

BERK-118WO SEQLIST.TXT

SEQUENCE LISTING

<110> The Regents of the University of California
Haurwitz, Rachel E.
Doudna, Jennifer A.
Wiedenheft, Blake
Jinek, Martin

<120> Endoribonuclease Compositions and
Methods of Use Thereof

<130> BERK-118WO

<150> US 61/413,287

<151> 2010-11-12

<150> US 61/365,627

<151> 2010-07-19

<150> US 61/333,163

<151> 2010-05-10

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<213> Artificial Sequence

<220>

<223> Synthetic oligonucleotide

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28

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<212> PRT

<213> Moritella sp. PE36

<400> 2

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

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

<210> 4
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 <213> Shewanella sp. W3-18-1

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

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Ala	Arg	Ala	Ile	Val	Ile	Ala	Gln	Lys	Asn	Gly	Phe	Ala	Ile	Asn	Glu
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Val	Lys	Thr	Arg	Leu	Leu	Ala	Ser	Ile	Asp	Asn	Leu	Asp	Thr	Lys	Ser
145					150					155					160
Lys	Leu	Pro	Phe	Ile	Asn	Leu	Arg	Ser	Leu	Ser	Thr	Glu	Lys	Asp	Val
				165					170					175	
Ser	Pro	Ala	Asp	Arg	Arg	Lys	Phe	Leu	Leu	Phe	Ile	Glu	Cys	Glu	Lys
			180					185					190		
Val	Thr	Lys	Pro	Ser	Gln	Asn	Asn	Gly	Leu	Phe	Asn	Cys	Tyr	Gly	Leu
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Ser	Arg	Arg	Ala	Gln	Thr	Glu	Gln	Ala	Ala	Val	Pro	Trp	Phe	Glu	Gly
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 <213> Pseudomonas aeruginosa

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

<210> 6
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 <213> Pseudomonas aeruginosa

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			20					25					30		
Val	Ala	Gln	Gly	Gly	Asp	Arg	Ile	Gly	Val	Ser	Phe	Pro	Asp	Leu	Asp
		35					40					45			
Glu	Ser	Arg	Ser	Arg	Leu	Gly	Glu	Arg	Leu	Arg	Ile	His	Ala	Ser	Ala
	50					55					60				
Asp	Asp	Leu	Arg	Ala	Leu	Leu	Ala	Arg	Pro	Trp	Leu	Glu	Gly	Leu	Arg
65					70				75					80	
Asp	His	Leu	Gln	Phe	Gly	Glu	Pro	Ala	Val	Val	Pro	His	Pro	Thr	Pro
			85						90					95	
Tyr	Arg	Gln	Val	Ser	Arg	Val	Gln	Val	Lys	Ser	Asn	Pro	Glu	Arg	Leu

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

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

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

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 <213> Dickeya dadantii

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

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<212> PRT

<213> Pectobacterium wasabiae

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Ala	Pro	Gln	Leu	Leu	Asn	Ala	Leu	Phe	Ala	Lys	Leu	His	Arg	Ala	Leu
			20					25					30		
Gly	Gln	Leu	Ala	Asp	Gly	Lys	Ile	Gly	Ile	Ser	Phe	Pro	Glu	Val	Gly
		35					40					45			
Lys	Thr	Leu	Gly	Glu	Cys	Leu	Arg	Leu	His	Gly	Thr	Ala	Asp	Ala	Leu
	50					55					60				
Ser	Thr	Leu	Glu	Lys	Thr	Ser	Trp	Leu	Lys	Gly	Leu	Arg	Asp	Tyr	Thr
65					70				75					80	
Gln	Val	Ser	Glu	Cys	Lys	Ala	Val	Pro	Asn	Asn	Val	Lys	Phe	Arg	Thr
			85					90					95		
Val	Arg	Arg	Val	Gln	Leu	Lys	Thr	Ser	Ala	Glu	Arg	Leu	Arg	Arg	Arg
			100					105					110		
Ser	Val	Asn	Lys	Gly	Trp	Leu	Thr	Glu	Ala	Glu	Ala	Ala	Ala	Arg	Ile
		115					120					125			
Pro	Asp	Ala	Val	Glu	Lys	Arg	Ser	Thr	Leu	Pro	Phe	Val	Gln	Ile	Lys
	130					135					140				
Ser	Leu	Ser	Asn	Gly	Gln	Met	Phe	Phe	Val	Phe	Val	Glu	His	Gly	Pro
145					150					155				160	
Leu	Gln	Asn	Ala	Pro	Ala	Thr	Gly	Arg	Phe	Ser	Ser	Tyr	Gly	Leu	Ser
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Ala	Glu	Ala	Thr	Val	Pro	Trp	Phe								
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<400> 14

guucacugcc guauaggcag cuuagaaa

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<213> Photorhabdus asymbiotica

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Gly Gln Val Gly Asn Gly Arg Ile Gly Val Ser Phe Pro Cys Ala Arg
35 40 45
Lys Thr Leu Gly Asp Lys Leu Arg Ile His Gly Ala Ser Glu Ala Leu
50 55 60
Asn Asp Leu Gln Ala Leu Pro Trp Leu Lys Gly Leu Arg Asp Tyr Thr
65 70 75 80
Glu Ile Met Asp Ile Gln Pro Val Pro Gln Asp Thr Gln Tyr Arg Arg
85 90 95
Val Ser Arg Val Gln Val Lys Ser Ser Ala Glu Arg Leu Arg Arg Arg
100 105 110
Ser Ile Lys Lys Gly Trp Leu Thr Glu Glu Gln Ala Arg Gln Arg Ile
115 120 125
Pro Ile Ser Lys Glu Gln Arg Thr His Leu Pro Phe Leu Leu Val Lys
130 135 140
Ser Leu Ser Ser Arg Gln Thr Phe Pro Leu Phe Ile Glu Gln Gly Pro
145 150 155 160
Ile Glu Asp Lys Pro Thr Pro Gly Val Phe Ser Ser Tyr Gly Leu Ser
165 170 175
Ala Ser Ala Thr Ile Pro Trp Phe
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BERK-118WO SEQLIST.TXT

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guucacugcc guacaggcag cuuagaaa 28

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

BERK-118WO SEQLIST.TXT

<210> 23
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<220>
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<400> 23
 guucacugcc guguaggcag cuuagaaa

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<210> 24
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 <213> Xanthomonas albilineans

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

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uucacugccg uguaggcagc ucagaaa

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guucacugcc guauaggcag cucagaaa

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<210> 28

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<212> PRT

<213> Pectobacterium atrosepticum

<400> 28

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

```

<210> 29

<211> 184

<212> PRT

<213> Photorhabdus luminescens

<400> 29

```

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

```

BERK-118WO SEQLIST.TXT

Val Ser Arg Val Gln Val Lys Ser Ser Ala Glu Arg Leu Arg Arg Arg
 100 105 110
 Ala Ile Lys Lys Gly Trp Leu Thr Gly Glu Gln Ala Arg Gln Arg Ile
 115 120 125
 Pro Ile Ser Lys Glu Gln Arg Thr His Leu Pro Phe Leu Phe Leu Lys
 130 135 140
 Ser Leu Ser Ser Gly Gln Ser Phe Leu Leu Phe Val Lys Gln Gly Pro
 145 150 155 160
 Ile Gln Asp Lys Pro Thr Ser Gly Ile Phe Ser Ser Tyr Gly Leu Ser
 165 170 175
 Ser Ser Ala Thr Ile Pro Trp Phe
 180

<210> 30
 <211> 188
 <212> PRT
 <213> Desulfurivibrio alkaliphilus

<400> 30
 Met Val Met Ala Met Asp Cys Tyr Val Glu Ile Ser Leu Leu Pro Asp
 1 5 10 15
 Pro Glu Phe Pro Asp Ser Ile Leu Met Asn Ala Leu Phe Ala Lys Leu
 20 25 30
 His Arg Ala Leu Ala Glu Asn Gly Lys Gln Glu Ile Gly Val Ser Phe
 35 40 45
 Pro Glu Phe Gly Lys Lys Leu Asn Ser Lys Leu Arg Ile His Gly Ser
 50 55 60
 Glu Glu Ser Leu Lys Arg Leu Met Asp Leu Asn Trp Ile Gln Gly Met
 65 70 75 80
 Lys Asp Tyr Thr Arg Val Ser Gly Ile Ala Lys Val Pro Asp Ser Cys
 85 90 95
 Gln Tyr Arg Thr Val Lys Arg Val Gln Ala Lys Ser Ser Val Asp Arg
 100 105 110
 Leu Tyr Arg Arg Ser Val Lys Lys Gly Trp Leu Ser Glu Glu Asn Ala
 115 120 125
 Glu Gln Gln Lys Glu Arg Ala Arg Glu Gly Arg Leu Lys Leu Pro Phe
 130 135 140
 Val Gln Leu Lys Ser Gln Thr Thr Gly Gln Gln Phe Arg Leu Phe Ile
 145 150 155 160
 Gln His Gly Ser Leu Gln Glu Lys Pro Val Thr Gly Arg Phe Ser Ser
 165 170 175
 Tyr Gly Leu Ser Asn Glu Ala Thr Val Pro Trp Phe
 180 185

<210> 31
 <211> 28
 <212> RNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 31
 guucacugcc gcacaggcag cucagaaa

28

<210> 32
 <211> 184
 <212> PRT
 <213> Dickeya zeae

<400> 32

BERK-118WO SEQLIST.TXT

