

eolf-seq1
SEQUENCE LISTING

<110> GLAXOSMITHKLINE BIOLOGICALS SA

<120> MUTANT STAPHYLOCOCCAL ANTIGENS

<130> VN56501-WO-PCT

<140>

<141>

<150> EP 14192913.3

<151> 2014-11-12

<150> EP 14161861.1

<151> 2014-03-26

<160> 54

<170> PatentIn version 3.5

<210> 1

<211> 97

<212> PRT

<213> Staphylococcus aureus

<400> 1

Met Ala Met Ile Lys Met Ser Pro Glu Glu Ile Arg Ala Lys Ser Gln
1 5 10 15

Ser Tyr Gly Gln Gly Ser Asp Gln Ile Arg Gln Ile Leu Ser Asp Leu
20 25 30

Thr Arg Ala Gln Gly Glu Ile Ala Ala Asn Trp Glu Gly Gln Ala Phe
35 40 45

Ser Arg Phe Glu Glu Gln Phe Gln Gln Leu Ser Pro Lys Val Glu Lys
50 55 60

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

Asp Ala Val Gln Glu Gln Asp Gln Gln Leu Ser Asn Asn Phe Gly Leu

85 eolf-seql 95

Gln

<210> 2
 <211> 104
 <212> PRT
 <213> Staphylococcus aureus

<400> 2
 Met Gly Gly Tyr Lys Gly Ile Lys Ala Asp Gly Gly Lys Val Asp Gln
 1 5 10 15

Ala Lys Gln Leu Ala Ala Lys Thr Ala Lys Asp Ile Glu Ala Cys Gln
 20 25 30

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

Gly Gln Phe Ala Asn Lys Val Lys Asp Val Leu Leu Ile Met Ala Lys
 50 55 60

Phe Gln Glu Glu Leu Val Gln Pro Met Ala Asp His Gln Lys Ala Ile
 65 70 75 80

Asp Asn Leu Ser Gln Asn Leu Ala Lys Tyr Asp Thr Leu Ser Ile Lys
 85 90 95

Gln Gly Leu Asp Arg Val Asn Pro
 100

<210> 3
 <211> 302
 <212> PRT
 <213> Staphylococcus aureus

<400> 3
 Met Lys Lys Leu Leu Leu Pro Leu Ile Ile Met Leu Leu Val Leu Ala

eolf-seql

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

eolf-seql

195

200

205

Gly Leu Lys Met Gln Pro Glu Gln Gln Lys Leu Thr Ala Lys Ala Gly
210 215 220

Trp Ala Glu Val Lys Gln Glu Glu Ile Glu Lys Tyr Ala Gly Asp Tyr
225 230 235 240

Ile Val Ser Thr Ser Glu Gly Lys Pro Thr Pro Gly Tyr Glu Ser Thr
245 250 255

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

Val Asp Ala Gly Thr Tyr Trp Tyr Asn Asp Pro Tyr Thr Leu Asp Phe
275 280 285

Met Arg Lys Asp Leu Lys Glu Lys Leu Ile Lys Ala Ala Lys
290 295 300

<210> 4

<211> 256

<212> PRT

<213> Staphylococcus aureus

<400> 4

Met Met Lys Arg Leu Asn Lys Leu Val Leu Gly Ile Ile Phe Leu Phe
1 5 10 15

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

Val Lys Lys Ser Phe Glu Lys Thr Leu Ser Met Tyr Pro Ile Lys Asn
35 40 45

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

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Lys Asn Asp Lys Gly Thr Trp Ile Ile Asn Ser Glu Met Val Ile Gln
65 70 75 80

Pro Asn Asn Glu Asp Met Val Ala Lys Gly Met Val Leu Tyr Met Asn
85 90 95

Arg Asn Thr Lys Thr Thr Asn Gly Tyr Tyr Tyr Val Asp Val Thr Lys
100 105 110

Asp Glu Asp Glu Gly Lys Pro His Asp Asn Glu Lys Arg Tyr Pro Val
115 120 125

Lys Met Val Asp Asn Lys Ile Ile Pro Thr Lys Glu Ile Lys Asp Glu
130 135 140

Lys Ile Lys Lys Glu Ile Glu Asn Phe Lys Phe Phe Val Gln Tyr Gly
145 150 155 160

Asp Phe Lys Asn Leu Lys Asn Tyr Lys Asp Gly Asp Ile Ser Tyr Asn
165 170 175

Pro Glu Val Pro Ser Tyr Ser Ala Lys Tyr Gln Leu Thr Asn Asp Asp
180 185 190

Tyr Asn Val Lys Gln Leu Arg Lys Arg Tyr Asp Ile Pro Thr Ser Lys
195 200 205

Ala Pro Lys Leu Leu Leu Lys Gly Ser Gly Asn Leu Lys Gly Ser Ser
210 215 220

Val Gly Tyr Lys Asp Ile Glu Phe Thr Phe Val Glu Lys Lys Glu Glu
225 230 235 240

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

eolf-seql

<210> 5

<211> 319

<212> PRT

<213> Staphylococcus aureus

<400> 5

Met	Lys	Thr	Arg	Ile	Val	Ser	Ser	Val	Thr	Thr	Thr	Leu	Leu	Leu	Gly
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Ser	Ile	Leu	Met	Asn	Pro	Val	Ala	Asn	Ala	Ala	Asp	Ser	Asp	Ile	Asn
			20					25					30		

Ile	Lys	Thr	Gly	Thr	Thr	Asp	Ile	Gly	Ser	Asn	Thr	Thr	Val	Lys	Thr
			35				40					45			

Gly	Asp	Leu	Val	Thr	Tyr	Asp	Lys	Glu	Asn	Gly	Met	His	Lys	Lys	Val
	50					55					60				

Phe	Tyr	Ser	Phe	Ile	Asp	Asp	Lys	Asn	His	Asn	Lys	Lys	Leu	Leu	Val
65					70					75					80

Ile	Arg	Thr	Lys	Gly	Thr	Ile	Ala	Gly	Gln	Tyr	Arg	Val	Tyr	Ser	Glu
				85					90					95	

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

Gln	Leu	Gln	Leu	Pro	Asp	Asn	Glu	Val	Ala	Gln	Ile	Ser	Asp	Tyr	Tyr
		115					120					125			

Pro	Arg	Asn	Ser	Ile	Asp	Thr	Lys	Glu	Tyr	Met	Ser	Thr	Leu	Thr	Tyr
		130					135				140				

Gly	Phe	Asn	Gly	Asn	Val	Thr	Gly	Asp	Asp	Thr	Gly	Lys	Ile	Gly	Gly
145					150					155					160

Leu	Ile	Gly	Ala	Asn	Val	Ser	Ile	Gly	His	Thr	Leu	Lys	Tyr	Val	Gln
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

eolf-seql

165

170

175

Pro Asp Phe Lys Thr Ile Leu Glu Ser Pro Thr Asp Lys Lys Val Gly
180 185 190

Trp Lys Val Ile Phe Asn Asn Met Val Asn Gln Asn Trp Gly Pro Tyr
195 200 205

Asp Arg Asp Ser Trp Asn Pro Val Tyr Gly Asn Gln Leu Phe Met Lys
210 215 220

Thr Arg Asn Gly Ser Met Lys Ala Ala Asp Asn Phe Leu Asp Pro Asn
225 230 235 240

Lys Ala Ser Ser Leu Leu Ser Ser Gly Phe Ser Pro Asp Phe Ala Thr
245 250 255

Val Ile Thr Met Asp Arg Lys Ala Ser Lys Gln Gln Thr Asn Ile Asp
260 265 270

Val Ile Tyr Glu Arg Val Arg Asp Asp Tyr Gln Leu His Trp Thr Ser
275 280 285

Thr Asn Trp Lys Gly Thr Asn Thr Lys Asp Lys Trp Ile Asp Arg Ser
290 295 300

Ser Glu Arg Tyr Lys Ile Asp Trp Glu Lys Glu Glu Met Thr Asn
305 310 315

<210> 6

<211> 285

<212> PRT

<213> Staphylococcus aureus

<400> 6

Cys Gly Asn Gln Gly Glu Lys Asn Asn Lys Ala Glu Thr Lys Ser Tyr
1 5 10 15

eolf-seql

Lys Met Asp Asp Gly Lys Thr Val Asp Ile Pro Lys Asp Pro Lys Arg
20 25 30

Ile Ala Val Val Ala Pro Thr Tyr Ala Gly Gly Leu Lys Lys Leu Gly
35 40 45

Ala Asn Ile Val Ala Val Asn Gln Gln Val Asp Gln Ser Lys Val Leu
50 55 60

Lys Asp Lys Phe Lys Gly Val Thr Lys Ile Gly Asp Gly Asp Val Glu
65 70 75 80

Lys Val Ala Lys Glu Lys Pro Asp Leu Ile Ile Val Tyr Ser Thr Asp
85 90 95

Lys Asp Ile Lys Lys Tyr Gln Lys Val Ala Pro Thr Val Val Val Asp
100 105 110

Tyr Asn Lys His Lys Tyr Leu Glu Gln Gln Glu Met Leu Gly Lys Ile
115 120 125

Val Gly Lys Glu Asp Lys Val Lys Ala Trp Lys Lys Asp Trp Glu Glu
130 135 140

Thr Thr Ala Lys Asp Gly Lys Glu Ile Lys Lys Ala Ile Gly Gln Asp
145 150 155 160

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

Gly Asp Asn Trp Gly Arg Gly Gly Glu Val Leu Tyr Gln Ala Phe Gly
180 185 190

Leu Lys Met Gln Pro Glu Gln Gln Lys Leu Thr Ala Lys Ala Gly Trp
195 200 205

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Ala Glu Val Lys Gln Glu Glu Ile Glu Lys Tyr Ala Gly Asp Tyr Ile
210 215 220

