

ARCDP0482W02
SEQUENCE LISTING

<110> SCHNEEWIND, OLAF
CHENG, ALICE G.
MISSIAKAS, DOMINIQUE
KIM, HWAN

<120> COMPOSITIONS AND METHODS RELATED TO PROTEIN A (SPA) VARIANTS

<130> ARCD.P0482W02

<140> UNKNOWN

<141> 2011-07-01

<150> 61/361,218

<151> 2010-07-02

<150> 61/370,725

<151> 2010-08-04

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Gln Val Leu Asn Met Pro Asn Leu Asn Ala Asp Gln Arg Asn Gly Phe
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Ile Gln Ser Leu Lys Asp Asp Pro Ser Gln Ser Ala Asn Val Leu Gly
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Glu Ala Gln Lys Leu Asn Asp Ser Gln Ala Pro Lys Ala Asp Ala Gln
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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
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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
 Page 4

180

185

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Gln Ser Ala Asn Leu Leu Ser Glu Ala Lys Lys Leu Asn Glu Ser Gln
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Ala Pro Lys Ala Asp Asn Lys Phe Asn Lys Glu Gln Gln Asn Ala Phe
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Tyr Glu Ile Leu His Leu Pro Asn Leu Asn Glu Glu Gln Arg Asn Gly
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Phe Ile Gln Ser Leu Lys Asp Asp Pro Ser Val Ser Lys Glu Ile Leu
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Ala Lys Ala Asn Gly Thr Thr Ala Asp Lys Ile Ala Ala Asp Asn Lys
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Lys Lys Gln Pro Ala Asn His Ala Asp Ala Asn Lys Ala Gln Ala Leu
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Gln Val Leu Asn Met Pro Asn Leu Asn Ala Asp Gln Arg Asn Gly Phe
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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
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Gln Asn Asn Phe Asn Lys Asp Gln Gln Ser Ala Phe Tyr Glu Ile Leu
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Asn Met Pro Asn Leu Asn Glu Ala Gln Arg Asn Gly Phe Ile Gln Ser
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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
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Glu Glu Gln Arg Asn Gly Phe Ile Gln Ser Leu Lys Asp Asp Pro Ser
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Gln Ser Ala Asn Leu Leu Ser Glu Ala Lys Lys Leu Asn Glu Ser Gln
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Ala Pro Lys Ala Asp Asn Lys Phe Asn Lys Glu Gln Gln Asn Ala Phe
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Tyr Glu Ile Leu His Leu Pro Asn Leu Asn Glu Glu Gln Arg Asn Gly
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Phe Ile Gln Ser Leu Lys Asp Asp Pro Ser Val Ser Lys Glu Ile Leu
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Ala Glu Ala Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys Glu Glu Asp
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Asn Lys Lys Pro Gly Lys Glu Asp Gly Asn Lys Pro Gly Lys Glu Asp
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Gly Asn Lys Pro Gly Lys Glu Asp Asn Lys Lys Pro Gly Lys Glu Asp
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Ala Lys Ala Asn Gly Thr Thr Ala Asp Lys Ile Ala Ala Asp Asn Lys
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Leu Ala Asp Lys Asn Met Ile Lys Pro Gly Gln Glu Leu Val Val Asp
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Lys Lys Gln Pro Ala Asn His Ala Asp Ala Asn Lys Ala Gln Ala Leu
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Glu Leu
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Thr Arg Ala Gln Gly Glu Ile Ala Ala Asn Trp Glu Gly Gln Ala Phe
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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
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Asp Ala Val Gln Glu Gln Asp Gln Gln Leu Ser Asn Asn Phe Gly Leu
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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
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Asp Asn Leu Ser Gln Asn Leu Ala Lys Tyr Asp Thr Leu Ser Ile Lys
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Gln Gly Leu Asp Arg Val
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 Ala Ser Ile Leu Val Gly Thr Thr Leu Ile Phe Gly Leu Gly Asn Gln
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 Thr Ser Ala Ser Asp Asn Gln Ser Ser Asp Lys Val Asp Met Gln Gln
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 Leu Asn Gln Glu Asp Asn Thr Lys Asn Asp Asn Gln Lys Glu Met Val
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 Ser Ser Gln Gly Asn Glu Thr Thr Ser Asn Gly Asn Lys Ser Ile Glu
 100 105 110
 Lys Glu Ser Val Gln Ser Thr Thr Gly Asn Lys Val Glu Val Ser Thr
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 Ala Lys Ser Asp Glu Gln Ala Ser Pro Lys Ser Thr Asn Glu Asp Leu
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 Leu Glu Asn Lys Ser Val Val Asn Val Gln Pro Thr Asn Glu Glu Asn
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 Lys Lys Val Asp Ala Lys Thr Glu Ser Thr Thr Leu Asn Val Lys Ser
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 Asp Ala Ile Lys Ser Asn Ala Glu Thr Leu Val Asp Asn Asn Ser Asn
 195 200 205
 Ser Asn Asn Glu Asn Asn Ala Asp Ile Ile Leu Pro Lys Ser Thr Ala
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 Pro Lys Ser Leu Asn Thr Arg Met Arg Met Ala Ala Ile Gln Pro Asn
 225 230 235 240
 Ser Thr Asp Ser Lys Asn Val Asn Asp Leu Ile Thr Ser Asn Thr Thr
 245 250 255
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 Asp Tyr Leu Ser Leu Lys Ser Gln Ile Thr Val Asp Asp Lys Val Lys
 Page 9

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280

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Ser Gly Asp Tyr Phe Thr Ile Lys Tyr Ser Asp Thr Val Gln Val Tyr
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 Gly Leu Asn Pro Glu Asp Ile Lys Asn Ile Gly Asp Ile Lys Asp Pro
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 405 410 415
 Asn Val Glu Asp Pro Gly Tyr Tyr Asn Gln Val Val Tyr Val Asn Pro
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 Met Asp Lys Asp Leu Lys Gly Ala Lys Leu Lys Val Glu Ala Tyr His
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 Pro Lys Tyr Pro Thr Asn Ile Gly Gln Ile Asn Gln Asn Val Thr Asn
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Tyr Glu Val Thr Pro Ser Lys Gln Gly Asn Asn Glu Glu Leu Asp Ser
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Asn Gly Leu Ser Ser Val Ile Thr Val Asn Gly Lys Asp Asn Leu Ser
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690 695 700

Ile Ser Gly Val Thr Val Thr Leu Lys Asp Glu Asn Gly Asn Val Leu
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Lys Thr Val Thr Thr Asp Ala Asp Gly Lys Tyr Lys Phe Thr Asp Leu
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Asp Asn Gly Asn Tyr Lys Val Glu Phe Thr Thr Pro Glu Gly Tyr Thr
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Pro Thr Thr Val Thr Ser Gly Ser Asp Ile Glu Lys Asp Ser Asn Gly
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Leu Thr Thr Thr Gly Val Ile Asn Gly Ala Asp Asn Met Thr Leu Asp
770 775 780

Ser Gly Phe Tyr Lys Thr Pro Lys Tyr Asn Leu Gly Asn Tyr Val Trp
785 790 795 800

Glu Asp Thr Asn Lys Asp Gly Lys Gln Asp Ser Thr Glu Lys Gly Ile
805 810 815

Ser Gly Val Thr Val Thr Leu Lys Asn Glu Asn Gly Glu Val Leu Gln
Page 11

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1345

1350

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Asn Lys
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Glu Ala Lys Ala Ala Glu Asn Thr Ser Thr Glu Asn Ala Lys Gln Asp
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Asp Ala Thr Thr Ser Asp Asn Lys Glu Val Val Ser Glu Thr Glu Asn
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Asn Ser Thr Thr Glu Asn Asp Ser Thr Asn Pro Ile Lys Lys Glu Thr
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Asn Thr Asp Ser Gln Pro Glu Ala Lys Glu Glu Ser Thr Thr Ser Ser
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Thr Gln Gln Gln Gln Asn Asn Val Thr Ala Thr Thr Glu Thr Lys Pro
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Gln Asn Ile Glu Lys Glu Asn Val Lys Pro Ser Thr Asp Lys Thr Ala
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Thr Glu Asp Thr Ser Val Ile Leu Glu Glu Lys Lys Ala Pro Asn Tyr
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Thr Asn Asn Asp Val Thr Thr Lys Pro Ser Thr Ser Glu Ile Gln Thr
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Lys Pro Thr Thr Pro Gln Glu Ser Thr Asn Ile Glu Asn Ser Gln Pro
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Gln Pro Thr Pro Ser Lys Val Asp Asn Gln Val Thr Asp Ala Thr Asn
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 Gly Asp Gly Lys Asp Asn Val Ala Ala Ala His Asp Gly Lys Asp Ile
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 Glu Tyr Asp Thr Glu Phe Thr Ile Asp Asn Lys Val Lys Lys Gly Asp
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 Thr Met Thr Ile Asn Tyr Asp Lys Asn Val Ile Pro Ser Asp Leu Thr
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 Ala Lys Gly Thr Phe Asp Lys Ala Thr Lys Gln Ile Thr Tyr Thr Phe
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 Thr Asp Tyr Val Asp Lys Tyr Glu Asp Ile Lys Ala Arg Leu Thr Leu
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 Tyr Ser Tyr Ile Asp Lys Gln Ala Val Pro Asn Glu Thr Ser Leu Asn
 385 390 395 400
 Leu Thr Phe Ala Thr Ala Gly Lys Glu Thr Ser Gln Asn Val Ser Val
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 Asp Tyr Gln Asp Pro Met Val His Gly Asp Ser Asn Ile Gln Ser Ile
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 Phe Thr Lys Leu Asp Glu Asn Lys Gln Thr Ile Glu Gln Gln Ile Tyr
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 Val Asn Pro Leu Lys Lys Thr Ala Thr Asn Thr Lys Val Asp Ile Ala
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 Glu Asp Val Thr Ser Gln Phe Asp Asn Lys Lys Ser Phe Ser Asn Asn
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 Val Ala Thr Leu Asp Phe Gly Asp Ile Asn Ser Ala Tyr Ile Ile Lys
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 Gln Gly Thr Ser Met Arg Thr Thr Asp Lys Tyr Gly Tyr Tyr Asn Tyr
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 Ala Gly Tyr Ser Asn Phe Ile Val Thr Ser Asn Asp Thr Gly Gly Gly
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 Gly Leu Lys Asp Gly Glu Thr Tyr Thr Val Lys Phe Glu Thr Pro Ala
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 Gly Tyr Leu Pro Thr Lys Val Asn Gly Thr Thr Asp Gly Glu Lys Asp
 675 680 685
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 Ser Leu Asp Thr Gly Phe Tyr Lys Glu Pro Lys Tyr Asn Leu Gly Asp
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 Val Ile Gly Thr Thr Thr Thr Asp Ala Ser Gly Lys Tyr Lys Phe Thr
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 Gly Leu Thr Thr Thr Gly Val Ile Lys Asp Ala Asp Asn Met Thr Leu
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 Asp Ser Gly Phe Tyr Lys Thr Pro Lys Tyr Ser Leu Gly Asp Tyr Val
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 Trp Tyr Asp Ser Asn Lys Asp Gly Lys Gln Asp Ser Thr Glu Lys Gly
 835 840 845
 Ile Lys Asp Val Lys Val Thr Leu Leu Asn Glu Lys Gly Glu Val Ile
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 Asp Ser Gly Lys Tyr Lys Val Ile Phe Glu Lys Pro Ala Gly Leu Thr
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 Gln Thr Val Thr Asn Thr Thr Glu Asp Asp Lys Asp Ala Asp Gly Gly
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 Gly Tyr Phe Glu Glu Asp Thr Ser Asp Ser Asp Ser Asp Ser Asp Ser
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Glu Ala Thr Asn Ala Thr Asn Asn Gln Ser Thr Gln Val Ser Gln Ala
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Thr Ser Gln Pro Ile Asn Phe Gln Val Gln Lys Asp Gly Ser Ser Glu
 65 70 75 80

Lys Ser His Met Asp Asp Tyr Met Gln His Pro Gly Lys Val Ile Lys
 85 90 95

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Gln Asn Asn Lys Tyr Tyr Phe Gln Thr Val Leu Asn Asn Ala Ser Phe
100 105 110

Trp Lys Glu Tyr Lys Phe Tyr Asn Ala Asn Asn Gln Glu Leu Ala Thr
115 120 125

Thr Val Val Asn Asp Asn Lys Lys Ala Asp Thr Arg Thr Ile Asn Val
130 135 140

Ala Val Glu Pro Gly Tyr Lys Ser Leu Thr Thr Lys Val His Ile Val
145 150 155 160

Val Pro Gln Ile Asn Tyr Asn His Arg Tyr Thr Thr His Leu Glu Phe
165 170 175

Glu Lys Ala Ile Pro Thr Leu Ala Asp Ala Ala Lys Pro Asn Asn Val
180 185 190

Lys Pro Val Gln Pro Lys Pro Ala Gln Pro Lys Thr Pro Thr Glu Gln
195 200 205

Thr Lys Pro Val Gln Pro Lys Val Glu Lys Val Lys Pro Thr Val Thr
210 215 220

Thr Thr Ser Lys Val Glu Asp Asn His Ser Thr Lys Val Val Ser Thr
225 230 235 240

Asp Thr Thr Lys Asp Gln Thr Lys Thr Gln Thr Ala His Thr Val Lys
245 250 255

Thr Ala Gln Thr Ala Gln Glu Gln Asn Lys Val Gln Thr Pro Val Lys
260 265 270

Asp Val Ala Thr Ala Lys Ser Glu Ser Asn Asn Gln Ala Val Ser Asp
275 280 285

Asn Lys Ser Gln Gln Thr Asn Lys Val Thr Lys His Asn Glu Thr Pro
290 295 300

Lys Gln Ala Ser Lys Ala Lys Glu Leu Pro Lys Thr Gly Leu Thr Ser
305 310 315 320

Val Asp Asn Phe Ile Ser Thr Val Ala Phe Ala Thr Leu Ala Leu Leu
325 330 335

Gly Ser Leu Ser Leu Leu Leu Phe Lys Arg Lys Glu Ser Lys
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<210> 16
<211> 645
<212> PRT

<213> Staphylococcus sp.

<400> 16

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 20 25 30

Met Ser Asn Gly Glu Ala Gln Ala Ala Ala Glu Glu Thr Gly Gly Thr
 35 40 45

Asn Thr Glu Ala Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr Thr
 50 55 60

Thr Ser Glu Lys Ala Pro Glu Thr Lys Pro Val Ala Asn Ala Val Ser
 65 70 75 80

Val Ser Asn Lys Glu Val Glu Ala Pro Thr Ser Glu Thr Lys Glu Ala
 85 90 95

Lys Glu Val Lys Glu Val Lys Ala Pro Lys Glu Thr Lys Ala Val Lys
 100 105 110

Pro Ala Ala Lys Ala Thr Asn Asn Thr Tyr Pro Ile Leu Asn Gln Glu
 115 120 125

Leu Arg Glu Ala Ile Lys Asn Pro Ala Ile Lys Asp Lys Asp His Ser
 130 135 140

Ala Pro Asn Ser Arg Pro Ile Asp Phe Glu Met Lys Lys Glu Asn Gly
 145 150 155 160

Glu Gln Gln Phe Tyr His Tyr Ala Ser Ser Val Lys Pro Ala Arg Val
 165 170 175

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

Gln Phe Trp Arg Lys Phe Glu Val Tyr Glu Gly Asp Lys Lys Leu Pro
 195 200 205

Ile Lys Leu Val Ser Tyr Asp Thr Val Lys Asp Tyr Ala Tyr Ile Arg
 210 215 220

Phe Ser Val Ser Asn Gly Thr Lys Ala Val Lys Ile Val Ser Ser Thr
 225 230 235 240

His Phe Asn Asn Lys Glu Glu Lys Tyr Asp Tyr Thr Leu Met Glu Phe
 245 250 255

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Ala Gln Pro Ile Tyr Asn Ser Ala Asp Lys Phe Lys Thr Glu Glu Asp
 260 265 270
 Tyr Lys Ala Glu Lys Leu Leu Ala Pro Tyr Lys Lys Ala Lys Thr Leu
 275 280 285
 Glu Arg Gln Val Tyr Glu Leu Asn Lys Ile Gln Asp Lys Leu Pro Glu
 290 295 300
 Lys Leu Lys Ala Glu Tyr Lys Lys Lys Leu Glu Asp Thr Lys Lys Ala
 305 310 315 320
 Leu Asp Glu Gln Val Lys Ser Ala Ile Thr Glu Phe Gln Asn Val Gln
 325 330 335
 Pro Thr Asn Glu Lys Met Thr Asp Leu Gln Asp Thr Lys Tyr Val Val
 340 345 350
 Tyr Glu Ser Val Glu Asn Asn Glu Ser Met Met Asp Thr Phe Val Lys
 355 360 365
 His Pro Ile Lys Thr Gly Met Leu Asn Gly Lys Lys Tyr Met Val Met
 370 375 380
 Glu Thr Thr Asn Asp Asp Tyr Trp Lys Asp Phe Met Val Glu Gly Gln
 385 390 395 400
 Arg Val Arg Thr Ile Ser Lys Asp Ala Lys Asn Asn Thr Arg Thr Ile
 405 410 415
 Ile Phe Pro Tyr Val Glu Gly Lys Thr Leu Tyr Asp Ala Ile Val Lys
 420 425 430
 Val His Val Lys Thr Ile Asp Tyr Asp Gly Gln Tyr His Val Arg Ile
 435 440 445
 Val Asp Lys Glu Ala Phe Thr Lys Ala Asn Thr Asp Lys Ser Asn Lys
 450 455 460
 Lys Glu Gln Gln Asp Asn Ser Ala Lys Lys Glu Ala Thr Pro Ala Thr
 465 470 475 480
 Pro Ser Lys Pro Thr Pro Ser Pro Val Glu Lys Glu Ser Gln Lys Gln
 485 490 495
 Asp Ser Gln Lys Asp Asp Asn Lys Gln Leu Pro Ser Val Glu Lys Glu
 500 505 510
 Asn Asp Ala Ser Ser Glu Ser Gly Lys Asp Lys Thr Pro Ala Thr Lys
 515 520 525

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Pro Thr Lys Gly Glu Val Glu Ser Ser Ser Thr Thr Pro Thr Lys Val
530 535 540

Val Ser Thr Thr Gln Asn Val Ala Lys Pro Thr Thr Ala Ser Ser Lys
545 550 555 560

Thr Thr Lys Asp Val Val Gln Thr Ser Ala Gly Ser Ser Glu Ala Lys
565 570 575

Asp Ser Ala Pro Leu Gln Lys Ala Asn Ile Lys Asn Thr Asn Asp Gly
580 585 590

His Thr Gln Ser Gln Asn Asn Lys Asn Thr Gln Glu Asn Lys Ala Lys
595 600 605

Ser Leu Pro Gln Thr Gly Glu Glu Ser Asn Lys Asp Met Thr Leu Pro
610 615 620

Leu Met Ala Leu Leu Ala Leu Ser Ser Ile Val Ala Phe Val Leu Pro
625 630 635 640

Arg Lys Arg Lys Asn
645

<210> 17
<211> 80
<212> PRT
<213> Staphylococcus sp.