```

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

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<210> 33
 <211> 28
 <212> RNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 33
 gugcacugcc guauaggcag cuuagaaa

28

<210> 34
 <211> 184
 <212> PRT
 <213> Yersinia pestis

```

<400> 34
Met Asp His Tyr Leu Asp Ile Arg Val Leu Pro Asp Pro Glu Phe Ser
 1      5      10      15
Ala Gln Thr Leu Leu Glu Ala Leu Phe Ala Lys Leu His Arg Ala Leu
 20      25      30
Val Ala Thr Ile Pro Gly Arg Val Gly Val Ser Phe Pro Thr Ala Gly
 35      40      45
Lys Thr Leu Gly Ser Gln Leu Arg Leu His Gly Ser Arg Gly Asp Leu
 50      55      60
Leu Glu Leu Gln Ser Ala Gly Trp Leu Lys Gly Leu Gln Asp Tyr Cys
 65      70      75      80
Glu Cys Ser Glu Ile Leu Pro Val Pro Ala Asp Val Lys His Arg Thr
 85      90      95
Ile Arg Arg Val Gln Val Lys Ser Ser Ala Gln Arg Leu Arg Arg Arg
100      105      110
Ser Val Ser Lys Gly Trp Leu Thr Glu Glu Gln Ala Arg Leu Arg Ile
115      120      125
Pro Asp Ser His Asp Lys Arg Cys Asp Leu Pro Phe Leu Arg Leu Lys
130      135      140
Ser Arg Ser Ser Glu Gln Tyr Phe Leu Leu Phe Ile Glu Gln Gly Thr
145      150      155      160

```

BERK-118WO SEQLIST.TXT

Leu Gln Ala Ser Ala Thr Thr Gly Glu Phe Ser Ala Tyr Gly Leu Ser
 165 170 175
 Val Asn Ala Thr Ile Pro Trp Phe
 180

<210> 35
 <211> 30
 <212> RNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 35
 uguucacugc cgcacaggca gcuuagaaaa

30

<210> 36
 <211> 184
 <212> PRT
 <213> Dickeya dadantii

<400> 36
 Met Asp His Tyr Ile Glu Ile Arg Val Leu Pro Asp Pro Glu Phe Ser
 1 5 10 15
 Ala Val Gln Leu Ser Ala Leu Phe Ala Lys Leu His Arg Ala Leu
 20 25 30
 Gly Gln Arg Ala Thr Gly Asp Ile Gly Val Ser Phe Pro Asp Ala Gly
 35 40 45
 Lys Thr Leu Gly Glu Arg Leu Arg Leu His Gly Ser Val Gln Ala Leu
 50 55 60
 Ala Ala Leu Glu Gln Thr Gly Trp Leu Lys Gly Leu Arg Asp Tyr Ser
 65 70 75 80
 Thr Ile Thr Asp Val Leu Thr Val Pro Thr Gly Ala Gln Tyr Arg Thr
 85 90 95
 Val Arg Arg Val Gln Val Lys Ser Ser Ala Glu Arg Leu Arg Arg Arg
 100 105 110
 Ala Val Ser Lys Gly Arg Met Thr Ala Asp Glu Ala Ala Arg Ile
 115 120 125
 Pro Tyr Ala Ala Glu Lys Arg Thr Ser Leu Pro Tyr Leu Pro Leu Arg
 130 135 140
 Ser Leu Ser Ser Gly Gln Thr Phe Leu Leu Phe Val Glu His Gly Pro
 145 150 155 160
 Leu Gln Glu Lys Pro Val Ala Gly Val Phe Ser Ser Tyr Gly Leu Ser
 165 170 175
 Ala Ile Ala Thr Ile Pro Trp Phe
 180

<210> 37
 <211> 28
 <212> RNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 37
 gugaacugcc gcuaaggcag cuuagaaa

28

<210> 38
 <211> 198
 <212> PRT

BERK-118WO SEQLIST.TXT

<213> Escherichia coli

<400> 38

```

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

```

<210> 39

<211> 184

<212> PRT

<213> Escherichia coli

<400> 39

```

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

```

BERK-118WO SEQLIST.TXT

<210> 40
 <211> 184
 <212> PRT
 <213> Tolumonas auensis

<400> 40
 Met Asp His Tyr Leu Asp Ile Arg Leu Leu Pro Glu Glu Pro Glu Val
 1 5 10 15
 Ser Glu Ser Phe Leu Leu Asn Ala Leu Phe Ala Lys Leu His Val Arg
 20 25 30
 Leu Gly Gln Gln Ala Gln Gly Arg Val Gly Val Ser Phe Pro Asp His
 35 40 45
 His Lys Arg Leu Gly Asp Leu Leu Arg Leu His Gly Gln Arg Thr Asp
 50 55 60
 Leu Gln Ala Leu Met Ala Asp Asp Trp Leu Gln Gly Leu Lys Gly Tyr
 65 70 75 80
 Thr Gln Cys Ser Glu Val Leu Pro Ile Pro Ala Thr Val Ser Tyr Arg
 85 90 95
 Ala Val Lys Arg Val Gln Ala Lys Ser Ala His Asn Lys Arg Gln Arg
 100 105 110
 Ser Ile Ala Lys Gly Trp Leu Thr Glu Ser Glu Ala Gln Ile Arg Ile
 115 120 125
 Pro Asp Thr Gln Gln Lys Glu Leu His Leu Pro Phe Val Gln Leu Lys
 130 135 140
 Ser Arg Ser Asn Gly Gln Met Met Arg Val Tyr Val Glu His Gly Pro
 145 150 155 160
 Val Leu Ala Val Pro Val Ser Gly Tyr Phe Asn Ala Tyr Gly Leu Ser
 165 170 175
 Ser Ile Ala Thr Ile Pro Trp Phe
 180

<210> 41
 <211> 28
 <212> RNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 41
 cuucacugcc gcacaggcag cuuagaaa

28

<210> 42
 <211> 184
 <212> PRT
 <213> Erwinia pyrifoliae

<400> 42
 Met Asp His Tyr Gln Asp Ile Arg Val Arg Val Asp Glu Glu Asn Gly
 1 5 10 15
 Glu Ala Val Leu Leu Ala Gln Val Phe Met His Leu His Gln Val Leu
 20 25 30
 Met Arg Ala Ala Asn Gly Arg Ile Gly Ile Ser Phe Pro Asn Val Lys
 35 40 45
 Arg Thr Leu Gly Asp Arg Ile Arg Leu His Gly Thr Leu Asp Asp Leu
 50 55 60
 Ser Ala Leu Gln Gln Ser Gly Trp Asn Lys Cys Leu Arg Asp Tyr Ile
 65 70 75 80
 Ala Cys Ser Asp Ile Ala Pro Val Pro Lys Gly Ala Ala Trp Arg Thr
 85 90 95
 Val Arg Arg Val Gln Val Lys Ser Ser Ala Glu Arg Leu Arg Arg Arg
 100 105 110

