagaat atgatccgga atgggggtcgt gcattttattg aaggcaaatt taacctgaac	660
agtccgcatt ataccctgct gagcgacatt aaaaccccga tgctgtatac ccatcacatg	720
cgttttgaag atccgcagac aggtctgctg attggtgcaa ccagcgattt tcaggcaagc	780
aaaatcaaag aaattgccct gaaaaccggc aatagcttcg aactgattga tgcaccggat	840
gcatttcata gtatgcatga agccgatccg cagcgttttg ttgatattct gaccagctgg	900
attgaacgtc tgaatctgca gtaa	924

<210> 25
 <211> 966
 <212> DNA
 <213> Artificial sequence

<220>
 <223> ORF was codon optimized and thus differce from natural occuring DNA sequence.

<220>
 <221> misc_feature
 <223> Artificial DNA sequence encodes polypeptid with SEQ ID NO: 9

<400> 25

Sequence listing

atgggtatta gcgaagcagc agatcgtgca gatacctttg ttgcacataa atttgaagaa	60
cagctgggttg atctgggtga aattcgtatg aattatgttg cagccggtga tccgaccagt	120
ccggcactgc tgctgattcc ggcacagggg gaaagttggg ggggttatga aaatgcaatt	180
accctgctgg caaatgattt tcgtgttttt gcaattgatc tgcgtgggtca gggtcgtagc	240
acctggacac cgggtcgtta taatctgaat acctggggta atgatgtgga acgctttatt	300
gatctgggta ttggtcgtcc gaccctgggt gcaggttaata gcagcgggtg tgttattgca	360
gcatggctgg cagcctatgc aaaaccgggt cagattcgtg gtgcaatgct ggaagatccg	420
cctctgtttg caagccaggc agcaccgcct tatgggtccg gtattatgca gaccctgggt	480
ccgatttttg ttctgtgggc aaaatggctg ggtccgcagt ggtcagttgg tgattgggat	540
ggtatgggtg cagcggcacc gcgtgaactg ccggaatttc tgcacccggg tatcgcat	600
ctgtttgggt atggcaccgg tgaaggtgca gcagcaaccc ctccgcagca tctgaaagaa	660
tatgatccgg aatgggcaca ggcattgggc accgatgttg caaatgcagg ttgtgatcat	720
gcaaccatgc tggcacagaa tcgtgttccg gttctgctga cccatcattt tcatctgacc	780
gatccggata caggccagct gatgggtgca atgaccgata ttcaggcaca gcaggcacgt	840
cgtctgctgg cagcaaccgg tcagccgggt acctttaccg cactggatgc accgcatacc	900
atgcatgatc ctgaacctga acgttatttt gaagttctga ccgaatgggc aagtgcactg	960
gattaa	966

<210> 26
 <211> 960
 <212> DNA
 <213> Artificial sequence

<220>
 <223> ORF was codon optimized and thus difference from natural occurring DNA sequence.

<220>
 <221> misc_feature
 <223> Artificial DNA sequence encodes polypeptid with SEQ ID NO: 10

<400> 26	
atgggtcggt atgccggtgt ttttgggtccg catgcaccgg aaagcaccta tgttgggtcat	60
gcatatccgg aacaactgtt tgataccggt gaagttcgct tgaattatgc agttgccggt	120
gatgcaagcg caagtccgct gctgctgatt ccgggtcaga ccgaaagttg gtgggggttat	180
gaaccggcaa tgggtctgct ggcagaacat tttcatgttc atgcagttga tctgctgggt	240
cagggtcgta gcaccgtac accgcgtcgt tataccctgg ataattattg taatgatctg	300
gtgctgtttc tggatgggtg tattgggtcgt ccggcatttg ttagcgggtc gagcagcggg	360
ggtctgctga gcgcatggct gagcgccttt gcagaaccgg gtcagggttct ggcagcatgt	420
tatgaagatc cgcctttttt tagcagcgaa ctggacccgg tgattgggtc ggggtctgatg	480
agcaccgttg gtccgctgtt tgcactgtat gttaaataatc tgggtgatca gtgggtcaatt	540

Sequence listing

ggtgattggg atggttttgt tgcaggcgca ccgcaagaac tggcaggttg gcaggcacat	600
gttgacttg caggcggtac agcagaaccg cctcagcatc tgaaagaata tgatccggaa	660
tggggtcgtg catttggttg tggcaccttt accaccggtt gtccgcatca ggttatgctg	720
agccaggtta aagttccggt tctgtttacc catcattttc gtatgctgga tgatgaaagc	780
ggtagcctga ttggtgcagc aaccgatgat caggcagcac gtgttggtga actggttgaa	840
aatagtgggtg caccgctgac ctatcgtagc tttccgatga tgggtcatag tatgcatgca	900
caagatccgg cactgtttgc aggcaccctg gttgattggt ttaccgcagc acgtagctaa	960

<210> 27

<211> 960

<212> DNA

<213> Artificial sequence

<220>

<223> ORF was codon optimized and thus difference from natural occurring DNA sequence.