<400> 17

Met Asn Gln His Val Lys Val Thr Phe Asp Phe Thr Asn Tyr Asn Tyr
1 5 10 15

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

Ile Ala Leu Val Leu Asp Ser Leu Asp Ile Ser Ile Phe Asp Val Asn
35 40 45

Thr Gln Ile Lys Val Met Thr Lys Gly Gln Leu Leu Val Glu Asn Asp
50 55 60

Arg Leu Ile Asp Tyr Gln Ile Ala Asp Gly Asp Ile Leu Lys Leu Leu
65 70 75 80

<210> 18
<211> 877
<212> PRT
<213> Staphylococcus sp.

<400> 18

Met Lys Lys Arg Ile Asp Tyr Leu Ser Asn Lys Gln Asn Lys Tyr Ser
1 5 10 15

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Ile Arg Arg Phe Thr Val Gly Thr Thr Ser Val Ile Val Gly Ala Thr
 20 25 30
 Ile Leu Phe Gly Ile Gly Asn His Gln Ala Gln Ala Ser Glu Gln Ser
 35 40 45
 Asn Asp Thr Thr Gln Ser Ser Lys Asn Asn Ala Ser Ala Asp Ser Glu
 50 55 60
 Lys Asn Asn Met Ile Glu Thr Pro Gln Leu Asn Thr Thr Ala Asn Asp
 65 70 75 80
 Thr Ser Asp Ile Ser Ala Asn Thr Asn Ser Ala Asn Val Asp Ser Thr
 85 90 95
 Thr Lys Pro Met Ser Thr Gln Thr Ser Asn Thr Thr Thr Thr Glu Pro
 100 105 110
 Ala Ser Thr Asn Glu Thr Pro Gln Pro Thr Ala Ile Lys Asn Gln Ala
 115 120 125
 Thr Ala Ala Lys Met Gln Asp Gln Thr Val Pro Gln Glu Ala Asn Ser
 130 135 140
 Gln Val Asp Asn Lys Thr Thr Asn Asp Ala Asn Ser Ile Ala Thr Asn
 145 150 155 160
 Ser Glu Leu Lys Asn Ser Gln Thr Leu Asp Leu Pro Gln Ser Ser Pro
 165 170 175
 Gln Thr Ile Ser Asn Ala Gln Gly Thr Ser Lys Pro Ser Val Arg Thr
 180 185 190
 Arg Ala Val Arg Ser Leu Ala Val Ala Glu Pro Val Val Asn Ala Ala
 195 200 205
 Asp Ala Lys Gly Thr Asn Val Asn Asp Lys Val Thr Ala Ser Asn Phe
 210 215 220
 Lys Leu Glu Lys Thr Thr Phe Asp Pro Asn Gln Ser Gly Asn Thr Phe
 225 230 235 240
 Met Ala Ala Asn Phe Thr Val Thr Asp Lys Val Lys Ser Gly Asp Tyr
 245 250 255
 Phe Thr Ala Lys Leu Pro Asp Ser Leu Thr Gly Asn Gly Asp Val Asp
 260 265 270
 Tyr Ser Asn Ser Asn Asn Thr Met Pro Ile Ala Asp Ile Lys Ser Thr
 275 280 285

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Asn Gly Asp Val Val Ala Lys Ala Thr Tyr Asp Ile Leu Thr Lys Thr
 290 295 300
 Tyr Thr Phe Val Phe Thr Asp Tyr Val Asn Asn Lys Glu Asn Ile Asn
 305 310 315 320
 Gly Gln Phe Ser Leu Pro Leu Phe Thr Asp Arg Ala Lys Ala Pro Lys
 325 330 335
 Ser Gly Thr Tyr Asp Ala Asn Ile Asn Ile Ala Asp Glu Met Phe Asn
 340 345 350
 Asn Lys Ile Thr Tyr Asn Tyr Ser Ser Pro Ile Ala Gly Ile Asp Lys
 355 360 365
 Pro Asn Gly Ala Asn Ile Ser Ser Gln Ile Ile Gly Val Asp Thr Ala
 370 375 380
 Ser Gly Gln Asn Thr Tyr Lys Gln Thr Val Phe Val Asn Pro Lys Gln
 385 390 395 400
 Arg Val Leu Gly Asn Thr Trp Val Tyr Ile Lys Gly Tyr Gln Asp Lys
 405 410 415
 Ile Glu Glu Ser Ser Gly Lys Val Ser Ala Thr Asp Thr Lys Leu Arg
 420 425 430
 Ile Phe Glu Val Asn Asp Thr Ser Lys Leu Ser Asp Ser Tyr Tyr Ala
 435 440 445
 Asp Pro Asn Asp Ser Asn Leu Lys Glu Val Thr Asp Gln Phe Lys Asn
 450 455 460
 Arg Ile Tyr Tyr Glu His Pro Asn Val Ala Ser Ile Lys Phe Gly Asp
 465 470 475 480
 Ile Thr Lys Thr Tyr Val Val Leu Val Glu Gly His Tyr Asp Asn Thr
 485 490 495
 Gly Lys Asn Leu Lys Thr Gln Val Ile Gln Glu Asn Val Asp Pro Val
 500 505 510
 Thr Asn Arg Asp Tyr Ser Ile Phe Gly Trp Asn Asn Glu Asn Val Val
 515 520 525
 Arg Tyr Gly Gly Gly Ser Ala Asp Gly Asp Ser Ala Val Asn Pro Lys
 530 535 540
 Asp Pro Thr Pro Gly Pro Pro Val Asp Pro Glu Pro Ser Pro Asp Pro
 545 550 555 560

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Glu Pro Glu Pro Thr Pro Asp Pro Glu Pro Ser Pro Asp Pro Glu Pro
 565 570 575
 Glu Pro Ser Pro Asp Pro Asp Pro Asp Ser Asp Ser Asp Ser Asp Ser
 580 585 590
 Gly Ser Asp Ser Asp Ser Gly Ser Asp Ser Asp Ser Glu Ser Asp Ser
 595 600 605
 Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Glu Ser
 610 615 620
 Asp Ser Asp Ser Glu Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
 625 630 635 640
 Asp Ser Asp Ser Asp Ser Glu Ser Asp Ser Asp Ser Asp Ser Asp Ser
 645 650 655
 Asp Ser Asp Ser Asp Ser Asp Ser Glu Ser Asp Ser Asp Ser Glu Ser
 660 665 670
 Asp Ser Glu Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
 675 680 685
 Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
 690 695 700
 Asp Ser Asp Ser Asp Ser Asp Ser Glu Ser Asp Ser Asp Ser Asp Ser
 705 710 715 720
 Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
 725 730 735
 Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
 740 745 750
 Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
 755 760 765
 Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
 770 775 780
 Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
 785 790 795 800
 Asp Ser Asp Ser Arg Val Thr Pro Pro Asn Asn Glu Gln Lys Ala Pro
 805 810 815
 Ser Asn Pro Lys Gly Glu Val Asn His Ser Asn Lys Val Ser Lys Gln
 820 825 830

His Lys Thr Asp Ala Leu Pro Glu Thr Gly Asp Lys Ser Glu Asn Thr
835 840 845

Asn Ala Thr Leu Phe Gly Ala Met Met Ala Leu Leu Gly Ser Leu Leu
850 855 860

Leu Phe Arg Lys Arg Lys Gln Asp His Lys Glu Lys Ala
865 870 875

<210> 19
<211> 227
<212> PRT
<213> Staphylococcus sp.

<400> 19

Met Lys Asn Ile Leu Lys Val Phe Asn Thr Thr Ile Leu Ala Leu Ile
1 5 10 15

Ile Ile Ile Ala Thr Phe Ser Asn Ser Ala Asn Ala Ala Asp Ser Gly
20 25 30

Thr Leu Asn Tyr Glu Val Tyr Lys Tyr Asn Thr Asn Asp Thr Ser Ile
35 40 45

Ala Asn Asp Tyr Phe Asn Lys Pro Ala Lys Tyr Ile Lys Lys Asn Gly
50 55 60

Lys Leu Tyr Val Gln Ile Thr Val Asn His Ser His Trp Ile Thr Gly
65 70 75 80

Met Ser Ile Glu Gly His Lys Glu Asn Ile Ile Ser Lys Asn Thr Ala
85 90 95

Lys Asp Glu Arg Thr Ser Glu Phe Glu Val Ser Lys Leu Asn Gly Lys
100 105 110

Ile Asp Gly Lys Ile Asp Val Tyr Ile Asp Glu Lys Val Asn Gly Lys
115 120 125

Pro Phe Lys Tyr Asp His His Tyr Asn Ile Thr Tyr Lys Phe Asn Gly
130 135 140

Pro Thr Asp Val Ala Gly Ala Asn Ala Pro Gly Lys Asp Asp Lys Asn
145 150 155 160

Ser Ala Ser Gly Ser Asp Lys Gly Ser Asp Gly Thr Thr Thr Gly Gln
165 170 175

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

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Asn Ala Gly Thr Pro Ala Tyr Ile Tyr Ala Ile Pro Val Ala Ser Leu
 195 200 205

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

Asn Val Glu
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<210> 20
 <211> 635
 <212> PRT
 <213> Staphylococcus sp.

<400> 20

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Cys Ser Thr Met Met Ala Ser Ser Ile Ile Leu Thr Asn Ile Leu Pro
 20 25 30

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

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

Gln Ile Glu Gln Leu Lys Gln Leu Ser Ala Ser Ser Lys Ala His Tyr
 65 70 75 80

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

Ile Lys Arg Ala Asn Glu Leu Asp Ser Lys Glu Asn Lys Ser Ser His
 100 105 110

Thr Glu Met Asn Gly Gln Ser Asp Ile Asp Ser Lys Leu Asp Gln Leu
 115 120 125

Leu Lys Asp Leu Asn Glu Val Ser Ser Asn Val Asp Arg Gly Gln Gln
 130 135 140

Ser Gly Glu Asp Asp Leu Asn Ala Met Lys Asn Asp Met Ser Gln Thr
 145 150 155 160

Ala Thr Thr Lys Tyr Gly Glu Lys Asp Asp Lys Asn Asp Glu Ala Met
 165 170 175

Val Asn Lys Ala Leu Glu Asp Leu Asp His Leu Asn Gln Gln Ile His
 180 185 190

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Lys Ser Lys Asp Ala Leu Lys Asp Ala Ser Lys Asp Pro Ala Val Ser
 195 200 205
 Thr Thr Asp Ser Asn His Glu Val Ala Lys Thr Pro Asn Asn Asp Gly
 210 215 220
 Ser Gly His Val Val Leu Asn Lys Phe Leu Ser Asn Glu Glu Asn Gln
 225 230 235 240
 Ser His Ser Asn Gln Leu Thr Asp Lys Leu Gln Gly Ser Asp Lys Ile
 245 250 255
 Asn His Ala Met Ile Glu Lys Leu Ala Lys Ser Asn Ala Ser Thr Gln
 260 265 270
 His Tyr Thr Tyr His Lys Leu Asn Thr Leu Gln Ser Leu Asp Gln Arg
 275 280 285
 Ile Ala Asn Thr Gln Leu Pro Lys Asn Gln Lys Ser Asp Leu Met Ser
 290 295 300
 Glu Val Asn Lys Thr Lys Glu Arg Ile Lys Ser Gln Arg Asn Ile Ile
 305 310 315 320
 Leu Glu Glu Leu Ala Arg Thr Asp Asp Lys Lys Tyr Ala Thr Gln Ser
 325 330 335
 Ile Leu Glu Ser Ile Phe Asn Lys Asp Glu Ala Asp Lys Ile Leu Lys
 340 345 350
 Asp Ile Arg Val Asp Gly Lys Thr Asp Gln Gln Ile Ala Asp Gln Ile
 355 360 365
 Thr Arg His Ile Asp Gln Leu Ser Leu Thr Thr Ser Asp Asp Leu Leu
 370 375 380
 Thr Ser Leu Ile Asp Gln Ser Gln Asp Lys Ser Leu Leu Ile Ser Gln
 385 390 395 400
 Ile Leu Gln Thr Lys Leu Gly Lys Ala Glu Ala Asp Lys Leu Ala Lys
 405 410 415
 Asp Trp Thr Asn Lys Gly Leu Ser Asn Arg Gln Ile Val Asp Gln Leu
 420 425 430
 Lys Lys His Phe Ala Ser Thr Gly Asp Thr Ser Ser Asp Asp Ile Leu
 435 440 445
 Lys Ala Ile Leu Asn Asn Ala Lys Asp Lys Lys Gln Ala Ile Glu Thr
 450 455 460

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Ile Leu Ala Thr Arg Ile Glu Arg Gln Lys Ala Lys Leu Leu Ala Asp
465 470 475 480

Leu Ile Thr Lys Ile Glu Thr Asp Gln Asn Lys Ile Phe Asn Leu Val
485 490 495

Lys Ser Ala Leu Asn Gly Lys Ala Asp Asp Leu Leu Asn Leu Gln Lys
500 505 510

Arg Leu Asn Gln Thr Lys Lys Asp Ile Asp Tyr Ile Leu Ser Pro Ile
515 520 525

Val Asn Arg Pro Ser Leu Leu Asp Arg Leu Asn Lys Asn Gly Lys Thr
530 535 540

Thr Asp Leu Asn Lys Leu Ala Asn Leu Met Asn Gln Gly Ser Asn Leu
545 550 555 560

Leu Asp Ser Ile Pro Asp Ile Pro Thr Pro Lys Pro Glu Lys Thr Leu
565 570 575

Thr Leu Gly Lys Gly Asn Gly Leu Leu Ser Gly Leu Leu Asn Ala Asp
580 585 590

Gly Asn Val Ser Leu Pro Lys Ala Gly Glu Thr Ile Lys Glu His Trp
595 600 605

Leu Pro Ile Ser Val Ile Val Gly Ala Met Gly Val Leu Met Ile Trp
610 615 620

Leu Ser Arg Arg Asn Lys Leu Lys Asn Lys Ala
625 630 635

<210> 21
<211> 953
<212> PRT
<213> Staphylococcus sp.