BERK-118WO SEQLIST.TXT

Ser Val Asn Lys Gly Trp Leu Ser Glu Gln Glu Ala Ala Glu Arg Ile
 115 120 125
 Ser Val Leu Asn Glu Gln Arg Ser Asn Leu Pro Phe Leu Gln Ile Lys
 130 135 140
 Ser Gly Ser Asn Gly Gln Ala Trp Arg Leu Phe Ile Glu His Gly Ser
 145 150 155 160
 Leu Val Ser Ala Pro Ser Asp Gly Ser Phe Ser Ser Tyr Gly Leu Ser
 165 170 175
 Ala Ala Ala Thr Ile Pro Trp Phe
 180

<210> 43
 <211> 28
 <212> RNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 43
 uucacugccg uacaggcagc uuagaaaa

28

<210> 44
 <211> 198
 <212> PRT
 <213> Escherichia coli

<400> 44
 Met Ala Val Ser Leu Val Arg Asn Arg Asn Lys Glu Leu Pro Met Asp
 1 5 10 15
 His Tyr Leu Glu Ile Arg Val Leu Pro Asp Pro Glu Phe Ser Ser Glu
 20 25 30
 Met Leu Met Ala Ala Leu Phe Ala Lys Leu His Arg Val Leu Gly Ala
 35 40 45
 Arg Gly Gln Gly Asp Ile Gly Val Ser Phe Pro Asp Val Asn Val Met
 50 55 60
 Pro Gly Thr His Leu Arg Leu His Gly Ser Ala Gln Ala Leu Gln Glu
 65 70 75 80
 Leu Glu Ala Ser Thr Trp Arg Lys Gly Leu Thr Asp Tyr Cys Gln Cys
 85 90 95
 Ser Pro Val Thr Pro Val Pro Glu Ile Lys Gly Trp Arg Val Val Ser
 100 105 110
 Arg Val Gln Val Lys Ser Asn Pro Gln Arg Leu Leu Arg Arg Ser Val
 115 120 125
 Lys Lys Gly Trp Leu Thr Glu Glu Gln Ala Ile Glu Arg Leu Ala Thr
 130 135 140
 Gln Ala Glu Gln Arg Thr Asp Leu Pro Phe Leu Asn Met Lys Ser Leu
 145 150 155 160
 Ser Ser Gln Gln Gln Phe Lys Leu Phe Ile Arg His Gly Asp Leu Leu
 165 170 175
 Lys Glu Pro Val Lys Gly Glu Phe Ser Ser Tyr Gly Leu Ser Ala Thr
 180 185 190
 Ala Thr Ile Pro Trp Phe
 195

<210> 45
 <211> 190
 <212> PRT
 <213> Verminephrobacter eiseniae

<400> 45

BERK-118WO SEQLIST.TXT

```

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

```

<210> 46
 <211> 28
 <212> RNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 46
 guucacugcc ggauaggcag cucagaaa

28

<210> 47
 <211> 195
 <212> PRT
 <213> Chromobacterium violaceum

```

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

```

BERK-118WO SEQLIST.TXT

Gly Gln Cys Phe Arg Leu Phe Val Glu Gln Gln Ala Ala Pro Ser Ile
 165 170 175
 Ala Ala Gly Ser Phe Asn Ala Tyr Gly Leu Ser Ala Ala Ala Ala Leu
 180 185 190
 Pro Ala Trp
 195

<210> 48
 <211> 28
 <212> RNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 48
 guucacugcc ggauaggcag cuuagaaa

28

<210> 49
 <211> 184
 <212> PRT
 <213> Erwinia tasmaniensis

<400> 49
 Met Asp Arg Tyr Gln Asp Ile Arg Val Arg Val Asp Ala Glu Met Thr
 1 5 10 15
 Ala Pro Val Leu Leu Ala Gln Val Phe Met Arg Leu His Gln Val Leu
 20 25 30
 Met Arg Ala Ala Asn Gly Arg Ile Gly Ile Ser Phe Pro Asp Val Lys
 35 40 45
 Leu Thr Leu Gly Asp Arg Ile Arg Leu His Gly Thr Leu Asp Asp Leu
 50 55 60
 Ser Ser Leu Gln Gln Ser Gly Trp Asp Lys Gly Leu Thr Asp Tyr Ile
 65 70 75 80
 Ala Cys Ser Ala Ile Asp Pro Val Pro Pro Gly Ala Ala Trp Arg Thr
 85 90 95
 Val Arg Arg Val Gln Val Lys Ser Ser Ala Glu Arg Leu Arg Arg Arg
 100 105 110
 Ser Val Asn Lys Gly Trp Leu Asn Glu Ala Glu Ala Glu Arg Ile
 115 120 125
 Asn Val Leu Ser Glu Gln Arg Ser Asp Leu Pro Tyr Leu Gln Ile Lys
 130 135 140
 Ser Gly Ser Asn Gly His Ala Trp Arg Leu Phe Ile Glu His Gly Pro
 145 150 155 160
 Leu Val Ser Val Pro Val Asn Gly Gly Phe Ser Ser Tyr Gly Leu Ser
 165 170 175
 Ala Thr Ala Thr Val Pro Trp Phe
 180

<210> 50
 <211> 28
 <212> RNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 50
 guucacugcc guacaggcag cuuagaag

28

<210> 51

BERK-118WO SEQLIST.TXT

<211> 190

<212> PRT

<213> Delftia acidovorans

<400> 51

```

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

```

<210> 52

<211> 28

<212> RNA

<213> Artificial Sequence

<220>

<223> Synthetic oligonucleotide

<400> 52

guucgcugcc gcguaggcag cucagaaa

28

<210> 53

<211> 184

<212> PRT

<213> Enterobacter sp. 638

<400> 53

```

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

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[illegible]

<210> 54
<211> 186
<212> PRT
<213> Thioalkalivibrio sp. K90mix

<400>	54														
Met	Asp	His	Tyr	Leu	Asp	Leu	Arg	Val	Met	Pro	Asp	Pro	Glu	Phe	Lys
1				5					10					15	
Glu	Thr	Thr	Leu	Leu	Gly	Ala	Leu	Val	Ser	Lys	Leu	His	Arg	Arg	Leu
			20					25					30		
Val	Ser	Met	Ser	Ala	Asp	Asp	Ile	Gly	Ile	Ser	Leu	Pro	Asp	His	Glu
		35					40					45			
Gln	Glu	Pro	Pro	Leu	Gly	Arg	Arg	Leu	Arg	Val	His	Gly	Thr	Gln	Gly
	50					55					60				
Arg	Leu	Asn	Leu	Leu	Met	Gln	Asp	Glu	Trp	Leu	Gly	Gly	Met	Gln	Ser
65					70					75					80
Leu	Val	Asp	Ala	Thr	Pro	Val	Gln	Pro	Val	Pro	Asp	Gln	Val	Thr	Tyr
				85					90					95	
Arg	Pro	Val	Arg	Arg	Arg	Gln	Tyr	Lys	Thr	Asn	Ala	Glu	Arg	Leu	Arg
			100					105					110		
Arg	Arg	Arg	Met	Arg	Arg	His	Gly	Glu	Ser	Tyr	Glu	Glu	Ala	Arg	Gln
			115				120					125			
His	Ile	Pro	Asp	Thr	Val	Glu	Arg	Arg	Val	Asn	Thr	Pro	Phe	Leu	Ser
	130					135					140				
Val	Gln	Ser	Ala	Ser	Thr	Gly	Gln	Arg	Phe	Ser	Leu	Phe	Ile	Glu	His
145					150					155					160
Gly	Pro	Pro	Gln	Gln	His	Ala	Ser	Pro	Gly	Arg	Phe	Asn	Thr	Tyr	Gly
				165					170					175	
Leu	Ser	Gln	Asp	Ala	Thr	Val	Pro	Trp	Phe						
			180					185							

<210> 55
<211> 28
<212> RNA
<213> Artificial Sequence

<220>
<223> Synthetic oligonucleotide

<400> 55
guuagcugcc gcacaggcag cucagaaa

