

P05341\_ST25  
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

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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  
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100	105	110
Gly Gly Val 115	Leu Ala Ala Trp Leu Ser Ala Tyr Ser Met 120	Pro Gly Gln 125
Val Arg Gly Ala Leu Cys 130	Glu Asp Ala Pro Phe Phe Ala Ser Glu Leu 135 140	
Val Thr Thr Cys Gly His 145	Ser Ile Arg Gln Ala Ala Gly Pro Met Phe 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		
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		

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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

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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

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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

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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  
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				P05341_ST25															
65				70				75				80							
Thr	Pro	Lys	Arg	Tyr 85	Ser	Leu	Asp	Asn	Phe 90	Gly	Asn	Asp	Leu	Val 95	Arg				
Phe	Ile	Ala	Leu 100	Val	Val	Lys	Arg	Pro 105	Val	Val	Val	Ala	Gly 110	Asn	Ser				
Ser	Gly	Gly 115	Val	Leu	Ala	Ala	Trp 120	Leu	Ser	Ala	Tyr	Ser 125	Met	Pro	Gly				
Gln	Leu 130	Arg	Gly	Val	Leu	Cys 135	Glu	Asp	Pro	Pro	Phe 140	Phe	Ala	Ser	Glu				
Leu 145	Val	Pro	Ala	His	Gly 150	His	Ser	Val	Arg	Gln 155	Gly	Ala	Gly	Pro	Val 160				
Phe	Glu	Leu	Phe	Arg 165	Thr	Tyr	Leu	Gly	Asp 170	Gln	Trp	Ser	Val	Gly 175	Asp				
Trp	Glu	Gly	Phe 180	Cys	Arg	Ala	Ala	Gly 185	Ala	Ser	Ala	Ser	Pro 190	Met	Ala				
Arg	Ser	Phe 195	Val	Ala	Asp	Gly	Ile 200	Pro	Gln	His	Leu	Gln 205	Glu	Tyr	Asp				
Pro	Glu 210	Trp	Ala	Arg	Val	Phe 215	Tyr	Glu	Gly	Thr	Val 220	Gly	Leu	Ser	Cys				
Pro 225	His	Glu	Arg	Met	Leu 230	Gly	Gln	Val	Lys	Thr 235	Pro	Val	Leu	Leu	Thr 240				
His	His	Met	Arg	Gly 245	Ile	Asp	Pro	Glu	Thr 250	Gly	Asn	Leu	Leu	Gly 255	Ala				
Leu	Ser	Asp	Glu 260	Gln	Ala	Leu	Arg	Ala 265	Arg	Arg	Leu	Met	Asp 270	Ser	Ala				
Gly	Val	Thr 275	Val	Asp	Tyr	Glu	Ser 280	Val	Pro	Asp	Ala	Ser 285	His	Met	Met				
His	Gln 290	Ser	Ala	Pro	Ala	Arg 295	Tyr	Val	Glu	Ile	Phe 300	Thr	Arg	Trp	Ala				
Ala 305	Ala	Leu	Ala	Pro															



&lt;400&gt; 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

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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

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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

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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  
Seite 12

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

305

310

315

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

&lt;400&gt; 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

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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> Gordonia 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

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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



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

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<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 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  
 Seite 18

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

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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  
cccgattcgc ggaacatctt tgtctcgac cgatttccgg aaaggcaggt cgatctcgg 120  
gaagtgggtga tgaacttcgc ggaggcgggc tctccggaca acccggcact gtcctcctc 180  
cccgagcaga ccgggtcgtg gtggagttac gagccagtga tgggtcttct ggcagagaac 240  
tttcatgtct ttgccgtcga tatccgtggg caaggctcga gtacctggac gccacggcga 300  
tacagcctgg acaacttcgc caatgatctg gtgcgtttca tcgctctggg catcaagcgc 360  
cctgtcgtcg tggcagggaa ctctcgggg gggctgctgg ccgcctggct ctcggcgtac 420  
gcgatgcccg gccagatccg tgcagcattg tgtgaggacg caccgttctt tgcgtcggag 480  
ttgggtccccg catacgggtca ctcggttctg caggcggcgg gtccggcatt cgagttgtac 540  
cgggacttcc tcggggacca gtggtcgatt ggggactgga aagggttcgt tgaggcagcc 600  
aaagcgtcgc cggcaaaggc tatgcaatta tttccgaccc cggatgaggc gccgcagaat 660  
ctcaaggaat acgacccgga atgggggcgc gcattcttcg aagggaactgt ggcactgcac 720