Val Ser Thr Ser Glu Gly Lys Pro Thr Pro Gly Tyr Glu Ser Thr Asn
225 230 235 240

Met Trp Lys Asn Leu Lys Ala Thr Lys Glu Gly His Ile Val Lys Val
245 250 255

Asp Ala Gly Thr Tyr Trp Tyr Asn Asp Pro Tyr Thr Leu Asp Phe Met
260 265 270

Arg Lys Asp Leu Lys Glu Lys Leu Ile Lys Ala Ala Lys
275 280 285

<210> 7

<211> 288

<212> PRT

<213> Staphylococcus aureus

<400> 7

Met Ala Ser Cys Gly Asn Gln Gly Glu Lys Asn Asn Lys Ala Glu Thr
1 5 10 15

Lys Ser Tyr Lys Met Asp Asp Gly Lys Thr Val Asp Ile Pro Lys Asp
20 25 30

Pro Lys Arg Ile Ala Val Val Ala Pro Thr Tyr Ala Gly Gly Leu Lys
35 40 45

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

Lys Val Leu Lys Asp Lys Phe Lys Gly Val Thr Lys Ile Gly Asp Gly
65 70 75 80

Asp Val Glu Lys Val Ala Lys Glu Lys Pro Asp Leu Ile Ile Val Tyr

eolf-seql

85

90

95

Ser Thr Asp Lys Asp Ile Lys Lys Tyr Gln Lys Val Ala Pro Thr Val
 100 105 110

Val Val Asp Tyr Asn Lys His Lys Tyr Leu Glu Gln Gln Glu Met Leu
 115 120 125

Gly Lys Ile Val Gly Lys Glu Asp Lys Val Lys Ala Trp Lys Lys Asp
 130 135 140

Trp Glu Glu Thr Thr Ala Lys Asp Gly Lys Glu Ile Lys Lys Ala Ile
 145 150 155 160

Gly Gln Asp Ala Thr Val Ser Leu Phe Asp Glu Phe Asp Lys Lys Leu
 165 170 175

Tyr Thr Tyr Gly Asp Asn Trp Gly Arg Gly Gly Glu Val Leu Tyr Gln
 180 185 190

Ala Phe Gly Leu Lys Met Gln Pro Glu Gln Gln Lys Leu Thr Ala Lys
 195 200 205

Ala Gly Trp Ala Glu Val Lys Gln Glu Glu Ile Glu Lys Tyr Ala Gly
 210 215 220

Asp Tyr Ile Val Ser Thr Ser Glu Gly Lys Pro Thr Pro Gly Tyr Glu
 225 230 235 240

Ser Thr Asn Met Trp Lys Asn Leu Lys Ala Thr Lys Glu Gly His Ile
 245 250 255

Val Lys Val Asp Ala Gly Thr Tyr Trp Tyr Asn Asp Pro Tyr Thr Leu
 260 265 270

Asp Phe Met Arg Lys Asp Leu Lys Glu Lys Leu Ile Lys Ala Ala Lys

eolf-seql

275

280

285

<210> 8

<211> 234

<212> PRT

<213> Staphylococcus aureus

<400> 8

Met Gly Cys Gly Ile Gly Lys Glu Ala Glu Val Lys Lys Ser Phe Glu
1 5 10 15

Lys Thr Leu Ser Met Tyr Pro Ile Lys Asn Leu Glu Asp Leu Tyr Asp
20 25 30

Lys Glu Gly Tyr Arg Asp Asp Gln Phe Asp Lys Asn Asp Lys Gly Thr
35 40 45

Trp Ile Ile Asn Ser Glu Met Val Ile Gln Pro Asn Asn Glu Asp Met
50 55 60

Val Ala Lys Gly Met Val Leu Tyr Met Asn Arg Asn Thr Lys Thr Thr
65 70 75 80

Asn Gly Tyr Tyr Tyr Val Asp Val Thr Lys Asp Glu Asp Glu Gly Lys
85 90 95

Pro His Asp Asn Glu Lys Arg Tyr Pro Val Lys Met Val Asp Asn Lys
100 105 110

Ile Ile Pro Thr Lys Glu Ile Lys Asp Glu Lys Ile Lys Lys Glu Ile
115 120 125

Glu Asn Phe Lys Phe Phe Val Gln Tyr Gly Asp Phe Lys Asn Leu Lys
130 135 140

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

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

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

Lys Gly Ser Gly Asn Leu Lys Gly Ser Ser Val Gly Tyr Lys Asp Ile
195 200 205

Glu Phe Thr Phe Val Glu Lys Lys Glu Glu Asn Ile Tyr Phe Ser Asp
210 215 220

Ser Leu Asp Tyr Lys Lys Ser Gly Asp Val
225 230

<210> 9

<211> 256

<212> PRT

<213> Staphylococcus aureus

<400> 9

Met Met Lys Arg Leu Asn Lys Leu Val Leu Gly Ile Ile Phe Leu Phe
1 5 10 15

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

Val Lys Lys Ser Phe Glu Lys Thr Leu Ser Met Tyr Pro Ile Lys Asn
35 40 45

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

Lys Asn Asp Lys Gly Thr Trp Ile Ile Asn Ser Glu Met Val Ile Gln
65 70 75 80

Pro Asn Asn Glu Asp Met Val Ala Lys Gly Met Val Leu Tyr Met Asn

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85

90

95

Arg Asn Thr Lys Thr Thr Asn Gly Tyr Tyr Tyr Val Asp Val Thr Lys
 100 105 110

Asp Glu Asp Glu Gly Lys Pro His Asp Asn Glu Lys Arg Tyr Pro Val
 115 120 125

Lys Met Val Asp Asn Lys Ile Ile Pro Thr Lys Glu Ile Lys Asp Glu
 130 135 140

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

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

Pro Glu Val Pro Ser Tyr Ser Ala Lys Tyr Gln Leu Thr Asn Asp Asp
 180 185 190

Tyr Asn Val Lys Gln Leu Arg Lys Arg Tyr Asp Ile Pro Thr Ser Lys
 195 200 205

Ala Pro Lys Leu Leu Leu Lys Gly Ser Gly Asn Leu Lys Gly Ser Ser
 210 215 220

Val Gly Tyr Lys Asp Ile Glu Phe Thr Phe Val Glu Lys Lys Glu Glu
 225 230 235 240

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

<210> 10

<211> 256

<212> PRT

<213> Staphylococcus aureus

eolf-seql

<400> 10

Met Met Lys Arg Leu Asn Lys Leu Val Leu Gly Ile Ile Phe Leu Phe
1 5 10 15

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

Val Lys Lys Ser Phe Glu Lys Thr Leu Ser Met Tyr Pro Ile Lys Asn
35 40 45

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

Lys Asn Asp Lys Gly Thr Trp Ile Ile Asn Ser Glu Met Val Ile Gln
65 70 75 80

Pro Asn Asn Glu Asp Met Val Ala Lys Gly Met Val Leu Tyr Met Asn
85 90 95

Arg Asn Thr Lys Thr Thr Asn Gly Tyr Tyr Tyr Val Asp Val Thr Lys
100 105 110

Asp Glu Asp Glu Gly Lys Pro His Asp Asn Glu Lys Arg Tyr Pro Val
115 120 125

Lys Met Val Asp Asn Lys Ile Ile Pro Thr Lys Glu Ile Lys Asp Glu
130 135 140

Lys Val Lys Lys Glu Ile Glu Asn Phe Lys Phe Phe Val Gln Tyr Gly
145 150 155 160

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

Pro Glu Val Pro Ser Tyr Ser Ala Lys Tyr Gln Leu Thr Asn Asp Asp
180 185 190

eolf-seql

Tyr Asn Val Lys Gln Leu Arg Lys Arg Tyr Asp Ile Pro Thr Ser Lys
195 200 205

Ala Pro Lys Leu Leu Leu Lys Gly Ser Gly Asn Leu Lys Gly Ser Ser
210 215 220

Val Gly Tyr Lys Asp Ile Glu Phe Thr Phe Val Glu Lys Lys Glu Glu
225 230 235 240

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

<210> 11

<211> 256

<212> PRT

<213> Staphylococcus aureus

<400> 11

Met Met Lys Arg Leu Asn Lys Leu Val Leu Gly Ile Ile Phe Leu Phe
1 5 10 15

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

Val Lys Lys Ser Phe Glu Lys Thr Leu Ser Met Tyr Pro Ile Lys Asn
35 40 45

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

Lys Asn Asp Lys Gly Thr Trp Ile Ile Asn Ser Glu Met Val Ile Gln
65 70 75 80

Pro Asn Asn Glu Asp Met Val Ala Lys Gly Met Val Leu Tyr Met Asn
85 90 95

Arg Asn Thr Lys Thr Thr Asn Gly Tyr Tyr Tyr Val Asp Val Thr Lys

eolf-seql

100

105

110

Asp Glu Asp Glu Gly Lys Pro His Asp Asn Glu Lys Arg Tyr Pro Val
115 120 125

Lys Met Val Asp Asn Lys Ile Ile Pro Thr Lys Glu Ile Lys Asp Glu
130 135 140

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

Asp Phe Lys Asn Val Lys Asn Tyr Lys Asp Gly Asp Ile Ser Tyr Asn
165 170 175

Pro Glu Val Pro Ser Tyr Ser Ala Lys Tyr Gln Leu Thr Asn Asp Asp
180 185 190

Tyr Asn Val Lys Gln Leu Arg Lys Arg Tyr Asp Ile Pro Thr Ser Lys
195 200 205

Ala Pro Lys Leu Leu Leu Lys Gly Ser Gly Asn Leu Lys Gly Ser Ser
210 215 220

Val Gly Tyr Lys Asp Ile Glu Phe Thr Phe Val Glu Lys Lys Glu Glu
225 230 235 240

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

<210> 12

<211> 293

<212> PRT

<213> Staphylococcus aureus

<400> 12

Ala Asp Ser Asp Ile Asn Ile Lys Thr Gly Thr Thr Asp Ile Gly Ser
1 5 10 15

eolf-seql

Asn Thr Thr Val Lys Thr Gly Asp Leu Val Thr Tyr Asp Lys Glu Asn
20 25 30

Gly Met His Lys Lys Val Phe Tyr Ser Phe Ile Asp Asp Lys Asn His
35 40 45

Asn Lys Lys Leu Leu Val Ile Arg Thr Lys Gly Thr Ile Ala Gly Gln
50 55 60

Tyr Arg Val Tyr Ser Glu Glu Gly Ala Asn Lys Ser Gly Leu Ala Trp
65 70 75 80

Pro Ser Ala Phe Lys Val Gln Leu Gln Leu Pro Asp Asn Glu Val Ala
85 90 95

Gln Ile Ser Asp Tyr Tyr Pro Arg Asn Ser Ile Asp Thr Lys Glu Tyr
100 105 110

Met Ser Thr Leu Thr Tyr Gly Phe Asn Gly Asn Val Thr Gly Asp Asp
115 120 125

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

Thr Leu Lys Tyr Val Gln Pro Asp Phe Lys Thr Ile Leu Glu Ser Pro
145 150 155 160

Thr Asp Lys Lys Val Gly Trp Lys Val Ile Phe Asn Asn Met Val Asn
165 170 175

Gln Asn Trp Gly Pro Tyr Asp Arg Asp Ser Trp Asn Pro Val Tyr Gly
180 185 190

Asn Gln Leu Phe Met Lys Thr Arg Asn Gly Ser Met Lys Ala Ala Asp
195 200 205

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Asn Phe Leu Asp Pro Asn Lys Ala Ser Ser Leu Leu Ser Ser Gly Phe
210 215 220