```
<210> 56
<211> 193
<212> PRT
<213> Zymomonas mobilis
```

<400> 56
Met Leu Ala Asn Pro Val Asp Ser Tyr Gln Asp Ile Tyr Ile Leu Pro
1 5 10 15
Asn Gln Glu Ile Ala Pro His Ile Ile Met Glu Lys Leu Phe Ser Leu
Page 20

BERK-118WO SEQLIST.TXT

```

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

```

<210> 57
 <211> 193
 <212> PRT
 <213> Zymomonas mobilis

```

<400> 57
Met Leu Ala Asn Pro Val Asp Ser Tyr Gln Asp Ile Tyr Ile Leu Pro
  1      5      10      15
Asn Gln Glu Ile Ala Pro His Ile Ile Met Glu Lys Leu Phe Ser Leu
      20      25      30
Leu His Leu Glu Leu Val Arg Leu Gly Ser Gln His Ile Gly Ile Ser
      35      40      45
Phe Pro Glu His Asp Asn Asn Lys Pro Cys Leu Gly Ser Arg Leu Arg
      50      55      60
Leu His Gly Ala Gly Ala Asp Leu His Glu Leu Ala Leu Ser Gly Trp
      65      70      75      80
Ile Thr Arg Leu Asp Asp Tyr Leu Tyr Cys Glu Asp Ile Lys Ser Val
      85      90      95
Pro Glu Ile Arg Gln Tyr Cys Val Val Ser Arg Val Gln Ala Lys Ser
      100      105      110
Ser Pro Ala Arg Leu Arg Arg Arg Ala Ile Arg Arg His Gly Phe His
      115      120      125
Asp Glu Glu Ala Lys Lys Val Ile Pro Asp Thr Ala Phe Glu Arg Leu
      130      135      140
Glu Leu Pro Phe Ile Met Thr Gly Ser Cys Ser Thr Lys Gln Pro Arg
      145      150      155      160
Phe Pro Val Phe Ile Ser His Lys Ile Ile Gln Asp Lys Leu Met Asn
      165      170      175
Gly Asn Phe Asn Ser Tyr Gly Leu Ser Leu Gly Ala Ser Val Pro Trp
      180      185      190
Phe

```

<210> 58
 <211> 191
 <212> PRT
 <213> Acidovorax sp. JS42

BERK-118WO SEQLIST.TXT

<400> 58

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

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<210> 59

<211> 28

<212> RNA

<213> Artificial Sequence

<220>

<223> Synthetic oligonucleotide

<400> 59

guucacugcc gcgauaggcag cucagaaa

28

<210> 60

<211> 182

<212> PRT

<213> Desulfurispirillum indicum

<400> 60

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

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BERK-118WO SEQLIST.TXT

Thr Ala Gln Lys Phe Pro Leu Phe Ile Glu Gln Arg Asn Ala Glu Lys
 145 150 155 160
 Ala Gly Lys Gln Ser Val Tyr Ser Ala Tyr Gly Leu Ser Val Gly Gly
 165 170 175
 Ser Thr Val Pro Trp Phe
 180

<210> 61
 <211> 184
 <212> PRT
 <213> Photobacterium profundum

<400> 61
 Met Met Asp Ser Tyr Val Asp Ile Gln Leu Lys Pro Asp Ala Glu Met
 1 5 10 15
 Arg Glu Ala Glu Leu Ser Ser Lys Val Phe Thr Lys Phe His Lys Ala
 20 25 30
 Leu Ala Thr Leu Asn Thr Asn Lys Ile Gly Ile Ser Phe Pro Gln Met
 35 40 45
 Asn Leu Lys Leu Gly Arg Leu Phe Arg Ile His Gly Asn Ala Ser Leu
 50 55 60
 Leu Lys Asp Leu Gln Gly Ile Lys Trp Leu Gly Ala Leu Ala Gly Tyr
 65 70 75 80
 Cys Gln Val Gly Glu Ile Thr Val Val Pro Asp Gln Val Gln Tyr Arg
 85 90 95
 Val Ile Ser Val Lys Arg Ser Asn Leu Ser Lys Ala Lys Leu Lys Arg
 100 105 110
 Leu Ile Ala Arg Gly Ser Ile Asp Lys Asp Gly Glu Lys Arg Tyr Lys
 115 120 125
 Val Lys Met Leu Ser Gln Gly Phe Asp Asn Pro Tyr Leu Asp Leu Phe
 130 135 140
 Ser Ser Ser Thr Gly Gln Val Tyr Arg Lys Phe Phe Glu Phe Gly Asp
 145 150 155 160
 Ile Gln Ala Thr Ser Val Ser Asp Glu Phe Asp Ser Tyr Gly Leu Ser
 165 170 175
 Asn Thr Ala Thr Ile Pro Trp Phe
 180

<210> 62
 <211> 184
 <212> PRT
 <213> Legionella pneumophila

<400> 62
 Met Asp His Tyr Leu Asp Ile Ser Ile Leu Pro Asp Ser Glu Phe Thr
 1 5 10 15
 Thr Pro Val Leu Met Asn Ala Ile Tyr Thr Asn Leu His Lys Ala Leu
 20 25 30
 His Thr Leu Ala Ser Thr Asn Ile Gly Val Ser Phe Pro Lys Tyr Ser
 35 40 45
 Ser Thr Leu Gly Asn Leu Leu Arg Ile His Gly Lys Lys Glu Ala Leu
 50 55 60
 Gln Glu Leu Gln Asn Leu Asn Trp Ile Gly Gly Met Ile Gly Tyr Cys
 65 70 75 80
 Glu Ala Ser Leu Ile Lys Thr Val Pro Ala Asp Thr Lys Phe Arg Thr
 85 90 95
 Val Ser Arg Lys Gln Pro Thr Met Ser Gln Ser Lys Leu Arg Arg Leu
 100 105 110
 Ile Lys Arg Asn Ser Leu Thr Glu Asp Glu Ile Arg Gln Tyr Lys Ala
 115 120 125
 Lys Met Phe Ser Lys Gly Leu Asp Asn Pro Tyr Ile Glu Leu Val Ser

BERK-118WO SEQLIST.TXT

130	135	140															
Val	Ser	Asn	Gly	Gln	Arg	His	Arg	Arg	Tyr	Ile	Glu	Phe	Gly	Glu	Leu		
145					150					155					160		
Phe	Asn	Glu	Pro	Ile	Pro	Gly	Leu	Phe	Asp	Gln	Phe	Gly	Leu	Ser	Asn		
				165					170					175			
Ser	Ala	Thr	Val	Pro	Trp	Phe	Asp										
			180														

<210> 63
 <211> 184
 <212> PRT
 <213> Legionella pneumophila

<400> 63																	
Met	Asp	His	Tyr	Leu	Glu	Ile	Ser	Ile	Leu	Pro	Asp	Ser	Glu	Phe	Thr		
1				5					10					15			
Thr	Pro	Val	Leu	Met	Asn	Ala	Ile	Tyr	Thr	Asn	Leu	His	Lys	Ala	Leu		
			20					25					30				
His	Thr	Leu	Ala	Ser	Thr	Ser	Ile	Gly	Val	Ser	Phe	Pro	Lys	Tyr	Ser		
		35					40					45					
Ser	Thr	Leu	Gly	Asn	Ile	Leu	Arg	Ile	His	Gly	Lys	Lys	Glu	Val	Leu		
	50					55					60						
Gln	Asp	Leu	Gln	Asn	Leu	Asn	Trp	Ile	Gly	Gly	Met	Ile	Gly	Tyr	Cys		
65					70				75						80		
Glu	Ala	Ser	Leu	Ile	Lys	Thr	Val	Pro	Ala	Asp	Thr	Lys	Phe	Arg	Thr		
				85					90					95			
Val	Ser	Arg	Lys	Gln	Pro	Thr	Met	Ser	Gln	Ser	Lys	Leu	Arg	Arg	Leu		
			100					105					110				
Ile	Lys	Arg	Asn	Thr	Leu	Thr	Glu	Asp	Glu	Ile	Arg	Gln	Tyr	Lys	Ala		
		115					120					125					
Lys	Met	Phe	Ser	Lys	Gly	Leu	Asp	Asn	Pro	Tyr	Ile	Glu	Leu	Val	Ser		
	130					135					140						
Val	Ser	Asn	Gly	Gln	Arg	His	Arg	Arg	Tyr	Ile	Glu	Phe	Gly	Glu	Leu		
145					150				155						160		
Phe	Asn	Glu	Pro	Ser	Pro	Gly	Leu	Phe	Asp	Gln	Phe	Gly	Leu	Ser	Asn		
				165					170					175			
Ser	Ala	Thr	Val	Pro	Trp	Phe	Asp										
			180														

<210> 64
 <211> 183
 <212> PRT
 <213> Shewanella putrefaciens

<400> 64																	
Met	Asn	Ser	Tyr	Ile	Asp	Ile	Arg	Leu	Lys	Pro	Asp	Ala	Glu	Met	Arg		
1				5					10					15			
Glu	Ala	Glu	Leu	Ser	Ser	Lys	Val	Phe	Thr	Lys	Phe	His	Lys	Ala	Leu		
			20					25					30				
Val	Thr	Leu	Asn	Ser	His	Lys	Ile	Gly	Ile	Ser	Phe	Pro	Gln	Met	Lys		
		35					40					45					
Leu	Ser	Leu	Gly	Gln	Leu	Phe	Arg	Ile	His	Gly	Asp	Ala	Ser	Leu	Leu		
	50					55					60						
His	Asp	Leu	Gln	Gly	Leu	Asp	Trp	Leu	Gly	Pro	Leu	Ala	Gly	Tyr	Cys		
65					70				75						80		
Gln	Val	Thr	Ala	Val	Ser	Ala	Val	Pro	Asp	His	Val	Gln	Tyr	Arg	Ile		
				85					90					95			
Val	Ser	Val	Lys	Arg	Ser	Asn	Leu	Ser	Lys	Ala	Lys	Leu	Lys	Arg	Leu		
			100					105					110				
Ile	Ala	Arg	Gly	Ser	Ile	Asp	Lys	Asp	Gly	Glu	Lys	Arg	Tyr	Lys	Val		
		115					120					125					

BERK-118WO SEQLIST.TXT

Lys Met Leu Gly Gln Gly Phe Asp Asn Pro Tyr Leu Asp Leu Phe Ser
 130 135 140
 Ser Ser Thr Gly Gln Val Tyr Arg Lys Phe Phe Glu Phe Ser Asp Ile
 145 150 155 160
 Gln Ala His Pro Leu Asp Gly Glu Phe Asp Ser Tyr Gly Leu Ser Lys
 165 170 175
 Thr Ala Thr Val Pro Trp Phe
 180

<210> 65
 <211> 28
 <212> RNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 65
 guucaccgcc gcacaggcgg cuuagaaa

28

<210> 66
 <211> 184
 <212> PRT
 <213> Legionella pneumophila

<400> 66
 Met Asp Tyr Tyr Val Asp Ile Leu Ile Lys Pro Asp Ser Glu Lys Ser
 1 5 10 15