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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 tgcttgcgaa 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 aaggcaccgc tagcgaagca gcagatgcag caaccaggc acgtcagctg	60
ccggatagcc gtaacatttt tgttagccat cgttttccgg aacgtcaggt tgatctgggt	120
gaagtgttta tgaattttgc agaagcaggt agtccggata atccggcatt actgctgctg	180
ccggaacaga ccggtagtgt gtggtcttat gaaccggtta tgggtctgct ggcagaaaac	240
tttcatgttt ttgcagttga tttcgtggt cagggtcgta gcacctggac accgcgtcgt	300
tatagcctgg ataattttgg taatgatctg gtgcgtttta ttgccctggg tattaaacgt	360
ccggttggtt ttgcaggtaa tagcagcggg ggcctgctgg ctgcatggct gagcgcctat	420
gcaatgcctg gtcagattcg tgcagcactg tgtgaagatg caccgttttt tgcaagcgaa	480
ctggttcctg cctatggtca tagcgttctg caggcagcag gtccggcatt tgaactgtat	540
cgtgattttc tgggtgatca gtggtcaatt ggtgattgga aagggtttgt tgaagcagca	600
aaagcaagtc cggctaaagc aatgcagctg tttccgacac cggatgaagc accgcagaat	660
ctgaaagaat atgatccgga atggggctcg gcattttttg aaggcaccgt tgcactgcac	720
tgtccgcatg atcgtatgct gagccagggt aaaacccga ttctgattac ccatcatgca	780
cgtaccatcg atccggaaac cgggtgaactg ctgggtgcac tgagtgatct gcaggccgaa	840
catgcacagg atattattcg tagtgccggg gttcgtgttg attatcagag ccatcctgat	900
gcactgcaca tgatgcacct gtttgatccg gcacgttatg cagaaattct gaccagttgg	960
agcgcaaccc tgcttgcaaa 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>

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<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 ttcatgttta tgcagttgat ctgctgggtc agggtcgtag cagctgggca      240
ccgaaacgtt atagcctgga taatttttgt aatgatctgg tgcgttttat tgccctgggt      300
gttaaacgtc cggttattgt tgcaggtaat agcagcgggt gtgttctggc agcatggctg      360
agcgcatata gcatgcctgg tcaggttcgt ggtgcactgt gtgaagatgc accgtttttt      420
gcaagcgaac tggttaccac ctgtgggtcat agcattcgtc aggcagcagg tccgatgttt      480
gaactgtttc gtacctatct gggcgatcag tggtcagttg gtgattggac cggctattgt      540
cgtgcagcag atgcaagcag cagcccgatg gcacgttatt ttgttgcaga tgaaattccg      600
cagcacatgc gtgaatatga tccggaatgg gcacgtgcat tttgggaagg caccgttgca      660
ctgcattgtc cgcatgaaca gctgctgacc caggttaaaa caccggtgct gctgacacat      720
cacatgcgcg atattgatcc tgataccggt catctggttg 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 differce from natural occuring DNA sequence.