<400> 21

Met Asn Asn Lys Lys Thr Ala Thr Asn Arg Lys Gly Met Ile Pro Asn
1 5 10 15

Arg Leu Asn Lys Phe Ser Ile Arg Lys Tyr Ser Val Gly Thr Ala Ser
20 25 30

Ile Leu Val Gly Thr Thr Leu Ile Phe Gly Leu Ser Gly His Glu Ala
35 40 45

Lys Ala Ala Glu His Thr Asn Gly Glu Leu Asn Gln Ser Lys Asn Glu
50 55 60

Thr Thr Ala Pro Ser Glu Asn Lys Thr Thr Glu Lys Val Asp Ser Arg
Page 29

65 70 75 80
 Gln Leu Lys Asp Asn Thr Gln Thr Ala Thr Ala Asp Gln Pro Lys Val
 85 90 95
 Thr Met Ser Asp Ser Ala Thr Val Lys Glu Thr Ser Ser Asn Met Gln
 100 105 110
 Ser Pro Gln Asn Ala Thr Ala Ser Gln Ser Thr Thr Gln Thr Ser Asn
 115 120 125
 Val Thr Thr Asn Asp Lys Ser Ser Thr Thr Tyr Ser Asn Glu Thr Asp
 130 135 140
 Lys Ser Asn Leu Thr Gln Ala Lys Asn Val Ser Thr Thr Pro Lys Thr
 145 150 155 160
 Thr Thr Ile Lys Gln Arg Ala Leu Asn Arg Met Ala Val Asn Thr Val
 165 170 175
 Ala Ala Pro Gln Gln Gly Thr Asn Val Asn Asp Lys Val His Phe Thr
 180 185 190
 Asn Ile Asp Ile Ala Ile Asp Lys Gly His Val Asn Lys Thr Thr Gly
 195 200 205
 Asn Thr Glu Phe Trp Ala Thr Ser Ser Asp Val Leu Lys Leu Lys Ala
 210 215 220
 Asn Tyr Thr Ile Asp Asp Ser Val Lys Glu Gly Asp Thr Phe Thr Phe
 225 230 235 240
 Lys Tyr Gly Gln Tyr Phe Arg Pro Gly Ser Val Arg Leu Pro Ser Gln
 245 250 255
 Thr Gln Asn Leu Tyr Asn Ala Gln Gly Asn Ile Ile Ala Lys Gly Ile
 260 265 270
 Tyr Asp Ser Lys Thr Asn Thr Thr Thr Tyr Thr Phe Thr Asn Tyr Val
 275 280 285
 Asp Gln Tyr Thr Asn Val Ser Gly Ser Phe Glu Gln Val Ala Phe Ala
 290 295 300
 Lys Arg Glu Asn Ala Thr Thr Asp Lys Thr Ala Tyr Lys Met Glu Val
 305 310 315 320
 Thr Leu Gly Asn Asp Thr Tyr Ser Lys Asp Val Ile Val Asp Tyr Gly
 325 330 335
 Asn Gln Lys Gly Gln Gln Leu Ile Ser Ser Thr Asn Tyr Ile Asn Asn

340

345

350

Glu Asp Leu Ser Arg Asn Met Thr Val Tyr Val Asn Gln Pro Lys Lys
 355 360 365

Thr Tyr Thr Lys Glu Thr Phe Val Thr Asn Leu Thr Gly Tyr Lys Phe
 370 375 380

Asn Pro Asp Ala Lys Asn Phe Lys Ile Tyr Glu Val Thr Asp Gln Asn
 385 390 395 400

Gln Phe Val Asp Ser Phe Thr Pro Asp Thr Ser Lys Leu Lys Asp Val
 405 410 415

Thr Gly Gln Phe Asp Val Ile Tyr Ser Asn Asp Asn Lys Thr Ala Thr
 420 425 430

Val Asp Leu Leu Asn Gly Gln Ser Ser Ser Asp Lys Gln Tyr Ile Ile
 435 440 445

Gln Gln Val Ala Tyr Pro Asp Asn Ser Ser Thr Asp Asn Gly Lys Ile
 450 455 460

Asp Tyr Thr Leu Glu Thr Gln Asn Gly Lys Ser Ser Trp Ser Asn Ser
 465 470 475 480

Tyr Ser Asn Val Asn Gly Ser Ser Thr Ala Asn Gly Asp Gln Lys Lys
 485 490 495

Tyr Asn Leu Gly Asp Tyr Val Trp Glu Asp Thr Asn Lys Asp Gly Lys
 500 505 510

Gln Asp Ala Asn Glu Lys Gly Ile Lys Gly Val Tyr Val Ile Leu Lys
 515 520 525

Asp Ser Asn Gly Lys Glu Leu Asp Arg Thr Thr Thr Asp Glu Asn Gly
 530 535 540

Lys Tyr Gln Phe Thr Gly Leu Ser Asn Gly Thr Tyr Ser Val Glu Phe
 545 550 555 560

Ser Thr Pro Ala Gly Tyr Thr Pro Thr Thr Ala Asn Ala Gly Thr Asp
 565 570 575

Asp Ala Val Asp Ser Asp Gly Leu Thr Thr Thr Gly Val Ile Lys Asp
 580 585 590

Ala Asp Asn Met Thr Leu Asp Ser Gly Phe Tyr Lys Thr Pro Lys Tyr
 595 600 605

Ser Leu Gly Asp Tyr Val Trp Tyr Asp Ser Asn Lys Asp Gly Lys Gln
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610

615

Asp Ser Thr Glu Lys Gly Ile Lys Gly Val Lys Val Thr Leu Gln Asn
625 630 635 640

Glu Lys Gly Glu Val Ile Gly Thr Thr Glu Thr Asp Glu Asn Gly Lys
645 650 655

Tyr Arg Phe Asp Asn Leu Asp Ser Gly Lys Tyr Lys Val Ile Phe Glu
660 665 670

Lys Pro Ala Gly Leu Thr Gln Thr Gly Thr Asn Thr Thr Glu Asp Asp
675 680 685

Lys Asp Ala Asp Gly Gly Glu Val Asp Val Thr Ile Thr Asp His Asp
690 695 700

Asp Phe Thr Leu Asp Asn Gly Tyr Tyr Glu Glu Glu Thr Ser Asp Ser
705 710 715 720

Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
725 730 735

Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
740 745 750

Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
755 760 765

Asp Ser Asp Ser Glu Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
770 775 780

Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
785 790 795 800

Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
805 810 815

Asp Ser Asp Ser Asp Ser Asp Asn Asp Ser Asp Ser Asp Ser Asp Ser
820 825 830

Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
835 840 845

Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
850 855 860

Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
865 870 875 880

Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
Ala Gly Lys

His Thr Pro Thr Lys Pro Met Ser Thr Val Lys Asp Gln His Lys Thr
900 905 910

Ala Lys Ala Leu Pro Glu Thr Gly Ser Glu Asn Asn Asn Ser Asn Asn
915 920 925

Gly Thr Leu Phe Gly Gly Leu Phe Ala Ala Leu Gly Ser Leu Leu Leu
930 935 940

Phe Gly Arg Arg Lys Lys Gln Asn Lys
945 950

<210> 22
<211> 989
<212> PRT
<213> Staphylococcus sp.

<400> 22

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35 40 45

Ser Ala Ser Asn Glu Ser Lys Ser Asn Asp Ser Ser Ser Val Ser Ala
50 55 60

Ala Pro Lys Thr Asp Asp Thr Asn Val Ser Asp Thr Lys Thr Ser Ser
65 70 75 80

Asn Thr Asn Asn Gly Glu Thr Ser Val Ala Gln Asn Pro Ala Gln Gln
85 90 95

Glu Thr Thr Gln Ser Ser Ser Thr Asn Ala Thr Thr Glu Glu Thr Pro
100 105 110

Val Thr Gly Glu Ala Thr Thr Thr Thr Thr Asn Gln Ala Asn Thr Pro
115 120 125

Ala Thr Thr Gln Ser Ser Asn Thr Asn Ala Glu Glu Leu Val Asn Gln
130 135 140

Thr Ser Asn Glu Thr Thr Ser Asn Asp Thr Asn Thr Val Ser Ser Val
145 150 155 160

Asn Ser Pro Gln Asn Ser Thr Asn Ala Glu Asn Val Ser Thr Thr Gln
165 170 175

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Asp Thr Ser Thr Glu Ala Thr Pro Ser Asn Asn Glu Ser Ala Pro Gln
 180 185 190
 Asn Thr Asp Ala Ser Asn Lys Asp Val Val Ser Gln Ala Val Asn Pro
 195 200 205
 Ser Thr Pro Arg Met Arg Ala Phe Ser Leu Ala Ala Val Ala Ala Asp
 210 215 220
 Ala Pro Ala Ala Gly Thr Asp Ile Thr Asn Gln Leu Thr Asp Val Lys
 225 230 235 240
 Val Thr Ile Asp Ser Gly Thr Thr Val Tyr Pro His Gln Ala Gly Tyr
 245 250 255
 Val Lys Leu Asn Tyr Gly Phe Ser Val Pro Asn Ser Ala Val Lys Gly
 260 265 270
 Asp Thr Phe Lys Ile Thr Val Pro Lys Glu Leu Asn Leu Asn Gly Val
 275 280 285
 Thr Ser Thr Ala Lys Val Pro Pro Ile Met Ala Gly Asp Gln Val Leu
 290 295 300
 Ala Asn Gly Val Ile Asp Ser Asp Gly Asn Val Ile Tyr Thr Phe Thr
 305 310 315 320
 Asp Tyr Val Asp Asn Lys Glu Asn Val Thr Ala Asn Ile Thr Met Pro
 325 330 335
 Ala Tyr Ile Asp Pro Glu Asn Val Thr Lys Thr Gly Asn Val Thr Leu
 340 345 350
 Thr Thr Gly Ile Gly Thr Asn Thr Ala Ser Lys Thr Val Leu Ile Asp
 355 360 365
 Tyr Glu Lys Tyr Gly Gln Phe His Asn Leu Ser Ile Lys Gly Thr Ile
 370 375 380
 Asp Gln Ile Asp Lys Thr Asn Asn Thr Tyr Arg Gln Thr Ile Tyr Val
 385 390 395 400
 Asn Pro Ser Gly Asp Asn Val Val Leu Pro Ala Leu Thr Gly Asn Leu
 405 410 415
 Ile Pro Asn Thr Lys Ser Asn Ala Leu Ile Asp Ala Lys Asn Thr Asp
 420 425 430
 Ile Lys Val Tyr Arg Val Asp Asn Ala Asn Asp Leu Ser Glu Ser Tyr
 435 440 445

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Tyr Val Asn Pro Ser Asp Phe Glu Asp Val Thr Asn Gln Val Arg Ile
 450 455 460
 Ser Phe Pro Asn Ala Asn Gln Tyr Lys Val Glu Phe Pro Thr Asp Asp
 465 470 475 480
 Asp Gln Ile Thr Thr Pro Tyr Ile Val Val Val Asn Gly His Ile Asp
 485 490 495
 Pro Ala Ser Thr Gly Asp Leu Ala Leu Arg Ser Thr Phe Tyr Gly Tyr
 500 505 510
 Asp Ser Asn Phe Ile Trp Arg Ser Met Ser Trp Asp Asn Glu Val Ala
 515 520 525
 Phe Asn Asn Gly Ser Gly Ser Gly Asp Gly Ile Asp Lys Pro Val Val
 530 535 540
 Pro Glu Gln Pro Asp Glu Pro Gly Glu Ile Glu Pro Ile Pro Glu Asp
 545 550 555 560
 Ser Asp Ser Asp Pro Gly Ser Asp Ser Gly Ser Asp Ser Asn Ser Asp
 565 570 575
 Ser Gly Ser Asp Ser Gly Ser Asp Ser Thr Ser Asp Ser Gly Ser Asp
 580 585 590
 Ser Ala Ser Asp Ser Asp Ser Ala Ser Asp Ser Asp Ser Ala Ser Asp
 595 600 605
 Ser Asp Ser Ala Ser Asp Ser Asp Ser Ala Ser Asp Ser Asp Ser Ala
 610 615 620
 Ser Asp Ser Asp Ser Ala Ser Asp Ser Asp Ser Ala Ser Asp Ser Asp
 625 630 635 640
 Ser Ala Ser Asp Ser Asp Ser Ala Ser Asp Ser Asp Ser Ala Ser Asp
 645 650 655
 Ser Asp Ser Ala Ser Asp Ser Asp Ser Ala Ser Asp Ser Asp Ser Asp
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 675 680 685
 Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp
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 Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp
 705 710 715 720

ARCDP0482W02

Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp

Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp

Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp

Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp
770 775 780

Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp
785 790 795 800

Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp
805 810 815

Ser Asp Ser Asp Ser Ala Ser Asp Ser Asp Ser Asp Ser Asp Ser Glu
820 825 830

Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp

Ser Asp Ser Asp Ser Asp Ser Glu Ser Asp Ser Asp Ser Asp Ser Asp
850 855 860

Ser 865 Asp Ser Glu Ser 870 Asp Ser Asp Ser Asp 875 Ser Asp Ser Asp Ser 880

Ser Ala Ser Asp Ser Asp Ser Gly Ser Asp Ser Asp Ser Ser Ser Asp
885 890 895

Ser Asp Ser Asp Ser Thr Ser Asp Thr Gly Ser Asp Asn Asp Ser Asp
900 905 910

Ser Asp Ser Asn Ser Asp Ser Glu Ser Gly Ser Asn Asn Asn Val Val
915 920 925

Pro 930 Pro Asn Ser Pro Lys Asn 935 Gly Thr Asn Ala Ser 940 Asn Lys Asn Glu

Ala Lys Asp Ser Lys Glu Pro Leu Pro Asp Thr Gly Ser Glu Asp Glu
945 950 955 960

Ala Asn Thr Ser Leu Ile Trp Gly Leu Leu Ala Ser Leu Gly Ser Leu
965 970 975

Leu Leu Phe Arg Arg Lys Lys Glu Asn Lys Asp Lys Lys
980 985

<210> 23
 <211> 584
 <212> PRT
 <213> Staphylococcus sp.

<400> 23

Met Lys Phe Lys Ser Leu Ile Thr Thr Thr Leu Ala Leu Gly Val Leu
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Ala Ser Thr Gly Ala Asn Phe Asn Asn Asn Glu Ala Ser Ala Ala Ala
 20 25 30

Lys Pro Leu Asp Lys Ser Ser Ser Ser Leu His His Gly Tyr Ser Lys
 35 40 45

Val His Val Pro Tyr Ala Ile Thr Val Asn Gly Thr Ser Gln Asn Ile
 50 55 60

Leu Ser Ser Leu Thr Phe Asn Lys Asn Gln Asn Ile Ser Tyr Lys Asp
 65 70 75 80

Leu Glu Asp Arg Val Lys Ser Val Leu Lys Ser Asp Arg Gly Ile Ser
 85 90 95

Asp Ile Asp Leu Arg Leu Ser Lys Gln Ala Lys Tyr Thr Val Tyr Phe
 100 105 110

Lys Asn Gly Thr Lys Lys Val Ile Asp Leu Lys Ala Gly Ile Tyr Thr
 115 120 125

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

Asp Thr Lys Lys Gln Val Glu Asp Lys Lys Lys Asp Lys Ala Asn Tyr
 145 150 155 160

Gln Val Pro Tyr Thr Ile Thr Val Asn Gly Thr Ser Gln Asn Ile Leu
 165 170 175

Ser Asn Leu Thr Phe Asn Lys Asn Gln Asn Ile Ser Tyr Lys Asp Leu
 180 185 190

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

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

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

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Asn Leu Ile Asn Ser Ser Asp Ile Lys Ser Ile Asn Ile Asn Val Asp
 245 250 255
 Thr Lys Lys His Ile Glu Asn Lys Ala Lys Arg Asn Tyr Gln Val Pro
 260 265 270
 Tyr Ser Ile Asn Leu Asn Gly Thr Ser Thr Asn Ile Leu Ser Asn Leu
 275 280 285
 Ser Phe Ser Asn Lys Pro Trp Thr Asn Tyr Lys Asn Leu Thr Ser Gln
 290 295 300
 Ile Lys Ser Val Leu Lys His Asp Arg Gly Ile Ser Glu Gln Asp Leu
 305 310 315 320
 Lys Tyr Ala Lys Lys Ala Tyr Tyr Thr Val Tyr Phe Lys Asn Gly Gly
 325 330 335
 Lys Arg Ile Leu Gln Leu Asn Ser Lys Asn Tyr Thr Ala Asn Leu Val
 340 345 350
 His Ala Lys Asp Val Lys Arg Ile Glu Ile Thr Val Lys Thr Gly Thr
 355 360 365
 Lys Ala Lys Ala Asp Arg Tyr Val Pro Tyr Thr Ile Ala Val Asn Gly
 370 375 380
 Thr Ser Thr Pro Ile Leu Ser Asp Leu Lys Phe Thr Gly Asp Pro Arg
 385 390 395 400
 Val Gly Tyr Lys Asp Ile Ser Lys Lys Val Lys Ser Val Leu Lys His
 405 410 415
 Asp Arg Gly Ile Gly Glu Arg Glu Leu Lys Tyr Ala Lys Lys Ala Thr
 420 425 430
 Tyr Thr Val His Phe Lys Asn Gly Thr Lys Lys Val Ile Asn Ile Asn
 435 440 445
 Ser Asn Ile Ser Gln Leu Asn Leu Leu Tyr Val Gln Asp Ile Lys Lys
 450 455 460
 Ile Asp Ile Asp Val Lys Thr Gly Thr Lys Ala Lys Ala Asp Ser Tyr
 465 470 475 480
 Val Pro Tyr Thr Ile Ala Val Asn Gly Thr Ser Thr Pro Ile Leu Ser
 485 490 495
 Lys Leu Lys Ile Ser Asn Lys Gln Leu Ile Ser Tyr Lys Tyr Leu Asn
 500 505 510

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Asp Lys Val Lys Ser Val Leu Lys Ser Glu Arg Gly Ile Ser Asp Leu
 515 520 525

Asp Leu Lys Phe Ala Lys Gln Ala Lys Tyr Thr Val Tyr Phe Lys Asn
 530 535 540

Gly Lys Lys Gln Val Val Asn Leu Lys Ser Asp Ile Phe Thr Pro Asn
 545 550 555 560

Leu Phe Ser Ala Lys Asp Ile Lys Lys Ile Asp Ile Asp Val Lys Gln
 565 570 575

Tyr Thr Lys Ser Lys Lys Asn Lys
 580

<210> 24
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 <212> PRT
 <213> Staphylococcus sp.