 Leu Asn Phe Leu Leu Ser Thr Leu Tyr Thr Lys Leu His Lys Val Leu
 20 25 30
 His Asp Met Ala Ser Thr Asn Ile Gly Val Ser Phe Pro Lys Tyr Asn
 35 40 45
 Ile Thr Leu Gly Asn Ile Leu Arg Ile His Ser Lys Lys Val Val Leu
 50 55 60
 Asp Glu Leu Leu Gly Met Asn Phe Leu Ser Gly Ile Asn Asn Tyr Tyr
 65 70 75 80
 Glu Val Ser Pro Ile Lys Ser Val Pro Ala Asp Ser Lys Phe Arg Ile
 85 90 95
 Ile Ser Arg Lys Gln Thr Thr Met Ser Gln Ser Lys Met Arg Arg Leu
 100 105 110
 Phe Lys Arg Gly Ser Met Thr Val Gly Asp Ile Arg Gln Tyr Lys Ala
 115 120 125
 Lys Met Phe Ala Lys Ser Ile Asp Asn Pro Tyr Leu Glu Leu Val Ser
 130 135 140
 Gly Ser Asn Gly Tyr Arg Tyr Arg Arg Tyr Ile Glu Phe Gly Glu Leu
 145 150 155 160
 Leu Asp Gln Pro Val Tyr Gly Glu Phe Asp Arg Phe Gly Leu Ser Lys
 165 170 175
 Thr Ala Thr Val Pro Trp Phe Asp
 180

<210> 67
 <211> 28
 <212> RNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 67
 guuaacugcc gcacaggcag cuuagaag

28

BERK-118WO SEQLIST.TXT

<210> 68
 <211> 183
 <212> PRT
 <213> *Vibrio metschnikovii*

<400> 68
 Met Asp Ser Tyr Ile Glu Ile Arg Leu Gln Pro Asp Ala Glu Met Pro
 1 5 10 15
 Glu Ala Glu Leu Ser Ser Lys Val Phe Thr Lys Phe His Lys Ala Leu
 20 25 30
 Val Ile Leu His Ser Asn Gln Ile Gly Ile Ser Phe Pro Glu Val Asn
 35 40 45
 Val Lys Leu Gly Arg Leu Phe Arg Leu His Gly Glu Ala Ser Phe Leu
 50 55 60
 His Asp Leu Gln Gly Leu Asn Trp Leu Gly Pro Leu Ser Gly Tyr Cys
 65 70 75 80
 Gln Val Ser Glu Ile Leu Ala Ile Pro Glu Gln Val Gln Tyr Arg Val
 85 90 95
 Ile Ser Val Lys Arg Ser Asn Leu Ser Gln Ala Lys Leu Arg Arg Leu
 100 105 110
 Ile Ala Arg Gly Ser Ile Asp Lys Glu Gly Glu Lys Arg Tyr Lys Val
 115 120 125
 Lys Met Leu Ser Gln Gly Phe Asp Asn Pro Tyr Leu Asp Leu Phe Ser
 130 135 140
 Ser Ser Thr Lys Gln Val His Arg Lys Phe Phe Glu Phe Gly Glu Ile
 145 150 155 160
 Gln Pro Leu Pro Val Ser Gly Lys Phe Asp Ser Tyr Gly Leu Ser His
 165 170 175
 Thr Thr Thr Val Pro Trp Phe
 180

<210> 69
 <211> 28
 <212> RNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 69
 guucacugcc gcuaaggcag cuuagaaa

28

<210> 70
 <211> 102
 <212> PRT
 <213> *Citrobacter koseri*

<400> 70
 Met Ala Ile Thr Pro Val Pro Ala Val Lys Gly Trp Arg Thr Val Ser
 1 5 10 15
 Arg Val Gln Val Lys Ser Ser Pro Gln Arg Leu Leu Arg Arg Ser Val
 20 25 30
 Arg Lys Gly Trp Leu Thr Glu Glu Gln Ala Gln Leu Arg Leu Val Glu
 35 40 45
 Ser Thr Glu Gln His Ser Asp Leu Pro Tyr Leu Asn Val Lys Ser Leu
 50 55 60
 Ser Asn Gln Gln Gln Phe Arg Val Phe Ile Arg His Ser Glu Leu Arg
 65 70 75 80
 Ser Glu Pro Val Ser Gly Thr Phe Thr Ser Tyr Gly Leu Ser Ser Thr
 85 90 95
 Ala Thr Ile Pro Trp Phe

100

<210> 71
 <211> 183
 <212> PRT
 <213> Vibrio sp. RC586

<400> 71
 Met Asp Ala Tyr Ile Asp Ile Arg Leu Met Pro Asp Ala Glu Met Arg
 1 5 10 15
 Glu Ala Glu Leu Ser Ser Lys Val Phe Ile Lys Phe His Lys Ala Leu
 20 25 30
 Val Lys Leu Arg Ser Asn Lys Ile Gly Ile Ser Phe Pro Glu Ala Asn
 35 40 45
 Ile Lys Leu Gly Arg Leu Phe Arg Leu His Gly Glu Met Ser Ala Leu
 50 55 60
 His Asp Leu Gln Gly Leu Asn Trp Leu Gly Pro Leu Ala Gly Tyr Cys
 65 70 75 80
 Lys Ile Thr Thr Val Thr His Val Pro Asp Gln Val Gln Tyr Arg Ile
 85 90 95
 Ile Ser Val Lys Arg Ser Asn Leu Ser Lys Ala Lys Leu Thr Arg Leu
 100 105 110
 Ile Ala Arg Gly Ser Ile Asp Lys Asp Gly Glu Lys Arg Tyr Lys Val
 115 120 125
 Lys Met Leu Ser Gln Gly Phe Asp Asn Pro Tyr Leu Asp Leu Ser Ser
 130 135 140
 Ser Ser Thr Gly Gln Val Tyr Arg Lys Phe Phe Glu Phe Ser Asp Ile
 145 150 155 160
 Gln Ala Asp Pro Val Asp Gly Glu Phe Asp Ser Tyr Gly Leu Ser Lys
 165 170 175
 Thr Ala Thr Val Pro Trp Phe
 180

<210> 72
 <211> 28
 <212> RNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 72
 aguguucugc cgaauaggca gcuaagaa

28

<210> 73
 <211> 184
 <212> PRT
 <213> Vibrio cholerae

<400> 73
 Met Met Asp Ala Tyr Ile Asp Ile Arg Leu Met Pro Asp Ala Glu Met
 1 5 10 15
 Arg Glu Ala Glu Leu Ser Ser Lys Val Phe Ile Lys Phe His Lys Ala
 20 25 30
 Leu Val Lys Leu Gln Ser Asn Lys Ile Gly Ile Ser Phe Pro Glu Ala
 35 40 45
 Asn Ile Lys Leu Gly Arg Leu Phe Arg Leu His Gly Glu Val Ser Ala
 50 55 60
 Leu His Asp Leu Gln Gly Leu Asn Trp Leu Gly Pro Leu Ala Gly Tyr
 65 70 75 80
 Cys Lys Ile Thr Thr Val Thr His Val Pro Asp Gln Val Glu Tyr Arg

BERK-118WO SEQLIST.TXT

Ile	Ile	Ser	Val	Lys	Arg	Ser	Asn	Leu	Ser	Lys	Ala	Lys	Leu	Ala	Arg
			100					105					110		
Leu	Ile	Ala	Arg	Gly	Ser	Ile	Asp	Lys	Asp	Gly	Glu	Lys	Arg	Tyr	Lys
		115					120					125			
Val	Lys	Met	Leu	Arg	Gln	Gly	Phe	Asp	Asn	Pro	Tyr	Leu	Asp	Leu	Ser
		130				135					140				
Ser	Ser	Ser	Thr	Gly	Gln	Val	Tyr	Arg	Lys	Phe	Phe	Glu	Phe	Ser	Asp
					150					155					160
Ile	Gln	Ala	Glu	Pro	Val	Asp	Gly	Glu	Phe	Asp	Ser	Tyr	Gly	Leu	Ser
				165					170					175	
Lys	Thr	Ala	Thr	Val	Pro	Trp	Phe								
			180												

<210> 74
 <211> 29
 <212> RNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 74
 guucacugcc gcacaggcag cuuagaaau

29

<210> 75
 <211> 197
 <212> PRT
 <213> Oxalobacter formigenes

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

<210> 76
 <211> 28
 <212> RNA

<213> Artificial Sequence

<220>

<223> Synthetic oligonucleotide

<400> 76

guucacugcc guauaggcag cuuagaag

28

<210> 77

<211> 193

<212> PRT

<213> *Psychromonas ingrahamii*

<400> 77

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

<210> 78

<211> 29

<212> RNA

<213> Artificial Sequence

<220>

<223> Synthetic oligonucleotide

<400> 78

guguuccccg ugcccacggg gaugaaccg

29

<210> 79

<211> 202

<212> PRT

<213> *Dichelobacter nodosus*

<400> 79

Met	Asn	Phe	Tyr	Gln	Glu	Ile	Thr	Leu	Leu	Pro	Asp	Ala	Glu	Val	Ser
1				5				10					15		
Leu	Tyr	Phe	Leu	Trp	Ser	Lys	Val	Tyr	Gly	Gln	Leu	His	Ile	Ala	Leu
			20					25					30		

BERK-118WO SEQLIST.TXT

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

<210> 80
 <211> 194
 <212> PRT
 <213> Shewanella baltica

<400> 80
 Met Asn His Tyr Leu Asp Ile Thr Leu Leu Pro Asn Glu Glu Val Gly
 1 5 10 15
 His Tyr Phe Leu Trp Glu Lys Leu Tyr His Gln Val His Leu Ala Leu
 20 25 30
 Val Glu His Lys Asn Arg Val Gly Gln Phe Glu Ile Ala Ala Ala Phe
 35 40 45
 Pro Gln Phe Asn Glu Met Asp Asn Ser Leu Gly Ser Lys Leu Arg Leu
 50 55 60
 Leu Ala Thr Gln Pro Gln His Leu Glu Asp Leu Lys Val Ser Asn Trp
 65 70 75 80
 Leu Arg His Phe Thr Asp Tyr Leu His Ile Ser Ser Ile Arg Pro Val
 85 90 95
 Pro Glu Lys Ile Glu Val Tyr Val Ala Tyr Ser Arg Pro Ala Ile Arg
 100 105 110
 Ala Asn Lys Ala Arg Glu Ile Ala Arg Met Lys Arg His Asn Glu
 115 120 125
 Thr Leu Glu Gln Ala Thr Ala His Phe Glu Gly Phe Lys Pro Lys Lys
 130 135 140
 Thr Lys Ala Pro Phe Val Tyr Met Gln Ser Tyr Thr Lys Asp Ser Arg
 145 150 155 160
 Phe Pro Leu Phe Ile Gln Gln Thr His Ser Ala Val Val Lys Glu Gly
 165 170 175
 Ser Val Ser Phe Asp Ser Tyr Gly Leu Ser Ser Arg Gly Tyr Leu Pro
 180 185 190
 Lys Phe

<210> 81
 <211> 194
 <212> PRT
 <213> Shewanella baltica

BERK-118WO SEQLIST.TXT

<400> 81

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

