

eolf-seql
SEQUENCE LISTING

<110> HANSA MEDICAL AB

<120> CYSTEINE PROTEASE

<130> N404707W0

<160> 37

<170> PatentIn version 3.5

<210> 1

<211> 339

<212> PRT

<213> Streptococcus pyogenes

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

Thr Ser Val Trp Thr Lys Gly Val Thr Pro Pro Ala Asn Phe Thr Gln
50 55 60

Gly Glu Asp Val Phe His Ala Pro Tyr Val Ala Asn Gln Gly Trp Tyr
65 70 75 80

Asp Ile Thr Lys Thr Phe Asn Gly Lys Asp Asp Leu Leu Cys Gly Ala
85 90 95

Ala Thr Ala Gly Asn Met Leu His Trp Trp Phe Asp Gln Asn Lys Asp
100 105 110

Gln Ile Lys Arg Tyr Leu Glu Glu His Pro Glu Lys Gln Lys Ile Asn

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115

120

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Phe Asn Gly Glu Gln Met Phe Asp Val Lys Glu Ala Ile Asp Thr Lys
130 135 140

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

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

Ile Asp Met Phe Ile Asn Gly Tyr Arg Leu Ser Leu Thr Asn His Gly
180 185 190

Pro Thr Pro Val Lys Glu Gly Ser Lys Asp Pro Arg Gly Gly Ile Phe
195 200 205

Asp Ala Val Phe Thr Arg Gly Asp Gln Ser Lys Leu Leu Thr Ser Arg
210 215 220

His Asp Phe Lys Glu Lys Asn Leu Lys Glu Ile Ser Asp Leu Ile Lys
225 230 235 240

Lys Glu Leu Thr Glu Gly Lys Ala Leu Gly Leu Ser His Thr Tyr Ala
245 250 255

Asn Val Arg Ile Asn His Val Ile Asn Leu Trp Gly Ala Asp Phe Asp
260 265 270

Ser Asn Gly Asn Leu Lys Ala Ile Tyr Val Thr Asp Ser Asp Ser Asn
275 280 285

Ala Ser Ile Gly Met Lys Lys Tyr Phe Val Gly Val Asn Ser Ala Gly
290 295 300

Lys Val Ala Ile Ser Ala Lys Glu Ile Lys Glu Asp Asn Ile Gly Ala

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305 310 315 320

Gln Val Leu Gly Leu Phe Thr Leu Ser Thr Gly Gln Asp Ser Trp Asn
325 330 335

Gln Thr Asn

$\langle 210 \rangle$	2
$\langle 211 \rangle$	310
$\langle 212 \rangle$	PRT
$\langle 213 \rangle$	Streptococcus pyogenes

 $\langle 400 \rangle$ 2

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

Tyr His Val Thr Ser Val Trp Thr Lys Gly Val Thr Pro Pro Ala Asn
20 25 30

Phe Thr Gln Gly Glu Asp Val Phe His Ala Pro Tyr Val Ala Asn Gln
35 40 45

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

Cys Gly Ala Ala Thr Ala Gly Asn Met Leu His Trp Trp Phe Asp Gln
65 70 75 80

Asn Lys Asp Gln Ile Lys Arg Tyr Leu Glu Glu His Pro Glu Lys Gln
85 90 95

Lys Ile Asn Phe Asn Gly Glu Gln Met Phe Asp Val Lys Glu Ala Ile
100 105 110

Asp Thr Lys Asn His Gln Leu Asp Ser Lys Leu Phe Glu Tyr Phe Lys
115 120 125

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Glu Lys Ala Phe Pro Tyr Leu Ser Thr Lys His Leu Gly Val Phe Pro
130 135 140

Asp His Val Ile Asp Met Phe Ile Asn Gly Tyr Arg Leu Ser Leu Thr
145 150 155 160

Asn His Gly Pro Thr Pro Val Lys Glu Gly Ser Lys Asp Pro Arg Gly
165 170 175

Gly Ile Phe Asp Ala Val Phe Thr Arg Gly Asp Gln Ser Lys Leu Leu
180 185 190

Thr Ser Arg His Asp Phe Lys Glu Lys Asn Leu Lys Glu Ile Ser Asp
195 200 205

Leu Ile Lys Lys Glu Leu Thr Glu Gly Lys Ala Leu Gly Leu Ser His
210 215 220

Thr Tyr Ala Asn Val Arg Ile Asn His Val Ile Asn Leu Trp Gly Ala
225 230 235 240

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

Asp Ser Asn Ala Ser Ile Gly Met Lys Lys Tyr Phe Val Gly Val Asn
260 265 270

Ser Ala Gly Lys Val Ala Ile Ser Ala Lys Glu Ile Lys Glu Asp Asn
275 280 285

Ile Gly Ala Gln Val Leu Gly Leu Phe Thr Leu Ser Thr Gly Gln Asp
290 295 300

Ser Trp Asn Gln Thr Asn
305 310

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<213> Streptococcus pyogenes

<400> 3

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Tyr His Val Thr Ser Val Trp Thr Lys Gly Val Thr Pro Pro Ala Asn
20 25 30

Phe Thr Gln Gly Glu Asp Val Phe His Ala Pro Tyr Val Ala Asn Gln
35 40 45

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

Cys Gly Ala Ala Thr Ala Gly Asn Met Leu His Trp Trp Phe Asp Gln
65 70 75 80

Asn Lys Asp Gln Ile Lys Arg Tyr Leu Glu Glu His Pro Glu Lys Gln
85 90 95

Lys Ile Asn Phe Arg Gly Glu Gln Met Phe Asp Val Lys Glu Ala Ile
100 105 110

Asp Thr Lys Asn His Gln Leu Asp Ser Lys Leu Phe Glu Tyr Phe Lys
115 120 125

Glu Lys Ala Phe Pro Tyr Leu Ser Thr Lys His Leu Gly Val Phe Pro
130 135 140

Asp His Val Ile Asp Met Phe Ile Asn Gly Tyr Arg Leu Ser Leu Thr
145 150 155 160

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Asn His Gly Pro Thr Pro Val Lys Glu Gly Ser Lys Asp Pro Arg Gly
165 170 175