<400> 24

Met Asn Tyr Arg Asp Lys Ile Gln Lys Phe Ser Ile Arg Lys Tyr Thr
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Val Gly Thr Phe Ser Thr Val Ile Ala Thr Leu Val Phe Leu Gly Phe
 20 25 30

Asn Thr Ser Gln Ala His Ala Ala Glu Thr Asn Gln Pro Ala Ser Val
 35 40 45

Val Lys Gln Lys Gln Gln Ser Asn Asn Glu Gln Thr Glu Asn Arg Glu
 50 55 60

Ser Gln Val Gln Asn Ser Gln Asn Ser Gln Asn Gly Gln Ser Leu Ser
 65 70 75 80

Ala Thr His Glu Asn Glu Gln Pro Asn Ile Ser Gln Ala Asn Leu Val
 85 90 95

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

Ser Gln Asn Val Asn Thr Lys Lys Asp Ser Ala Thr Ala Ala Thr Thr
 115 120 125

Gln Pro Asp Lys Glu Gln Ser Lys His Lys Gln Asn Glu Ser Gln Ser
 130 135 140

Ala Asn Lys Asn Gly Asn Asp Asn Arg Ala Ala His Val Glu Asn His
 145 150 155 160

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Glu Ala Asn Val Val Thr Ala Ser Asp Ser Ser Asp Asn Gly Asn Val
 165 170 175

Gln His Asp Arg Asn Glu Leu Gln Ala Phe Phe Asp Ala Asn Tyr His
 180 185 190

Asp Tyr Arg Phe Ile Asp Arg Glu Asn Ala Asp Ser Gly Thr Phe Asn
 195 200 205

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

Asp Pro Ile Asn Asn Lys Asp Leu Gln Leu Ala Tyr Lys Glu Leu Glu
 225 230 235 240

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

Arg Arg Ser Asn Arg Ile Gln Thr Arg Ser Val Glu Ser Arg Ala Ala
 260 265 270

Glu Pro Arg Ser Val Ser Asp Tyr Gln Asn Ala Asn Ser Ser Tyr Tyr
 275 280 285

Val Glu Asn Ala Asn Asp Gly Ser Gly Tyr Pro Val Gly Thr Tyr Ile
 290 295 300

Asn Ala Ser Ser Lys Gly Ala Pro Tyr Asn Leu Pro Thr Thr Pro Trp
 305 310 315 320

Asn Thr Leu Lys Ala Ser Asp Ser Lys Glu Ile Ala Leu Met Thr Ala
 325 330 335

Lys Gln Thr Gly Asp Gly Tyr Gln Trp Val Ile Lys Phe Asn Lys Gly
 340 345 350

His Ala Pro His Gln Asn Met Ile Phe Trp Phe Ala Leu Pro Ala Asp
 355 360 365

Gln Val Pro Val Gly Arg Thr Asp Phe Val Thr Val Asn Ser Asp Gly
 370 375 380

Thr Asn Val Gln Trp Ser His Gly Ala Gly Ala Gly Ala Asn Lys Pro
 385 390 395 400

Leu Gln Gln Met Trp Glu Tyr Gly Val Asn Asp Pro His Arg Ser His
 405 410 415

Asp Phe Lys Ile Arg Asn Arg Ser Gly Gln Val Ile Tyr Asp Trp Pro
 420 425 430

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Thr Val His Ile Tyr Ser Leu Glu Asp Leu Ser Arg Ala Ser Asp Tyr
 435 440 445

Phe Ser Glu Ala Gly Ala Thr Pro Ala Thr Lys Ala Phe Gly Arg Gln
 450 455 460

Asn Phe Glu Tyr Ile Asn Gly Gln Lys Pro Ala Glu Ser Pro Gly Val
 465 470 475 480

Pro Lys Val Tyr Thr Phe Ile Gly Gln Gly Asp Ala Ser Tyr Thr Ile
 485 490 495

Ser Phe Lys Thr Gln Gly Pro Thr Val Asn Lys Leu Tyr Tyr Ala Ala
 500 505 510

Gly Gly Arg Ala Leu Glu Tyr Asn Gln Leu Phe Met Tyr Ser Gln Leu
 515 520 525

Tyr Val Glu Ser Thr Gln Asp His Gln Gln Arg Leu Asn Gly Leu Arg
 530 535 540

Gln Val Val Asn Arg Thr Tyr Arg Ile Gly Thr Thr Lys Arg Val Glu
 545 550 555 560

Val Ser Gln Gly Asn Val Gln Thr Lys Lys Val Leu Glu Ser Thr Asn
 565 570 575

Leu Asn Ile Asp Asp Phe Val Asp Asp Pro Leu Ser Tyr Val Lys Thr
 580 585 590

Pro Ser Asn Lys Val Leu Gly Phe Tyr Ser Asn Asn Ala Asn Thr Asn
 595 600 605

Ala Phe Arg Pro Gly Gly Ala Gln Gln Leu Asn Glu Tyr Gln Leu Ser
 610 615 620

Gln Leu Phe Thr Asp Gln Lys Leu Gln Glu Ala Ala Arg Thr Arg Asn
 625 630 635 640

Pro Ile Arg Leu Met Ile Gly Phe Asp Tyr Pro Asp Ala Tyr Gly Asn
 645 650 655

Ser Glu Thr Leu Val Pro Val Asn Leu Thr Val Leu Pro Glu Ile Gln
 660 665 670

His Asn Ile Lys Phe Phe Lys Asn Asp Asp Thr Gln Asn Ile Ala Glu
 675 680 685

Lys Pro Phe Ser Lys Gln Ala Gly His Pro Val Phe Tyr Val Tyr Ala
 690 695 700

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Gly Asn Gln Gly Asn Ala Ser Val Asn Leu Gly Gly Ser Val Thr Ser
 705 710 715 720
 Ile Gln Pro Leu Arg Ile Asn Leu Thr Ser Asn Glu Asn Phe Thr Asp
 725 730 735
 Lys Asp Trp Gln Ile Thr Gly Ile Pro Arg Thr Leu His Ile Glu Asn
 740 745 750
 Ser Thr Asn Arg Pro Asn Asn Ala Arg Glu Arg Asn Ile Glu Leu Val
 755 760 765
 Gly Asn Leu Leu Pro Gly Asp Tyr Phe Gly Thr Ile Arg Phe Gly Arg
 770 775 780
 Lys Glu Gln Leu Phe Glu Ile Arg Val Lys Pro His Thr Pro Thr Ile
 785 790 795 800
 Thr Thr Thr Ala Glu Gln Leu Arg Gly Thr Ala Leu Gln Lys Val Pro
 805 810 815
 Val Asn Ile Ser Gly Ile Pro Leu Asp Pro Ser Ala Leu Val Tyr Leu
 820 825 830
 Val Ala Pro Thr Asn Gln Thr Thr Asn Gly Gly Ser Glu Ala Asp Gln
 835 840 845
 Ile Pro Ser Gly Tyr Thr Ile Leu Ala Thr Gly Thr Pro Asp Gly Val
 850 855 860
 His Asn Thr Ile Thr Ile Arg Pro Gln Asp Tyr Val Val Phe Ile Pro
 865 870 875 880
 Pro Val Gly Lys Gln Ile Arg Ala Val Val Tyr Tyr Asn Lys Val Val
 885 890 895
 Ala Ser Asn Met Ser Asn Ala Val Thr Ile Leu Pro Asp Asp Ile Pro
 900 905 910
 Pro Thr Ile Asn Asn Pro Val Gly Ile Asn Ala Lys Tyr Tyr Arg Gly
 915 920 925
 Asp Glu Val Asn Phe Thr Met Gly Val Ser Asp Arg His Ser Gly Ile
 930 935 940
 Lys Asn Thr Thr Ile Thr Thr Leu Pro Asn Gly Trp Thr Ser Asn Leu
 945 950 955 960
 Thr Lys Ala Asp Lys Asn Asn Gly Ser Leu Ser Ile Thr Gly Arg Val
 965 970 975

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Ser Met Asn Gln Ala Phe Asn Ser Asp Ile Thr Phe Lys Val Ser Ala
 980 985 990

Thr Asp Asn Val Asn Asn Thr Thr Asn Asp Ser Gln Ser Lys His Val
 995 1000 1005

Ser Ile His Val Gly Lys Ile Ser Glu Asp Ala His Pro Ile Val
 1010 1015 1020

Leu Gly Asn Thr Glu Lys Val Val Val Val Asn Pro Thr Ala Val
 1025 1030 1035

Ser Asn Asp Glu Lys Gln Ser Ile Ile Thr Ala Phe Met Asn Lys
 1040 1045 1050

Asn Gln Asn Ile Arg Gly Tyr Leu Ala Ser Thr Asp Pro Val Thr
 1055 1060 1065

Val Asp Asn Asn Gly Asn Val Thr Leu His Tyr Arg Asp Gly Ser
 1070 1075 1080

Ser Thr Thr Leu Asp Ala Thr Asn Val Met Thr Tyr Glu Pro Val
 1085 1090 1095

Val Lys Pro Glu Tyr Gln Thr Val Asn Ala Ala Lys Thr Ala Thr
 1100 1105 1110

Val Thr Ile Ala Lys Gly Gln Ser Phe Ser Ile Gly Asp Ile Lys
 1115 1120 1125

Gln Tyr Phe Thr Leu Ser Asn Gly Gln Pro Ile Pro Ser Gly Thr
 1130 1135 1140

Phe Thr Asn Ile Thr Ser Asp Arg Thr Ile Pro Thr Ala Gln Glu
 1145 1150 1155

Val Ser Gln Met Asn Ala Gly Thr Gln Leu Tyr His Ile Thr Ala
 1160 1165 1170

Thr Asn Ala Tyr His Lys Asp Ser Glu Asp Phe Tyr Ile Ser Leu
 1175 1180 1185

Lys Ile Ile Asp Val Lys Gln Pro Glu Gly Asp Gln Arg Val Tyr
 1190 1195 1200

Arg Thr Ser Thr Tyr Asp Leu Thr Thr Asp Glu Ile Ser Lys Val
 1205 1210 1215

Lys Gln Ala Phe Ile Asn Ala Asn Arg Asp Val Ile Thr Leu Ala
 1220 1225 1230

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Glu Gly Asp Ile Ser Val Thr Asn Thr Pro Asn Gly Ala Asn Val
 1235 1240 1245
 Ser Thr Ile Thr Val Asn Ile Asn Lys Gly Arg Leu Thr Lys Ser
 1250 1255 1260
 Phe Ala Ser Asn Leu Ala Asn Met Asn Phe Leu Arg Trp Val Asn
 1265 1270 1275
 Phe Pro Gln Asp Tyr Thr Val Thr Trp Thr Asn Ala Lys Ile Ala
 1280 1285 1290
 Asn Arg Pro Thr Asp Gly Gly Leu Ser Trp Ser Asp Asp His Lys
 1295 1300 1305
 Ser Leu Ile Tyr Arg Tyr Asp Ala Thr Leu Gly Thr Gln Ile Thr
 1310 1315 1320
 Thr Asn Asp Ile Leu Thr Met Leu Lys Ala Thr Thr Thr Val Pro
 1325 1330 1335
 Gly Leu Arg Asn Asn Ile Thr Gly Asn Glu Lys Ser Gln Ala Glu
 1340 1345 1350
 Ala Gly Gly Arg Pro Asn Phe Arg Thr Thr Gly Tyr Ser Gln Ser
 1355 1360 1365
 Asn Ala Thr Thr Asp Gly Gln Arg Gln Phe Thr Leu Asn Gly Gln
 1370 1375 1380
 Val Ile Gln Val Leu Asp Ile Ile Asn Pro Ser Asn Gly Tyr Gly
 1385 1390 1395
 Gly Gln Pro Val Thr Asn Ser Asn Thr Arg Ala Asn His Ser Asn
 1400 1405 1410
 Ser Thr Val Val Asn Val Asn Glu Pro Ala Ala Asn Gly Ala Gly
 1415 1420 1425
 Ala Phe Thr Ile Asp His Val Val Lys Ser Asn Ser Thr His Asn
 1430 1435 1440
 Ala Ser Asp Ala Val Tyr Lys Ala Gln Leu Tyr Leu Thr Pro Tyr
 1445 1450 1455
 Gly Pro Lys Gln Tyr Val Glu His Leu Asn Gln Asn Thr Gly Asn
 1460 1465 1470
 Thr Thr Asp Ala Ile Asn Ile Tyr Phe Val Pro Ser Asp Leu Val
 1475 1480 1485

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Asn Pro Thr Ile Ser Val Gly Asn Tyr Thr Asn His Gln Val Phe
 1490 1495 1500
 Ser Gly Glu Thr Phe Thr Asn Thr Ile Thr Ala Asn Asp Asn Phe
 1505 1510 1515
 Gly Val Gln Ser Val Thr Val Pro Asn Thr Ser Gln Ile Thr Gly
 1520 1525 1530
 Thr Val Asp Asn Asn His Gln His Val Ser Ala Thr Ala Pro Asn
 1535 1540 1545
 Val Thr Ser Ala Thr Asn Lys Thr Ile Asn Leu Leu Ala Thr Asp
 1550 1555 1560
 Thr Ser Gly Asn Thr Ala Thr Thr Ser Phe Asn Val Thr Val Lys
 1565 1570 1575
 Pro Leu Arg Asp Lys Tyr Arg Val Gly Thr Ser Ser Thr Ala Ala
 1580 1585 1590
 Asn Pro Val Arg Ile Ala Asn Ile Ser Asn Asn Ala Thr Val Ser
 1595 1600 1605
 Gln Ala Asp Gln Thr Thr Ile Ile Asn Ser Leu Thr Phe Thr Glu
 1610 1615 1620
 Thr Val Pro Asn Arg Ser Tyr Ala Arg Ala Ser Ala Asn Glu Ile
 1625 1630 1635
 Thr Ser Lys Thr Val Ser Asn Val Ser Arg Thr Gly Asn Asn Ala
 1640 1645 1650
 Asn Val Thr Val Thr Val Thr Tyr Gln Asp Gly Thr Thr Ser Thr
 1655 1660 1665
 Val Thr Val Pro Val Lys His Val Ile Pro Glu Ile Val Ala His
 1670 1675 1680
 Ser His Tyr Thr Val Gln Gly Gln Asp Phe Pro Ala Gly Asn Gly
 1685 1690 1695
 Ser Ser Ala Ser Asp Tyr Phe Lys Leu Ser Asn Gly Ser Asp Ile
 1700 1705 1710
 Ala Asp Ala Thr Ile Thr Trp Val Ser Gly Gln Ala Pro Asn Lys
 1715 1720 1725
 Asp Asn Thr Arg Ile Gly Glu Asp Ile Thr Val Thr Ala His Ile
 1730 1735 1740

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Leu Ile Asp Gly Glu Thr Thr Pro Ile Thr Lys Thr Ala Thr Tyr
 1745 1750 1755
 Lys Val Val Arg Thr Val Pro Lys His Val Phe Glu Thr Ala Arg
 1760 1765 1770
 Gly Val Leu Tyr Pro Gly Val Ser Asp Met Tyr Asp Ala Lys Gln
 1775 1780 1785
 Tyr Val Lys Pro Val Asn Asn Ser Trp Ser Thr Asn Ala Gln His
 1790 1795 1800
 Met Asn Phe Gln Phe Val Gly Thr Tyr Gly Pro Asn Lys Asp Val
 1805 1810 1815
 Val Gly Ile Ser Thr Arg Leu Ile Arg Val Thr Tyr Asp Asn Arg
 1820 1825 1830
 Gln Thr Glu Asp Leu Thr Ile Leu Ser Lys Val Lys Pro Asp Pro
 1835 1840 1845
 Pro Arg Ile Asp Ala Asn Ser Val Thr Tyr Lys Ala Gly Leu Thr
 1850 1855 1860
 Asn Gln Glu Ile Lys Val Asn Asn Val Leu Asn Asn Ser Ser Val
 1865 1870 1875
 Lys Leu Phe Lys Ala Asp Asn Thr Pro Leu Asn Val Thr Asn Ile
 1880 1885 1890
 Thr His Gly Ser Gly Phe Ser Ser Val Val Thr Val Ser Asp Ala
 1895 1900 1905
 Leu Pro Asn Gly Gly Ile Lys Ala Lys Ser Ser Ile Ser Met Asn
 1910 1915 1920
 Asn Val Thr Tyr Thr Thr Gln Asp Glu His Gly Gln Val Val Thr
 1925 1930 1935
 Val Thr Arg Asn Glu Ser Val Asp Ser Asn Asp Ser Ala Thr Val
 1940 1945 1950
 Thr Val Thr Pro Gln Leu Gln Ala Thr Thr Glu Gly Ala Val Phe
 1955 1960 1965
 Ile Lys Gly Gly Asp Gly Phe Asp Phe Gly His Val Glu Arg Phe
 1970 1975 1980
 Ile Gln Asn Pro Pro His Gly Ala Thr Val Ala Trp His Asp Ser
 1985 1990 1995