Ser Pro Asp Phe Ala Thr Val Ile Thr Met Asp Arg Lys Ala Ser Lys
225 230 235 240

Gln Gln Thr Asn Ile Asp Val Ile Tyr Glu Arg Val Arg Asp Asp Tyr
245 250 255

Gln Leu His Trp Thr Ser Thr Asn Trp Lys Gly Thr Asn Thr Lys Asp
260 265 270

Lys Trp Ile Asp Arg Ser Ser Glu Arg Tyr Lys Ile Asp Trp Glu Lys
275 280 285

Glu Glu Met Thr Asn
290

<210> 13

<211> 293

<212> PRT

<213> Staphylococcus aureus

<400> 13

Ala Asp Ser Asp Ile Asn Ile Lys Thr Gly Thr Thr Asp Ile Gly Ser
1 5 10 15

Asn Thr Thr Val Lys Thr Gly Asp Leu Val Thr Tyr Asp Lys Glu Asn
20 25 30

Gly Met Leu Lys Lys Val Phe Tyr Ser Phe Ile Asp Asp Lys Asn His
35 40 45

Asn Lys Lys Leu Leu Val Ile Arg Thr Lys Gly Thr Ile Ala Gly Gln
50 55 60

Tyr Arg Val Tyr Ser Glu Glu Gly Ala Asn Lys Ser Gly Leu Ala Trp

eolf-seql

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

eolf-seql

260

265

270

Lys Trp Ile Asp Arg Ser Ser Glu Arg Tyr Lys Ile Asp Trp Glu Lys
 275 280 285

Glu Glu Met Thr Asn
 290

<210> 14

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<221> source

<223> /note="Description of Artificial Sequence: Synthetic
 replacement tetramer peptide"

<400> 14

Pro Ser Gly Ser

1

<210> 15

<211> 258

<212> PRT

<213> Staphylococcus aureus

<400> 15

Ala Asp Ser Asp Ile Asn Ile Lys Thr Gly Thr Thr Asp Ile Gly Ser
 1 5 10 15

Asn Thr Thr Val Lys Thr Gly Asp Leu Val Thr Tyr Asp Lys Glu Asn
 20 25 30

Gly Met Leu Lys Lys Val Phe Tyr Ser Phe Ile Asp Asp Lys Asn His
 35 40 45

Asn Lys Lys Leu Leu Val Ile Arg Thr Lys Gly Thr Ile Ala Gly Gln
 50 55 60

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Tyr Arg Val Tyr Ser Glu Glu Gly Ala Asn Lys Ser Gly Leu Ala Trp
65 70 75 80

Pro Ser Ala Phe Lys Val Gln Leu Gln Leu Pro Asp Asn Glu Val Ala
85 90 95

Gln Ile Ser Asp Tyr Tyr Pro Arg Asn Ser Ile Asp Thr Pro Ser Gly
100 105 110

Ser Val Gln Pro Asp Phe Lys Thr Ile Leu Glu Ser Pro Thr Asp Lys
115 120 125

Lys Val Gly Trp Lys Val Ile Phe Asn Asn Met Val Asn Gln Asn Trp
130 135 140

Gly Pro Tyr Asp Arg Asp Ser Trp Asn Pro Val Tyr Gly Asn Gln Leu
145 150 155 160

Phe Met Lys Thr Arg Asn Gly Ser Met Lys Ala Ala Asp Asn Phe Leu
165 170 175

Asp Pro Asn Lys Ala Ser Ser Leu Leu Ser Ser Gly Phe Ser Pro Asp
180 185 190

Phe Ala Thr Val Ile Thr Met Asp Arg Lys Ala Ser Lys Gln Gln Thr
195 200 205

Asn Ile Asp Val Ile Tyr Glu Arg Val Arg Asp Asp Tyr Gln Leu His
210 215 220

Trp Thr Ser Thr Asn Trp Lys Gly Thr Asn Thr Lys Asp Lys Trp Ile
225 230 235 240

Asp Arg Ser Ser Glu Arg Tyr Lys Ile Asp Trp Glu Lys Glu Glu Met
245 250 255

eolf-seql

Thr Asn

<210> 16

<211> 258

<212> PRT

<213> Staphylococcus aureus

<400> 16

Ala Asp Ser Asp Ile Asn Ile Lys Thr Gly Thr Thr Asp Ile Gly Ser
1 5 10 15

Asn Thr Thr Val Lys Thr Gly Asp Leu Val Thr Tyr Asp Lys Glu Asn
20 25 30

Gly Met His Lys Lys Val Phe Tyr Ser Phe Ile Asp Asp Lys Asn His
35 40 45

Asn Lys Lys Leu Leu Val Ile Arg Thr Lys Gly Thr Ile Ala Gly Gln
50 55 60

Tyr Arg Val Tyr Ser Glu Glu Gly Ala Asn Lys Ser Gly Leu Ala Trp
65 70 75 80

Pro Ser Ala Phe Lys Val Gln Leu Gln Leu Pro Asp Asn Glu Val Ala
85 90 95

Gln Ile Ser Asp Tyr Tyr Pro Arg Asn Ser Ile Asp Thr Pro Ser Gly
100 105 110

Ser Val Gln Pro Asp Phe Lys Thr Ile Leu Glu Ser Pro Thr Asp Lys
115 120 125

Lys Val Gly Trp Lys Val Ile Phe Asn Asn Met Val Asn Gln Asn Trp
130 135 140

Gly Pro Tyr Asp Arg Asp Ser Trp Asn Pro Val Tyr Gly Asn Gln Leu
145 150 155 160

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Phe Met Lys Thr Arg Asn Gly Ser Met Lys Ala Ala Asp Asn Phe Leu
165 170 175