<220>

<221> misc\_feature

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

<400> 19

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

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tttgaactgt ttcgtaccta tctgggcgat cagtgggtcag ttggtgattg ggaagggtttt	540
cgtagcgcag cagatgcaag cgcaagcccg atggcacgta gctttgttgc agataccatt	600
ccgcagcatc tgaaagaata tgatccggaa tgggcacgtg ctttttatga aggaccggtt	660
ggtctgaatt gtccgcatga acgtatgctg aatcgtgtta atacaccggt gctgctgacc	720
catcacatgc gtggcaccga tccggaaacc ggtaatctgc tgggtgcact gagtgatgaa	780
caggcagcac aggtgcgtcg tctgatggaa agtgccggtg ttaaagttga ttatgaaagc	840
gttccggatg caagccacat gatgcaccag agcgatccgg cacgttatgc agaaattctg	900
accccgtaga 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 gtcaggggtcg tagcagctgg	240
accccgaaac gttatagcct ggataatttt ggtaatgata tgggtgcgttt tattgccctg	300
gttggttaaac gtccggttgt tgttgacaggt aatagcagcg gtggtgttct ggcagcatgg	360
ctgagcgcac atagcatgcc tggtcagctg cgtggtgtgc tgtgtgaaga tccgcctttt	420
tttgcaagcg aactgggttc ggcacatggt catagcgttc gtcaggggtgc aggtccggtt	480
tttgaactgt ttcgtaccta tctgggcgat cagtgggtcag ttagcgattg ggaagggtttt	540
tgtcgtgcag ccggtgcaag cgcaagcccg atggcacgta gctttgttgc agatgggtatt	600
ccgcagcatc tgaaagaata tgatccggaa tgggcacgtg cttttcatga aggaccggtt	660
ggtctgaatt gtccgcatga acgtatgctg ggtcgtgtta atacaccggt gctgctgacc	720
catcatatgc gtggcaccga tccggaaacc ggtaatctgc tgggtgcact gagtgatgaa	780
caggcagcac aggcacgtct gctgatggaa agtgccggtg ttcgtgttga ttatgaaagc	840
gttccggatg caagccatat gatgcaccag agcgatccgg cacgttatgc agaaatcttt	900
acccgttggg cagcagccct ggcaccgtaa	930

<210> 21  
 <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: 5

<400> 21

atggttacca gtccggcact gcgtgatggt catgttccgc atgcatatcc ggaacagcag	60
gttgatctgg gtgaaattac catgaattat gccgaagccg gtgatccggg tcgtccggca	120
gttctgctga tcccggaaca gaccggtagt tgggtggtctt atgaagaagc aatgggtctg	180
ctggcagaac attttcatgt ttatgcagtt gatctgcgtg gtcagggtcg tagcagctgg	240
accccgaaac gttatagcct ggataatttt ggtaatgatac tgggtgcgttt tatggcactg	300
gttggttcgtc gtccggttgt tgttgacaggt aatagcagcg gtggtgttct ggcagcatgg	360
ctgagcgcac atagcatgcc tggtcagatt cgtggtgtgc tgtgtgaaga tccgcctttt	420
tttgcaagcg aactggttcc ggcacatggt catagcgttc gtcaggggtgc aggtccgggt	480
tttgaactgt ttcgtacct tctgggcat cagtggctcag ttggtgattg ggaagggttt	540
cgtagcgcag ccggtgcaag cgcaagccc atggcacgta gctttgttgc agataccatt	600
ccgcagcatc tgaaagaata tgatccggaa tgggcacgtg cattttatga aggcaccggt	660
ggctctgaatt gtccgcatga acgtatgctg aatcgtgtta atacaccggt gctgctgacc	720
catcacatgc gtggcaccga tccggaaacc ggtaatctgc tgggtgcact gagtgatgaa	780
caggcagcac aggcacgtcg tctgatggaa agtgccggtg tttaaagtga ttatgaaagc	840
gttccggatg caagccacat gatgcaccag agcgatccgg cacgttatgc agaaattctg	900
accccggtggg cagcagccct ggcaccgtaa	930