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Pro Asp Thr Trp Lys Asn Thr Val Gly Asn Thr His Lys Thr Ala
 2000 2005 2010
 Val Val Thr Leu Pro Asn Gly Gln Gly Thr Arg Asn Val Glu Val
 2015 2020 2025
 Pro Val Lys Val Tyr Pro Val Ala Asn Ala Lys Ala Pro Ser Arg
 2030 2035 2040
 Asp Val Lys Gly Gln Asn Leu Thr Asn Gly Thr Asp Ala Met Asn
 2045 2050 2055
 Tyr Ile Thr Phe Asp Pro Asn Thr Asn Thr Asn Gly Ile Thr Ala
 2060 2065 2070
 Ala Trp Ala Asn Arg Gln Gln Pro Asn Asn Gln Gln Ala Gly Val
 2075 2080 2085
 Gln His Leu Asn Val Asp Val Thr Tyr Pro Gly Ile Ser Ala Ala
 2090 2095 2100
 Lys Arg Val Pro Val Thr Val Asn Val Tyr Gln Phe Glu Phe Pro
 2105 2110 2115
 Gln Thr Thr Tyr Thr Thr Thr Val Gly Gly Thr Leu Ala Ser Gly
 2120 2125 2130
 Thr Gln Ala Ser Gly Tyr Ala His Met Gln Asn Ala Thr Gly Leu
 2135 2140 2145
 Pro Thr Asp Gly Phe Thr Tyr Lys Trp Asn Arg Asp Thr Thr Gly
 2150 2155 2160
 Thr Asn Asp Ala Asn Trp Ser Ala Met Asn Lys Pro Asn Val Ala
 2165 2170 2175
 Lys Val Val Asn Ala Lys Tyr Asp Val Ile Tyr Asn Gly His Thr
 2180 2185 2190
 Phe Ala Thr Ser Leu Pro Ala Lys Phe Val Val Lys Asp Val Gln
 2195 2200 2205
 Pro Ala Lys Pro Thr Val Thr Glu Thr Ala Ala Gly Ala Ile Thr
 2210 2215 2220
 Ile Ala Pro Gly Ala Asn Gln Thr Val Asn Thr His Ala Gly Asn
 2225 2230 2235
 Val Thr Thr Tyr Ala Asp Lys Leu Val Ile Lys Arg Asn Gly Asn
 2240 2245 2250

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Val Val Thr Thr Phe Thr Arg Arg Asn Asn Thr Ser Pro Trp Val
 2255 2260 2265
 Lys Glu Ala Ser Ala Ala Thr Val Ala Gly Ile Ala Gly Thr Asn
 2270 2275 2280
 Asn Gly Ile Thr Val Ala Ala Gly Thr Phe Asn Pro Ala Asp Thr
 2285 2290 2295
 Ile Gln Val Val Ala Thr Gln Gly Ser Gly Glu Thr Val Ser Asp
 2300 2305 2310
 Glu Gln Arg Ser Asp Asp Phe Thr Val Val Ala Pro Gln Pro Asn
 2315 2320 2325
 Gln Ala Thr Thr Lys Ile Trp Gln Asn Gly His Ile Asp Ile Thr
 2330 2335 2340
 Pro Asn Asn Pro Ser Gly His Leu Ile Asn Pro Thr Gln Ala Met
 2345 2350 2355
 Asp Ile Ala Tyr Thr Glu Lys Val Gly Asn Gly Ala Glu His Ser
 2360 2365 2370
 Lys Thr Ile Asn Val Val Arg Gly Gln Asn Asn Gln Trp Thr Ile
 2375 2380 2385
 Ala Asn Lys Pro Asp Tyr Val Thr Leu Asp Ala Gln Thr Gly Lys
 2390 2395 2400
 Val Thr Phe Asn Ala Asn Thr Ile Lys Pro Asn Ser Ser Ile Thr
 2405 2410 2415
 Ile Thr Pro Lys Ala Gly Thr Gly His Ser Val Ser Ser Asn Pro
 2420 2425 2430
 Ser Thr Leu Thr Ala Pro Ala Ala His Thr Val Asn Thr Thr Glu
 2435 2440 2445
 Ile Val Lys Asp Tyr Gly Ser Asn Val Thr Ala Ala Glu Ile Asn
 2450 2455 2460
 Asn Ala Val Gln Val Ala Asn Lys Arg Thr Ala Thr Ile Lys Asn
 2465 2470 2475
 Gly Thr Ala Met Pro Thr Asn Leu Ala Gly Gly Ser Thr Thr Thr
 2480 2485 2490
 Ile Pro Val Thr Val Thr Tyr Asn Asp Gly Ser Thr Glu Glu Val
 2495 2500 2505

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Gln Glu Ser Ile Phe Thr Lys Ala Asp Lys Arg Glu Leu Ile Thr
 2510 2515 2520
 Ala Lys Asn His Leu Asp Asp Pro Val Ser Thr Glu Gly Lys Lys
 2525 2530 2535
 Pro Gly Thr Ile Thr Gln Tyr Asn Asn Ala Met His Asn Ala Gln
 2540 2545 2550
 Gln Gln Ile Asn Thr Ala Lys Thr Glu Ala Gln Gln Val Ile Asn
 2555 2560 2565
 Asn Glu Arg Ala Thr Pro Gln Gln Val Ser Asp Ala Leu Thr Lys
 2570 2575 2580
 Val Arg Ala Ala Gln Thr Lys Ile Asp Gln Ala Lys Ala Leu Leu
 2585 2590 2595
 Gln Asn Lys Glu Asp Asn Ser Gln Leu Val Thr Ser Lys Asn Asn
 2600 2605 2610
 Leu Gln Ser Ser Val Asn Gln Val Pro Ser Thr Ala Gly Met Thr
 2615 2620 2625
 Gln Gln Ser Ile Asp Asn Tyr Asn Ala Lys Lys Arg Glu Ala Glu
 2630 2635 2640
 Thr Glu Ile Thr Ala Ala Gln Arg Val Ile Asp Asn Gly Asp Ala
 2645 2650 2655
 Thr Ala Gln Gln Ile Ser Asp Glu Lys His Arg Val Asp Asn Ala
 2660 2665 2670
 Leu Thr Ala Leu Asn Gln Ala Lys His Asp Leu Thr Ala Asp Thr
 2675 2680 2685
 His Ala Leu Glu Gln Ala Val Gln Gln Leu Asn Arg Thr Gly Thr
 2690 2695 2700
 Thr Thr Gly Lys Lys Pro Ala Ser Ile Thr Ala Tyr Asn Asn Ser
 2705 2710 2715
 Ile Arg Ala Leu Gln Ser Asp Leu Thr Ser Ala Lys Asn Ser Ala
 2720 2725 2730
 Asn Ala Ile Ile Gln Lys Pro Ile Arg Thr Val Gln Glu Val Gln
 2735 2740 2745
 Ser Ala Leu Thr Asn Val Asn Arg Val Asn Glu Arg Leu Thr Gln
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Ala Ile Asn Gln Leu Val Pro Leu Ala Asp Asn Ser Ala Leu Lys
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Thr Ala Lys Thr Lys Leu Asp Glu Glu Ile Asn Lys Ser Val Thr
 2780 2785 2790

Thr Asp Gly Met Thr Gln Ser Ser Ile Gln Ala Tyr Glu Asn Ala
 2795 2800 2805

Lys Arg Ala Gly Gln Thr Glu Ser Thr Asn Ala Gln Asn Val Ile
 2810 2815 2820

Asn Asn Gly Asp Ala Thr Asp Gln Gln Ile Ala Ala Glu Lys Thr
 2825 2830 2835

Lys Val Glu Glu Lys Tyr Asn Ser Leu Lys Gln Ala Ile Ala Gly
 2840 2845 2850

Leu Thr Pro Asp Leu Ala Pro Leu Gln Thr Ala Lys Thr Gln Leu
 2855 2860 2865

Gln Asn Asp Ile Asp Gln Pro Thr Ser Thr Thr Gly Met Thr Ser
 2870 2875 2880

Ala Ser Ile Ala Ala Phe Asn Glu Lys Leu Ser Ala Ala Arg Thr
 2885 2890 2895

Lys Ile Gln Glu Ile Asp Arg Val Leu Ala Ser His Pro Asp Val
 2900 2905 2910

Ala Thr Ile Arg Gln Asn Val Thr Ala Ala Asn Ala Ala Lys Ser
 2915 2920 2925

Ala Leu Asp Gln Ala Arg Asn Gly Leu Thr Val Asp Lys Ala Pro
 2930 2935 2940

Leu Glu Asn Ala Lys Asn Gln Leu Gln His Ser Ile Asp Thr Gln
 2945 2950 2955

Thr Ser Thr Thr Gly Met Thr Gln Asp Ser Ile Asn Ala Tyr Asn
 2960 2965 2970

Ala Lys Leu Thr Ala Ala Arg Asn Lys Ile Gln Gln Ile Asn Gln
 2975 2980 2985

Val Leu Ala Gly Ser Pro Thr Val Glu Gln Ile Asn Thr Asn Thr
 2990 2995 3000

Ser Thr Ala Asn Gln Ala Lys Ser Asp Leu Asp His Ala Arg Gln
 3005 3010 3015

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Ala Leu Thr Pro Asp Lys Ala Pro Leu Gln Thr Ala Lys Thr Gln
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 Leu Glu Gln Ser Ile Asn Gln Pro Thr Asp Thr Thr Gly Met Thr
 3035 3040 3045
 Thr Ala Ser Leu Asn Ala Tyr Asn Gln Lys Leu Gln Ala Ala Arg
 3050 3055 3060
 Gln Lys Leu Thr Glu Ile Asn Gln Val Leu Asn Gly Asn Pro Thr
 3065 3070 3075
 Val Gln Asn Ile Asn Asp Lys Val Thr Glu Ala Asn Gln Ala Lys
 3080 3085 3090
 Asp Gln Leu Asn Thr Ala Arg Gln Gly Leu Thr Leu Asp Arg Gln
 3095 3100 3105
 Pro Ala Leu Thr Thr Leu His Gly Ala Ser Asn Leu Asn Gln Ala
 3110 3115 3120
 Gln Gln Asn Asn Phe Thr Gln Gln Ile Asn Ala Ala Gln Asn His
 3125 3130 3135
 Ala Ala Leu Glu Thr Ile Lys Ser Asn Ile Thr Ala Leu Asn Thr
 3140 3145 3150
 Ala Met Thr Lys Leu Lys Asp Ser Val Ala Asp Asn Asn Thr Ile
 3155 3160 3165
 Lys Ser Asp Gln Asn Tyr Thr Asp Ala Thr Pro Ala Asn Lys Gln
 3170 3175 3180
 Ala Tyr Asp Asn Ala Val Asn Ala Ala Lys Gly Val Ile Gly Glu
 3185 3190 3195
 Thr Thr Asn Pro Thr Met Asp Val Asn Thr Val Asn Gln Lys Ala
 3200 3205 3210
 Ala Ser Val Lys Ser Thr Lys Asp Ala Leu Asp Gly Gln Gln Asn
 3215 3220 3225
 Leu Gln Arg Ala Lys Thr Glu Ala Thr Asn Ala Ile Thr His Ala
 3230 3235 3240
 Ser Asp Leu Asn Gln Ala Gln Lys Asn Ala Leu Thr Gln Gln Val
 3245 3250 3255
 Asn Ser Ala Gln Asn Val Gln Ala Val Asn Asp Ile Lys Gln Thr
 3260 3265 3270

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Thr Gln Ser Leu Asn Thr Ala Met Thr Gly Leu Lys Arg Gly Val
 3275 3280 3285

Ala Asn His Asn Gln Val Val Gln Ser Asp Asn Tyr Val Asn Ala
 3290 3295 3300

Asp Thr Asn Lys Lys Asn Asp Tyr Asn Asn Ala Tyr Asn His Ala
 3305 3310 3315

Asn Asp Ile Ile Asn Gly Asn Ala Gln His Pro Val Ile Thr Pro
 3320 3325 3330

Ser Asp Val Asn Asn Ala Leu Ser Asn Val Thr Ser Lys Glu His
 3335 3340 3345

Ala Leu Asn Gly Glu Ala Lys Leu Asn Ala Ala Lys Gln Glu Ala
 3350 3355 3360

Asn Thr Ala Leu Gly His Leu Asn Asn Leu Asn Asn Ala Gln Arg
 3365 3370 3375

Gln Asn Leu Gln Ser Gln Ile Asn Gly Ala His Gln Ile Asp Ala
 3380 3385 3390

Val Asn Thr Ile Lys Gln Asn Ala Thr Asn Leu Asn Ser Ala Met
 3395 3400 3405

Gly Asn Leu Arg Gln Ala Val Ala Asp Lys Asp Gln Val Lys Arg
 3410 3415 3420

Thr Glu Asp Tyr Ala Asp Ala Asp Thr Ala Lys Gln Asn Ala Tyr
 3425 3430 3435

Asn Ser Ala Val Ser Ser Ala Glu Thr Ile Ile Asn Gln Thr Thr
 3440 3445 3450

Asn Pro Thr Met Ser Val Asp Asp Val Asn Arg Ala Thr Ser Ala
 3455 3460 3465

Val Thr Ser Asn Lys Asn Ala Leu Asn Gly Tyr Glu Lys Leu Ala
 3470 3475 3480

Gln Ser Lys Thr Asp Ala Ala Arg Ala Ile Asp Ala Leu Pro His
 3485 3490 3495

Leu Asn Asn Ala Gln Lys Ala Asp Val Lys Ser Lys Ile Asn Ala
 3500 3505 3510

Ala Ser Asn Ile Ala Gly Val Asn Thr Val Lys Gln Gln Gly Thr
 3515 3520 3525

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Asp Leu Asn Thr Ala Met Gly Asn Leu Gln Gly Ala Ile Asn Asp
 3530 3535 3540
 Glu Gln Thr Thr Leu Asn Ser Gln Asn Tyr Gln Asp Ala Thr Pro
 3545 3550 3555
 Ser Lys Lys Thr Ala Tyr Thr Asn Ala Val Gln Ala Ala Lys Asp
 3560 3565 3570
 Ile Leu Asn Lys Ser Asn Gly Gln Asn Lys Thr Lys Asp Gln Val
 3575 3580 3585
 Thr Glu Ala Met Asn Gln Val Asn Ser Ala Lys Asn Asn Leu Asp
 3590 3595 3600
 Gly Thr Arg Leu Leu Asp Gln Ala Lys Gln Thr Ala Lys Gln Gln
 3605 3610 3615
 Leu Asn Asn Met Thr His Leu Thr Thr Ala Gln Lys Thr Asn Leu
 3620 3625 3630
 Thr Asn Gln Ile Asn Ser Gly Thr Thr Val Ala Gly Val Gln Thr
 3635 3640 3645
 Val Gln Ser Asn Ala Asn Thr Leu Asp Gln Ala Met Asn Thr Leu
 3650 3655 3660
 Arg Gln Ser Ile Ala Asn Lys Asp Ala Thr Lys Ala Ser Glu Asp
 3665 3670 3675
 Tyr Val Asp Ala Asn Asn Asp Lys Gln Thr Ala Tyr Asn Asn Ala
 3680 3685 3690
 Val Ala Ala Ala Glu Thr Ile Ile Asn Ala Asn Ser Asn Pro Glu
 3695 3700 3705
 Met Asn Pro Ser Thr Ile Thr Gln Lys Ala Glu Gln Val Asn Ser
 3710 3715 3720
 Ser Lys Thr Ala Leu Asn Gly Asp Glu Asn Leu Ala Ala Ala Lys
 3725 3730 3735
 Gln Asn Ala Lys Thr Tyr Leu Asn Thr Leu Thr Ser Ile Thr Asp
 3740 3745 3750
 Ala Gln Lys Asn Asn Leu Ile Ser Gln Ile Thr Ser Ala Thr Arg
 3755 3760 3765
 Val Ser Gly Val Asp Thr Val Lys Gln Asn Ala Gln His Leu Asp
 3770 3775 3780

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Gln Ala Met Ala Ser Leu Gln Asn Gly Ile Asn Asn Glu Ser Gln
 3785 3790 3795
 Val Lys Ser Ser Glu Lys Tyr Arg Asp Ala Asp Thr Asn Lys Gln
 3800 3805 3810
 Gln Glu Tyr Asp Asn Ala Ile Thr Ala Ala Lys Ala Ile Leu Asn
 3815 3820 3825
 Lys Ser Thr Gly Pro Asn Thr Ala Gln Asn Ala Val Glu Ala Ala
 3830 3835 3840
 Leu Gln Arg Val Asn Asn Ala Lys Asp Ala Leu Asn Gly Asp Ala
 3845 3850 3855
 Lys Leu Ile Ala Ala Gln Asn Ala Ala Lys Gln His Leu Gly Thr
 3860 3865 3870
 Leu Thr His Ile Thr Thr Ala Gln Arg Asn Asp Leu Thr Asn Gln
 3875 3880 3885
 Ile Ser Gln Ala Thr Asn Leu Ala Gly Val Glu Ser Val Lys Gln
 3890 3895 3900
 Asn Ala Asn Ser Leu Asp Gly Ala Met Gly Asn Leu Gln Thr Ala
 3905 3910 3915
 Ile Asn Asp Lys Ser Gly Thr Leu Ala Ser Gln Asn Phe Leu Asp
 3920 3925 3930
 Ala Asp Glu Gln Lys Arg Asn Ala Tyr Asn Gln Ala Val Ser Ala
 3935 3940 3945
 Ala Glu Thr Ile Leu Asn Lys Gln Thr Gly Pro Asn Thr Ala Lys
 3950 3955 3960
 Thr Ala Val Glu Gln Ala Leu Asn Asn Val Asn Asn Ala Lys His
 3965 3970 3975
 Ala Leu Asn Gly Thr Gln Asn Leu Asn Asn Ala Lys Gln Ala Ala
 3980 3985 3990
 Ile Thr Ala Ile Asn Gly Ala Ser Asp Leu Asn Gln Lys Gln Lys
 3995 4000 4005
 Asp Ala Leu Lys Ala Gln Ala Asn Gly Ala Gln Arg Val Ser Asn
 4010 4015 4020
 Ala Gln Asp Val Gln His Asn Ala Thr Glu Leu Asn Thr Ala Met
 4025 4030 4035