<220>

<221> misc_feature

<223> Artificial DNA sequence encodes polypeptid with SEQ ID NO: 11

<400> 27

atgggtcgtt atgccggtgt ttttgggtccg catgcaccgg aagcaaccta tgttgaacat	60
ggttatccgg aacgtctgtt tgataccggt gaagtgcagc tgaattatgt tgttgccggt	120
gatgcagcag caccgcctct gctgctgatt ccgggtcaga gcgaaagttg gtgggggttat	180
gaagcagcaa ttccgctgct ggcacgtcat tttcatgttc atgcagttga tctgcgtggt	240
cagggtcgta gcaccgtac accgggtcgc tataccctgg ataattgttg taatgatctg	300
gtgcgttttc tggatggtgt tattgggtcgt ccggcatttg ttagcggctt gagcagcgg	360
ggtctggcaa gcgcattggt gagcgcattt gcaaaaccgg gtcaggttgt tgcagcatgt	420
tgggaagatc cgcctttttt tagcagcgaa accgcaccga ttgttggtcc gcctattacc	480
gatagcattg gtccgctgtt tggatgtggt gcacgttatt tgggtgatca gtggtcagtt	540
ggtgattggg atggttttgt tgccgcagtt ccgaccgaac tggcagattg gcaggcacat	600
gttgacttg ttgttggcac cgcagatcct ccgcagaatc tgcgtgaata tgatccggaa	660
tggggtaaag catttattac cggcaccttt gcagcaagct gtccgcatca tgttatgctg	720
agcaaagtta aagttccggt tctgtatacc catcactttc gcatgattga tgaaggtagt	780
ggtggtctga ttggtgcatg tagcgatatt caggcaggtc gtgttaccga gctggcaaaa	840
tcagggtggtc gtagcgttac ctatcgtagc tttccgatga tggcacatag catgcatggt	900
caagatccgg cactgttttag cgaaaccctg gttgaatggt ttagccggtt taccgggttaa	960

<210> 28

<211> 969

<212> DNA

<213> Artificial sequence

Sequence Listing

<220>
 <223> ORF was codon optimized and thus differce from natural occuring DNA sequence.

<220>
 <221> misc_feature
 <223> Artificial DNA sequence encodes polypeptid with SEQ ID NO: 12

<400> 28
 atgccgaaaa gcgaagcagc agatcgtgca gatagctttg ttagccatga tttcaaagaa 60
 aacattgtgg atctgggcga aatccgcatg aattatgttg ttcagggcaa caaaaaaagt 120
 ccggcactgc tgctgattcc ggcacagggg gaaagtgggt ggggttatga agcagcaatt 180
 ccgctgctgg caaaacattt tcagggtttt gcaattgata tgcgtgggtc gggtcgtacc 240
 acctggacac cgggtcgtta taccctggat attttttgga atgatgtggg gcgctttatc 300
 gatctgggta ttgggtcgtg aaccctgatt gcaggtaata gcagcgggtg tctgattggg 360
 gcatggctgg cagcatttgc aaaaccgggt cagggttcgtg cagttatgct ggaagatccg 420
 cctctgtttg caagcgaaat tcgtccgcct tatgggtccg gtatttgga gggctcgggt 480
 ccgatgtttg cagcatgggc aaaatggctg ggtccgcagt ggtcaattgg tgattgggat 540
 ggtatgggta aagcactgcc ggatgaactg ccggaagatc tgctgcctgg tattgggttt 600
 atgctgggtg atggtgaaag tgatgggtgca gcaccgaccc ctccgcagca tctgaaagaa 660
 tatgatccgg aatgggggtg aagctgggca agcgggtttg ccaataccgg ttgtgaacat 720
 gaagcagtta ttagccaggt gcgtgttccg gttctgctga cccatcattt tcgtcagatt 780
 aatgaagaaa ccggatcatc gatgggtgca ctgagcgatc tgcaggcagc acagggttcgt 840
 catatcattg aagaagttgc aggtcaagag gttacctatg ttagcctgga tgcaccgcat 900
 accatgcatg aaccgcagcc ggaacgttat accgatgttc tgctggattg ggtaaaaaaa 960
 ctgggttaa 969

<210> 29
 <211> 987
 <212> DNA
 <213> Artificial sequence

<220>
 <223> ORF was codon optimized and thus differce from natural occuring DNA sequence.