```

<210> 82

<211> 204

<212> PRT

<213> Acinetobacter baumannii

<400> 82

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

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BERK-118WO SEQLIST.TXT

<210> 83
<211> 28
<212> RNA
<213> Artificial Sequence

<220>
<223> Synthetic oligonucleotide

<400> 83
guucauggcg gcacacgccca uuuagaaa

28

<210> 84
<211> 203
<212> PRT
<213> Acinetobacter baumannii

<400> 84
Met Asn Trp Tyr Gln Glu Ile Thr Leu Ile Asp Gln Asp Glu Ile Ser
1 5 10 15
Leu Tyr Phe Ile Trp Ser Lys Val Tyr Thr Gln Leu His Ile Ala Phe
20 25 30
Ala Glu His Ser Asn Glu Gln Gly Arg Ile Ser Phe Gly Val Ser Phe
35 40 45
Pro Gln Tyr Arg Ile Asn Glu Gln Lys Lys Ile Gly Phe Leu Gly Thr
50 55 60
Lys Ile Arg Val Phe Ala Ser Ser Glu Asn Asp Leu Gln Gln Leu Asn
65 70 75 80
Leu Gly Lys Trp Leu Glu Arg Phe Ile Asp Tyr Val His Ile Thr Gln
85 90 95
Pro Arg Glu Val Pro Arg Ala Lys Ile Thr Gly Tyr Ala His Tyr Tyr
100 105 110
Arg Val Asn His Arg Met Ser Val Glu Glu Arg Ile Val His Gln Ala
115 120 125
Gln Arg Arg Asn Ile Ser Leu Asp Gln Ala Arg Gln His Phe Lys Gln
130 135 140
Tyr Val Glu Gln Pro Val Val Glu Pro Tyr Val Ser Leu Lys Ser Leu
145 150 155 160
Ser Ala Lys Arg Glu Asn Val Asp Arg Pro Tyr Arg Leu Tyr Ile
165 170 175
Gly Lys Ser Leu Val Asp Glu Ala Arg Asp Gly Met Phe Gly Thr Tyr
180 185 190
Gly Leu Ser Arg Met Thr Thr Val Pro Glu Phe
195 200