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Gly Thr Leu Lys His Ala Ile Ala Asp Lys Thr Asn Thr Leu Ala
 4040 4045 4050
 Ser Ser Lys Tyr Val Asn Ala Asp Ser Thr Lys Gln Asn Ala Tyr
 4055 4060 4065
 Thr Thr Lys Val Thr Asn Ala Glu His Ile Ile Ser Gly Thr Pro
 4070 4075 4080
 Thr Val Val Thr Thr Pro Ser Glu Val Thr Ala Ala Ala Asn Gln
 4085 4090 4095
 Val Asn Ser Ala Lys Gln Glu Leu Asn Gly Asp Glu Arg Leu Arg
 4100 4105 4110
 Glu Ala Lys Gln Asn Ala Asn Thr Ala Ile Asp Ala Leu Thr Gln
 4115 4120 4125
 Leu Asn Thr Pro Gln Lys Ala Lys Leu Lys Glu Gln Val Gly Gln
 4130 4135 4140
 Ala Asn Arg Leu Glu Asp Val Gln Thr Val Gln Thr Asn Gly Gln
 4145 4150 4155
 Ala Leu Asn Asn Ala Met Lys Gly Leu Arg Asp Ser Ile Ala Asn
 4160 4165 4170
 Glu Thr Thr Val Lys Thr Ser Gln Asn Tyr Thr Asp Ala Ser Pro
 4175 4180 4185
 Asn Asn Gln Ser Thr Tyr Asn Ser Ala Val Ser Asn Ala Lys Gly
 4190 4195 4200
 Ile Ile Asn Gln Thr Asn Asn Pro Thr Met Asp Thr Ser Ala Ile
 4205 4210 4215
 Thr Gln Ala Thr Thr Gln Val Asn Asn Ala Lys Asn Gly Leu Asn
 4220 4225 4230
 Gly Ala Glu Asn Leu Arg Asn Ala Gln Asn Thr Ala Lys Gln Asn
 4235 4240 4245
 Leu Asn Thr Leu Ser His Leu Thr Asn Asn Gln Lys Ser Ala Ile
 4250 4255 4260
 Ser Ser Gln Ile Asp Arg Ala Gly His Val Ser Glu Val Thr Ala
 4265 4270 4275
 Thr Lys Asn Ala Ala Thr Glu Leu Asn Thr Gln Met Gly Asn Leu
 4280 4285 4290

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Glu Gln Ala Ile His Asp Gln Asn Thr Val Lys Gln Ser Val Lys
 4295 4300 4305
 Phe Thr Asp Ala Asp Lys Ala Lys Arg Asp Ala Tyr Thr Asn Ala
 4310 4315 4320
 Val Ser Arg Ala Glu Ala Ile Leu Asn Lys Thr Gln Gly Ala Asn
 4325 4330 4335
 Thr Ser Lys Gln Asp Val Glu Ala Ala Ile Gln Asn Val Ser Ser
 4340 4345 4350
 Ala Lys Asn Ala Leu Asn Gly Asp Gln Asn Val Thr Asn Ala Lys
 4355 4360 4365
 Asn Ala Ala Lys Asn Ala Leu Asn Asn Leu Thr Ser Ile Asn Asn
 4370 4375 4380
 Ala Gln Lys Arg Asp Leu Thr Thr Lys Ile Asp Gln Ala Thr Thr
 4385 4390 4395
 Val Ala Gly Val Glu Ala Val Ser Asn Thr Ser Thr Gln Leu Asn
 4400 4405 4410
 Thr Ala Met Ala Asn Leu Gln Asn Gly Ile Asn Asp Lys Thr Asn
 4415 4420 4425
 Thr Leu Ala Ser Glu Asn Tyr His Asp Ala Asp Ser Asp Lys Lys
 4430 4435 4440
 Thr Ala Tyr Thr Gln Ala Val Thr Asn Ala Glu Asn Ile Leu Asn
 4445 4450 4455
 Lys Asn Ser Gly Ser Asn Leu Asp Lys Thr Ala Val Glu Asn Ala
 4460 4465 4470
 Leu Ser Gln Val Ala Asn Ala Lys Gly Ala Leu Asn Gly Asn His
 4475 4480 4485
 Asn Leu Glu Gln Ala Lys Ser Asn Ala Asn Thr Thr Ile Asn Gly
 4490 4495 4500
 Leu Gln His Leu Thr Thr Ala Gln Lys Asp Lys Leu Lys Gln Gln
 4505 4510 4515
 Val Gln Gln Ala Gln Asn Val Ala Gly Val Asp Thr Val Lys Ser
 4520 4525 4530
 Ser Ala Asn Thr Leu Asn Gly Ala Met Gly Thr Leu Arg Asn Ser
 4535 4540 4545

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Ile Gln Asp Asn Thr Ala Thr Lys Asn Gly Gln Asn Tyr Leu Asp
 4550 4555 4560
 Ala Thr Glu Arg Asn Lys Thr Asn Tyr Asn Asn Ala Val Asp Ser
 4565 4570 4575
 Ala Asn Gly Val Ile Asn Ala Thr Ser Asn Pro Asn Met Asp Ala
 4580 4585 4590
 Asn Ala Ile Asn Gln Ile Ala Thr Gln Val Thr Ser Thr Lys Asn
 4595 4600 4605
 Ala Leu Asp Gly Thr His Asn Leu Thr Gln Ala Lys Gln Thr Ala
 4610 4615 4620
 Thr Asn Ala Ile Asp Gly Ala Thr Asn Leu Asn Lys Ala Gln Lys
 4625 4630 4635
 Asp Ala Leu Lys Ala Gln Val Thr Ser Ala Gln Arg Val Ala Asn
 4640 4645 4650
 Val Thr Ser Ile Gln Gln Thr Ala Asn Glu Leu Asn Thr Ala Met
 4655 4660 4665
 Gly Gln Leu Gln His Gly Ile Asp Asp Glu Asn Ala Thr Lys Gln
 4670 4675 4680
 Thr Gln Lys Tyr Arg Asp Ala Glu Gln Ser Lys Lys Thr Ala Tyr
 4685 4690 4695
 Asp Gln Ala Val Ala Ala Ala Lys Ala Ile Leu Asn Lys Gln Thr
 4700 4705 4710
 Gly Ser Asn Ser Asp Lys Ala Ala Val Asp Arg Ala Leu Gln Gln
 4715 4720 4725
 Val Thr Ser Thr Lys Asp Ala Leu Asn Gly Asp Ala Lys Leu Ala
 4730 4735 4740
 Glu Ala Lys Ala Ala Ala Lys Gln Asn Leu Gly Thr Leu Asn His
 4745 4750 4755
 Ile Thr Asn Ala Gln Arg Thr Asp Leu Glu Gly Gln Ile Asn Gln
 4760 4765 4770
 Ala Thr Thr Val Asp Gly Val Asn Thr Val Lys Thr Asn Ala Asn
 4775 4780 4785
 Thr Leu Asp Gly Ala Met Asn Ser Leu Gln Gly Ser Ile Asn Asp
 4790 4795 4800

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Lys Asp Ala Thr Leu Arg Asn Gln Asn Tyr Leu Asp Ala Asp Glu
 4805 4810 4815
 Ser Lys Arg Asn Ala Tyr Thr Gln Ala Val Thr Ala Ala Glu Gly
 4820 4825 4830
 Ile Leu Asn Lys Gln Thr Gly Gly Asn Thr Ser Lys Ala Asp Val
 4835 4840 4845
 Asp Asn Ala Leu Asn Ala Val Thr Arg Ala Lys Ala Ala Leu Asn
 4850 4855 4860
 Gly Ala Asp Asn Leu Arg Asn Ala Lys Thr Ser Ala Thr Asn Thr
 4865 4870 4875
 Ile Asp Gly Leu Pro Asn Leu Thr Gln Leu Gln Lys Asp Asn Leu
 4880 4885 4890
 Lys His Gln Val Glu Gln Ala Gln Asn Val Ala Gly Val Asn Gly
 4895 4900 4905
 Val Lys Asp Lys Gly Asn Thr Leu Asn Thr Ala Met Gly Ala Leu
 4910 4915 4920
 Arg Thr Ser Ile Gln Asn Asp Asn Thr Thr Lys Thr Ser Gln Asn
 4925 4930 4935
 Tyr Leu Asp Ala Ser Asp Ser Asn Lys Asn Asn Tyr Asn Thr Ala
 4940 4945 4950
 Val Asn Asn Ala Asn Gly Val Ile Asn Ala Thr Asn Asn Pro Asn
 4955 4960 4965
 Met Asp Ala Asn Ala Ile Asn Gly Met Ala Asn Gln Val Asn Thr
 4970 4975 4980
 Thr Lys Ala Ala Leu Asn Gly Ala Gln Asn Leu Ala Gln Ala Lys
 4985 4990 4995
 Thr Asn Ala Thr Asn Thr Ile Asn Asn Ala His Asp Leu Asn Gln
 5000 5005 5010
 Lys Gln Lys Asp Ala Leu Lys Thr Gln Val Asn Asn Ala Gln Arg
 5015 5020 5025
 Val Ser Asp Ala Asn Asn Val Gln His Thr Ala Thr Glu Leu Asn
 5030 5035 5040
 Ser Ala Met Thr Ala Leu Lys Ala Ala Ile Ala Asp Lys Glu Arg
 5045 5050 5055

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Thr Lys Ala Ser Gly Asn Tyr Val Asn Ala Asp Gln Glu Lys Arg
 5060 5065 5070
 Gln Ala Tyr Asp Ser Lys Val Thr Asn Ala Glu Asn Ile Ile Ser
 5075 5080 5085
 Gly Thr Pro Asn Ala Thr Leu Thr Val Asn Asp Val Asn Ser Ala
 5090 5095 5100
 Ala Ser Gln Val Asn Ala Ala Lys Thr Ala Leu Asn Gly Asp Asn
 5105 5110 5115
 Asn Leu Arg Val Ala Lys Glu His Ala Asn Asn Thr Ile Asp Gly
 5120 5125 5130
 Leu Ala Gln Leu Asn Asn Ala Gln Lys Ala Lys Leu Lys Glu Gln
 5135 5140 5145
 Val Gln Ser Ala Thr Thr Leu Asp Gly Val Gln Thr Val Lys Asn
 5150 5155 5160
 Ser Ser Gln Thr Leu Asn Thr Ala Met Lys Gly Leu Arg Asp Ser
 5165 5170 5175
 Ile Ala Asn Glu Ala Thr Ile Lys Ala Gly Gln Asn Tyr Thr Asp
 5180 5185 5190
 Ala Ser Pro Asn Asn Arg Asn Glu Tyr Asp Ser Ala Val Thr Ala
 5195 5200 5205
 Ala Lys Ala Ile Ile Asn Gln Thr Ser Asn Pro Thr Met Glu Pro
 5210 5215 5220
 Asn Thr Ile Thr Gln Val Thr Ser Gln Val Thr Thr Lys Glu Gln
 5225 5230 5235
 Ala Leu Asn Gly Ala Arg Asn Leu Ala Gln Ala Lys Thr Thr Ala
 5240 5245 5250
 Lys Asn Asn Leu Asn Asn Leu Thr Ser Ile Asn Asn Ala Gln Lys
 5255 5260 5265
 Asp Ala Leu Thr Arg Ser Ile Asp Gly Ala Thr Thr Val Ala Gly
 5270 5275 5280
 Val Asn Gln Glu Thr Ala Lys Ala Thr Glu Leu Asn Asn Ala Met
 5285 5290 5295
 His Ser Leu Gln Asn Gly Ile Asn Asp Glu Thr Gln Thr Lys Gln
 5300 5305 5310

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Thr	Gln	Lys	Tyr	Leu	Asp	Ala	Glu	Pro	Ser	Lys	Lys	Ser	Ala	Tyr
5315						5320					5325			
Asp	Gln	Ala	Val	Asn	Ala	Ala	Lys	Ala	Ile	Leu	Thr	Lys	Ala	Ser
5330						5335					5340			
Gly	Gln	Asn	Val	Asp	Lys	Ala	Ala	Val	Glu	Gln	Ala	Leu	Gln	Asn
5345						5350					5355			
Val	Asn	Ser	Thr	Lys	Thr	Ala	Leu	Asn	Gly	Asp	Ala	Lys	Leu	Asn
5360						5365					5370			
Glu	Ala	Lys	Ala	Ala	Ala	Lys	Gln	Thr	Leu	Gly	Thr	Leu	Thr	His
5375						5380					5385			
Ile	Asn	Asn	Ala	Gln	Arg	Thr	Ala	Leu	Asp	Asn	Glu	Ile	Thr	Gln
5390						5395					5400			
Ala	Thr	Asn	Val	Glu	Gly	Val	Asn	Thr	Val	Lys	Ala	Lys	Ala	Gln
5405						5410					5415			
Gln	Leu	Asp	Gly	Ala	Met	Gly	Gln	Leu	Glu	Thr	Ser	Ile	Arg	Asp
5420						5425					5430			
Lys	Asp	Thr	Thr	Leu	Gln	Ser	Gln	Asn	Tyr	Gln	Asp	Ala	Asp	Asp
5435						5440					5445			
Ala	Lys	Arg	Thr	Ala	Tyr	Ser	Gln	Ala	Val	Asn	Ala	Ala	Ala	Thr
5450						5455					5460			
Ile	Leu	Asn	Lys	Thr	Ala	Gly	Gly	Asn	Thr	Pro	Lys	Ala	Asp	Val
5465						5470					5475			
Glu	Arg	Ala	Met	Gln	Ala	Val	Thr	Gln	Ala	Asn	Thr	Ala	Leu	Asn
5480						5485					5490			
Gly	Ile	Gln	Asn	Leu	Asp	Arg	Ala	Lys	Gln	Ala	Ala	Asn	Thr	Ala
5495						5500					5505			
Ile	Thr	Asn	Ala	Ser	Asp	Leu	Asn	Thr	Lys	Gln	Lys	Glu	Ala	Leu
5510						5515					5520			
Lys	Ala	Gln	Val	Thr	Ser	Ala	Gly	Arg	Val	Ser	Ala	Ala	Asn	Gly
5525						5530					5535			
Val	Glu	His	Thr	Ala	Thr	Glu	Leu	Asn	Thr	Ala	Met	Thr	Ala	Leu
5540						5545					5550			
Lys	Arg	Ala	Ile	Ala	Asp	Lys	Ala	Glu	Thr	Lys	Ala	Ser	Gly	Asn
5555						5560					5565			

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Tyr Val Asn Ala Asp Ala Asn Lys Arg Gln Ala Tyr Asp Glu Lys
 5570 5575 5580
 Val Thr Ala Ala Glu Asn Ile Val Ser Gly Thr Pro Thr Pro Thr
 5585 5590 5595
 Leu Thr Pro Ala Asp Val Thr Asn Ala Ala Thr Gln Val Thr Asn
 5600 5605 5610
 Ala Lys Thr Gln Leu Asn Gly Asn His Asn Leu Glu Val Ala Lys
 5615 5620 5625
 Gln Asn Ala Asn Thr Ala Ile Asp Gly Leu Thr Ser Leu Asn Gly
 5630 5635 5640
 Pro Gln Lys Ala Lys Leu Lys Glu Gln Val Gly Gln Ala Thr Thr
 5645 5650 5655
 Leu Pro Asn Val Gln Thr Val Arg Asp Asn Ala Gln Thr Leu Asn
 5660 5665 5670
 Thr Ala Met Lys Gly Leu Arg Asp Ser Ile Ala Asn Glu Ala Thr
 5675 5680 5685
 Ile Lys Ala Gly Gln Asn Tyr Thr Asp Ala Ser Gln Asn Lys Gln
 5690 5695 5700
 Thr Asp Tyr Asn Ser Ala Val Thr Ala Ala Lys Ala Ile Ile Gly
 5705 5710 5715
 Gln Thr Thr Ser Pro Ser Met Asn Ala Gln Glu Ile Asn Gln Ala
 5720 5725 5730
 Lys Asp Gln Val Thr Ala Lys Gln Gln Ala Leu Asn Gly Gln Glu
 5735 5740 5745
 Asn Leu Arg Thr Ala Gln Thr Asn Ala Lys Gln His Leu Asn Gly
 5750 5755 5760
 Leu Ser Asp Leu Thr Asp Ala Gln Lys Asp Ala Val Lys Arg Gln
 5765 5770 5775
 Ile Glu Gly Ala Thr His Val Asn Glu Val Thr Gln Ala Gln Asn
 5780 5785 5790
 Asn Ala Asp Ala Leu Asn Thr Ala Met Thr Asn Leu Lys Asn Gly
 5795 5800 5805
 Ile Gln Asp Gln Asn Thr Ile Lys Gln Gly Val Asn Phe Thr Asp
 5810 5815 5820

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Ala Asp Glu Ala Lys Arg Asn Ala Tyr Thr Asn Ala Val Thr Gln
5825 5830 5835