<220>
 <221> misc_feature
 <223> Artificial DNA sequence encodes polypeptid with SEQ ID NO: 13

<400> 29
 atgaattatg caaccgcagg tagcagcgat aaaccggcac tgctgctggg tccgggtcag 60
 agcgaaagtt ggtgggggta tgaaatggca atgtggctgc tgaaagatga ttatcaggtt 120
 tttgcagttg atatgcgtgg tcagggtcag agtacctgga caccgggtcg ttatagcctg 180
 gatacctttg gtaatgatct ggtgaaattc atcgatatcg tgattaaacg tccggttggt 240

Sequence listing

gtagcggtc tgagcagcgg tgggtgtgtg agcgcatggc tgagcgcatt tgcaaacct	300
ggtcagattc gtgcagcagt ttatgaagat ccgcctctgt ttgcaagcca gagcaaaccg	360
gcaattgggtc agagtgttat gcagaccgtt gcagggtccgt tttttaacct gtggtataaa	420
tggctgggtg cacagtggac cattgggtgat caggcaggta tggttgcagc aatgccgaaa	480
gaaattccgg catggattct gcagtatctg ggtaatacca ccagtgggtcc gaccggtctg	540
gatctgacac tgaatgaata tgatccggaa tgggggtcatg gttttgttag tggcaccgtt	600
gatgcaacct gtgatcatga agcaatgctg acccatgtta aagttccggt tctgtttacc	660
catcatagcc gtgcaattga tccgtatacc ggtaatctga ttggtagcgt tagcgatacc	720
caggttagct atgcacaggg tctgattacc accaatggca atcagagctt taccctgaaa	780
aactttccgc tggcaagcca tgatatgcat aattctgac cggaaccta tgtagcgca	840
attaccacct ggatggcaag cctgggtatt ggtagtcag ttattccggg tccggttaaa	900
gttgcaagcg caagcgaca ggtagcgca gcaagcaccg caccgcctag ctgtaccagc	960
accagcgac cgagcaccgg tcattaa	987

<210> 30
 <211> 843
 <212> DNA
 <213> Artificial sequence

<220>
 <223> ORF was codon optimized and thus difference from natural occurring DNA sequence.

<220>
 <221> misc_feature
 <223> Artificial DNA sequence encodes polypeptid with SEQ ID NO: 14

<400> 30	
atgaccgttg ttgatccgcc tgcaccgcgt gattttccgg aactgctggg tgatctgggt	60
gaagttgttc tgaatcatgc agaagcagg agtccggatc gtccggcact gggtccgggtg	120
ccggaacagg gtggtagttg gtggtcttat gaacgtgtta tgccgctgcc tgcacgcgat	180
tttcatgttt ttgcagttga tctgcgtggg cgtggctgta gcacccgtac accgcgtcgt	240
tatagcctgg atgattttgg taatgatctg gttcgttttc tggccctggg tggtcgccgt	300
ccggcagttg ttgcaggtaa tagcagcggg ggtgttctgg cagcatgggc aagcgcttat	360
gcaatgcctg gtcaggttcg tgcagttctg ctggaagatc cgcctctgtt tagcagcgaa	420
ctgacaccgg tttgtgggtc ggggtgttcgt caggcagcag gtccgctgtt tgaactgctg	480
agcaccatc tgggcatca gtgggggtgg ggtcgtccgg gtcgtgttca tgggtggcgtt	540
ccgcgtctgg gtctggcagc cgcagcagca gttcgtgttg cacgtcgtgc agcagcaacc	600
gatgcacgtg gtcgccctgg tgcagcacgt ggacgtcctg ccgggtgttg tgggtcagct	660
cgtcgcgggtc gcggtgggtc tgaacgcacc ggtacaacca ccgttctgag cgggtctgacc	720
ggtagccgta ccagcggcac cggtcgttgt cgtaaaccgt ttcgtctgcg tcagtgggtg	780