Gly Ile Phe Asp Ala Val Phe Thr Arg Gly Asp Gln Ser Lys Leu Leu
180 185 190

Thr Ser Arg His Asp Phe Lys Glu Lys Asn Leu Lys Glu Ile Ser Asp
195 200 205

Leu Ile Lys Lys Glu Leu Thr Glu Gly Lys Ala Leu Gly Leu Ser His
210 215 220

Thr Tyr Ala Asn Val Arg Ile Asn His Val Ile Asn Leu Trp Gly Ala
225 230 235 240

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

Asp Ser Asn Ala Ser Ile Gly Met Lys Lys Tyr Phe Val Gly Val Asn
260 265 270

Ser Ala Gly Lys Val Ala Ile Ser Ala Lys Glu Ile Lys Glu Asp Asn
275 280 285

Ile Gly Ala Gln Val Leu Gly Leu Phe Thr Leu Ser Thr Gly Gln Asp
290 295 300

Ser Trp Asn Gln Thr Asn
305 310

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<213> Streptococcus pyogenes
<400> 4

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Asp Ser Phe Ser Ala Asn Gln Glu Ile Arg Tyr Ser Glu Val Thr Pro
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Tyr His Val Thr Ser Val Trp Thr Lys Gly Val Thr Pro Pro Ala Asn
20 25 30

Phe Thr Gln Gly Glu Asp Val Phe His Ala Pro Tyr Val Ala Asn Gln
35 40 45

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

Cys Gly Ala Ala Thr Ala Gly Asn Met Leu His Trp Trp Phe Asp Gln
65 70 75 80

Asn Lys Asp Gln Ile Lys Arg Tyr Leu Glu Glu His Pro Glu Lys Gln
85 90 95

Lys Ile Asn Phe Lys Gly Glu Gln Met Phe Asp Val Lys Glu Ala Ile
100 105 110

Asp Thr Lys Asn His Gln Leu Asp Ser Lys Leu Phe Glu Tyr Phe Lys
115 120 125

Glu Lys Ala Phe Pro Tyr Leu Ser Thr Lys His Leu Gly Val Phe Pro
130 135 140

Asp His Val Ile Asp Met Phe Ile Asn Gly Tyr Arg Leu Ser Leu Thr
145 150 155 160

Asn His Gly Pro Thr Pro Val Lys Arg Gly Ser Lys Asp Pro Arg Gly
165 170 175

Gly Ile Phe Asp Ala Val Phe Thr Arg Gly Asn Gln Ser Lys Leu Leu
180 185 190

eolf-seq1

Thr Ser Arg His Asp Phe Lys Glu Lys Asn Leu Lys Glu Ile Ser Asp
195 200 205

Leu Ile Lys Lys Glu Leu Thr Glu Gly Lys Ala Leu Gly Leu Ser His
210 215 220

Thr Tyr Ala Asn Val Arg Ile Asn His Val Ile Asn Leu Trp Gly Ala
225 230 235 240

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

Asp Ser Asn Ala Ser Ile Gly Met Lys Lys Tyr Phe Val Gly Val Asn
260 265 270

Ser Ala Gly Lys Val Ala Ile Ser Ala Lys Glu Ile Lys Glu Asp Asn
275 280 285

Ile Gly Ala Gln Val Leu Gly Leu Phe Thr Leu Ser Thr Gly Gln Asp
290 295 300

Ser Trp Asn Gln Thr Asn
305 310

<210> 5
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<213> Streptococcus pyogenes

<400> 5

Asp Ser Phe Ser Ala Asn Gln Glu Ile Arg Tyr Ser Glu Val Thr Pro
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Tyr His Val Thr Ser Val Trp Thr Lys Gly Val Thr Pro Pro Ala Asn
20 25 30

Phe Thr Gln Gly Glu Asp Val Phe His Ala Pro Tyr Val Ala Asn Gln

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35

40

45

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

Cys Gly Ala Ala Thr Ala Gly Asn Met Leu His Trp Trp Phe Asp Gln
 65 70 75 80

Asn Lys Asp Gln Ile Lys Arg Tyr Leu Glu Glu His Pro Glu Lys Gln
 85 90 95

Lys Ile Asn Phe Arg Gly Glu Gln Met Phe Asp Val Lys Glu Ala Ile
 100 105 110

Asp Thr Lys Asn His Gln Leu Asp Ser Lys Leu Phe Glu Tyr Phe Lys
 115 120 125

Glu Lys Ala Phe Pro Tyr Leu Ser Thr Lys His Leu Gly Val Phe Pro
 130 135 140

Asp His Val Ile Asp Met Phe Ile Asn Gly Tyr Arg Leu Ser Leu Thr
 145 150 155 160

Asn His Gly Pro Thr Pro Val Lys Lys Gly Ser Lys Asp Pro Arg Gly
 165 170 175

Gly Ile Phe Asp Ala Val Phe Thr Arg Gly Asn Gln Ser Lys Leu Leu
 180 185 190

Thr Ser Arg His Asp Phe Lys Glu Lys Asn Leu Lys Glu Ile Ser Asp
 195 200 205

Leu Ile Lys Lys Glu Leu Thr Glu Gly Lys Ala Leu Gly Leu Ser His
 210 215 220

Thr Tyr Ala Asn Val Arg Ile Asn His Val Ile Asn Leu Trp Gly Ala

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Asn Lys Asp Gln Ile Lys Arg Tyr Leu Arg Glu His Pro Glu Lys Gln
85 90 95