Ala Glu Gln Ile Leu Asn Lys Ala Gln Gly Pro Asn Thr Ser Lys
5840 5845 5850

Asp Gly Val Glu Thr Ala Leu Glu Asn Val Gln Arg Ala Lys Asn
5855 5860 5865

Glu Leu Asn Gly Asn Gln Asn Val Ala Asn Ala Lys Thr Thr Ala
5870 5875 5880

Lys Asn Ala Leu Asn Asn Leu Thr Ser Ile Asn Asn Ala Gln Lys
5885 5890 5895

Glu Ala Leu Lys Ser Gln Ile Glu Gly Ala Thr Thr Val Ala Gly
5900 5905 5910

Val Asn Gln Val Ser Thr Thr Ala Ser Glu Leu Asn Thr Ala Met
5915 5920 5925

Ser Asn Leu Gln Asn Gly Ile Asn Asp Glu Ala Ala Thr Lys Ala
5930 5935 5940

Ala Gln Lys Tyr Thr Asp Ala Asp Arg Glu Lys Gln Thr Ala Tyr
5945 5950 5955

Asn Asp Ala Val Thr Ala Ala Lys Thr Leu Leu Asp Lys Thr Ala
5960 5965 5970

Gly Ser Asn Asp Asn Lys Ala Ala Val Glu Gln Ala Leu Gln Arg
5975 5980 5985

Val Asn Thr Ala Lys Thr Ala Leu Asn Gly Asp Glu Arg Leu Asn
5990 5995 6000

Glu Ala Lys Asn Thr Ala Lys Gln Gln Val Ala Thr Met Ser His
6005 6010 6015

Leu Thr Asp Ala Gln Lys Ala Asn Leu Thr Ser Gln Ile Glu Ser
6020 6025 6030

Gly Thr Thr Val Ala Gly Val Gln Gly Ile Gln Ala Asn Ala Gly
6035 6040 6045

Thr Leu Asp Gln Ala Met Asn Gln Leu Arg Gln Ser Ile Ala Ser
6050 6055 6060

Lys Asp Ala Thr Lys Ser Ser Glu Asp Tyr Gln Asp Ala Asn Ala
6065 6070 6075

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Asp Leu 6080 Gln Asn Ala Tyr Asn 6085 Asp Ala Val Thr Asn 6090 Ala Glu Gly
 Ile Ile 6095 Ser Ala Thr Asn Asn 6100 Pro Glu Met Asn Pro 6105 Asp Thr Ile
 Asn Gln 6110 Lys Ala Ser Gln Val 6115 Asn Ser Ala Lys Ser 6120 Ala Leu Asn
 Gly Asp 6125 Glu Lys Leu Ala Ala 6130 Ala Lys Gln Thr Ala 6135 Lys Ser Asp
 Ile Gly 6140 Arg Leu Thr Asp Leu 6145 Asn Asn Ala Gln Arg 6150 Thr Ala Ala
 Asn Ala 6155 Glu Val Asp Gln Ala 6160 Pro Asn Leu Ala Ala 6165 Val Thr Ala
 Ala Lys 6170 Asn Lys Ala Thr Ser 6175 Leu Asn Thr Ala Met 6180 Gly Asn Leu
 Lys His 6185 Ala Leu Ala Glu Lys 6190 Asp Asn Thr Lys Arg 6195 Ser Val Asn
 Tyr Thr 6200 Asp Ala Asp Gln Pro 6205 Lys Gln Gln Ala Tyr 6210 Asp Thr Ala
 Val Thr 6215 Gln Ala Glu Ala Ile 6220 Thr Asn Ala Asn Gly 6225 Ser Asn Ala
 Asn Glu 6230 Thr Gln Val Gln Ala 6235 Ala Leu Asn Gln Leu 6240 Asn Gln Ala
 Lys Asn 6245 Asp Leu Asn Gly Asp 6250 Asn Lys Val Ala Gln 6255 Ala Lys Glu
 Ser Ala 6260 Lys Arg Ala Leu Ala 6265 Ser Tyr Ser Asn Leu 6270 Asn Asn Ala
 Gln Ser 6275 Thr Ala Ala Ile Ser 6280 Gln Ile Asp Asn Ala 6285 Thr Thr Val
 Ala Gly 6290 Val Thr Ala Ala Gln 6295 Asn Thr Ala Asn Glu 6300 Leu Asn Thr
 Ala Met 6305 Gly Gln Leu Gln Asn 6310 Gly Ile Asn Asp Gln 6315 Asn Thr Val
 Lys Gln 6320 Gln Val Asn Phe Thr 6325 Asp Ala Asp Gln Gly 6330 Lys Lys Asp

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Ala Tyr Thr Asn Ala Val Thr Asn Ala Gln Gly Ile Leu Asp Lys
 6335 6340 6345
 Ala His Gly Gln Asn Met Thr Lys Ala Gln Val Glu Ala Ala Leu
 6350 6355 6360
 Asn Gln Val Thr Thr Ala Lys Asn Ala Leu Asn Gly Asp Ala Asn
 6365 6370 6375
 Val Arg Gln Ala Lys Ser Asp Ala Lys Ala Asn Leu Gly Thr Leu
 6380 6385 6390
 Thr His Leu Asn Asn Ala Gln Lys Gln Asp Leu Thr Ser Gln Ile
 6395 6400 6405
 Glu Gly Ala Thr Thr Val Asn Gly Val Asn Gly Val Lys Thr Lys
 6410 6415 6420
 Ala Gln Asp Leu Asp Gly Ala Met Gln Arg Leu Gln Ser Ala Ile
 6425 6430 6435
 Ala Asn Lys Asp Gln Thr Lys Ala Ser Glu Asn Tyr Ile Asp Ala
 6440 6445 6450
 Asp Pro Thr Lys Lys Thr Ala Phe Asp Asn Ala Ile Thr Gln Ala
 6455 6460 6465
 Glu Ser Tyr Leu Asn Lys Asp His Gly Ala Asn Lys Asp Lys Gln
 6470 6475 6480
 Ala Val Glu Gln Ala Ile Gln Ser Val Thr Ser Thr Glu Asn Ala
 6485 6490 6495
 Leu Asn Gly Asp Ala Asn Leu Gln Arg Ala Lys Thr Glu Ala Ile
 6500 6505 6510
 Gln Ala Ile Asp Asn Leu Thr His Leu Asn Thr Pro Gln Lys Thr
 6515 6520 6525
 Ala Leu Lys Gln Gln Val Asn Ala Ala Gln Arg Val Ser Gly Val
 6530 6535 6540
 Thr Asp Leu Lys Asn Ser Ala Thr Ser Leu Asn Asn Ala Met Asp
 6545 6550 6555
 Gln Leu Lys Gln Ala Ile Ala Asp His Asp Thr Ile Val Ala Ser
 6560 6565 6570
 Gly Asn Tyr Thr Asn Ala Ser Pro Asp Lys Gln Gly Ala Tyr Thr
 6575 6580 6585

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Asp Ala Tyr Asn Ala Ala Lys Asn Ile Val Asn Gly Ser Pro Asn
 6590 6595 6600
 Val Ile Thr Asn Ala Ala Asp Val Thr Ala Ala Thr Gln Arg Val
 6605 6610 6615
 Asn Asn Ala Glu Thr Gly Leu Asn Gly Asp Thr Asn Leu Ala Thr
 6620 6625 6630
 Ala Lys Gln Gln Ala Lys Asp Ala Leu Arg Gln Met Thr His Leu
 6635 6640 6645
 Ser Asp Ala Gln Lys Gln Ser Ile Thr Gly Gln Ile Asp Ser Ala
 6650 6655 6660
 Thr Gln Val Thr Gly Val Gln Ser Val Lys Asp Asn Ala Thr Asn
 6665 6670 6675
 Leu Asp Asn Ala Met Asn Gln Leu Arg Asn Ser Ile Ala Asn Lys
 6680 6685 6690
 Asp Asp Val Lys Ala Ser Gln Pro Tyr Val Asp Ala Asp Arg Asp
 6695 6700 6705
 Lys Gln Asn Ala Tyr Asn Thr Ala Val Thr Asn Ala Glu Asn Ile
 6710 6715 6720
 Ile Asn Ala Thr Ser Gln Pro Thr Leu Asp Pro Ser Ala Val Thr
 6725 6730 6735
 Gln Ala Ala Asn Gln Val Ser Thr Asn Lys Thr Ala Leu Asn Gly
 6740 6745 6750
 Ala Gln Asn Leu Ala Asn Lys Lys Gln Glu Thr Thr Ala Asn Ile
 6755 6760 6765
 Asn Gln Leu Ser His Leu Asn Asn Ala Gln Lys Gln Asp Leu Asn
 6770 6775 6780
 Thr Gln Val Thr Asn Ala Pro Asn Ile Ser Thr Val Asn Gln Val
 6785 6790 6795
 Lys Thr Lys Ala Glu Gln Leu Asp Gln Ala Met Glu Arg Leu Ile
 6800 6805 6810
 Asn Gly Ile Gln Asp Lys Asp Gln Val Lys Gln Ser Val Asn Phe
 6815 6820 6825
 Thr Asp Ala Asp Pro Glu Lys Gln Thr Ala Tyr Asn Asn Ala Val
 6830 6835 6840

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Thr Ala Ala Glu Asn Ile Ile Asn Gln Ala Asn Gly Thr Asn Ala
 6845 6850 6855
 Asn Gln Ser Gln Val Glu Ala Ala Leu Ser Thr Val Thr Thr Thr
 6860 6865 6870
 Lys Gln Ala Leu Asn Gly Asp Arg Lys Val Thr Asp Ala Lys Asn
 6875 6880 6885
 Asn Ala Asn Gln Thr Leu Ser Thr Leu Asp Asn Leu Asn Asn Ala
 6890 6895 6900
 Gln Lys Gly Ala Val Thr Gly Asn Ile Asn Gln Ala His Thr Val
 6905 6910 6915
 Ala Glu Val Thr Gln Ala Ile Gln Thr Ala Gln Glu Leu Asn Thr
 6920 6925 6930
 Ala Met Gly Asn Leu Lys Asn Ser Leu Asn Asp Lys Asp Thr Thr
 6935 6940 6945
 Leu Gly Ser Gln Asn Phe Ala Asp Ala Asp Pro Glu Lys Lys Asn
 6950 6955 6960
 Ala Tyr Asn Glu Ala Val His Asn Ala Glu Asn Ile Leu Asn Lys
 6965 6970 6975
 Ser Thr Gly Thr Asn Val Pro Lys Asp Gln Val Glu Ala Ala Met
 6980 6985 6990
 Asn Gln Val Asn Ala Thr Lys Ala Ala Leu Asn Gly Thr Gln Asn
 6995 7000 7005
 Leu Glu Lys Ala Lys Gln His Ala Asn Thr Ala Ile Asp Gly Leu
 7010 7015 7020
 Ser His Leu Thr Asn Ala Gln Lys Glu Ala Leu Lys Gln Leu Val
 7025 7030 7035
 Gln Gln Ser Thr Thr Val Ala Glu Ala Gln Gly Asn Glu Gln Lys
 7040 7045 7050
 Ala Asn Asn Val Asp Ala Ala Met Asp Lys Leu Arg Gln Ser Ile
 7055 7060 7065
 Ala Asp Asn Ala Thr Thr Lys Gln Asn Gln Asn Tyr Thr Asp Ala
 7070 7075 7080
 Ser Gln Asn Lys Lys Asp Ala Tyr Asn Asn Ala Val Thr Thr Ala
 7085 7090 7095

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Gln Gly Ile Ile Asp Gln Thr Thr Ser Pro Thr Leu Asp Pro Thr
 7100 7105 7110
 Val Ile Asn Gln Ala Ala Gly Gln Val Ser Thr Thr Lys Asn Ala
 7115 7120 7125
 Leu Asn Gly Asn Glu Asn Leu Glu Ala Ala Lys Gln Gln Ala Ser
 7130 7135 7140
 Gln Ser Leu Gly Ser Leu Asp Asn Leu Asn Asn Ala Gln Lys Gln
 7145 7150 7155
 Thr Val Thr Asp Gln Ile Asn Gly Ala His Thr Val Asp Glu Ala
 7160 7165 7170
 Asn Gln Ile Lys Gln Asn Ala Gln Asn Leu Asn Thr Ala Met Gly
 7175 7180 7185
 Asn Leu Lys Gln Ala Ile Ala Asp Lys Asp Ala Thr Lys Ala Thr
 7190 7195 7200
 Val Asn Phe Thr Asp Ala Asp Gln Ala Lys Gln Gln Ala Tyr Asn
 7205 7210 7215
 Thr Ala Val Thr Asn Ala Glu Asn Ile Ser Lys Ala Asn Gly Asn
 7220 7225 7230
 Ala Thr Gln Ala Glu Val Glu Gln Ala Ile Lys Gln Val Asn Ala
 7235 7240 7245
 Ala Lys Gln Ala Leu Asn Gly Asn Ala Asn Val Gln His Ala Lys
 7250 7255 7260
 Asp Glu Ala Thr Ala Leu Ile Asn Ser Ser Asn Asp Leu Asn Gln
 7265 7270 7275
 Ala Gln Lys Asp Ala Leu Lys Gln Gln Val Gln Asn Ala Thr Thr
 7280 7285 7290
 Val Ala Gly Val Asn Asn Val Lys Gln Thr Ala Gln Glu Leu Asn
 7295 7300 7305
 Asn Ala Met Thr Gln Leu Lys Gln Gly Ile Ala Asp Lys Glu Gln
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 Thr Lys Ala Asp Gly Asn Phe Val Asn Ala Asp Pro Asp Lys Gln
 7325 7330 7335
 Asn Ala Tyr Asn Gln Ala Val Ala Lys Ala Glu Ala Leu Ile Ser
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Ala Thr Pro Asp Val Val Val Thr Pro Ser Glu Ile Thr Ala Ala
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Leu Asn Lys Val Thr Gln Ala Lys Asn Asp Leu Asn Gly Asn Thr
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Asn Leu Ala Thr Ala Lys Gln Asn Val Gln His Ala Ile Asp Gln
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Leu Pro Asn Leu Asn Gln Ala Gln Arg Asp Glu Tyr Ser Lys Gln
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Ile Thr Gln Ala Thr Leu Val Pro Asn Val Asn Ala Ile Gln Gln
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Ala Ala Thr Thr Leu Asn Asp Ala Met Thr Gln Leu Lys Gln Gly
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Ile Ala Asn Lys Ala Gln Ile Lys Gly Ser Glu Asn Tyr His Asp
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Asn Thr Ile Gln Gln Ala Leu Thr Lys Val Asn Asp Thr Asn Gln
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Lys Thr Thr Leu Gly Thr Leu Asp His Leu Asn Asp Ala Gln Lys
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Gln Ala Leu Thr Thr Gln Val Glu Gln Ala Pro Asp Ile Ala Thr
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Val Asn Asn Val Lys Gln Asn Ala Gln Asn Leu Asn Asn Ala Met
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Thr Asn Leu Asn Asn Ala Leu Gln Asp Lys Thr Glu Thr Leu Asn
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Ser Ile Asn Phe Thr Asp Ala Asp Gln Ala Lys Lys Asp Ala Tyr
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Thr Asn Ala Val Ser His Ala Glu Gly Ile Leu Ser Lys Ala Asn
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Gly Ser Asn Ala Ser Gln Thr Glu Val Glu Gln Ala Met Gln Arg
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 Leu Asn Gln Ala Gln Lys Asp Ala Leu Lys Gln Gln Val Asp Ala
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 Ile Ile Ser Gly Thr Pro Asn Ala Asn Val Asp Pro Gln Gln Val
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 Ile Asp Gln Leu Pro Asn Leu Asn Gln Pro Gln Lys Thr Ala Leu
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 Lys Asp Gln Val Ser His Ala Glu Leu Val Thr Gly Val Asn Ala
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 Phe Thr Gln Ala Asp Gln Asp Lys Gln Gln Ala Tyr Asn Asn Ala
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 Ala Asn Gln Ala Gln Gln Ile Ala Asn Gly Ile Pro Thr Pro Val
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Leu Thr Pro Asp Thr Val Thr Gln Ala Val Thr Thr Met Asn Gln
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 Pro Gln Arg Asp Ala Leu Arg Asn Gln Ile Asn Gln Ala Gln Ala
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 Thr Ala Met Ser Asn Leu Lys Gln Gly Ile Ala Asn Lys Asp Thr
 7940 7945 7950
 Val Lys Ala Ser Glu Asn Tyr His Asp Ala Asp Ala Asp Lys Gln
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Ser Ser Asp Ile Ala Ala Val Asn Gly His Lys Gln Thr Ala Glu
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His Gln Ala Val Glu Gln Arg Gly Asn Phe Ile Asn Ala Asp Thr
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Asp Lys Gln Thr Ala Tyr Asn Thr Ala Val Asn Glu Ala Ala Ala
8345 8350 8355