Sequence listing

gcaggcggtg cccgtggtcc tcctccgcct cgtcagattc gcgcagatgt tcgtaccctg	840
ttaa	843

<210> 31
 <211> 981
 <212> DNA
 <213> Artificial sequence

<220>
 <221> misc_feature
 <223> Artificial DNA sequence encodes polypeptid with SEQ ID NO: 15

<400> 31	
atgagcggtc cggttacccc gagcgcacgt aatgtttttg ttccgcatgc atttccagag	60
aaacaaattg atctgggtga agtggttctg aattatgcag aagcaggtac accggataaa	120
ccggcattac tgctgctgcc ggaacagacc ggtagttggt ggtcttatga accggcaatg	180
ggctctgctgg cagaacattt tcatgttttt gcagttgatc tgcgtggtca gggtcgtagc	240
acctggacac cgggtcgtta tagcctggat aattttggta atgatctggt gcgttttatt	300
gcactggcaa ttcgtcgtcc gggtgttggt gcaggttgta gcagcgggtg tgttctggca	360
gcatggctga ggcctatgc actgcctggt cagattcgtg gtgcactgtg tgaagatgca	420
ccgctgtttg caagcgaact gacaccggca catggtcatg gtgttcgtca gggcgcaggt	480
ccggtttttg aactgtatcg tgattatctg ggcgatcagt ggtcagttgg tgattgggca	540
ggctctggtt cagcagcaca ggcaagtccg gcaaaaatga tgagcctgtt taaaatgcct	600
ggatgaaccgc ctcaaatct gcgtgaatat gatccggaat gggcacgtgt ttttttgaa	660
ggcaccgttg gtctgcattg tccgcatgat cgtatgctga gccagggtta aacaccggtt	720
ctgattaccc atcatgcacg taccaccgat ccggaaaccg gtgaatttct gggcgcactg	780
agcgaactgc aggcagaacg tgcacaggcc attattcgtg cagccggtgt tccggttgat	840
tatcagagct ttccggatgc agcacatgca atgcatacca cagaaccggc acgttatgca	900
gcagttctga ccgcatgggc agcaaaactg cctccggttg cagataccag cccgtcagca	960
gcagcaagcg cacatgttta a	981

<210> 32
 <211> 7
 <212> PRT
 <213> Artificial sequence

<220>
 <223> amino acid motif

<220>
 <221> PEPTIDE
 <222> (1)..(7)

<400> 32

Ala Gly Asn Ser Ser Gly Gly
 1 5

Sequence listing

<210> 33
 <211> 7
 <212> PRT
 <213> Artificial sequence

<220>
 <223> amino acid motif

<220>
 <221> PEPTIDE
 <222> (1)..(7)

<400> 33

Arg Thr Ile Asp Pro Glu Thr
 1 5

<210> 34
 <211> 7
 <212> PRT
 <213> Artificial sequence

<220>
 <223> amino acid motif

<220>
 <221> PEPTIDE
 <222> (1)..(7)

<400> 34

Asp Ala Leu His Met Met His
 1 5

<210> 35
 <211> 7
 <212> PRT
 <213> Artificial sequence

<220>
 <223> amino acid motif

<220>
 <221> PEPTIDE
 <222> (1)..(7)

<400> 35

Ala Gly Asp Ser Ser Gly Gly
 1 5

<210> 36
 <211> 7
 <212> PRT
 <213> Artificial sequence

<220>
 <223> amino acid motif

Sequence listing

<220>
<221> PEPTIDE
<222> (1)..(7)

<400> 36

Ala Gly Asp Ser Ser Leu Gly
1 5

<210> 37
<211> 7
<212> PRT
<213> Artificial sequence

<220>
<223> amino acid motif

<220>
<221> PEPTIDE
<222> (1)..(7)

<400> 37

Ala Gly Gln Ser Ser Gly Gly
1 5

<210> 38
<211> 7
<212> PRT
<213> Artificial sequence

<220>
<223> amino acid motif

<220>
<221> PEPTIDE
<222> (1)..(7)

<400> 38

Ala Gly His Ser Ser Gly Gly
1 5

<210> 39
<211> 7
<212> PRT
<213> Artificial sequence

<220>
<223> amino acid motif

<220>
<221> PEPTIDE
<222> (1)..(7)