Asp Pro Asn Lys Ala Ser Ser Leu Leu Ser Ser Gly Phe Ser Pro Asp
180 185 190

Phe Ala Thr Val Ile Thr Met Asp Arg Lys Ala Ser Lys Gln Gln Thr
195 200 205

Asn Ile Asp Val Ile Tyr Glu Arg Val Arg Asp Asp Tyr Gln Leu His
210 215 220

Trp Thr Ser Thr Asn Trp Lys Gly Thr Asn Thr Lys Asp Lys Trp Ile
225 230 235 240

Asp Arg Ser Ser Glu Arg Tyr Lys Ile Asp Trp Glu Lys Glu Glu Met
245 250 255

Thr Asn

<210> 17

<211> 293

<212> PRT

<213> Staphylococcus aureus

<400> 17

Ala Asp Ser Asp Ile Asn Ile Lys Thr Gly Thr Thr Asp Ile Gly Ser
1 5 10 15

Asn Thr Thr Val Lys Thr Gly Asp Leu Val Thr Tyr Asp Lys Glu Asn
20 25 30

Gly Met His Lys Lys Val Phe Tyr Ser Phe Ile Asp Asp Lys Asn His
35 40 45

eolf-seq1

Asn Lys Lys Leu Leu Val Ile Arg Thr Lys Gly Thr Ile Ala Gly Gln
50 55 60

Tyr Arg Val Tyr Ser Glu Glu Gly Ala Asn Lys Ser Gly Leu Ala Trp
65 70 75 80

Pro Ser Ala Phe Lys Val Gln Leu Gln Leu Pro Asp Asn Glu Val Ala
85 90 95

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

Met Ser Thr Leu Thr Tyr Gly Phe Asn Gly Asn Val Thr Gly Asp Asp
115 120 125

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

Thr Leu Lys Tyr Val Gln Pro Asp Phe Lys Thr Ile Leu Glu Ser Pro
145 150 155 160

Thr Asp Lys Lys Val Gly Trp Lys Val Ile Phe Asn Asn Met Val Asn
165 170 175

Gln Asn Trp Gly Pro Tyr Asp Arg Asp Ser Trp Asn Pro Val Tyr Gly
180 185 190

Asn Gln Leu Phe Met Lys Thr Arg Asn Gly Ser Met Lys Ala Ala Asp
195 200 205

Asn Phe Leu Asp Pro Asn Lys Ala Ser Ser Leu Leu Ser Ser Gly Phe
210 215 220

Ser Pro Asp Phe Ala Thr Val Ile Thr Met Asp Arg Lys Ala Ser Lys
225 230 235 240

eolf-seql

Gln Gln Thr Asn Ile Asp Val Ile Tyr Glu Arg Val Arg Asp Asp Tyr
245 250 255

Gln Leu His Trp Thr Ser Thr Asn Trp Lys Gly Thr Asn Thr Lys Asp
260 265 270

Lys Trp Ile Asp Arg Ser Ser Glu Arg Tyr Lys Ile Asp Trp Glu Lys
275 280 285

Glu Glu Met Thr Asn
290

<210> 18

<211> 293

<212> PRT

<213> Staphylococcus aureus

<400> 18

Ala Asp Ser Asp Ile Asn Ile Lys Thr Gly Thr Thr Asp Ile Gly Ser
1 5 10 15

Asn Thr Thr Val Lys Thr Gly Asp Leu Val Thr Tyr Asp Lys Glu Asn
20 25 30

Gly Met His Lys Lys Val Phe Tyr Ser Phe Ile Asp Asp Lys Asn His
35 40 45

Asn Lys Lys Leu Leu Val Ile Arg Thr Lys Gly Thr Ile Ala Gly Gln
50 55 60

Tyr Arg Val Tyr Ser Glu Glu Gly Ala Asn Lys Ser Gly Leu Ala Trp
65 70 75 80

Pro Ser Ala Phe Lys Val Gln Leu Gln Leu Pro Asp Asn Glu Val Ala
85 90 95

Gln Ile Ser Asp Tyr Tyr Pro Arg Asn Ser Ile Asp Thr Lys Glu Tyr
100 105 110

eolf-seql

Met Ser Thr Leu Thr Tyr Gly Phe Asn Gly Asn Val Thr Gly Asp Asp
 115 120 125

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

Thr Leu Lys Tyr Val Gln Pro Leu Phe Lys Thr Ile Leu Glu Ser Pro
 145 150 155 160

Thr Asp Lys Lys Val Gly Trp Lys Val Ile Phe Asn Asn Met Val Asn
 165 170 175

Gln Asn Trp Gly Pro Tyr Asp Arg Asp Ser Trp Asn Pro Val Tyr Gly
 180 185 190

Asn Gln Leu Phe Met Lys Thr Arg Asn Gly Ser Met Lys Ala Ala Asp
 195 200 205

Asn Phe Leu Asp Pro Asn Lys Ala Ser Ser Leu Leu Ser Ser Gly Phe
 210 215 220

Ser Pro Asp Phe Ala Thr Val Ile Thr Met Asp Arg Lys Ala Ser Lys
 225 230 235 240

Gln Gln Thr Asn Ile Asp Val Ile Tyr Glu Arg Val Arg Asp Asp Tyr
 245 250 255

Gln Leu His Trp Thr Ser Thr Asn Trp Lys Gly Thr Asn Thr Lys Asp
 260 265 270

Lys Trp Ile Asp Arg Ser Ser Glu Arg Tyr Lys Ile Asp Trp Glu Lys
 275 280 285

Glu Glu Met Thr Asn
 290

eolf-seql

<210> 19

<211> 293

<212> PRT

<213> Staphylococcus aureus

<400> 19

Ala Asp Ser Asp Ile Asn Ile Lys Thr Gly Thr Thr Asp Ile Gly Ser
1 5 10 15

Asn Thr Thr Val Lys Thr Gly Asp Leu Val Thr Tyr Asp Lys Glu Asn
20 25 30

Gly Met Leu Lys Lys Val Phe Tyr Ser Phe Ile Asp Asp Lys Asn His
35 40 45

Asn Lys Lys Leu Leu Val Ile Arg Thr Lys Gly Thr Ile Ala Gly Gln
50 55 60

Tyr Arg Val Tyr Ser Glu Glu Gly Ala Asn Lys Ser Gly Leu Ala Trp
65 70 75 80

Pro Ser Ala Phe Lys Val Gln Leu Gln Leu Pro Asp Asn Glu Val Ala
85 90 95

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

Met Ser Thr Leu Thr Tyr Gly Phe Asn Gly Asn Val Thr Gly Asp Asp
115 120 125

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

Thr Leu Lys Tyr Val Gln Pro Asp Phe Lys Thr Ile Leu Glu Ser Pro
145 150 155 160

eolf-seql

Thr Asp Lys Lys Val Gly Trp Lys Val Ile Phe Asn Asn Met Val Asn
165 170 175

Gln Asn Trp Gly Pro Tyr Asp Arg Asp Ser Trp Asn Pro Val Tyr Gly
180 185 190

Asn Gln Leu Phe Met Lys Thr Arg Asn Gly Ser Met Lys Ala Ala Asp
195 200 205

Asn Phe Leu Asp Pro Asn Lys Ala Ser Ser Leu Leu Ser Ser Gly Phe
210 215 220

Ser Pro Asp Phe Ala Thr Val Ile Thr Met Asp Arg Lys Ala Ser Lys
225 230 235 240

Gln Gln Thr Asn Ile Asp Val Ile Tyr Glu Arg Val Arg Asp Asp Tyr
245 250 255

Gln Leu His Trp Thr Ser Thr Asn Trp Lys Gly Thr Asn Thr Lys Asp
260 265 270

Lys Trp Ile Asp Arg Ser Ser Glu Arg Tyr Lys Ile Asp Trp Glu Lys
275 280 285

Glu Glu Met Thr Asn
290

<210> 20

<211> 293

<212> PRT

<213> Staphylococcus aureus

<400> 20

Ala Asp Ser Asp Ile Asn Ile Lys Thr Gly Thr Thr Asp Ile Gly Ser
1 5 10 15

Asn Thr Thr Val Lys Thr Gly Asp Leu Val Thr Tyr Asp Lys Glu Asn
20 25 30

eolf-seql

Gly Met Leu Lys Lys Val Phe Tyr Ser Phe Ile Asp Asp Lys Asn His
35 40 45

Asn Lys Lys Leu Leu Val Ile Arg Thr Lys Gly Thr Ile Ala Gly Gln
50 55 60

Tyr Arg Val Tyr Ser Glu Glu Gly Ala Asn Lys Ser Gly Leu Ala Trp
65 70 75 80

Pro Ser Ala Phe Lys Val Gln Leu Gln Leu Pro Asp Asn Glu Val Ala
85 90 95

Gln Ile Ser Asp Tyr Tyr Pro Arg Asn Ser Ile Asp Thr Lys Glu Tyr
100 105 110

Met Ser Thr Leu Thr Tyr Gly Phe Asn Gly Asn Val Thr Gly Asp Asp
115 120 125

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

Thr Leu Lys Tyr Val Gln Pro Leu Phe Lys Thr Ile Leu Glu Ser Pro
145 150 155 160

Thr Asp Lys Lys Val Gly Trp Lys Val Ile Phe Asn Asn Met Val Asn
165 170 175

Gln Asn Trp Gly Pro Tyr Asp Arg Asp Ser Trp Asn Pro Val Tyr Gly
180 185 190

Asn Gln Leu Phe Met Lys Thr Arg Asn Gly Ser Met Lys Ala Ala Asp
195 200 205

Asn Phe Leu Asp Pro Asn Lys Ala Ser Ser Leu Leu Ser Ser Gly Phe
210 215 220

eolf-seql

Ser Pro Asp Phe Ala Thr Val Ile Thr Met Asp Arg Lys Ala Ser Lys
225 230 235 240

Gln Gln Thr Asn Ile Asp Val Ile Tyr Glu Arg Val Arg Asp Asp Tyr
245 250 255

Gln Leu His Trp Thr Ser Thr Asn Trp Lys Gly Thr Asn Thr Lys Asp
260 265 270

Lys Trp Ile Asp Arg Ser Ser Glu Arg Tyr Lys Ile Asp Trp Glu Lys
275 280 285

Glu Glu Met Thr Asn
290

<210> 21
<211> 50
<212> PRT
<213> Staphylococcus aureus

<400> 21
Ala Asp Ser Asp Ile Asn Ile Lys Thr Gly Thr Thr Asp Ile Gly Ser
1 5 10 15

Asn Thr Thr Val Lys Thr Gly Asp Leu Val Thr Tyr Asp Lys Glu Asn
20 25 30

Gly Met His Lys Lys Val Phe Tyr Ser Phe Ile Asp Asp Lys Asn His
35 40 45

Asn Lys
50

<210> 22
<211> 63
<212> PRT
<213> Staphylococcus aureus

eolf-seql

<400> 22

Ala Asp Ser Asp Ile Asn Ile Lys Thr Gly Thr Thr Asp Ile Gly Ser
1 5 10 15

Asn Thr Thr Val Lys Thr Gly Asp Leu Val Thr Tyr Asp Lys Glu Asn
20 25 30

Gly Met His Lys Lys Val Phe Tyr Ser Phe Ile Asp Asp Lys Asn His
35 40 45

Asn Lys Lys Leu Leu Val Ile Arg Thr Lys Gly Thr Ile Ala Gly
50 55 60

<210> 23

<211> 53

<212> PRT

<213> Staphylococcus aureus

<400> 23

Ala Asp Ser Asp Ile Asn Ile Lys Thr Gly Thr Thr Asp Ile Gly Ser
1 5 10 15

Asn Thr Thr Val Lys Thr Gly Asp Leu Val Thr Tyr Asp Lys Glu Asn
20 25 30

Gly Met His Lys Lys Val Phe Tyr Ser Phe Ile Asp Asp Lys Asn His
35 40 45

Asn Lys Lys Leu Leu
50

<210> 24

<211> 50

<212> PRT

<213> Staphylococcus aureus

<400> 24

Ala Asp Ser Asp Ile Asn Ile Lys Thr Gly Thr Thr Asp Ile Gly Ser
1 5 10 15

eolf-seql

Asn Thr Thr Val Lys Thr Gly Asp Leu Val Thr Tyr Asp Lys Glu Asn
20 25 30

Gly Met Leu Lys Lys Val Phe Tyr Ser Phe Ile Asp Asp Lys Asn His
35 40 45

Asn Lys
50

<210> 25

<211> 63

<212> PRT

<213> Staphylococcus aureus

<400> 25

Ala Asp Ser Asp Ile Asn Ile Lys Thr Gly Thr Thr Asp Ile Gly Ser
1 5 10 15

Asn Thr Thr Val Lys Thr Gly Asp Leu Val Thr Tyr Asp Lys Glu Asn
20 25 30

Gly Met Leu Lys Lys Val Phe Tyr Ser Phe Ile Asp Asp Lys Asn His
35 40 45

Asn Lys Lys Leu Leu Val Ile Arg Thr Lys Gly Thr Ile Ala Gly
50 55 60

<210> 26

<211> 53

<212> PRT

<213> Staphylococcus aureus

<400> 26

Ala Asp Ser Asp Ile Asn Ile Lys Thr Gly Thr Thr Asp Ile Gly Ser
1 5 10 15

Asn Thr Thr Val Lys Thr Gly Asp Leu Val Thr Tyr Asp Lys Glu Asn
20 25 30

eolf-seql

Gly Met Leu Lys Lys Val Phe Tyr Ser Phe Ile Asp Asp Lys Asn His
 35 40 45

Asn Lys Lys Leu Leu
 50

<210> 27
 <211> 296
 <212> PRT
 <213> Staphylococcus aureus

<400> 27
 Met Ala Ser Ala Asp Ser Asp Ile Asn Ile Lys Thr Gly Thr Thr Asp
 1 5 10 15