<210> 85
<211> 186
<212> PRT
<213> Pasteurella multocida

<400> 85
Met Thr Thr His Tyr Ile Glu Leu Lys Ala Ile Pro Gln Met Asp Met
1 5 10 15
Leu Gln Ser Glu Val Ile Gly His Cys Met Gln Ile Leu His Gln Phe
20 25 30
Leu Pro His Phe Glu Gly Arg Val Gly Val Ala Phe Pro Ala Tyr Gly
35 40 45
Leu Gly Arg Thr Leu Gly Gly Ile Val Arg Leu Phe Ala Asn Gln Glu
50 55 60
Asp Cys Asn Gln Leu His Gln Gln Leu Leu Arg Ser Gly Leu Ser Asp
65 70 75 80
Tyr Ala Leu Ile Ser Glu Val Ser Lys Thr Pro Leu Pro Thr Glu His
85 90 95

BERK-118WO SEQLIST.TXT

Arg	Ser	Tyr	Ser	Arg	Val	His	Arg	Lys	Gly	Gln	Ser	Ala	Ile	Arg	Arg
			100					105					110		
Thr	Glu	Lys	Arg	Leu	Lys	Ser	Gln	Gly	Arg	Trp	Asp	Glu	Ser	Ile	Arg
		115					120					125			
Ala	Asp	Met	Gln	Gln	Arg	Gln	Gln	Asn	Val	Ala	Phe	Phe	Pro	His	Cys
	130					135					140				
His	Leu	Lys	Ser	Ala	Ser	Thr	Gly	Gln	Arg	Phe	Ile	Leu	Ala	Val	Lys
145					150					155					160
Glu	Asn	Arg	Met	Pro	Gln	Ser	Cys	Val	Gly	Val	Phe	Asn	Ala	Tyr	Gly
				165					170					175	
Leu	Ser	Asn	Ser	Ala	Thr	Val	Pro	His	Phe						
			180					185							

<210> 86
 <211> 28
 <212> RNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 86
 guucaccauc guguagaugg cuuagaaa 28

<210> 87
 <211> 28
 <212> RNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 87
 guuaacugcc guauaggcag cuuagaaa 28

<210> 88
 <211> 187
 <212> PRT
 <213> Aggregatibacter actinomycetemcomitans

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

BERK-118WO SEQLIST.TXT

Gly Leu Ser Gln Thr Thr Thr Val Pro His Phe
 165 170 175
 180 185

<210> 89
 <211> 28
 <212> RNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 89
 cuucacugcc gaauaggcag cuuagaaa

28

<210> 90
 <211> 199
 <212> PRT
 <213> Marinomonas sp. MWYL1

<400> 90
 Met Lys His Tyr Ile Asp Ile Thr Leu Leu Pro Ser Asp Asp Ile Gly
 1 5 10 15
 Val His Phe Leu Trp Ser Lys Leu Met Met Gln Val His Leu Ala Leu
 20 25 30
 Val Glu Ile Gln Asn Glu Gln Lys Gln Val Pro Val Ala Val Ser Phe
 35 40 45
 Pro Lys Tyr Gln Pro Arg Glu Asn Glu Lys Leu Gly Phe Val Gly Asn
 50 55 60
 Lys Leu Arg Leu Phe Ala Asn Asp Lys Thr Asp Leu Glu Arg Leu Asn
 65 70 75 80
 Phe Gly Lys Trp Leu His Arg Leu Glu Asp Tyr Val His Ile Lys Ser
 85 90 95
 Ile Ala Asp Val Pro Asn Asp Val Ile Ser Tyr Glu Ser Phe Asn Arg
 100 105 110
 Arg Ser Lys Ser Gly Ser Pro Asp Lys His Ile Lys Arg Arg Met Gln
 115 120 125
 Arg His Asn Glu Thr Trp Glu Gln Ala Ala Ala Phe Phe Lys Gly Tyr
 130 135 140
 Ser Met Glu Lys Ala Asp Lys Asp Leu Pro Phe Ile Arg Met Lys Ser
 145 150 155 160
 Leu His Ser Asp Asn Glu Phe Cys Met Ser Ile Ile Arg Lys Glu Ala
 165 170 175
 Ala Pro Ser Asn Lys His Ile Met Phe Asn Thr Tyr Gly Leu Ser Ala
 180 185 190
 Glu Gly Val Leu Pro Lys Phe
 195

<210> 91
 <211> 28
 <212> RNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 91
 guucgccgcc gagcacgcgg cuuagaaa

28

<210> 92
 <211> 190

BERK-118WO SEQLIST.TXT

<212> PRT

<213> Dialister invisus

<400> 92

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

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<210> 93

<211> 28

<212> RNA

<213> Artificial Sequence

<220>

<223> Synthetic oligonucleotide

<400> 93

guuaacugcc gcuaagguag uuuagaaa

28

<210> 94

<211> 28

<212> RNA

<213> Artificial Sequence

<220>

<223> Synthetic oligonucleotide

<400> 94

guuaucugcc guauaggcag cuuagaaa

28

<210> 95

<211> 189

<212> PRT

<213> Actinobacillus pleuropneumoniae

<400> 95

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Met Ser Glu Leu Thr His Tyr Ile Glu Leu Lys Ala Ile Pro Gln Val
 1      5      10      15
Asp Ile Leu Gln Thr Asp Val Ile Ala His Gly Leu Gln Ile Leu His
 20      25      30
Lys Phe Leu Pro Leu Tyr Gln Gly Glu Ile Gly Leu Ser Phe Pro Ala

```

BERK-118WO SEQLIST.TXT