<210> 22

<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: 6

<400> 22

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



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accccgaaac gttatagcct ggataat	300
ttt ggtaatgatac tgggtgcgttt tattgc	
cctg gttgttaa	360
ac gtccggttgt tgttgcaggt aatagcagcg	
gtgggtgttct ggcagcatgg	
ctgagcgc	420
atagcatgcc tggtcagctg cgtgggtgtgc	
tgtgtgaaga tccgcctttt	
tttgcaagcg aactggttcc ggcacatggt	480
catagcgttc gtcaggggtgc aggtccggtt	
tttgaactgt ttcgtaccta tctggg	540
cgat cagtggtcag ttgggtgattg	
ggaaggtttt	
tgtcgtgcag ccggtgcaag cgcaagcccg	600
atggcacgta gctttgttgc agatgggtatt	
ccgcagcatc tgcaagaata tgatccggaa	660
tgggcacgtg ttttttatga aggcaccgtt	
ggctctgagct gtccgcatga acgtatgctg	720
ggtcaggtta aaacaccggt gctgctgacc	
catcacatgc gtgggtatcga tccggaaacc	780
ggtaatctgc tgggtgcact gagtgatgaa	
caggccctgc gtgcacgtcg tctgatggat	840
agtgccgggtg ttaccgttga ttatgaaagc	
gttccggatg caagccacat gatgcaccag	900
agcgcaccgg cacgttatgt tgaaatcttt	
acccgttggg cagcagccct ggcaccgtaa	930

<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 gatctggg	60
cg aaatcgatct gaattatgca	
gaagcaggta gtccggataa accggcactg ctgctgattc	120
cgagccagag cgaaagttgg	
tggggctatg aagaagcaat ggggtctgctg gccgaagatt	180
atcatgtttt tgcagttgat	
atgcgtggtc aggggtcgtag cacctggaca ccgggtcgtt	240
atagcctgga taatttttgggt	
aatgatctgg tgcgctttat cgatctgggt attggtcgta	300
ccgttattgt tagcggtaat	
agcagcgggtg gtgtttgttgc agcatggctg gcagcattta	360
gcctgcctgg tcagggttcgt	
gcagcactgg cagaagatgc accgtttttt gcaagcgaac	420
tggacccgaa agtgggtcat	
accattcgtc aggcagcagg tcatattttt gttaactggc	480
gtgattatct ggggtgatcag	
tggtcagttg gtgattatgc aggttttctg aaagcaatga	540
aaagcagcga agttccgatg	
ctgcgtcagg ttccgctgcc ggaaaccgca ccgcagaatc	600
tgctggaata tgatccggaa	
tgggcacgtg cattttatga aggcaccgtt gcacagacct	660
gtccgcatga ttatatgctg	
agccagggtta aagtgcctat gctggttacc catcatgcac	720
gtatgattga tgaagcaacc	
agcgggtctg ttgggtgcaat gagcgatctg caggttcaga	780
aagcagcaga aattattcgt	
ggcaccgggtg ttcagggttga tgttgttgat ctgccggaag	840
caccgcatat tctgcatcag	

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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 aaaaactggg tgatctgggc	60
gaaatcaaaa tgaactatat tgttgccggg gcagatgtta gtccggcact gctgctgatt	120
ccgggtcaga ccgaaagttg gtgggggtttt gaagcagcaa ttgagaaact ggaaagcaac	180
tttcaggtgt ttgcaattga tctgctgggt cagggtaaaa gcaccagac accgggtcgt	240
tatagcctga atctgatggg taatgatctg gttcgtttta ttagcctggg 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 gtgggtcaatt aacaattggg aagggtctgaa agcagcacag	540
gcaaaagata cccatccggc aaacaaaatg attagccagg ttgaacagcc tccgcagcat	600
ctgaaagaat atgatccgga atgggggtcgt gcattttattg aaggcaaatt taacctgaac	660
agtccgcata ataccctgct gagcgacatt aaaaccccgga 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