Ile Gly Ser Asn Thr Thr Val Lys Thr Gly Asp Leu Val Thr Tyr Asp
 20 25 30

Lys Glu Asn Gly Met Leu Lys Lys Val Phe Tyr Ser Phe Ile Asp Asp
 35 40 45

Lys Asn His Asn Lys Lys Leu Leu Val Ile Arg Thr Lys Gly Thr Ile
 50 55 60

Ala Gly Gln Tyr Arg Val Tyr Ser Glu Glu Gly Ala Asn Lys Ser Gly
 65 70 75 80

Leu Ala Trp Pro Ser Ala Phe Lys Val Gln Leu Gln Leu Pro Asp Asn
 85 90 95

Glu Val Ala Gln Ile Ser Asp Tyr Tyr Pro Arg Asn Ser Ile Asp Thr
 100 105 110

Lys Glu Tyr Met Ser Thr Leu Thr Tyr Gly Phe Asn Gly Asn Val Thr
 115 120 125

eolf-seq1

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

Ile Gly His Thr Leu Lys Tyr Val Gln Pro Asp Phe Lys Thr Ile Leu
145 150 155 160

Glu Ser Pro Thr Asp Lys Lys Val Gly Trp Lys Val Ile Phe Asn Asn
165 170 175

Met Val Asn Gln Asn Trp Gly Pro Tyr Asp Arg Asp Ser Trp Asn Pro
180 185 190

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

Ala Ala Asp Asn Phe Leu Asp Pro Asn Lys Ala Ser Ser Leu Leu Ser
210 215 220

Ser Gly Phe Ser Pro Asp Phe Ala Thr Val Ile Thr Met Asp Arg Lys
225 230 235 240

Ala Ser Lys Gln Gln Thr Asn Ile Asp Val Ile Tyr Glu Arg Val Arg
245 250 255

Asp Asp Tyr Gln Leu His Trp Thr Ser Thr Asn Trp Lys Gly Thr Asn
260 265 270

Thr Lys Asp Lys Trp Ile Asp Arg Ser Ser Glu Arg Tyr Lys Ile Asp
275 280 285

Trp Glu Lys Glu Glu Met Thr Asn
290 295

<210> 28

<211> 207

<212> PRT

<213> Staphylococcus aureus

eolf-seql

<400> 28

Met Ala Met Ile Lys Met Ser Pro Glu Glu Ile Arg Ala Lys Ser Gln
1 5 10 15

Ser Tyr Gly Gln Gly Ser Asp Gln Ile Arg Gln Ile Leu Ser Asp Leu
20 25 30

Thr Arg Ala Gln Gly Glu Ile Ala Ala Asn Trp Glu Gly Gln Ala Phe
35 40 45

Ser Arg Phe Glu Glu Gln Phe Gln Gln Leu Ser Pro Lys Val Glu Lys
50 55 60

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

Asp Ala Val Gln Glu Gln Asp Gln Gln Leu Ser Asn Asn Phe Gly Leu
85 90 95

Gln Ala Ser Gly Gly Gly Ser Met Gly Gly Tyr Lys Gly Ile Lys Ala
100 105 110

Asp Gly Gly Lys Val Asp Gln Ala Lys Gln Leu Ala Ala Lys Thr Ala
115 120 125

Lys Asp Ile Glu Ala Cys Gln Lys Gln Thr Gln Gln Leu Ala Glu Tyr
130 135 140

Ile Glu Gly Ser Asp Trp Glu Gly Gln Phe Ala Asn Lys Val Lys Asp
145 150 155 160

Val Leu Leu Ile Met Ala Lys Phe Gln Glu Glu Leu Val Gln Pro Met
165 170 175

Ala Asp His Gln Lys Ala Ile Asp Asn Leu Ser Gln Asn Leu Ala Lys
180 185 190

eolf-seql

Tyr Asp Thr Leu Ser Ile Lys Gln Gly Leu Asp Arg Val Asn Pro
 195 200 205

<210> 29

<211> 207

<212> PRT

<213> Staphylococcus aureus

<400> 29

Met Gly Gly Tyr Lys Gly Ile Lys Ala Asp Gly Gly Lys Val Asp Gln
 1 5 10 15

Ala Lys Gln Leu Ala Ala Lys Thr Ala Lys Asp Ile Glu Ala Cys Gln
 20 25 30

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

Gly Gln Phe Ala Asn Lys Val Lys Asp Val Leu Leu Ile Met Ala Lys
 50 55 60

Phe Gln Glu Glu Leu Val Gln Pro Met Ala Asp His Gln Lys Ala Ile
 65 70 75 80

Asp Asn Leu Ser Gln Asn Leu Ala Lys Tyr Asp Thr Leu Ser Ile Lys
 85 90 95

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

Met Ile Lys Met Ser Pro Glu Glu Ile Arg Ala Lys Ser Gln Ser Tyr
 115 120 125

Gly Gln Gly Ser Asp Gln Ile Arg Gln Ile Leu Ser Asp Leu Thr Arg
 130 135 140

eolf-seq1

Ala Gln Gly Glu Ile Ala Ala Asn Trp Glu Gly Gln Ala Phe Ser Arg
145 150 155 160

Phe Glu Glu Gln Phe Gln Gln Leu Ser Pro Lys Val Glu Lys Phe Ala
165 170 175

Gln Leu Leu Glu Glu Ile Lys Gln Gln Leu Asn Ser Thr Ala Asp Ala
180 185 190

Val Gln Glu Gln Asp Gln Gln Leu Ser Asn Asn Phe Gly Leu Gln
195 200 205

<210> 30

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<221> source

<223> /note="Description of Artificial Sequence: Synthetic
linker peptide"

<400> 30

Ala Ser Gly Gly Gly Ser
1 5

<210> 31

<211> 205

<212> PRT

<213> Staphylococcus aureus

<400> 31

Ala Met Ile Lys Met Ser Pro Glu Glu Ile Arg Ala Lys Ser Gln Ser
1 5 10 15

Tyr Gly Gln Gly Ser Asp Gln Ile Arg Gln Ile Leu Ser Asp Leu Thr
20 25 30

Arg Ala Gln Gly Glu Ile Ala Ala Asn Trp Glu Gly Gln Ala Phe Ser
35 40 45

eolf-seql

Arg Phe Glu Glu Gln Phe Gln Gln Leu Ser Pro Lys Val Glu Lys Phe
50 55 60

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

Ala Val Gln Glu Gln Asp Gln Gln Leu Ser Asn Asn Phe Gly Leu Gln
85 90 95

Ala Ser Gly Gly Gly Ser Gly Gly Tyr Lys Gly Ile Lys Ala Asp Gly
100 105 110

Gly Lys Val Asp Gln Ala Lys Gln Leu Ala Ala Lys Thr Ala Lys Asp
115 120 125

Ile Glu Ala Cys Gln Lys Gln Thr Gln Gln Leu Ala Glu Tyr Ile Glu
130 135 140

Gly Ser Asp Trp Glu Gly Gln Phe Ala Asn Lys Val Lys Asp Val Leu
145 150 155 160

Leu Ile Met Ala Lys Phe Gln Glu Glu Leu Val Gln Pro Met Ala Asp
165 170 175

His Gln Lys Ala Ile Asp Asn Leu Ser Gln Asn Leu Ala Lys Tyr Asp
180 185 190

Thr Leu Ser Ile Lys Gln Gly Leu Asp Arg Val Asn Pro
195 200 205

<210> 32

<211> 206

<212> PRT

<213> Staphylococcus aureus

<400> 32

Met Ala Met Ile Lys Met Ser Pro Glu Glu Ile Arg Ala Lys Ser Gln

eolf-seql

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

eolf-seql

195

200

205

<210> 33

<211> 233

<212> PRT

<213> Staphylococcus aureus

<400> 33

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

Thr Leu Ser Met Tyr Pro Ile Lys Asn Leu Glu Asp Leu Tyr Asp Lys
20 25 30

Glu Gly Tyr Arg Asp Asp Gln Phe Asp Lys Asn Asp Lys Gly Thr Trp
35 40 45

Ile Ile Asn Ser Glu Met Val Ile Gln Pro Asn Asn Glu Asp Met Val
50 55 60

Ala Lys Gly Met Val Leu Tyr Met Asn Arg Asn Thr Lys Thr Thr Asn
65 70 75 80

Gly Tyr Tyr Tyr Val Asp Val Thr Lys Asp Glu Asp Glu Gly Lys Pro
85 90 95

His Asp Asn Glu Lys Arg Tyr Pro Val Lys Met Val Asp Asn Lys Ile
100 105 110

Ile Pro Thr Lys Glu Ile Lys Asp Glu Lys Ile Lys Lys Glu Ile Glu
115 120 125

Asn Phe Lys Phe Phe Val Gln Tyr Gly Asp Phe Lys Asn Leu Lys Asn
130 135 140

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

eolf-seql

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

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

Gly Ser Gly Asn Leu Lys Gly Ser Ser Val Gly Tyr Lys Asp Ile Glu
195 200 205

Phe Thr Phe Val Glu Lys Lys Glu Glu Asn Ile Tyr Phe Ser Asp Ser
210 215 220

Leu Asp Tyr Lys Lys Ser Gly Asp Val
225 230

<210> 34

<211> 284

<212> PRT

<213> Staphylococcus aureus

<400> 34

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

Met Asp Asp Gly Lys Thr Val Asp Ile Pro Lys Asp Pro Lys Arg Ile
20 25 30

Ala Val Val Ala Pro Thr Tyr Ala Gly Gly Leu Lys Lys Leu Gly Ala
35 40 45

Asn Ile Val Ala Val Asn Gln Gln Val Asp Gln Ser Lys Val Leu Lys
50 55 60

Asp Lys Phe Lys Gly Val Thr Lys Ile Gly Asp Gly Asp Val Glu Lys
65 70 75 80

Val Ala Lys Glu Lys Pro Asp Leu Ile Ile Val Tyr Ser Thr Asp Lys

eolf-seql

85

90

95

Asp Ile Lys Lys Tyr Gln Lys Val Ala Pro Thr Val Val Val Asp Tyr
 100 105 110

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

Gly Lys Glu Asp Lys Val Lys Ala Trp Lys Lys Asp Trp Glu Glu Thr
 130 135 140

Thr Ala Lys Asp Gly Lys Glu Ile Lys Lys Ala Ile Gly Gln Asp Ala
 145 150 155 160

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

Asp Asn Trp Gly Arg Gly Gly Glu Val Leu Tyr Gln Ala Phe Gly Leu
 180 185 190

Lys Met Gln Pro Glu Gln Gln Lys Leu Thr Ala Lys Ala Gly Trp Ala
 195 200 205

Glu Val Lys Gln Glu Glu Ile Glu Lys Tyr Ala Gly Asp Tyr Ile Val
 210 215 220

Ser Thr Ser Glu Gly Lys Pro Thr Pro Gly Tyr Glu Ser Thr Asn Met
 225 230 235 240

Trp Lys Asn Leu Lys Ala Thr Lys Glu Gly His Ile Val Lys Val Asp
 245 250 255

Ala Gly Thr Tyr Trp Tyr Asn Asp Pro Tyr Thr Leu Asp Phe Met Arg
 260 265 270

Lys Asp Leu Lys Glu Lys Leu Ile Lys Ala Ala Lys

eolf-seql

275

280

<210> 35
 <211> 103
 <212> PRT
 <213> Staphylococcus aureus

<220>
 <221> MOD_RES
 <222> (30)..(30)
 <223> Any amino acid which lacks a free thiol or absent

<400> 35
 Gly Gly Tyr Lys Gly Ile Lys Ala Asp Gly Gly Lys Val Asp Gln Ala
 1 5 10 15