<400> 39

Ala Gly Ser Ser Ser Gly Gly
1 5

<210> 40

Sequence listing

<211> 7
 <212> PRT
 <213> Artificial sequence

<220>
 <223> amino acid motif

<220>
 <221> PEPTIDE
 <222> (1)..(7)

<400> 40

Ser Gly Asn Ser Ser Gly Gly
 1 5

<210> 41
 <211> 7
 <212> PRT
 <213> Artificial sequence

<220>
 <223> amino acid motif

<220>
 <221> PEPTIDE
 <222> (1)..(7)

<400> 41

Ser Gly Asp Ser Ser Gly Gly
 1 5

<210> 42
 <211> 7
 <212> PRT
 <213> Artificial sequence

<220>
 <223> amino acid motif

<220>
 <221> PEPTIDE
 <222> (1)..(7)

<400> 42

Ser Gly Gln Ser Ser Gly Gly
 1 5

<210> 43
 <211> 7
 <212> PRT
 <213> Artificial sequence

<220>
 <223> amino acid motif

<220>
 <221> PEPTIDE
 <222> (1)..(7)

Sequence listing

<400> 43

Ser Gly His Ser Ser Gly Gly
1 5

<210> 44

<211> 7

<212> PRT

<213> Artificial sequence

<220>

<223> amino acid motif

<220>

<221> PEPTIDE

<222> (1)..(7)

<400> 44

Ser Gly Ser Ser Ser Gly Gly
1 5

<210> 45

<211> 7

<212> PRT

<213> Artificial sequence

<220>

<223> amino acid motif

<220>

<221> PEPTIDE

<222> (1)..(7)

<400> 45

Arg Thr Ile Asp Pro Glu Thr
1 5

<210> 46

<211> 7

<212> PRT

<213> Artificial sequence

<220>

<223> amino acid motif

<220>

<221> PEPTIDE

<222> (1)..(7)

<400> 46

Arg Asp Ile Asp Pro Asp Thr
1 5

<210> 47

<211> 7

<212> PRT

<213> Artificial sequence

Sequence listing

<220>
<223> amino acid motif

<220>
<221> PEPTIDE
<222> (1)..(7)

<400> 47

Arg Gly Thr Asp Pro Glu Thr
1 5

<210> 48
<211> 7
<212> PRT
<213> Artificial sequence

<220>
<223> amino acid motif

<220>
<221> PEPTIDE
<222> (1)..(7)

<400> 48

Arg Gly Ile Asp Pro Glu Thr
1 5

<210> 49
<211> 7
<212> PRT
<213> Artificial sequence

<220>
<223> amino acid motif

<220>
<221> PEPTIDE
<222> (1)..(7)

<400> 49

Asp Ala Leu His Met Met His
1 5

<210> 50
<211> 7
<212> PRT
<213> Artificial sequence

<220>
<223> amino acid motif

<220>
<221> PEPTIDE
<222> (1)..(7)

<400> 50

Sequence listing

Asp Ala Ser His Met Met His
1 5

<210> 51
<211> 11
<212> PRT
<213> Artificial sequence

<220>
<223> amino acid motif

<220>
<221> PEPTIDE
<222> (1)..(11)

<400> 51

Val Val Ala Gly Asn Ser Ser Gly Gly Leu Leu
1 5 10

<210> 52
<211> 11
<212> PRT
<213> Artificial sequence

<220>
<223> amino acid motif

<220>
<221> PEPTIDE
<222> (1)..(11)

<400> 52

Ile Val Ala Gly Asn Ser Ser Gly Gly Val Leu
1 5 10

<210> 53
<211> 11
<212> PRT
<213> Artificial sequence

<220>
<223> amino acid motif

<220>
<221> PEPTIDE
<222> (1)..(11)

<400> 53

His Ala Arg Thr Ile Asp Pro Glu Thr Gly Glu
1 5 10

<210> 54
<211> 11
<212> PRT
<213> Artificial sequence

<220>
<223> amino acid motif

Sequence listing

<220>
 <221> PEPTIDE
 <222> (1)..(11)

<400> 54

His Met Arg Asp Ile Asp Pro Asp Thr Gly His
 1 5 10

<210> 55
 <211> 11
 <212> PRT
 <213> Artificial sequence

<220>
 <223> amino acid motif

<220>
 <221> PEPTIDE
 <222> (1)..(11)