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atgggtatta gcgaagcagc agatcgtgca gatacctttg ttgcacataa atttgaagaa	60
cagctgggtg atctgggtga aattcgtatg aattatgttg cagccggtga tccgaccagt	120
ccggcactgc tgctgattcc ggcacagggt gaaagtgggt ggggttatga aaatgcaatt	180
accctgctgg caaatgattt tcgtgttttt gcaattgatc tgcgtggtca gggtcgtagc	240
acctggacac cgggtcgtta taatctgaat acctggggta atgatgtgga acgctttatt	300
gatctgggtta ttggctcgtc gaccctgggt gcaggtaata gcagcgggtg tgttattgca	360
gcatggctgg cagcctatgc aaaaccgggt cagattcgtg gtgcaatgct ggaagatccg	420
cctctgtttg caagccaggc agcaccgcct tatggtccgg gtattatgca gaccctgggt	480
ccgatttttg ttctgtgggc aaaatggctg ggtccgcagt ggtcagttgg tgattgggat	540
ggtatgggtg cagcggcacc gcgtgaactg ccggaatttc tgcattccgg tatcgcat	600
ctgtttggtg atggcaccgg tgaagggtgca gcagcaacc ctccgcagca tctgaaagaa	660
tatgatccgg aatgggcaca ggcattgggc accgatgttg caaatgcagg ttgtgatcat	720
gcaaccatgc tggcacagaa tcgtgttccg gttctgctga cccatcattt tcattctgacc	780
gatccggata caggccagct gatgggtgca atgaccgata ttcaggcaca gcaggcacgt	840
cgtctgctgg cagcaaccgg tcagccgggt acctttaccg cactggatgc accgcatacc	900
atgcatgatc ctgaacctga acgtttattt gaagttctga ccgaatgggc aagtgcactg	960
gattaa	966

<210> 26  
 <211> 960  
 <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: 10

<400> 26	
atgggtcggt atgccggtgt ttttggtccg catgcaccgg aaagcaccta tggtggtcat	60
gcatatccgg aacaactgtt tgataccggg gaagttcgtc tgaattatgc agttgccggg	120
gatgcaagcg caagtccgct gctgctgatt ccgggtcaga ccgaaagttg gtgggggttat	180
gaaccggcaa tgggtctgct ggcagaacat tttcatgttc atgcagttga tctgcgtggt	240
cagggtcgta gcaccgtac accgcgtcgt tataccctgg ataattattg taatgatctg	300
gtgcgttttc tggatggtgt tattggtcgt ccggcatttg ttagcgggtc gagcagcggg	360
ggtctgctga gcgcatggct gagcgccttt gcagaaccgg gtcagggttct ggcagcatgt	420
tatgaagatc cgcctttttt tagcagcgaa ctggaccggg tgattgggtc gggctctgatg	480
agcaccggtg gtccgctggt tgcactgtat gttaaataatc tgggtgatca gtgggtcaatt	540

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ggtgattggg	atggttttgt	tgcaggcgca	ccgcaagaac	tggcaggttg	gcaggcacat	600
gttgcactgg	caggcggtac	agcagaaccg	cctcagcatc	tgaaagaata	tgatccggaa	660
tggggtcgtg	catttgttgg	tggcaccttt	accaccgggt	gtccgcatca	ggttatgctg	720
agccagggtta	aagttccggt	tctgtttacc	catcattttc	gtatgctgga	tgatgaaagc	780
ggtagcctga	ttggtgcagc	aaccgatgat	caggcagcac	gtgttggtga	actggttgaa	840
aatagtgggtg	caccgctgac	ctatcgtagc	tttccgatga	tgggtcatag	tatgcatgca	900
caagatccgg	cactgtttgc	aggcacctcg	gttgattggg	ttaccgcagc	acgtagctaa	960

<210> 27  
 <211> 960  
 <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: 11