Lys Ile Asn Phe Asn Gly Glu Gln Met Phe Asp Val Lys Glu Ala Ile
100 105 110

Asp Thr Lys Asn His Gln Leu Asp Ser Lys Leu Phe Glu Tyr Phe Lys
115 120 125

Glu Lys Ala Phe Pro Tyr Leu Ser Thr Lys His Leu Gly Val Phe Pro
130 135 140

Asp His Val Ile Asp Met Phe Ile Asn Gly Tyr Arg Leu Ser Leu Thr
145 150 155 160

Asn His Gly Pro Thr Pro Val Lys Glu Gly Ser Lys Asp Pro Arg Gly
165 170 175

Gly Ile Phe Asp Ala Val Phe Thr Arg Gly Asn Gln Ser Lys Leu Leu
180 185 190

Thr Ser Arg His Asp Phe Lys Glu Lys Asn Leu Lys Glu Ile Ser Asp
195 200 205

Leu Ile Lys Lys Glu Leu Asp Glu Gly Lys Ala Leu Gly Leu Ser His
210 215 220

Thr Tyr Ala Asn Val Arg Ile Asn His Val Ile Asn Leu Trp Gly Ala
225 230 235 240

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

Asp Ser Asn Ala Ser Ile Gly Met Lys Lys Tyr Phe Val Gly Val Asn
260 265 270

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Ser Ala Gly Lys Val Ala Ile Ser Ala Lys Glu Ile Lys Glu Asp Asn
275 280 285

Ile Gly Ala Gln Val Leu Gly Leu Phe Thr Leu Ser Thr Gly Gln Asp
290 295 300

Ser Trp Asn Gln Thr Asn
305 310

<210> 7
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Asp Ser Phe Ser Ala Asn Gln Glu Ile Arg Tyr Ser Glu Val Thr Pro
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Tyr His Val Thr Ser Val Trp Thr Lys Gly Val Thr Pro Pro Ala Asn
20 25 30

Phe Thr Gln Gly Glu Asp Val Phe His Ala Pro Tyr Val Ala Asn Gln
35 40 45

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

Cys Gly Ala Ala Thr Ala Gly Asn Met Leu His Trp Trp Phe Asp Gln
65 70 75 80

Asn Lys Asp Gln Ile Lys Arg Tyr Leu Lys Glu His Pro Glu Lys Gln
85 90 95

Lys Ile Asn Phe Asn Gly Glu Gln Met Phe Asp Val Lys Glu Ala Ile
100 105 110

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Arg Thr Lys Asn His Gln Leu Asp Ser Lys Leu Phe Glu Tyr Phe Lys
115 120 125

Glu Lys Ala Phe Pro Tyr Leu Ser Thr Lys His Leu Gly Val Phe Pro
130 135 140

Asp His Val Ile Asp Met Phe Ile Asn Gly Tyr Arg Leu Ser Leu Thr
145 150 155 160

Asn His Gly Pro Thr Pro Val Lys Glu Gly Ser Lys Asp Pro Arg Gly
165 170 175

Gly Ile Phe Asp Ala Val Phe Thr Arg Gly Asn Gln Ser Lys Leu Leu
180 185 190

Thr Ser Arg His Asp Phe Lys Glu Lys Asn Leu Lys Glu Ile Ser Asp
195 200 205

Leu Ile Lys Lys Glu Leu Glu Glu Gly Lys Ala Leu Gly Leu Ser His
210 215 220

Thr Tyr Ala Asn Val Arg Ile Asn His Val Ile Asn Leu Trp Gly Ala
225 230 235 240

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

Asp Ser Asn Ala Ser Ile Gly Met Lys Lys Tyr Phe Val Gly Val Asn
260 265 270

Lys Ala Gly Lys Val Ala Ile Ser Ala Lys Glu Ile Lys Glu Asp Asn
275 280 285

Ile Gly Ala Gln Val Leu Gly Leu Phe Thr Leu Ser Thr Gly Gln Asp
290 295 300

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Ser Trp Asn Gln Thr Asn
305 310

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<212> PRT
<213> Streptococcus pyogenes

<400> 8

Asp Ser Phe Ser Ala Asn Gln Glu Ile Arg Tyr Ser Glu Val Thr Pro
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Tyr His Val Thr Ser Val Trp Thr Lys Gly Val Thr Pro Pro Ala Asn
20 25 30

Phe Thr Gln Gly Glu Asp Val Phe His Ala Pro Tyr Val Ala Asn Gln
35 40 45

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

Cys Gly Ala Ala Thr Ala Gly Asn Met Leu His Trp Trp Phe Asp Gln
65 70 75 80

Asn Lys Asp Gln Ile Glu Arg Tyr Leu Glu Glu His Pro Glu Lys Gln
85 90 95

Lys Ile Asn Phe Asn Gly Glu Gln Met Phe Asp Val Lys Glu Ala Ile
100 105 110

Asp Thr Lys Asn His Gln Leu Asp Ser Lys Leu Phe Glu Tyr Phe Lys
115 120 125

Glu Lys Ala Phe Pro Tyr Leu Ser Thr Lys His Leu Gly Val Phe Pro
130 135 140

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Asp His Val Ile Asp Met Phe Ile Asn Gly Tyr Arg Leu Ser Leu Thr
145 150 155 160