Lys Gln Leu Ala Ala Lys Thr Ala Lys Asp Ile Glu Ala Xaa Gln Lys
 20 25 30

Gln Thr Gln Gln Leu Ala Glu Tyr Ile Glu Gly Ser Asp Trp Glu Gly
 35 40 45

Gln Phe Ala Asn Lys Val Lys Asp Val Leu Leu Ile Met Ala Lys Phe
 50 55 60

Gln Glu Glu Leu Val Gln Pro Met Ala Asp His Gln Lys Ala Ile Asp
 65 70 75 80

Asn Leu Ser Gln Asn Leu Ala Lys Tyr Asp Thr Leu Ser Ile Lys Gln
 85 90 95

Gly Leu Asp Arg Val Asn Pro
 100

<210> 36
 <211> 231
 <212> PRT
 <213> Staphylococcus aureus

eolf-seql

<400> 36

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

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

Tyr Arg Asp Asp Gln Phe Asp Lys Asn Asp Lys Gly Thr Trp Ile Ile
35 40 45

Asn Ser Glu Met Val Ile Gln Pro Asn Asn Glu Asp Met Val Ala Lys
50 55 60

Gly Met Val Leu Tyr Met Asn Arg Asn Thr Lys Thr Thr Asn Gly Tyr
65 70 75 80

Tyr Tyr Val Asp Val Thr Lys Asp Glu Asp Glu Gly Lys Pro His Asp
85 90 95

Asn Glu Lys Arg Tyr Pro Val Lys Met Val Asp Asn Lys Ile Ile Pro
100 105 110

Thr Lys Glu Ile Lys Asp Glu Lys Ile Lys Lys Glu Ile Glu Asn Phe
115 120 125

Lys Phe Phe Val Gln Tyr Gly Asp Phe Lys Asn Leu Lys Asn Tyr Lys
130 135 140

Asp Gly Asp Ile Ser Tyr Asn Pro Glu Val Pro Ser Tyr Ser Ala Lys
145 150 155 160

Tyr Gln Leu Thr Asn Asp Asp Tyr Asn Val Lys Gln Leu Arg Lys Arg
165 170 175

Tyr Asp Ile Pro Thr Ser Lys Ala Pro Lys Leu Leu Leu Lys Gly Ser
180 185 190

eolf-seql

Gly Asn Leu Lys Gly Ser Ser Val Gly Tyr Lys Asp Ile Glu Phe Thr
 195 200 205

Phe Val Glu Lys Lys Glu Glu Asn Ile Tyr Phe Ser Asp Ser Leu Asp
 210 215 220

Tyr Lys Lys Ser Gly Asp Val
 225 230

<210> 37

<211> 287

<212> PRT

<213> Staphylococcus aureus

<400> 37

Met Ala Ser Gly Asn Gln Gly Glu Lys Asn Asn Lys Ala Glu Thr Lys
 1 5 10 15

Ser Tyr Lys Met Asp Asp Gly Lys Thr Val Asp Ile Pro Lys Asp Pro
 20 25 30

Lys Arg Ile Ala Val Val Ala Pro Thr Tyr Ala Gly Gly Leu Lys Lys
 35 40 45

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

Val Leu Lys Asp Lys Phe Lys Gly Val Thr Lys Ile Gly Asp Gly Asp
 65 70 75 80

Val Glu Lys Val Ala Lys Glu Lys Pro Asp Leu Ile Ile Val Tyr Ser
 85 90 95

Thr Asp Lys Asp Ile Lys Lys Tyr Gln Lys Val Ala Pro Thr Val Val
 100 105 110

Val Asp Tyr Asn Lys His Lys Tyr Leu Glu Gln Gln Glu Met Leu Gly

eolf-seql

115

120

125

Lys Ile Val Gly Lys Glu Asp Lys Val Lys Ala Trp Lys Lys Asp Trp
130 135 140

Glu Glu Thr Thr Ala Lys Asp Gly Lys Glu Ile Lys Lys Ala Ile Gly
145 150 155 160

Gln Asp Ala Thr Val Ser Leu Phe Asp Glu Phe Asp Lys Lys Leu Tyr
165 170 175

Thr Tyr Gly Asp Asn Trp Gly Arg Gly Gly Glu Val Leu Tyr Gln Ala
180 185 190

Phe Gly Leu Lys Met Gln Pro Glu Gln Gln Lys Leu Thr Ala Lys Ala
195 200 205

Gly Trp Ala Glu Val Lys Gln Glu Glu Ile Glu Lys Tyr Ala Gly Asp
210 215 220

Tyr Ile Val Ser Thr Ser Glu Gly Lys Pro Thr Pro Gly Tyr Glu Ser
225 230 235 240

Thr Asn Met Trp Lys Asn Leu Lys Ala Thr Lys Glu Gly His Ile Val
245 250 255

Lys Val Asp Ala Gly Thr Tyr Trp Tyr Asn Asp Pro Tyr Thr Leu Asp
260 265 270

Phe Met Arg Lys Asp Leu Lys Glu Lys Leu Ile Lys Ala Ala Lys
275 280 285

<210> 38

<211> 206

<212> PRT

<213> Staphylococcus aureus

eolf-seql

<400> 38

Met Ala Met Ile Lys Met Ser Pro Glu Glu Ile Arg Ala Lys Ser Gln
1 5 10 15

Ser Tyr Gly Gln Gly Ser Asp Gln Ile Arg Gln Ile Leu Ser Asp Leu
20 25 30

Thr Arg Ala Gln Gly Glu Ile Ala Ala Asn Trp Glu Gly Gln Ala Phe
35 40 45

Ser Arg Phe Glu Glu Gln Phe Gln Gln Leu Ser Pro Lys Val Glu Lys
50 55 60

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

Asp Ala Val Gln Glu Gln Asp Gln Gln Leu Ser Asn Asn Phe Gly Leu
85 90 95

Gln Ala Ser Gly Gly Gly Ser Gly Gly Tyr Lys Gly Ile Lys Ala Asp
100 105 110

Gly Gly Lys Val Asp Gln Ala Lys Gln Leu Ala Ala Lys Thr Ala Lys
115 120 125

Asp Ile Glu Ala Ala Gln Lys Gln Thr Gln Gln Leu Ala Glu Tyr Ile
130 135 140

Glu Gly Ser Asp Trp Glu Gly Gln Phe Ala Asn Lys Val Lys Asp Val
145 150 155 160

Leu Leu Ile Met Ala Lys Phe Gln Glu Glu Leu Val Gln Pro Met Ala
165 170 175

Asp His Gln Lys Ala Ile Asp Asn Leu Ser Gln Asn Leu Ala Lys Tyr
180 185 190

eolf-seql

Asp Thr Leu Ser Ile Lys Gln Gly Leu Asp Arg Val Asn Pro
 195 200 205

<210> 39

<211> 234

<212> PRT

<213> Staphylococcus aureus

<400> 39

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

Lys Thr Leu Ser Met Tyr Pro Ile Lys Asn Leu Glu Asp Leu Tyr Asp
 20 25 30

Lys Glu Gly Tyr Arg Asp Asp Gln Phe Asp Lys Asn Asp Lys Gly Thr
 35 40 45

Trp Ile Ile Asn Ser Glu Met Val Ile Gln Pro Asn Asn Glu Asp Met
 50 55 60

Val Ala Lys Gly Met Val Leu Tyr Met Asn Arg Asn Thr Lys Thr Thr
 65 70 75 80

Asn Gly Tyr Tyr Tyr Val Asp Val Thr Lys Asp Glu Asp Glu Gly Lys
 85 90 95

Pro His Asp Asn Glu Lys Arg Tyr Pro Val Lys Met Val Asp Asn Lys
 100 105 110

Ile Ile Pro Thr Lys Glu Ile Lys Asp Glu Lys Ile Lys Lys Glu Ile
 115 120 125

Glu Asn Phe Lys Phe Phe Val Gln Tyr Gly Asp Phe Lys Asn Leu Lys
 130 135 140

Asn Tyr Lys Asp Gly Asp Ile Ser Tyr Asn Pro Glu Val Pro Ser Tyr

eolf-seql

145	150	155	160
Ser Ala Lys Tyr Gln Leu Thr Asn Asp Asp Tyr Asn Val Lys Gln Leu	165	170	175
Arg Lys Arg Tyr Asp Ile Pro Thr Ser Lys Ala Pro Lys Leu Leu Leu	180	185	190
Lys Gly Ser Gly Asn Leu Lys Gly Ser Ser Val Gly Tyr Lys Asp Ile	195	200	205
Glu Phe Thr Phe Val Glu Lys Lys Glu Glu Asn Ile Tyr Phe Ser Asp	210	215	220
Ser Leu Asp Tyr Lys Lys Ser Gly Asp Val	225	230	

<210> 40
 <211> 205
 <212> PRT
 <213> Staphylococcus aureus

<220>
 <221> MOD_RES
 <222> (132)..(132)
 <223> Any amino acid which lacks a free thiol or absent

<400> 40
 Ala Met Ile Lys Met Ser Pro Glu Glu Ile Arg Ala Lys Ser Gln Ser
 1 5 10 15

Tyr Gly Gln Gly Ser Asp Gln Ile Arg Gln Ile Leu Ser Asp Leu Thr
 20 25 30

Arg Ala Gln Gly Glu Ile Ala Ala Asn Trp Glu Gly Gln Ala Phe Ser
 35 40 45

Arg Phe Glu Glu Gln Phe Gln Gln Leu Ser Pro Lys Val Glu Lys Phe

eolf-seq1

50

55

60

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

Ala Val Gln Glu Gln Asp Gln Gln Leu Ser Asn Asn Phe Gly Leu Gln
85 90 95

Ala Ser Gly Gly Gly Ser Gly Gly Tyr Lys Gly Ile Lys Ala Asp Gly
100 105 110

Gly Lys Val Asp Gln Ala Lys Gln Leu Ala Ala Lys Thr Ala Lys Asp
115 120 125

Ile Glu Ala Xaa Gln Lys Gln Thr Gln Gln Leu Ala Glu Tyr Ile Glu
130 135 140

Gly Ser Asp Trp Glu Gly Gln Phe Ala Asn Lys Val Lys Asp Val Leu
145 150 155 160

Leu Ile Met Ala Lys Phe Gln Glu Glu Leu Val Gln Pro Met Ala Asp
165 170 175

His Gln Lys Ala Ile Asp Asn Leu Ser Gln Asn Leu Ala Lys Tyr Asp
180 185 190

Thr Leu Ser Ile Lys Gln Gly Leu Asp Arg Val Asn Pro
195 200 205

<210> 41

<211> 26

<212> DNA

<213> Artificial Sequence

<220>

<221> source

<223> /note="Description of Artificial Sequence: Synthetic immunostimulatory oligonucleotide"

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<222> (1)..(1)
<223> Inosine

<220>
<221> modified_base
<222> (3)..(3)
<223> Inosine

<220>
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<222> (5)..(5)
<223> Inosine

<220>
<221> modified_base
<222> (7)..(7)
<223> Inosine

<220>
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<222> (9)..(9)
<223> Inosine

<220>
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<222> (11)..(11)
<223> Inosine

<220>
<221> modified_base
<222> (13)..(13)
<223> Inosine

<220>
<221> modified_base
<222> (15)..(15)
<223> Inosine

<220>
<221> modified_base
<222> (17)..(17)
<223> Inosine

<220>

eolf-seq1

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<222> (19)..(19)
<223> Inosine

<220>
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<222> (21)..(21)
<223> Inosine

<220>
<221> modified_base
<222> (23)..(23)
<223> Inosine

<220>
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<222> (25)..(25)
<223> Inosine

<400> 41
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26

<210> 42
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
cationic oligopeptide"

<400> 42
Lys Leu Lys Leu Leu Leu Leu Lys Leu Lys
1 5 10

<210> 43
<211> 516
<212> PRT
<213> Staphylococcus aureus

<400> 43
Met Lys Lys Lys Asn Ile Tyr Ser Ile Arg Lys Leu Gly Val Gly Ile
1 5 10 15

eolf-seq1

Ala Ser Val Thr Leu Gly Thr Leu Leu Ile Ser Gly Gly Val Thr Pro
20 25 30

Ala Ala Asn Ala Ala Gln His Asp Glu Ala Gln Gln Asn Ala Phe Tyr
35 40 45

Gln Val Leu Asn Met Pro Asn Leu Asn Ala Asp Gln Arg Asn Gly Phe
50 55 60

Ile Gln Ser Leu Lys Asp Asp Pro Ser Gln Ser Ala Asn Val Leu Gly
65 70 75 80

Glu Ala Gln Lys Leu Asn Asp Ser Gln Ala Pro Lys Ala Asp Ala Gln
85 90 95

Gln Asn Asn Phe Asn Lys Asp Gln Gln Ser Ala Phe Tyr Glu Ile Leu
100 105 110

Asn Met Pro Asn Leu Asn Glu Ala Gln Arg Asn Gly Phe Ile Gln Ser
115 120 125

Leu Lys Asp Asp Pro Ser Gln Ser Thr Asn Val Leu Gly Glu Ala Lys
130 135 140

Lys Leu Asn Glu Ser Gln Ala Pro Lys Ala Asp Asn Asn Phe Asn Lys
145 150 155 160

Glu Gln Gln Asn Ala Phe Tyr Glu Ile Leu Asn Met Pro Asn Leu Asn
165 170 175

Glu Glu Gln Arg Asn Gly Phe Ile Gln Ser Leu Lys Asp Asp Pro Ser
180 185 190

Gln Ser Ala Asn Leu Leu Ser Glu Ala Lys Lys Leu Asn Glu Ser Gln
195 200 205

eolf-seq1

Ala Pro Lys Ala Asp Asn Lys Phe Asn Lys Glu Gln Gln Asn Ala Phe
210 215 220

Tyr Glu Ile Leu His Leu Pro Asn Leu Asn Glu Glu Gln Arg Asn Gly
225 230 235 240

Phe Ile Gln Ser Leu Lys Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu
245 250 255