<400> 27						
atgggtcgtt	atgccggtgt	ttttggtccg	catgcaccgg	aagcaaccta	tgttgaacat	60
ggttatccgg	aacgtctggt	tgataccggt	gaagtgcagc	tgaattatgt	tgttgccggt	120
gatgcagcag	caccgcctct	gctgctgatt	ccgggtcaga	gcgaaagttg	gtgggggttat	180
gaagcagcaa	ttccgctgct	ggcacgtcat	tttcatgttc	atgcagttga	tctgcgtggg	240
cagggtcgta	gcacccgtac	accgggtcgc	tataccctgg	ataatgttgg	taatgatctg	300
gtgcgttttc	tggtatggtg	tattggtcgt	ccggcatttg	ttagcgggtct	gagcagcggg	360
ggctctggcaa	gcgcatggct	gagcgcattt	gcaaaaccgg	gtcaggttgt	tgacgcatgt	420
tgggaagatc	cgcctttttt	tagcagcgaa	accgcaccga	ttgttgggtcc	gcctattacc	480
gatagcattg	gtccgctggt	tggtatgtgg	gcacgttatc	tgggtgatca	gtgggtcagtt	540
ggtgattggg	atggttttgt	tgccgcagtt	ccgaccgaac	tggcagattg	gcaggcacat	600
gttgcactgg	ttgttggcac	cgcagatcct	ccgcagaatc	tgctgaata	tgatccggaa	660
tggggtaaag	cattttattac	cggcaccttt	gcagcaagct	gtccgcatca	tgttatgctg	720
agcaaagtta	aagttccggt	tctgtatacc	catcactttc	gcatgattga	tgaaggtagt	780
gggtggtctga	ttggtgcatg	tagcgatatt	caggcagggtc	gtgttaccca	gctggcaaaa	840
tcaggtggtc	gtagcgttac	ctatcgtagc	tttccgatga	tggcacatag	catgcatggg	900
caagatccgg	cactgttttag	cgaaaccctg	gttgaatggg	ttagccgttt	taccgggttaa	960

<210> 28  
 <211> 969  
 <212> DNA  
 <213> Artificial sequence

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<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 ggcacagggt gaaagttggt ggggttatga agcagcaatt 180  
 ccgctgctgg caaaacattt tcaggttttt gcaattgata tgcgtgggtca gggtcgtacc 240  
 acctggacac cgggtcgtta taccctggat atttttggta atgatgtggt gcgctttatc 300  
 gatctgggta ttggctgtga aaccctgatt gcaggtaata gcagcgggtg tctgattggt 360  
 gcatggctgg cagcatttgc aaaaccgggt caggttcgtg cagttatgct ggaagatccg 420  
 cctctgtttg caagcgaaat tcgtccgcct tatggtccgg gtatttggca gggctcgggt 480  
 ccgatgtttg cagcatgggc aaaatggctg ggtccgcagt ggtcaattgg tgattgggat 540  
 ggtatgggta aagcactgcc ggatgaactg ccggaagatc tgctgcctgg tattggtttt 600  
 atgctgggtg atggtgaaag tgatggtgca gcaccgaccc ctccgcagca tctgaaagaa 660  
 tatgatccgg aatgggggtgc aagctgggca agcggttttg ccaataccgg ttgtgaacat 720  
 gaagcagtta ttagccaggt gcgtgttccg gttctgctga cccatcattt tcgtcagatt 780  
 aatgaagaaa ccggtcattt gatgggtgca ctgagcgatc tgcaggcagc acaggttcgt 840  
 catatcattg aagaagttgc aggtcaagag gttacctatg ttagcctgga tgcaccgcac 900  
 accatgcatg aaccgcagcc ggaacgttat accgatgttc tgctggattg gggttaaaaaa 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 tgctgctggt tccgggtcag 60  
 agcgaaagt ggtgggggta tgaaatggca atgtggctgc tgaaagatga ttatcaggtt 120  
 tttgcagttg atatgcgtgg tcagggtcag agtacctgga caccgggtcg ttatagcctg 180  
 gatacctttg gtaatgatct ggtgaaattc atcgatatcg tgattaaacg tccggttggt 240