Asn His Gly Pro Thr Pro Val Lys Glu Gly Ser Lys Asp Pro Arg Gly
165 170 175

Gly Ile Phe Asp Ala Val Phe Thr Arg Gly Asn Gln Ser Lys Leu Leu
180 185 190

Thr Ser Arg His Asp Phe Lys Glu Lys Asn Leu Lys Glu Ile Ser Asp
195 200 205

Leu Ile Lys Glu Glu Leu Thr Lys Gly Lys Ala Leu Gly Leu Ser His
210 215 220

Thr Tyr Ala Asn Val Arg Ile Asn His Val Ile Asn Leu Trp Gly Ala
225 230 235 240

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

Asp Ser Asn Ala Ser Ile Gly Met Lys Lys Tyr Phe Val Gly Val Asn
260 265 270

Ser Ala Gly Lys Val Ala Ile Ser Ala Lys Glu Ile Lys Glu Lys Asn
275 280 285

Ile Gly Ala Gln Val Leu Gly Leu Phe Thr Leu Ser Thr Gly Gln Lys
290 295 300

Ser Trp Asn Gln Thr Asn
305 310

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<212> PRT
<213> Streptococcus pyogenes

eolf-seql

<400> 9

Asp Ser Phe Ser Ala Asn Gln Glu Ile Arg Tyr Ser Glu Val Thr Pro
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Tyr His Val Thr Ser Val Trp Thr Lys Gly Val Thr Pro Pro Ala Asn
20 25 30

Phe Thr Gln Gly Glu Asp Val Phe His Ala Pro Tyr Val Ala Asn Gln
35 40 45

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

Cys Gly Ala Ala Thr Ala Gly Asn Met Leu His Trp Trp Phe Asp Gln
65 70 75 80

Asn Lys Asp Gln Ile Lys Arg Tyr Leu Lys Glu His Pro Glu Lys Gln
85 90 95

Lys Ile Asn Phe Arg Gly Glu Gln Met Phe Asp Val Lys Glu Ala Ile
100 105 110

Arg Thr Lys Asn His Gln Leu Asp Ser Lys Leu Phe Glu Tyr Phe Lys
115 120 125

Glu Lys Ala Phe Pro Tyr Leu Ser Thr Lys His Leu Gly Val Phe Pro
130 135 140

Asp His Val Ile Asp Met Phe Ile Asn Gly Tyr Arg Leu Ser Leu Thr
145 150 155 160

Asn His Gly Pro Thr Pro Val Lys Glu Gly Ser Lys Asp Pro Arg Gly
165 170 175

Gly Ile Phe Asp Ala Val Phe Thr Arg Gly Asn Gln Ser Lys Leu Leu

eolf-seql

180

185

190

Thr Ser Arg His Asp Phe Lys Glu Lys Asn Leu Lys Glu Ile Ser Asp
195 200 205

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

Thr Tyr Ala Asn Val Arg Ile Asn His Val Ile Asn Leu Trp Gly Ala
225 230 235 240

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

Asp Ser Asn Ala Ser Ile Gly Met Lys Lys Tyr Phe Val Gly Val Asn
260 265 270

Lys Ala Gly Lys Val Ala Ile Ser Ala Lys Glu Ile Lys Glu Asp Asn
275 280 285

Ile Gly Ala Gln Val Leu Gly Leu Phe Thr Leu Ser Thr Gly Gln Asp
290 295 300

Ser Trp Asn Gln Thr Asn
305 310

<210> 10
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<213> Streptococcus pyogenes

<400> 10

Asp Ser Phe Ser Ala Asn Gln Glu Ile Arg Tyr Ser Glu Val Thr Pro
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Tyr His Val Thr Ser Val Trp Thr Lys Gly Val Thr Pro Pro Ala Asn
20 25 30

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Phe Thr Gln Gly Glu Asp Val Phe His Ala Pro Tyr Val Ala Asn Gln
35 40 45

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

Cys Gly Ala Ala Thr Ala Gly Asn Met Leu His Trp Trp Phe Asp Gln
65 70 75 80

Asn Lys Asp Gln Ile Lys Arg Tyr Leu Lys Glu His Pro Glu Lys Gln
85 90 95

Lys Ile Asn Phe Arg Gly Glu Gln Met Phe Asp Val Lys Glu Ala Ile
100 105 110

Arg Thr Lys Asn His Gln Leu Asp Ser Lys Leu Phe Glu Tyr Phe Lys
115 120 125

Glu Lys Ala Phe Pro Tyr Leu Ser Thr Lys His Leu Gly Val Phe Pro
130 135 140

Asp His Val Ile Asp Met Phe Ile Asn Gly Tyr Arg Leu Ser Leu Thr
145 150 155 160

Asn His Gly Pro Thr Pro Val Lys Lys Gly Ser Lys Asp Pro Arg Gly
165 170 175

Gly Ile Phe Asp Ala Val Phe Thr Arg Gly Asn Gln Ser Lys Leu Leu
180 185 190

Thr Ser Arg His Asp Phe Lys Glu Lys Asn Leu Lys Glu Ile Ser Asp
195 200 205

Leu Ile Lys Lys Glu Leu Glu Glu Gly Lys Ala Leu Gly Leu Ser His
210 215 220

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Thr Tyr Ala Asn Val Arg Ile Asn His Val Ile Asn Leu Trp Gly Ala
225 230 235 240

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

Asp Ser Asn Ala Ser Ile Gly Met Lys Lys Tyr Phe Val Gly Val Asn
260 265 270

Ser Ala Gly Lys Val Ala Ile Ser Ala Lys Glu Ile Lys Glu Asp Asn
275 280 285

Ile Gly Ala Gln Val Leu Gly Leu Phe Thr Leu Ser Thr Gly Gln Asp
290 295 300

Ser Trp Asn Gln Thr Asn
305 310

<210> 11
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<400> 11

Asp Ser Phe Ser Ala Asn Gln Glu Ile Arg Tyr Ser Glu Val Thr Pro
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Tyr His Val Thr Ser Val Trp Thr Lys Gly Val Thr Pro Pro Ala Asn
20 25 30