```

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

```

<210> 96
 <211> 28
 <212> RNA
 <213> Artificial Sequence

<220>
 <223> Synthetic oligonucleotide

<400> 96
 cuucacugcc guauaggcag cuuagaaa

28

<210> 97
 <211> 189
 <212> PRT
 <213> Actinobacillus pleuropneumoniae

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<400> 97
Met Ser Glu Leu Thr His Tyr Ile Glu Leu Lys Ala Ile Pro Gln Val
  1      5      10      15
Asp Ile Leu Gln Thr Asp Val Ile Ala His Gly Leu Gln Ile Leu His
  20      25      30
Lys Phe Leu Pro Leu Tyr Gln Gly Glu Ile Gly Leu Ser Phe Pro Ala
  35      40      45
Tyr Gly Leu Gly Arg Thr Leu Gly Gly Ile Ile Arg Val Phe Gly Asn
  50  55  60
Glu Gln His Cys Thr Gln Ile Lys Thr Gln Leu Ile Gly Glu Gly Leu
  65  70  75  80
Gln Asp Tyr Val Leu Ile Thr Ser Val Thr Pro Val Pro Glu Glu Ile
  85  90  95
Val Glu Tyr His Arg Tyr Gln Arg Val His Arg Lys Gly Gln Ser Ala
 100 105 110
Ile Arg Arg Thr Glu Gln Phe Leu Val Gln Gln Gly Lys Trp Thr Glu
 115 120 125
Glu Ile Arg Gln Glu Met Leu Ile His Gln Gln Asn Gln Lys Val Phe
 130 135 140
Pro Tyr Val Lys Leu Lys Ser Gly Ser Thr Lys Gln His Phe Val Leu
 145 150 155 160
Ala Ile Arg Gln Leu Arg Leu Ala Glu Pro Val Ser Gly Leu Phe Asn
 165 170 175
Ala Tyr Gly Leu Ser Lys Ile Ala Thr Val Pro His Phe
 180 185

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BERK-118WO SEQLIST.TXT

<210> 98
 <211> 189
 <212> PRT
 <213> Actinobacillus pleuropneumoniae

<400> 98
 Met Ser Glu Leu Thr His Tyr Ile Glu Leu Lys Ala Ile Pro Gln Val
 1 5 10 15
 Asp Ile Leu Gln Thr Asp Val Ile Ala His Gly Leu Gln Ile Leu His
 20 25 30
 Lys Phe Leu Pro Leu Tyr Gln Gly Glu Ile Gly Leu Ser Phe Pro Ala
 35 40 45
 Tyr Gly Leu Gly Arg Thr Leu Gly Gly Ile Ile Arg Val Phe Gly Asn
 50 55 60
 Glu Gln His Cys Thr Gln Ile Lys Thr Gln Leu Ile Gly Glu Gly Leu
 65 70 75 80
 Gln Asp Tyr Val Leu Ile Thr Ser Val Thr Pro Val Pro Glu Glu Ile
 85 90 95
 Val Glu Tyr His Arg Tyr Gln Arg Val His Arg Lys Gly Gln Ser Ala
 100 105 110
 Ile Arg Arg Thr Glu Gln Phe Leu Val Gln Gln Gly Lys Trp Thr Glu
 115 120 125
 Glu Ile Arg Gln Glu Met Leu Ile His Gln Gln Asn Gln Lys Val Phe
 130 135 140
 Pro His Val Lys Leu Lys Ser Gly Ser Thr Lys Gln His Phe Val Leu
 145 150 155 160
 Ala Ile Arg Gln Leu Arg Leu Ala Glu Pro Ser Phe Gly Leu Phe Asn
 165 170 175
 Thr Tyr Gly Leu Ser Lys Ile Ala Thr Val Pro His Phe
 180 185

<210> 99
 <211> 189
 <212> PRT
 <213> Actinobacillus pleuropneumoniae

<400> 99
 Met Ser Glu Leu Thr His Tyr Ile Glu Leu Lys Ala Ile Pro Gln Val
 1 5 10 15
 Asp Ile Leu Gln Thr Asp Val Ile Ala His Gly Leu Gln Ile Leu His
 20 25 30
 Lys Phe Leu Pro Leu Tyr Gln Gly Glu Ile Gly Leu Ser Phe Pro Ala
 35 40 45
 Tyr Gly Leu Gly Arg Thr Leu Gly Gly Ile Ile Arg Val Leu Gly Asn
 50 55 60
 Glu Gln His Cys Thr Gln Ile Lys Thr Gln Leu Ile Gly Glu Gly Leu
 65 70 75 80
 Gln Asp Tyr Val Leu Ile Thr Ser Val Thr Pro Val Pro Glu Glu Ile
 85 90 95
 Val Glu Tyr His Arg Tyr Gln Arg Val His Arg Lys Gly Gln Ser Ala
 100 105 110
 Ile Arg Arg Thr Glu Gln Phe Leu Val Gln Gln Gly Lys Trp Thr Glu
 115 120 125
 Glu Ile Arg Gln Glu Met Leu Ile His Gln Gln Asn Gln Lys Val Phe
 130 135 140
 Pro His Val Lys Leu Lys Ser Gly Ser Thr Lys Gln His Phe Val Leu
 145 150 155 160
 Ala Ile Arg Gln Leu Arg Leu Ala Glu Pro Ser Phe Gly Leu Phe Asn
 165 170 175
 Thr Tyr Gly Leu Ser Lys Ile Ala Thr Val Pro His Phe
 180 185

BERK-118WO SEQLIST.TXT

<210> 100
 <211> 201
 <212> PRT
 <213> Streptococcus thermophilus

<400> 100
 Met Ser Lys Thr Met Ile Ile Gly Leu Thr Gly Gly Ile Ala Ser Gly
 1 5 10 15
 Lys Ser Thr Val Val Glu Ile Ile Lys Asp Ala Gly Tyr Lys Val Ile
 20 25 30
 Asp Ala Asp Gln Leu Val His Asp Met Gln Val Lys Gly Gly Arg Leu
 35 40 45
 Tyr Gln Ala Leu Leu Asp Trp Leu Gly Asp Gly Ile Leu Leu Pro Asn
 50 55 60
 Gly Glu Leu Asn Arg Pro Lys Leu Gly Gln Leu Ile Phe Ser Ser Glu
 65 70 75 80
 Glu Met Arg Tyr Gln Ser Ala Glu Ile Gln Gly Lys Ile Ile Arg Glu
 85 90 95
 Glu Leu Ala Ala Lys Arg Asp Cys Leu Ala Lys Glu Glu Asp Val Phe
 100 105 110
 Phe Met Asp Ile Pro Leu Leu Phe Glu Asn Asp Tyr Gln Asp Trp Phe
 115 120 125
 Asp Gln Ile Trp Leu Val Ala Val Ser Pro Gln Val Gln Gly Gln Arg
 130 135 140
 Leu Met Lys Arg Asn His Leu Ser Ala Glu Glu Ala Gly Met Arg Ile
 145 150 155 160
 Ala Ser Gln Met Pro Leu Ala Glu Lys Leu Pro Tyr Ala Ser Leu Val
 165 170 175
 Ile Asp Asn Asn Gly Asn Ile Asp Asp Leu Lys Lys Lys Val Lys Gly
 180 185 190
 Ala Ile Lys Asp Leu Ala Asn Leu Val
 195 200

<210> 101
 <211> 187
 <212> PRT
 <213> Pseudomonas aeruginosa

<400> 101
 Met Asp His Tyr Leu Asp Ile Arg Leu Arg Pro Asp Pro Glu Phe Pro
 1 5 10 15
 Pro Ala Gln Leu Met Ser Val Leu Phe Gly Lys Leu Ala Gln Ala Leu
 20 25 30
 Val Ala Gln Gly Gly Asp Arg Ile Gly Val Ser Phe Pro Asp Leu Asp
 35 40 45
 Glu Ser Arg Ser Arg Leu Gly Glu Arg Leu Arg Ile His Ala Ser Ala
 50 55 60
 Asp Asp Leu Arg Ala Leu Leu Ala Arg Pro Trp Leu Glu Gly Leu Arg
 65 70 75 80
 Asp His Leu Gln Phe Gly Glu Pro Ala Val Val Pro His Pro Thr Pro
 85 90 95
 Tyr Arg Gln Val Ser Arg Val Gln Val Lys Ser Asn Pro Glu Arg Leu
 100 105 110
 Arg Arg Arg Leu Met Arg Arg His Asp Leu Ser Glu Glu Glu Ala Arg
 115 120 125
 Lys Arg Ile Pro Asp Thr Val Ala Arg Ala Leu Asp Leu Pro Phe Val
 130 135 140
 Thr Leu Arg Ser Gln Ser Thr Gly Gln His Phe Arg Leu Phe Ile Arg
 145 150 155 160
 His Gly Pro Leu Gln Ala Thr Ala Glu Glu Gly Gly Phe Thr Cys Tyr
 165 170 175 180 185 190 195 200

BERK-118WO SEQLIST.TXT

Gly Leu Ser Lys Gly Gly Phe Val Pro Trp Phe
165 170 175
180 185

<210> 102
<211> 187
<212> PRT
<213> Pseudomonas aeruginosa

<400> 102
Met Asp His Tyr Leu Asp Ile Arg Leu Arg Pro Asp Pro Glu Phe Pro
1 5 10 15
Pro Ala Gln Leu Met Ser Val Leu Phe Gly Lys Leu Ala Gln Ala Leu
20 25 30
Val Ala Gln Gly Gly Asp Arg Ile Gly Val Ser Phe Pro Asp Leu Asp
35 40 45
Glu Cys Arg Ser Arg Leu Gly Glu Arg Leu Arg Ile His Ala Ser Ala
50 55 60
Asp Asp Leu Arg Ala Leu Leu Ala Arg Pro Trp Leu Glu Gly Leu Arg
65 70 75 80
Asp His Leu Gln Phe Gly Glu Pro Ala Val Val Pro His Pro Thr Pro
85 90 95
Tyr Arg Gln Val Ser Arg Val Gln Val Lys Ser Asn Pro Glu Arg Leu
100 105 110
Arg Arg Arg Leu Met Arg Arg His Asp Leu Ser Glu Glu Glu Ala Arg
115 120 125
Lys Arg Ile Pro Asp Thr Val Ala Arg Ala Leu Asp Leu Pro Phe Val
130 135 140
Thr Leu Arg Ser Gln Ser Thr Gly Gln His Phe Arg Leu Phe Ile Arg
145 150 155 160
His Gly Pro Leu Gln Ala Thr Ala Glu Glu Gly Gly Phe Thr Cys Tyr
165 170 175
Gly Leu Ser Lys Gly Gly Phe Val Pro Trp Phe
180 185

<210> 103
<211> 20
<212> RNA
<213> Artificial Sequence

<220>
<223> Synthetic oligonucleotide

<400> 103
guacacugcc guauaggcag

20