Ala Glu Ala Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys Ala Asp Asn
260 265 270

Lys Phe Asn Lys Glu Gln Gln Asn Ala Phe Tyr Glu Ile Leu His Leu
275 280 285

Pro Asn Leu Thr Glu Glu Gln Arg Asn Gly Phe Ile Gln Ser Leu Lys
290 295 300

Asp Asp Pro Ser Val Ser Lys Glu Ile Leu Ala Glu Ala Lys Lys Leu
305 310 315 320

Asn Asp Ala Gln Ala Pro Lys Glu Glu Asp Asn Asn Lys Pro Gly Lys
325 330 335

Glu Asp Asn Asn Lys Pro Gly Lys Glu Asp Asn Asn Lys Pro Gly Lys
340 345 350

Glu Asp Asn Asn Lys Pro Gly Lys Glu Asp Asn Asn Lys Pro Gly Lys
355 360 365

Glu Asp Gly Asn Lys Pro Gly Lys Glu Asp Asn Lys Lys Pro Gly Lys
370 375 380

Glu Asp Gly Asn Lys Pro Gly Lys Glu Asp Asn Lys Lys Pro Gly Lys
385 390 395 400

eolf-seql

Glu Asp Gly Asn Lys Pro Gly Lys Glu Asp Gly Asn Lys Pro Gly Lys
405 410 415

Glu Asp Gly Asn Gly Val His Val Val Lys Pro Gly Asp Thr Val Asn
420 425 430

Asp Ile Ala Lys Ala Asn Gly Thr Thr Ala Asp Lys Ile Ala Ala Asp
435 440 445

Asn Lys Leu Ala Asp Lys Asn Met Ile Lys Pro Gly Gln Glu Leu Val
450 455 460

Val Asp Lys Lys Gln Pro Ala Asn His Ala Asp Ala Asn Lys Ala Gln
465 470 475 480

Ala Leu Pro Glu Thr Gly Glu Glu Asn Pro Phe Ile Gly Thr Thr Val
485 490 495

Phe Gly Gly Leu Ser Leu Ala Leu Gly Ala Ala Leu Leu Ala Gly Arg
500 505 510

Arg Arg Glu Leu
515

<210> 44

<211> 291

<212> PRT

<213> Staphylococcus aureus

<220>

<221> MOD_RES

<222> (7)..(8)

<223> Any amino acid except Gln

<220>

<221> MOD_RES

<222> (34)..(35)

<223> Any amino acid except Asp

eolf-seql

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<222> (68)..(69)
<223> Any amino acid except Gln

<220>
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<222> (95)..(96)
<223> Any amino acid except Asp

<220>
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<222> (126)..(127)
<223> Any amino acid except Gln

<220>
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<222> (153)..(154)
<223> Any amino acid except Asp

<220>
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<222> (184)..(185)
<223> Any amino acid except Gln

<220>
<221> MOD_RES
<222> (211)..(212)
<223> Any amino acid except Asp

<220>
<221> MOD_RES
<222> (242)..(243)
<223> Any amino acid except Gln

<220>
<221> MOD_RES
<222> (269)..(270)
<223> Any amino acid except Asp

<400> 44
Ala Gln His Asp Glu Ala Xaa Xaa Asn Ala Phe Tyr Gln Val Leu Asn
1 5 10 15

Met Pro Asn Leu Asn Ala Asp Gln Arg Asn Gly Phe Ile Gln Ser Leu
20 25 30

eolf-seql

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

Leu Asn Asp Ser Gln Ala Pro Lys Ala Asp Ala Gln Gln Asn Asn Phe
50 55 60

Asn Lys Asp Xaa Xaa Ser Ala Phe Tyr Glu Ile Leu Asn Met Pro Asn
65 70 75 80

Leu Asn Glu Ala Gln Arg Asn Gly Phe Ile Gln Ser Leu Lys Xaa Xaa
85 90 95

Pro Ser Gln Ser Thr Asn Val Leu Gly Glu Ala Lys Lys Leu Asn Glu
100 105 110

Ser Gln Ala Pro Lys Ala Asp Asn Asn Phe Asn Lys Glu Xaa Xaa Asn
115 120 125

Ala Phe Tyr Glu Ile Leu Asn Met Pro Asn Leu Asn Glu Glu Gln Arg
130 135 140

Asn Gly Phe Ile Gln Ser Leu Lys Xaa Xaa Pro Ser Gln Ser Ala Asn
145 150 155 160

Leu Leu Ser Glu Ala Lys Lys Leu Asn Glu Ser Gln Ala Pro Lys Ala
165 170 175

Asp Asn Lys Phe Asn Lys Glu Xaa Xaa Asn Ala Phe Tyr Glu Ile Leu
180 185 190

His Leu Pro Asn Leu Asn Glu Glu Gln Arg Asn Gly Phe Ile Gln Ser
195 200 205

Leu Lys Xaa Xaa Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala Lys
210 215 220

eolf-seql

Lys Leu Asn Asp Ala Gln Ala Pro Lys Ala Asp Asn Lys Phe Asn Lys
225 230 235 240

Glu Xaa Xaa Asn Ala Phe Tyr Glu Ile Leu His Leu Pro Asn Leu Thr
245 250 255

Glu Glu Gln Arg Asn Gly Phe Ile Gln Ser Leu Lys Xaa Xaa Pro Ser
260 265 270

Val Ser Lys Glu Ile Leu Ala Glu Ala Lys Lys Leu Asn Asp Ala Gln
275 280 285

Ala Pro Lys
290

<210> 45

<211> 291

<212> PRT

<213> Staphylococcus aureus

<400> 45

Ala Gln His Asp Glu Ala Lys Lys Asn Ala Phe Tyr Gln Val Leu Asn
1 5 10 15

Met Pro Asn Leu Asn Ala Asp Gln Arg Asn Gly Phe Ile Gln Ser Leu
20 25 30

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

Leu Asn Asp Ser Gln Ala Pro Lys Ala Asp Ala Gln Gln Asn Asn Phe
50 55 60

Asn Lys Asp Lys Lys Ser Ala Phe Tyr Glu Ile Leu Asn Met Pro Asn
65 70 75 80

Leu Asn Glu Ala Gln Arg Asn Gly Phe Ile Gln Ser Leu Lys Ala Ala

eolf-seql

85

90

95

Pro Ser Gln Ser Thr Asn Val Leu Gly Glu Ala Lys Lys Leu Asn Glu
 100 105 110

Ser Gln Ala Pro Lys Ala Asp Asn Asn Phe Asn Lys Glu Lys Lys Asn
 115 120 125

Ala Phe Tyr Glu Ile Leu Asn Met Pro Asn Leu Asn Glu Glu Gln Arg
 130 135 140

Asn Gly Phe Ile Gln Ser Leu Lys Ala Ala Pro Ser Gln Ser Ala Asn
 145 150 155 160

Leu Leu Ser Glu Ala Lys Lys Leu Asn Glu Ser Gln Ala Pro Lys Ala
 165 170 175

Asp Asn Lys Phe Asn Lys Glu Lys Lys Asn Ala Phe Tyr Glu Ile Leu
 180 185 190

His Leu Pro Asn Leu Asn Glu Glu Gln Arg Asn Gly Phe Ile Gln Ser
 195 200 205

Leu Lys Ala Ala Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala Lys
 210 215 220

Lys Leu Asn Asp Ala Gln Ala Pro Lys Ala Asp Asn Lys Phe Asn Lys
 225 230 235 240

Glu Lys Lys Asn Ala Phe Tyr Glu Ile Leu His Leu Pro Asn Leu Thr
 245 250 255

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

Val Ser Lys Glu Ile Leu Ala Glu Ala Lys Lys Leu Asn Asp Ala Gln

eolf-seql

275

280

285

Ala Pro Lys
290

<210> 46

<211> 291

<212> PRT

<213> Staphylococcus aureus

<220>

<221> MOD_RES

<222> (60)..(61)

<223> Any amino acid except Gln

<400> 46

Ala	Gln	His	Asp	Glu	Ala	Lys	Lys	Asn	Ala	Phe	Tyr	Gln	Val	Leu	Asn
1				5				10						15	

Met	Pro	Asn	Leu	Asn	Ala	Asp	Gln	Arg	Asn	Gly	Phe	Ile	Gln	Ser	Leu
			20					25					30		

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

Leu	Asn	Asp	Ser	Gln	Ala	Pro	Lys	Ala	Asp	Ala	Xaa	Xaa	Asn	Asn	Phe
	50					55					60				

Asn	Lys	Asp	Lys	Lys	Ser	Ala	Phe	Tyr	Glu	Ile	Leu	Asn	Met	Pro	Asn
65					70				75						80

Leu	Asn	Glu	Ala	Gln	Arg	Asn	Gly	Phe	Ile	Gln	Ser	Leu	Lys	Ala	Ala
				85					90					95	

Pro	Ser	Gln	Ser	Thr	Asn	Val	Leu	Gly	Glu	Ala	Lys	Lys	Leu	Asn	Glu
			100					105					110		

Ser	Gln	Ala	Pro	Lys	Ala	Asp	Asn	Asn	Phe	Asn	Lys	Glu	Lys	Lys	Asn
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

eolf-seql

115

120

125

Ala Phe Tyr Glu Ile Leu Asn Met Pro Asn Leu Asn Glu Glu Gln Arg
 130 135 140

Asn Gly Phe Ile Gln Ser Leu Lys Ala Ala Pro Ser Gln Ser Ala Asn
 145 150 155 160

Leu Leu Ser Glu Ala Lys Lys Leu Asn Glu Ser Gln Ala Pro Lys Ala
 165 170 175

Asp Asn Lys Phe Asn Lys Glu Lys Lys Asn Ala Phe Tyr Glu Ile Leu
 180 185 190

His Leu Pro Asn Leu Asn Glu Glu Gln Arg Asn Gly Phe Ile Gln Ser
 195 200 205

Leu Lys Ala Ala Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala Lys
 210 215 220