Phe Thr Gln Gly Glu Asp Val Phe His Ala Pro Tyr Val Ala Asn Gln
35 40 45

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

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Cys Gly Ala Ala Thr Ala Gly Asn Met Leu His Trp Trp Phe Asp Gln
65 70 75 80

Asn Lys Asp Gln Ile Glu Arg Tyr Leu Glu Glu His Pro Glu Lys Gln
85 90 95

Lys Ile Asn Phe Arg Gly Glu Gln Met Phe Asp Val Lys Glu Ala Ile
100 105 110

Asp Thr Lys Asn His Gln Leu Asp Ser Lys Leu Phe Glu Tyr Phe Lys
115 120 125

Glu Lys Ala Phe Pro Tyr Leu Ser Thr Lys His Leu Gly Val Phe Pro
130 135 140

Asp His Val Ile Asp Met Phe Ile Asn Gly Tyr Arg Leu Ser Leu Thr
145 150 155 160

Asn His Gly Pro Thr Pro Val Lys Lys Gly Ser Lys Asp Pro Arg Gly
165 170 175

Gly Ile Phe Asp Ala Val Phe Thr Arg Gly Asn Gln Ser Lys Leu Leu
180 185 190

Thr Ser Arg His Asp Phe Lys Glu Lys Asn Leu Lys Glu Ile Ser Asp
195 200 205

Leu Ile Lys Glu Glu Leu Thr Lys Gly Lys Ala Leu Gly Leu Ser His
210 215 220

Thr Tyr Ala Asn Val Arg Ile Asn His Val Ile Asn Leu Trp Gly Ala
225 230 235 240

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

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Asp Ser Asn Ala Ser Ile Gly Met Lys Lys Tyr Phe Val Gly Val Asn
260 265 270

Ser Ala Gly Lys Val Ala Ile Ser Ala Lys Glu Ile Lys Glu Asp Asn
275 280 285

Ile Gly Ala Gln Val Leu Gly Leu Phe Thr Leu Ser Thr Gly Gln Lys
290 295 300

Ser Trp Asn Gln Thr Asn
305 310

<210> 12
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<213> Streptococcus pyogenes

<400> 12

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

Tyr His Val Thr Ser Val Trp Thr Lys Gly Val Thr Pro Pro Ala Asn
20 25 30

Phe Thr Gln Gly Glu Asp Val Phe His Ala Pro Tyr Val Ala Asn Gln
35 40 45

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

Cys Gly Ala Ala Thr Ala Gly Asn Met Leu His Trp Trp Phe Asp Gln
65 70 75 80

Asn Lys Asp Gln Ile Lys Arg Tyr Leu Glu Glu His Pro Glu Lys Gln
85 90 95

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Lys Ile Asn Phe Asn Gly Glu Gln Met Phe Asp Val Lys Glu Ala Ile
100 105 110

Asp Thr Lys Asn His Gln Leu Asp Ser Lys Leu Phe Glu Tyr Phe Lys
115 120 125

Glu Lys Ala Phe Pro Tyr Leu Ser Thr Lys His Leu Gly Val Phe Pro
130 135 140

Asp His Val Ile Asp Met Phe Ile Asn Gly Tyr Arg Leu Ser Leu Thr
145 150 155 160

Asn His Gly Pro Thr Pro Val Lys Glu Gly Ser Lys Asp Pro Arg Gly
165 170 175

Gly Ile Phe Asp Ala Val Phe Thr Arg Gly Asp Gln Ser Lys Leu Leu
180 185 190

Thr Ser Arg His Asp Phe Lys Glu Lys Asn Leu Lys Glu Ile Ser Asp
195 200 205

Leu Ile Lys Lys Glu Leu Thr Glu Gly Lys Ala Leu Gly Leu Ser His
210 215 220

Thr Tyr Ala Asn Val Arg Ile Asn His Val Ile Asn Leu Trp Gly Ala
225 230 235 240

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

Asp Ser Asn Ala Ser Ile Gly Met Lys Lys Tyr Phe Val Gly Val Asn
260 265 270

Ser Ala Gly Lys Val Ala Ile Ser Ala Lys Glu Ile Lys Glu Asp Asn
275 280 285

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Ile Gly Ala Gln Val Leu Gly Leu Phe Thr Leu Ser Thr Gly Gln Asp
 290 295 300