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gttagcggtc tgagcagcgg tgggtgtgtg agcgcattggc tgagcgcatt tgcaaaacct	300
ggtcagattc gtgcagcagt ttatgaagat ccgcctctgt ttgcaagcca gagcaaaccg	360
gcaattgggtc agagtgttat gcagaccggt gcaggtccgt tttttaacct gtggtataaa	420
tggctgggtg cacagtggac cattggtgat caggcaggta tggttgcagc aatgccgaaa	480
gaaattccgg catggattct gcagtatctg ggtaatacca ccagtgggtcc gaccgggtctg	540
gatctgacac tgaatgaata tgatccggaa tgggggtcatg gttttgttag tggcaccggt	600
gatgcaacct gtgatcatga agcaatgctg acccatgtta aagttccgggt tctgtttacc	660
catcatagcc gtgcaattga tccgtatacc ggtaatctga ttggtagcgt tagcgatacc	720
caggttagct atgcacaggg tctgattacc accaatggca atcagagctt taccctgaaa	780
aactttccgc tggcaagcca tgatatgcat aattctgac cggaacctta tgtagcgca	840
attaccacct ggatggcaag cctgggtatt ggtagtgcag ttattccggg tccgggtaaa	900
gttgcaagcg caagcgcaca ggtagcgca gcaagcaccg caccgcctag ctgtaccagc	960
accagcgcac cgagcaccgg tcattaa	987

<210> 30

<211> 843

<212> DNA

<213> Artificial sequence

<220>

<223> ORF was codon optimized and thus differ 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 aactgctggt tgatctgggt	60
gaagtgtttc tgaatcatgc agaagcaggt agtccggatc gtccggcact ggttccgggtg	120
ccggaacagg gtggtagtgt gtggtcttat gaacgtgtta tgccgctgcc tgcacgcgat	180
tttcatgttt ttgcagttga tctgcgtggt cgtggtcgta gcaccgtac accgcgtcgt	240
tatagcctgg atgatttttg taatgatctg gttcgttttc tggccctgggt tgttcgccgt	300
ccggcagttg ttgcaggtaa tagcagcgggt ggtgttctgg cagcatgggtc aagcgcctat	360
gcaatgcctg gtcaggttcg tgcagttctg ctggaagatc cgctctgtt tagcagcgaa	420
ctgacaccgg tttgtggtcc ggggtgttcgt caggcagcag gtccgctgtt tgaactgctg	480
agcacccatc tgggcgatca gtgggggtgg ggtcgtccgg gtcgtgttca tgggtggcgtt	540
ccgcgtctgg gtctggcagc cgcagcagca gttcgtgttg cacgtcgtgc agcagcaacc	600
gatgcacgtg gtcgccctgg tgcagcacgt ggacgtcctg ccggtgttgg tgggtgcagct	660
cgtcgcgggtc gcggtggtcg tgaacgcacc ggtacaacca ccgttctgag cgggtctgacc	720
ggtagccgta ccagcggcac cggtcgttgt cgtaaaccgt ttcgtctgctg tcagtgggtg	780

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gcaggcggtg cccgtggtcc tcctccgcct cgtcagattc ggcagatgt tcgtaccggt 840  
taa 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  
atgagcgttc cggttacccc gagcgcacgt aatgtttttg ttccgcatgc atttccagag 60  
aaacaaattg atctgggtga agtggttctg aattatgcag aagcaggtag accggataaa 120  
ccggcattac tgctgctgcc ggaacagacc ggtagtgggt ggtcttatga accggcaatg 180  
ggtctgctgg cagaacattt tcatgttttt gcagttgatc tgcgtggtca gggtcgtagc 240  
acctggacac cgggtcgtta tagcctggat aattttggta atgatctggt gcgttttatt 300  
gcactggcaa ttcgtcgtcc ggttggtggt gcagggtgta gcagcgggtg tgttctggca 360  
gcatggctga ggcctatgc actgcctggt cagattcgtg gtgcactgtg tgaagatgca 420  
ccgctgtttg caagcgaact gacaccggca catggtcatg gtgttcgtca gggcgcaggt 480  
ccggtttttg aactgtatcg tgattatctg ggcgatcagt ggtcagttgg tgattgggca 540  
ggtctgggtg cagcagcaca ggcaagtccg gcaaaaatga tgagcctggt taaaatgcct 600  
ggtgaaccgc ctcagaatct gcgtgaatat gatccggaat gggcacgtgt tttttttgaa 660  
ggcaccgttg gtctgcattg tccgcatgat cgtatgctga gccagggttaa aacaccggtt 720  
ctgattaccc atcatgcacg taccaccgat ccggaaccg 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

<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



<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

<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)

<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

<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

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

<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

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<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

<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



<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

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<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