Lys Leu Asn Asp Ala Gln Ala Pro Lys Ala Asp Asn Lys Phe Asn Lys
 225 230 235 240

Glu Lys Lys Asn Ala Phe Tyr Glu Ile Leu His Leu Pro Asn Leu Thr
 245 250 255

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

Val Ser Lys Glu Ile Leu Ala Glu Ala Lys Lys Leu Asn Asp Ala Gln
 275 280 285

Ala Pro Lys
 290

<210> 47

eolf-seql

<211> 291

<212> PRT

<213> Staphylococcus aureus

<400> 47

Ala Gln His Asp Glu Ala Lys Lys Asn Ala Phe Tyr Gln Val Leu Asn
1 5 10 15

Met Pro Asn Leu Asn Ala Asp Gln Arg Asn Gly Phe Ile Gln Ser Leu
20 25 30

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

Leu Asn Asp Ser Gln Ala Pro Lys Ala Asp Ala Lys Arg Asn Asn Phe
50 55 60

Asn Lys Asp Lys Lys Ser Ala Phe Tyr Glu Ile Leu Asn Met Pro Asn
65 70 75 80

Leu Asn Glu Ala Gln Arg Asn Gly Phe Ile Gln Ser Leu Lys Ala Ala
85 90 95

Pro Ser Gln Ser Thr Asn Val Leu Gly Glu Ala Lys Lys Leu Asn Glu
100 105 110

Ser Gln Ala Pro Lys Ala Asp Asn Asn Phe Asn Lys Glu Lys Lys Asn
115 120 125

Ala Phe Tyr Glu Ile Leu Asn Met Pro Asn Leu Asn Glu Glu Gln Arg
130 135 140

Asn Gly Phe Ile Gln Ser Leu Lys Ala Ala Pro Ser Gln Ser Ala Asn
145 150 155 160

Leu Leu Ser Glu Ala Lys Lys Leu Asn Glu Ser Gln Ala Pro Lys Ala
165 170 175

eolf-seql

Asp Asn Lys Phe Asn Lys Glu Lys Lys Asn Ala Phe Tyr Glu Ile Leu
180 185 190

His Leu Pro Asn Leu Asn Glu Glu Gln Arg Asn Gly Phe Ile Gln Ser
195 200 205

Leu Lys Ala Ala Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala Lys
210 215 220

Lys Leu Asn Asp Ala Gln Ala Pro Lys Ala Asp Asn Lys Phe Asn Lys
225 230 235 240

Glu Lys Lys Asn Ala Phe Tyr Glu Ile Leu His Leu Pro Asn Leu Thr
245 250 255

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

Val Ser Lys Glu Ile Leu Ala Glu Ala Lys Lys Leu Asn Asp Ala Gln
275 280 285

Ala Pro Lys
290

<210> 48

<211> 292

<212> PRT

<213> Staphylococcus aureus

<400> 48

Met Ala Gln His Asp Glu Ala Lys Lys Asn Ala Phe Tyr Gln Val Leu
1 5 10 15

Asn Met Pro Asn Leu Asn Ala Asp Gln Arg Asn Gly Phe Ile Gln Ser
20 25 30

Leu Lys Ala Ala Pro Ser Gln Ser Ala Asn Val Leu Gly Glu Ala Gln

eolf-seql

35

40

45

Lys Leu Asn Asp Ser Gln Ala Pro Lys Ala Asp Ala Lys Arg Asn Asn
 50 55 60

Phe Asn Lys Asp Lys Lys Ser Ala Phe Tyr Glu Ile Leu Asn Met Pro
 65 70 75 80

Asn Leu Asn Glu Ala Gln Arg Asn Gly Phe Ile Gln Ser Leu Lys Ala
 85 90 95

Ala Pro Ser Gln Ser Thr Asn Val Leu Gly Glu Ala Lys Lys Leu Asn
 100 105 110

Glu Ser Gln Ala Pro Lys Ala Asp Asn Asn Phe Asn Lys Glu Lys Lys
 115 120 125

Asn Ala Phe Tyr Glu Ile Leu Asn Met Pro Asn Leu Asn Glu Glu Gln
 130 135 140

Arg Asn Gly Phe Ile Gln Ser Leu Lys Ala Ala Pro Ser Gln Ser Ala
 145 150 155 160

Asn Leu Leu Ser Glu Ala Lys Lys Leu Asn Glu Ser Gln Ala Pro Lys
 165 170 175

Ala Asp Asn Lys Phe Asn Lys Glu Lys Lys Asn Ala Phe Tyr Glu Ile
 180 185 190

Leu His Leu Pro Asn Leu Asn Glu Glu Gln Arg Asn Gly Phe Ile Gln
 195 200 205

Ser Leu Lys Ala Ala Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala
 210 215 220

Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys Ala Asp Asn Lys Phe Asn

eolf-seql																
225				230				235				240				
Lys	Glu	Lys	Lys	Asn	Ala	Phe	Tyr	Glu	Ile	Leu	His	Leu	Pro	Asn	Leu	
				245					250					255		
Thr	Glu	Glu	Gln	Arg	Asn	Gly	Phe	Ile	Gln	Ser	Leu	Lys	Ala	Ala	Pro	
				260					265					270		
Ser	Val	Ser	Lys	Glu	Ile	Leu	Ala	Glu	Ala	Lys	Lys	Leu	Asn	Asp	Ala	
				275					280					285		
Gln	Ala	Pro	Lys													
				290												

eolf-seql

<223> Any amino acid except Asp

<220>

<221> MOD_RES

<222> (126)..(127)

<223> Any amino acid except Gln

<220>

<221> MOD_RES

<222> (153)..(154)

<223> Any amino acid except Asp

<220>

<221> MOD_RES

<222> (184)..(185)

<223> Any amino acid except Gln

<220>

<221> MOD_RES

<222> (211)..(212)

<223> Any amino acid except Asp

<220>

<221> MOD_RES

<222> (242)..(243)

<223> Any amino acid except Gln

<220>

<221> MOD_RES

<222> (269)..(270)

<223> Any amino acid except Asp

<400> 49

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Met	Pro	Asn	Leu	Asn	Ala	Asp	Gln	Arg	Asn	Gly	Phe	Ile	Gln	Ser	Leu
			20					25					30		

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

Leu	Asn	Asp	Ser	Gln	Ala	Pro	Lys	Ala	Asp	Ala	Xaa	Xaa	Asn	Asn	Phe
	50					55					60				

eolf-seql

Asn Lys Asp Xaa Xaa Ser Ala Phe Tyr Glu Ile Leu Asn Met Pro Asn
65 70 75 80

Leu Asn Glu Ala Gln Arg Asn Gly Phe Ile Gln Ser Leu Lys Xaa Xaa
85 90 95

Pro Ser Gln Ser Thr Asn Val Leu Gly Glu Ala Lys Lys Leu Asn Glu
100 105 110

Ser Gln Ala Pro Lys Ala Asp Asn Asn Phe Asn Lys Glu Xaa Xaa Asn
115 120 125

Ala Phe Tyr Glu Ile Leu Asn Met Pro Asn Leu Asn Glu Glu Gln Arg
130 135 140

Asn Gly Phe Ile Gln Ser Leu Lys Xaa Xaa Pro Ser Gln Ser Ala Asn
145 150 155 160

Leu Leu Ser Glu Ala Lys Lys Leu Asn Glu Ser Gln Ala Pro Lys Ala
165 170 175

Asp Asn Lys Phe Asn Lys Glu Xaa Xaa Asn Ala Phe Tyr Glu Ile Leu
180 185 190

His Leu Pro Asn Leu Asn Glu Glu Gln Arg Asn Gly Phe Ile Gln Ser
195 200 205

Leu Lys Xaa Xaa Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala Lys
210 215 220

Lys Leu Asn Asp Ala Gln Ala Pro Lys Ala Asp Asn Lys Phe Asn Lys
225 230 235 240

Glu Xaa Xaa Asn Ala Phe Tyr Glu Ile Leu His Leu Pro Asn Leu Thr
245 250 255

eolf-seql

Glu Glu Gln Arg Asn Gly Phe Ile Gln Ser Leu Lys Xaa Xaa Pro Ser
 260 265 270

Val Ser Lys Glu Ile Leu Ala Glu Ala Lys Lys Leu Asn Asp Ala Gln
 275 280 285

Ala Pro Lys
 290

<210> 50
 <211> 67
 <212> PRT
 <213> Staphylococcus aureus

<220>
 <221> MOD_RES
 <222> (7)..(8)
 <223> Any amino acid except Gln

<220>
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 <222> (34)..(35)
 <223> Any amino acid except Asp

<220>
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 <222> (60)..(61)
 <223> Any amino acid except Gln

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

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

Leu Asn Asp Ser Gln Ala Pro Lys Ala Asp Ala Xaa Xaa Asn Asn Phe

eolf-seq1

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55

60

Asn Lys Asp
65

<210> 51
<211> 67
<212> PRT
<213> Staphylococcus aureus

<220>
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<222> (7)..(8)
<223> Any amino acid except Gln

<220>
<221> MOD_RES
<222> (34)..(35)
<223> Any amino acid except Asp

<400> 51
Ala Gln His Asp Glu Ala Xaa Xaa Asn Ala Phe Tyr Gln Val Leu Asn
1 5 10 15

Met Pro Asn Leu Asn Ala Asp Gln Arg Asn Gly Phe Ile Gln Ser Leu
20 25 30

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

Leu Asn Asp Ser Gln Ala Pro Lys Ala Asp Ala Lys Arg Asn Asn Phe
50 55 60

Asn Lys Asp
65

<210> 52
<211> 67
<212> PRT
<213> Staphylococcus aureus

eolf-seql

<400> 52

Ala Gln His Asp Glu Ala Lys Lys Asn Ala Phe Tyr Gln Val Leu Asn
1 5 10 15

Met Pro Asn Leu Asn Ala Asp Gln Arg Asn Gly Phe Ile Gln Ser Leu
20 25 30

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

Leu Asn Asp Ser Gln Ala Pro Lys Ala Asp Ala Lys Arg Asn Asn Phe
50 55 60

Asn Lys Asp
65

<210> 53

<211> 68

<212> PRT

<213> Staphylococcus aureus

<400> 53

Met Ala Gln His Asp Glu Ala Lys Lys Asn Ala Phe Tyr Gln Val Leu
1 5 10 15

Asn Met Pro Asn Leu Asn Ala Asp Gln Arg Asn Gly Phe Ile Gln Ser
20 25 30

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

Lys Leu Asn Asp Ser Gln Ala Pro Lys Ala Asp Ala Lys Arg Asn Asn
50 55 60

Phe Asn Lys Asp
65

eolf-seql

<210> 54

<211> 67

<212> PRT

<213> Staphylococcus aureus

<400> 54

Ala	Gln	His	Asp	Glu	Ala	Gln	Gln	Asn	Ala	Phe	Tyr	Gln	Val	Leu	Asn
1				5				10						15	

Met	Pro	Asn	Leu	Asn	Ala	Asp	Gln	Arg	Asn	Gly	Phe	Ile	Gln	Ser	Leu
			20					25					30		

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

Leu	Asn	Asp	Ser	Gln	Ala	Pro	Lys	Ala	Asp	Ala	Gln	Gln	Asn	Asn	Phe
	50					55					60				

Asn	Lys	Asp
65		