Ser Trp
 305

<210> 13
 <211> 290
 <212> PRT
 <213> Streptococcus pyogenes

<400> 13

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

Glu Asp Val Phe His Ala Pro Tyr Val Ala Asn Gln Gly Trp Tyr Asp
 20 25 30

Ile Thr Lys Thr Phe Asn Gly Lys Asp Asp Leu Leu Cys Gly Ala Ala
 35 40 45

Thr Ala Gly Asn Met Leu His Trp Trp Phe Asp Gln Asn Lys Asp Gln
 50 55 60

Ile Lys Arg Tyr Leu Glu Glu His Pro Glu Lys Gln Lys Ile Asn Phe
 65 70 75 80

Asn Gly Glu Gln Met Phe Asp Val Lys Glu Ala Ile Asp Thr Lys Asn
 85 90 95

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

Pro Tyr Leu Ser Thr Lys His Leu Gly Val Phe Pro Asp His Val Ile
 115 120 125

Asp Met Phe Ile Asn Gly Tyr Arg Leu Ser Leu Thr Asn His Gly Pro

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130

135

140

Thr Pro Val Lys Glu Gly Ser Lys Asp Pro Arg Gly Gly Ile Phe Asp
145 150 155 160

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

Asp Phe Lys Glu Lys Asn Leu Lys Glu Ile Ser Asp Leu Ile Lys Lys
180 185 190

Glu Leu Thr Glu Gly Lys Ala Leu Gly Leu Ser His Thr Tyr Ala Asn
195 200 205

Val Arg Ile Asn His Val Ile Asn Leu Trp Gly Ala Asp Phe Asp Ser
210 215 220

Asn Gly Asn Leu Lys Ala Ile Tyr Val Thr Asp Ser Asp Ser Asn Ala
225 230 235 240

Ser Ile Gly Met Lys Lys Tyr Phe Val Gly Val Asn Ser Ala Gly Lys
245 250 255

Val Ala Ile Ser Ala Lys Glu Ile Lys Glu Asp Asn Ile Gly Ala Gln
260 265 270

Val Leu Gly Leu Phe Thr Leu Ser Thr Gly Gln Asp Ser Trp Asn Gln
275 280 285

Thr Asn
290

<210> 14

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<212> PRT

<213> Streptococcus pyogenes

eolf-seql

<400> 14

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

Glu Asp Val Phe His Ala Pro Tyr Val Ala Asn Gln Gly Trp Tyr Asp
20 25 30

Ile Thr Lys Thr Phe Asn Gly Lys Asp Asp Leu Leu Cys Gly Ala Ala
35 40 45

Thr Ala Gly Asn Met Leu His Trp Trp Phe Asp Gln Asn Lys Asp Gln
50 55 60

Ile Lys Arg Tyr Leu Glu Glu His Pro Glu Lys Gln Lys Ile Asn Phe
65 70 75 80

Lys Gly Glu Gln Met Phe Asp Val Lys Glu Ala Ile Asp Thr Lys Asn
85 90 95

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

Pro Tyr Leu Ser Thr Lys His Leu Gly Val Phe Pro Asp His Val Ile
115 120 125

Asp Met Phe Ile Asn Gly Tyr Arg Leu Ser Leu Thr Asn His Gly Pro
130 135 140

Thr Pro Val Lys Glu Gly Ser Lys Asp Pro Arg Gly Gly Ile Phe Asp
145 150 155 160

Ala Val Phe Thr Arg Gly Asn Gln Ser Lys Leu Leu Thr Ser Arg His
165 170 175

Asp Phe Lys Glu Lys Asn Leu Lys Glu Ile Ser Asp Leu Ile Lys Lys
180 185 190

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Glu Leu Thr Glu Gly Lys Ala Leu Gly Leu Ser His Thr Tyr Ala Asn
195 200 205

Val Arg Ile Asn His Val Ile Asn Leu Trp Gly Ala Asp Phe Asp Ser
210 215 220

Asn Gly Asn Leu Lys Ala Ile Tyr Val Thr Asp Ser Asp Ser Asn Ala
225 230 235 240

Ser Ile Gly Met Lys Lys Tyr Phe Val Gly Val Asn Ser Ala Gly Lys
245 250 255

Val Ala Ile Ser Ala Lys Glu Ile Lys Glu Asp Asn Ile Gly Ala Gln
260 265 270

Val Leu Gly Leu Phe Thr Leu Ser Thr Gly Gln Asp Ser Trp Asn Gln
275 280 285

Thr Asn
290

<210> 15
<211> 290
<212> PRT
<213> Streptococcus pyogenes

<400> 15

Ser Val Trp Thr Lys Gly Val Thr Pro Pro Ala Asn Phe Thr Gln Gly
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Ile Thr Lys Thr Phe Asn Gly Lys Asp Asp Leu Leu Cys Gly Ala Ala
35 40 45

eolf-seql

Thr Ala Gly Asn Met Leu His Trp Trp Phe Asp Gln Asn Lys Asp Gln
50 55 60

Ile Glu Arg Tyr Leu Glu Glu His Pro Glu Lys Gln Lys Ile Asn Phe
65 70 75 80

Lys Gly Glu Gln Met Phe Asp Val Lys Lys Ala Ile Asp Thr Lys Asn
85 90 95

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

Pro Tyr Leu Ser Thr Lys His Leu Gly Val Phe Pro Asp His Val Ile
115 120 125

Asp Met Phe Ile Asn Gly Tyr Arg Leu Ser Leu Thr Asn His Gly Pro
130 135 140

Thr Pro Val Lys Glu Gly Ser Lys Asp Pro Arg Gly Gly Ile Phe Asp
145 150 155 160

Ala Val Phe Thr Arg Gly Asn Gln Ser Lys Leu Leu Thr Ser Arg His
165 170 175

Asp Phe Lys Glu Lys Asn Leu Lys Glu Ile Ser Asp Leu Ile Lys Glu
180 185 190

Glu Leu Thr Lys Gly Lys Ala Leu Gly Leu Ser His Thr Tyr Ala Asn
195 200 205

Val Arg Ile Asn His Val Ile Asn Leu Trp Gly Ala Asp Phe Asp Ser
210 215 220

Asn Gly Asn Leu Lys Ala Ile Tyr Val Thr Asp Ser Asp Ser Asn Ala
225 230 235 240

eolf-seql

Ser Ile Gly Met Lys Lys Tyr Phe Val Gly Val Asn Ser Ala Gly Lys
 245 250 255

Val Ala Ile Ser Ala Lys Glu Ile Lys Glu Asp Asn Ile Gly Ala Gln
 260 265 270

Val Leu Gly Leu Phe Thr Leu Ser Thr Gly Gln Lys Ser Trp Asn Gln
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Thr Asn
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 <213> Streptococcus pyogenes

<400> 16

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His Gln Ile Thr Ser Val Trp Thr Lys Gly Val Thr Pro Pro Ala Asn
 20 25 30