<400> 55

His Met Arg Gly Thr Asp Pro Glu Thr Gly Asn
 1 5 10

<210> 56
 <211> 11
 <212> PRT
 <213> Artificial sequence

<220>
 <223> amino acid motif

<220>
 <221> PEPTIDE
 <222> (1)..(11)

<400> 56

His Pro Asp Ala Leu His Met Met His Leu Phe
 1 5 10

<210> 57
 <211> 11
 <212> PRT
 <213> Artificial sequence

<220>
 <223> amino acid motif

<220>
 <221> PEPTIDE
 <222> (1)..(11)

<400> 57

Val Pro Asp Ala Leu His Met Met His Gln Phe
 1 5 10

Sequence listing

<210> 58
 <211> 11
 <212> PRT
 <213> Artificial sequence

<220>
 <223> amino acid motif

<220>
 <221> PEPTIDE
 <222> (1)..(11)

<400> 58

Val Pro Asp Ala Ser His Met Met His Gln Ser
 1 5 10

<210> 59
 <211> 21
 <212> PRT
 <213> Artificial sequence

<220>
 <223> amino acid motif

<220>
 <221> PEPTIDE
 <222> (1)..(21)

<400> 59

Ile Lys Arg Pro Val Val Val Ala Gly Asn Ser Ser Gly Gly Leu Leu
 1 5 10 15

Ala Ala Trp Leu Ser
 20

<210> 60
 <211> 21
 <212> PRT
 <213> Artificial sequence

<220>
 <223> amino acid motif

<220>
 <221> PEPTIDE
 <222> (1)..(21)

<400> 60

Val Lys Arg Pro Val Ile Val Ala Gly Asn Ser Ser Gly Gly Val Leu
 1 5 10 15

Ala Ala Trp Leu Ser
 20

<210> 61
 <211> 21

Sequence listing

<212> PRT
<213> Artificial sequence

<220>
<223> amino acid motif

<220>
<221> PEPTIDE
<222> (1)..(21)

<400> 61

Val Arg Arg Pro Val Val Val Ala Gly Asn Ser Ser Gly Gly Val Leu
1 5 10 15

Ala Ala Trp Leu Ser
20

<210> 62
<211> 21
<212> PRT
<213> Artificial sequence

<220>
<223> amino acid motif

<220>
<221> PEPTIDE
<222> (1)..(21)

<400> 62

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

Ala Ala Trp Leu Ser
20

<210> 63
<211> 21
<212> PRT
<213> Artificial sequence

<220>
<223> amino acid motif

<220>
<221> PEPTIDE
<222> (1)..(21)

<400> 63

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

Leu Leu Gly Ala Leu
20

<210> 64

Sequence listing

<211> 21
 <212> PRT
 <213> Artificial sequence

<220>
 <223> amino acid motif

<220>
 <221> PEPTIDE
 <222> (1)..(21)

<400> 64

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

Leu Val Gly Ala Leu
 20

<210> 65
 <211> 21
 <212> PRT
 <213> Artificial sequence

<220>
 <223> amino acid motif

<220>
 <221> PEPTIDE
 <222> (1)..(21)

<400> 65

Val Leu Leu Thr His His Met Arg Gly Thr Asp Pro Glu Thr Gly Asn
 1 5 10 15

Leu Leu Gly Ala Leu
 20

<210> 66
 <211> 21
 <212> PRT
 <213> Artificial sequence

<220>
 <223> amino acid motif

<220>
 <221> PEPTIDE
 <222> (1)..(21)

<400> 66

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

Leu Leu Gly Ala Leu
 20

Sequence listing

<210> 67
 <211> 21
 <212> PRT
 <213> Artificial sequence

<220>
 <223> amino acid motif

<220>
 <221> PEPTIDE
 <222> (1)..(21)

<400> 67

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

Asp Pro Ala Arg Tyr
 20

<210> 68
 <211> 21
 <212> PRT
 <213> Artificial sequence

<220>
 <223> amino acid motif

<220>
 <221> PEPTIDE
 <222> (1)..(21)

<400> 68

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

Asp Pro Pro Arg Tyr
 20

<210> 69
 <211> 21
 <212> PRT
 <213> Artifical sequence

<220>
 <221> PEPTIDE
 <222> (1)..(21)

<400> 69

Val Asp Tyr Glu Ser Val Pro Asp Ala Ser His Met Met His Gln Ser
 1 5 10 15

Ala Pro Ala Arg Tyr
 20