Phe Thr Gln Gly Glu Asp Val Phe His Ala Pro Tyr Val Ala Asn Gln
 35 40 45

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

Cys Gly Ala Ala Thr Ala Gly Asn Met Leu His Trp Trp Phe Asp Gln
 65 70 75 80

Asn Lys Asp Gln Ile Glu Arg Tyr Leu Glu Glu His Pro Glu Lys Gln
 85 90 95

eolf-seq1

Lys Ile Asn Phe Lys Gly Glu Gln Met Phe Asp Val Lys Lys Ala Ile
 100 105 110

Asp Thr Lys Asn His Gln Leu Asp Ser Lys Leu Phe Glu Tyr Phe Lys
 115 120 125

Glu Lys Ala Phe Pro Tyr Leu Ser Thr Lys His Leu Gly Val Phe Pro
 130 135 140

Asp His Val Ile Asp Met Phe Ile Asn Gly Tyr Arg Leu Ser Leu Thr
 145 150 155 160

Asn His Gly Pro Thr Pro Val Lys Glu Gly Ser Lys Asp Pro Arg Gly
 165 170 175

Gly Ile Phe Asp Ala Val Phe Thr Arg Gly Asn Gln Ser Lys Leu Leu
 180 185 190

Thr Ser Arg His Asp Phe Lys Glu Lys Asn Leu Lys Glu Ile Ser Asp
 195 200 205

Leu Ile Lys Glu Glu Leu Thr Lys Gly Lys Ala Leu Gly Leu Ser His
 210 215 220

Thr Tyr Ala Asn Val Arg Ile Asn His Val Ile Asn Leu Trp Gly Ala
 225 230 235 240

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

Asp Ser Asn Ala Ser Ile Gly Met Lys Lys Tyr Phe Val Gly Val Asn
 260 265 270

Ser Ala Gly Lys Val Ala Ile Ser Ala Lys Glu Ile Lys Glu Asp Asn
 275 280 285

eolf-seql

Ile Gly Ala Gln Val Leu Gly Leu Phe Thr Leu Ser Thr Gly Gln Lys
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Ser Trp Asn Gln Thr Asn Gly Gly Gly His His His His His His
 305 310 315

<210> 17

<211> 320

<212> PRT

<213> Streptococcus pyogenes

<400> 17

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Pro Tyr His Val Thr Ser Val Trp Thr Lys Gly Val Thr Pro Pro Ala
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Asn Phe Thr Gln Gly Glu Asp Val Phe His Ala Pro Tyr Val Ala Asn
 35 40 45

Gln Gly Trp Tyr Asp Ile Thr Lys Thr Phe Asn Gly Lys Asp Asp Leu
 50 55 60

Leu Cys Gly Ala Ala Thr Ala Gly Asn Met Leu His Trp Trp Phe Asp
 65 70 75 80

Gln Asn Lys Asp Gln Ile Lys Arg Tyr Leu Glu Glu His Pro Glu Lys
 85 90 95

Gln Lys Ile Asn Phe Asn Gly Glu Gln Met Phe Asp Val Lys Glu Ala
 100 105 110

Ile Asp Thr Lys Asn His Gln Leu Asp Ser Lys Leu Phe Glu Tyr Phe
 115 120 125

Lys Glu Lys Ala Phe Pro Tyr Leu Ser Thr Lys His Leu Gly Val Phe

eolf-seql

130

135

140

Pro Asp His Val Ile Asp Met Phe Ile Asn Gly Tyr Arg Leu Ser Leu
145 150 155 160

Thr Asn His Gly Pro Thr Pro Val Lys Glu Gly Ser Lys Asp Pro Arg
165 170 175

Gly Gly Ile Phe Asp Ala Val Phe Thr Arg Gly Asp Gln Ser Lys Leu
180 185 190

Leu Thr Ser Arg His Asp Phe Lys Glu Lys Asn Leu Lys Glu Ile Ser
195 200 205

Asp Leu Ile Lys Lys Glu Leu Thr Glu Gly Lys Ala Leu Gly Leu Ser
210 215 220

His Thr Tyr Ala Asn Val Arg Ile Asn His Val Ile Asn Leu Trp Gly
225 230 235 240

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

Ser Asp Ser Asn Ala Ser Ile Gly Met Lys Lys Tyr Phe Val Gly Val
260 265 270

Asn Ser Ala Gly Lys Val Ala Ile Ser Ala Lys Glu Ile Lys Glu Asp
275 280 285

Asn Ile Gly Ala Gln Val Leu Gly Leu Phe Thr Leu Ser Thr Gly Gln
290 295 300

Asp Ser Trp Asn Gln Thr Asn Gly Gly Gly His His His His His His
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<210> 18

eolf-seql

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 <213> Streptococcus pyogenes

<400> 18

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<210> 19
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 <213> Streptococcus pyogenes

<400> 19

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Tyr His Val Thr
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 ctaggagttt tccctgatca tgtaattgat atgttcatta acggctaccg ccttagtcta 480
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eolf-seq1

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ctaggcctat cacacaccta cgctaacgta cgcatcaacc atgttataaa cctgtgggga	720
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gcatctattg gtatgaagaa atactttgtt ggtgttaatt ccgctggaaa agtagctatt	840
tctgctaaag aaataaaaaga agataatata ggtgctcaag tactagggtt atttacactt	900
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taa	963

<210> 21

<211> 963

<212> DNA

<213> Streptococcus pyogenes

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ttccgtggcg aacagatggt tgacgtaaaa gaagctatcg aactaaaaa ccaccagcta	360
gatagtaaat tatttgaata ttttaaagaa aaagctttcc cttatctatc tactaaacac	420
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gaaaaaaaaatc tcaaagaaat cagtgatctc attaagaaag agttaaccga aggcaaggct	660
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eolf-seq1

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tctgctaaag aaataaaaaga agataatata ggtgctcaag tactaggggtt atttacactt	900
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taa	963

<210> 22
 <211> 963
 <212> DNA
 <213> Streptococcus pyogenes

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tttcacgctc cttatgttgc taaccaagga tggatgata ttaccaaacc attcaatgga	180
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ctaggagttt tccctgatca tgtaattgat atgttcatta acggctaccg ccttagtcta	480
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tctgctaaag aaataaaaaga agataatata ggtgctcaag tactaggggtt atttacactt	900
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eolf-seq1

taa 963

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 ctaggagttt tccctgatca tgtaattgat atgttcatta acggctaccg ccttagtcta 480
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 tctgctaaag aaataaaaaga agataatata ggtgctcaag tactagggtt atttacactt 900
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 taa 963

<210> 24
 <211> 963
 <212> DNA

eolf-seq1

<213> Streptococcus pyogenes

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caaaacaaag accaaattaa acgttatttg cgtgagcatc cagaaaagca aaaaataaac	300
ttcaatggcg aacagatggt tgacgtaaaa gaagctatcg acactaaaaa ccaccagcta	360
gatagtaaat tatttgaata ttttaaagaa aaagctttcc cttatctatc tactaaacac	420
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gacgccgtat ttacaagagg taaccaaagt aagctattga caagtcgtca tgattttaaa	600
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gcatctattg gtatgaagaa atactttgtt ggtgttaatt ccgctggaaa agtagctatt	840
tctgctaaag aaataaaaga agataatata ggtgctcaag tactagggtt atttacactt	900
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taa	963

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<211> 963

<212> DNA

<213> Streptococcus pyogenes

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eolf-seq1

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aaagacgatc ttctttgcgg ggctgccaca gcagggaata tgcttcactg gtggttcgat	240
caaaacaaag accaaattaa acgttatttg aaagagcatc cagaaaagca aaaaataaac	300
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gatatgaaat tatttgaata ttttaaagaa aaagctttcc cttatctatc tactaaacac	420
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gcatctattg gtatgaagaa atactttgtt ggtgttaata aagctggaaa agtagctatt	840
tctgctaaag aaataaaaaga agataatata ggtgctcaag tactagggtt atttacactt	900
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taa	963

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<211> 963

<212> DNA

<213> Streptococcus pyogenes

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aaagacgatc ttctttgcgg ggctgccaca gcagggaata tgcttcactg gtggttcgat	240
caaaacaaag accaaattga acgttatttg gaagagcatc cagaaaagca aaaaataaac	300
ttcaatggcg aacagatggt tgacgtaaaa gaagctatcg acactaaaaa ccaccagcta	360

eolf-seql

gatagtaaat tatttgaata ttttaaagaa aaagctttcc cttatctatc tactaaacac	420
ctaggagttt tccctgatca tgtaattgat atgttcatta acggctaccg ccttagtcta	480
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gacgccgtat ttacaagagg taaccaaagt aagctattga caagtcgtca tgattttaaa	600
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taa	963

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<213> Streptococcus pyogenes

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caaaacaaag accaaattaa acgttatttg aaagagcatc cagaaaagca aaaaataaac	300
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gatagtaaat tatttgaata ttttaaagaa aaagctttcc cttatctatc tactaaacac	420
ctaggagttt tccctgatca tgtaattgat atgttcatta acggctaccg ccttagtcta	480
actaaccacg gtccaacgcc agtaaaagaa ggtagtaaag atccccgagg tgggtattttt	540

eolf-seq1

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tctgctaaag aaataaaaaga agataatata ggtgctcaag tactagggtt atttacactt	900
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taa	963

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<213> Streptococcus pyogenes

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caaaacaaag accaaattaa acgttatttg aaagagcatc cagaaaagca aaaaataaac	300
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gaaaaaaaaatc tcaaagaaat cagtgatctc attaagaaag agttagaaga aggcaaggct	660
ctaggcctat cacacaccta cgctaacgta cgcatcaacc atgttataaa cctgtgggga	720
gctgactttg attctaacgg gaaccttaaa gctattttatg taacagactc tgatagtaat	780

eolf-seq1

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tctgctaaag aaataaaaaga agataatata ggtgctcaag tactagggtt atttacactt	900
tcaacagggc aagatagttg gaatcagacc aatggcggtg gccatcatca ccatcaccac	960
taa	963

<210> 29

<211> 963

<212> DNA

<213> Streptococcus pyogenes

<400> 29

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tttcacgctc cttatgttgc taaccaagga tggatatgata ttacccaaac attcaatgga	180
aaagacgatc ttctttgcgg ggctgccaca gcagggaata tgcttcactg gtggttcgat	240
caaaacaaag accaaattga acgttatttg gaagagcatc cagaaaagca aaaaataaac	300
ttccgtggcg aacagatggt tgacgtaaaa gaagctatcg aactaaaaa ccaccagcta	360
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gacgccgtat ttacaagagg taaccaaaagt aagctattga caagtcgtca tgattttaaa	600
gaaaaaaaaatc tcaaagaaat cagtgatctc attaaggaag agttaaccaa aggcaaggct	660
ctaggcctat cacacaccta cgctaacgta cgcatcaacc atgttataaa cctgtgggga	720
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gcatctattg gtatgaagaa atactttggtt ggtgttaatt ccgctggaaa agtagctatt	840
tctgctaaag aaataaaaaga agataatata ggtgctcaag tactagggtt atttacactt	900
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eolf-seq1

taa

963

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<211> 957

<212> DNA

<213> Streptococcus pyogenes

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eolf-seql

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eolf-seq1

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eolf-seql

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eolf-seql

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