Met Ile Asn Lys Gln Thr Gly Gln Asn Ala Asn Gln Thr Glu Val
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 Ser Tyr Asp Glu Ala Val Gln Asn Ala Glu Ser Ile Ile Ala Gly
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 Lys Asp Leu Ile Asn Gln Thr Asn Asn Pro Thr Leu Asp Lys Ala
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 Gln Val Glu Gln Leu Thr Gln Ala Val Asn Gln Ala Lys Asp Asn
 8750 8755 8760
 Leu His Gly Asp Gln Lys Leu Ala Asp Asp Lys Gln His Ala Val
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 Thr Asp Leu Asn Gln Leu Asn Gly Leu Asn Asn Pro Gln Arg Gln
 8780 8785 8790
 Ala Leu Glu Ser Gln Ile Asn Asn Ala Ala Thr Arg Gly Glu Val
 8795 8800 8805
 Ala Gln Lys Leu Ala Glu Ala Lys Ala Leu Asp Gln Ala Met Gln
 8810 8815 8820
 Ala Leu Arg Asn Ser Ile Gln Asp Gln Gln Gln Thr Glu Ser Gly
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 Ser Lys Phe Ile Asn Glu Asp Lys Pro Gln Lys Asp Ala Tyr Gln
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 Pro Thr Leu Asp Lys Ser Gln Val Glu Gln Leu Thr Gln Ala Val
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Thr Thr Ala Lys Asp Asn Leu His Gly Asp Gln Lys Leu Ala Arg
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 Pro Thr Arg Thr Glu Val Ala Gln His Val Gln Thr Ala Thr Glu
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 Leu Asp His Ala Met Glu Thr Leu Lys Asn Lys Val Asp Gln Val
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 8960 8965 8970
 Lys Lys Glu Ala Val Asp Gln Ala Leu Gln Ala Ala Glu Ser Ile
 8975 8980 8985
 Thr Asp Pro Thr Asn Gly Ser Asn Ala Asn Lys Asp Ala Val Asp
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 9020 9025 9030
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 Gln Asn Ile Asp Gln Ala Thr Lys Leu Gln Pro Ile Ala Glu Leu
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 Glu Thr Val Asp Lys Ala Lys Gln Ala Leu Asp Lys Ser Thr Gly
 9230 9235 9240
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 His Leu Gly Val Ile Ser Ser Thr Asn Tyr Ile Asn Ala Asp Asp
 9335 9340 9345
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 Lys His Leu Val Asp Asn Glu Ile Pro Asn Ala Glu Gln Thr Val
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 Asn Tyr Gln Asn Ala Asp Asp Asn Ala Lys Thr Asn Phe Asp Asp
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 9545 9550 9555
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 Lys Ala Thr Ser Asn Gln Ala Val Ser Gln Val Gln Thr Ala Gly
 9575 9580 9585
 Asn His Ala Ile Glu Gln Val His Ala Asn Glu Ile Pro Lys Ala
 9590 9595 9600
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 Gln Val Glu Ala Ala Leu Asn Asn Gly Ile Ala Arg Ile Ser Ala
 10145 10150 10155

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10190						10195					10200			
Asp	Glu	Asp	Asp	Asp	Ile	Asp	Pro	Leu	His	Met	Arg	His	Phe	Ser
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Asn	Asn	Phe	Gly	Asn	Val	Ile	Lys	Asn	Ala	Ile	Gly	Val	Val	Gly
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Ile	Ser	Gly	Leu	Leu	Ala	Ser	Phe	Trp	Phe	Phe	Ile	Ala	Lys	Arg
10235						10240					10245			
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Asn	Lys	Asp	Ser	Ile	Lys	Glu	Thr	Leu	Asp	Asp	Thr	Lys	His	Leu
10265						10270					10275			
Pro	Leu	Leu	Phe	Ala	Lys	Arg	Arg	Arg	Lys	Glu	Asp	Glu	Glu	Asp
10280						10285					10290			
Val	Thr	Val	Glu	Glu	Lys	Asp	Ser	Leu	Asn	Asn	Gly	Glu	Ser	Leu
10295						10300					10305			
Asp	Lys	Val	Lys	His	Thr	Pro	Phe	Phe	Leu	Pro	Lys	Arg	Arg	Arg
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Lys	Glu	Asp	Glu	Glu	Asp	Val	Glu	Val	Thr	Asn	Glu	Asn	Thr	Asp
10325						10330					10335			
Glu	Lys	Val	Leu	Lys	Asp	Asn	Glu	His	Ser	Pro	Leu	Leu	Phe	Ala
10340						10345					10350			
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10355						10360					10365			
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10370						10375					10380			
Lys	Asn	Gln	Lys	Asp	Asn	Gln	Ser	Lys	Asp	Lys	Lys	Ser	Ala	Ser
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Ala Tyr Asp Glu Phe Lys Asn Ser Pro Lys Val Asn Val Ser Asn Leu
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Thr Asp Asn Lys Asn Phe Val Ala Ser Glu Asp Lys Leu Asn Lys Ile
65 70 75 80

Ala Asp Ser Ser Ala Ala Ser Lys Ile Val Asp Lys Asn Phe Val Val
85 90 95

Pro Glu Ser Lys Leu Gly Asn Ile Val Pro Glu Tyr Lys Glu Ile Asn
100 105 110

Asn Arg Val Asn Val Ala Thr Asn Asn Pro Ala Ser Gln Gln Val Asp
115 120 125

Lys His Phe Val Ala Lys Gly Pro Glu Val Asn Arg Phe Ile Thr Gln
130 135 140

Asn Lys Val Asn His His Phe Ile Thr Thr Gln Thr His Tyr Lys Lys
145 150 155 160

Val Ile Thr Ser Tyr Lys Ser Thr His Val His Lys His Val Asn His
165 170 175

Ala Lys Asp Ser Ile Asn Lys His Phe Ile Val Lys Pro Ser Glu Ser
180 185 190

Pro Arg Tyr Thr His Pro Ser Gln Ser Leu Ile Ile Lys His His Phe
195 200 205

Ala Val Pro Gly Tyr His Ala His Lys Phe Val Thr Pro Gly His Ala
210 215 220

Ser Ile Lys Ile Asn His Phe Cys Val Val Pro Gln Ile Asn Ser Phe
Page 80

225 230 235 240
 Lys Val Ile Pro Pro Tyr Gly His Asn Ser His Arg Met His Val Pro
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 Ser Phe Gln Asn Asn Thr Thr Ala Thr His Gln Asn Ala Lys Val Asn
 260 265 270
 Lys Ala Tyr Asp Tyr Lys Tyr Phe Tyr Ser Tyr Lys Val Val Lys Gly
 275 280 285
 Val Lys Lys Tyr Phe Ser Phe Ser Gln Ser Asn Gly Tyr Lys Ile Gly
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 50 55 60
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35 40 45

Asp Ser Arg Tyr Leu Asn Ser Ala Leu Tyr Tyr Leu Glu Asp Tyr Ile
50 55 60

Ile Tyr Ala Ile Gly Leu Thr Asn Lys Tyr Glu Tyr Gly Asp Asn Ile
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Tyr Lys Glu Ala Lys Asp Arg Leu Leu Glu Lys Val Leu Arg Glu Asp
85 90 95

Gln Tyr Leu Leu Glu Arg Lys Lys Ser Gln Tyr Glu Asp Tyr Lys Gln
100 105 110

Trp Tyr Ala Asn Tyr Lys Lys Glu Asn Pro Arg Thr Asp Leu Lys Met
115 120 125

Ala Asn Phe His Lys Tyr Asn Leu Glu Glu Leu Ser Met Lys Glu Tyr
130 135 140

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

Glu Val Lys Asp Ile Lys Asp Lys Asn Ser Asp Leu Lys Thr Phe Asn
165 170 175

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

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

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

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Thr Asp Asn Pro His Lys Ile Thr Asn Glu Arg Ile Lys Lys Glu Met
 225 230 235 240
 Ile Asp Asp Leu Asn Ser Ile Ile Asp Asp Phe Phe Met Glu Thr Lys
 245 250 255
 Gln Asn Arg Pro Lys Ser Ile Thr Lys Tyr Asn Pro Thr Thr His Asn
 260 265 270
 Tyr Lys Thr Asn Ser Asp Asn Lys Pro Asn Phe Asp Lys Leu Val Glu
 275 280 285
 Glu Thr Lys Lys Ala Val Lys Glu Ala Asp Asp Ser Trp Lys Lys Lys
 290 295 300
 Thr Val Lys Lys Tyr Gly Glu Thr Glu Thr Lys Ser Pro Val Val Lys
 305 310 315 320
 Glu Glu Lys Lys Val Glu Glu Pro Gln Ala Pro Lys Val Asp Asn Gln
 325 330 335
 Gln Glu Val Lys Thr Thr Ala Gly Lys Ala Glu Glu Thr Thr Gln Pro
 340 345 350
 Val Ala Gln Pro Leu Val Lys Ile Pro Gln Gly Thr Ile Thr Gly Glu
 355 360 365
 Ile Val Lys Gly Pro Glu Tyr Pro Thr Met Glu Asn Lys Thr Val Gln
 370 375 380
 Gly Glu Ile Val Gln Gly Pro Asp Phe Leu Thr Met Glu Gln Ser Gly
 385 390 395 400
 Pro Ser Leu Ser Asn Asn Tyr Thr Asn Pro Pro Leu Thr Asn Pro Ile
 405 410 415
 Leu Glu Gly Leu Glu Gly Ser Ser Ser Lys Leu Glu Ile Lys Pro Gln
 420 425 430
 Gly Thr Glu Ser Thr Leu Lys Gly Thr Gln Gly Glu Ser Ser Asp Ile
 435 440 445
 Glu Val Lys Pro Gln Ala Thr Glu Thr Thr Glu Ala Ser Gln Tyr Gly
 450 455 460
 Pro Arg Pro Gln Phe Asn Lys Thr Pro Lys Tyr Val Lys Tyr Arg Asp
 465 470 475 480
 Ala Gly Thr Gly Ile Arg Glu Tyr Asn Asp Gly Thr Phe Gly Tyr Glu
 485 490 495

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Ala Arg Pro Arg Phe Asn Lys Pro Ser Glu Thr Asn Ala Tyr Asn Val
 500 505 510

Thr Thr His Ala Asn Gly Gln Val Ser Tyr Gly Ala Arg Pro Thr Tyr
 515 520 525

Lys Lys Pro Ser Glu Thr Asn Ala Tyr Asn Val Thr Thr His Ala Asn
 530 535 540

Gly Gln Val Ser Tyr Gly Ala Arg Pro Thr Gln Asn Lys Pro Ser Lys
 545 550 555 560

Thr Asn Ala Tyr Asn Val Thr Thr His Gly Asn Gly Gln Val Ser Tyr
 565 570 575

Gly Ala Arg Pro Thr Gln Asn Lys Pro Ser Lys Thr Asn Ala Tyr Asn
 580 585 590

Val Thr Thr His Ala Asn Gly Gln Val Ser Tyr Gly Ala Arg Pro Thr
 595 600 605

Tyr Lys Lys Pro Ser Lys Thr Asn Ala Tyr Asn Val Thr Thr His Ala
 610 615 620

Asp Gly Thr Ala Thr Tyr Gly Pro Arg Val Thr Lys
 625 630 635

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 <212> PRT
 <213> Staphylococcus sp.

<400> 28

Ala Glu Gln His Thr Pro Met Lys Ala His Ala Val Thr Thr Ile Asp
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Lys Ala Thr Thr Asp Lys Gln Gln Val Pro Pro Thr Lys Glu Ala Ala
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His His Ser Gly Lys Glu Ala Ala Thr Asn Val Ser Ala Ser Ala Gln
 35 40 45

Gly Thr Ala Asp Asp Thr Asn Ser Lys Val Thr Ser Asn Ala Pro Ser
 50 55 60

Asn Lys Pro Ser Thr Val Val Ser Thr Lys Val Asn Glu Thr Arg Asp
 65 70 75 80

Val Asp Thr Gln Gln Ala Ser Thr Gln Lys Pro Thr His Thr Ala Thr
 85 90 95

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Phe Lys Leu Ser Asn Ala Lys Thr Ala Ser Leu Ser Pro Arg Met Phe
 100 105 110
 Ala Ala Asn Ala Pro Gln Thr Thr Thr His Lys Ile Leu His Thr Asn
 115 120 125
 Asp Ile His Gly Arg Leu Ala Glu Glu Lys Gly Arg Val Ile Gly Met
 130 135 140
 Ala Lys Leu Lys Thr Val Lys Glu Gln Glu Lys Pro Asp Leu Met Leu
 145 150 155 160
 Asp Ala Gly Asp Ala Phe Gln Gly Leu Pro Leu Ser Asn Gln Ser Lys
 165 170 175
 Gly Glu Glu Met Ala Lys Ala Met Asn Ala Val Gly Tyr Asp Ala Met
 180 185 190
 Ala Val Gly Asn His Glu Phe Asp Phe Gly Tyr Asp Gln Leu Lys Lys
 195 200 205
 Leu Glu Gly Met Leu Asp Phe Pro Met Leu Ser Thr Asn Val Tyr Lys
 210 215 220
 Asp Gly Lys Arg Ala Phe Lys Pro Ser Thr Ile Val Thr Lys Asn Gly
 225 230 235 240
 Ile Arg Tyr Gly Ile Ile Gly Val Thr Thr Pro Glu Thr Lys Thr Lys
 245 250 255
 Thr Arg Pro Glu Gly Ile Lys Gly Val Glu Phe Arg Asp Pro Leu Gln
 260 265 270
 Ser Val Thr Ala Glu Met Met Arg Ile Tyr Lys Asp Val Asp Thr Phe
 275 280 285
 Val Val Ile Ser His Leu Gly Ile Asp Pro Ser Thr Gln Glu Thr Trp
 290 295 300
 Arg Gly Asp Tyr Leu Val Lys Gln Leu Ser Gln Asn Pro Gln Leu Lys
 305 310 315 320
 Lys Arg Ile Thr Val Ile Asp Gly His Ser His Thr Val Leu Gln Asn
 325 330 335
 Gly Gln Ile Tyr Asn Asn Asp Ala Leu Ala Gln Thr Gly Thr Ala Leu
 340 345 350
 Ala Asn Ile Gly Lys Ile Thr Phe Asn Tyr Arg Asn Gly Glu Val Ser
 355 360 365

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Asn Ile Lys Pro Ser Leu Ile Asn Val Lys Asp Val Glu Asn Val Thr
 370 375 380
 Pro Asn Lys Ala Leu Ala Glu Gln Ile Asn Gln Ala Asp Gln Thr Phe
 385 390 395 400
 Arg Ala Gln Thr Ala Glu Val Ile Ile Pro Asn Asn Thr Ile Asp Phe
 405 410 415
 Lys Gly Glu Arg Asp Asp Val Arg Thr Arg Glu Thr Asn Leu Gly Asn
 420 425 430
 Ala Ile Ala Asp Ala Met Glu Ala Tyr Gly Val Lys Asn Phe Ser Lys
 435 440 445
 Lys Thr Asp Phe Ala Val Thr Asn Gly Gly Gly Ile Arg Ala Ser Ile
 450 455 460
 Ala Lys Gly Lys Val Thr Arg Tyr Asp Leu Ile Ser Val Leu Pro Phe
 465 470 475 480
 Gly Asn Thr Ile Ala Gln Ile Asp Val Lys Gly Ser Asp Val Trp Thr
 485 490 495
 Ala Phe Glu His Ser Leu Gly Ala Pro Thr Thr Gln Lys Asp Gly Lys
 500 505 510
 Thr Val Leu Thr Ala Asn Gly Gly Leu Leu His Ile Ser Asp Ser Ile
 515 520 525
 Arg Val Tyr Tyr Asp Ile Asn Lys Pro Ser Gly Lys Arg Ile Asn Ala
 530 535 540
 Ile Gln Ile Leu Asn Lys Glu Thr Gly Lys Phe Glu Asn Ile Asp Leu
 545 550 555 560
 Lys Arg Val Tyr His Val Thr Met Asn Asp Phe Thr Ala Ser Gly Gly
 565 570 575
 Asp Gly Tyr Ser Met Phe Gly Gly Pro Arg Glu Glu Gly Ile Ser Leu
 580 585 590
 Asp Gln Val Leu Ala Ser Tyr Leu Lys Thr Ala Asn Leu Ala Lys Tyr
 595 600 605
 Asp Thr Thr Glu Pro Gln Arg Met Leu Leu Gly Lys Pro Ala Val Ser
 610 615 620
 Glu Gln Pro Ala Lys Gly Gln Gln Gly Ser Lys Gly Ser Lys Ser Gly
 625 630 635 640

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Lys Asp Thr Gln Pro Ile Gly Asp Asp Lys Val Met Asp Pro Ala Lys
645 650 655

Lys Pro Ala Pro Gly Lys Val Val Leu Leu Leu Ala His Arg Gly Thr
660 665 670

Val Ser Ser Gly Thr Glu Gly Ser Gly Arg Thr Ile Glu Gly Ala Thr
675 680 685

Val Ser Ser Lys Ser Gly Lys Gln Leu Ala Arg Met Ser Val Pro Lys
690 695 700

Gly Ser Ala His Glu Lys Gln Leu Pro Lys Thr Gly Thr Asn Gln Ser
705 710 715 720

Ser Ser Pro Glu Ala Met Phe Val Leu Leu Ala Gly Ile Gly Leu Ile
725 730 735

Ala Thr Val Arg Arg Arg Lys Ala Ser
740 745

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<211> 628
<212> PRT
<213> Staphylococcus sp.

<400> 29

Met Ser Asp Arg Phe Ile Lys Phe Asn Asp Glu Gln Leu Asp Ala Lys
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Gln Val Met Met Leu Gln Asp Leu Ala Arg Leu Leu Leu Lys Asn Glu
20 25 30

Gln Thr Gln Val Lys Ile Gln Lys Phe Pro Tyr Tyr Asn Pro Val Gln
35 40 45

Asn Val Leu Ile Thr Ser Trp Phe Trp Ser His Arg Pro Ser His Ile
50 55 60

Glu Met Ala Gly Leu Lys Thr Asp Val Met Leu Ala Ala Tyr Gly Tyr
65 70 75 80

His Met Met Asp Val Gln Ile Val Asn Glu Val Val Gln Asp Lys Thr
85 90 95

Phe Lys His Pro Lys Phe Tyr Gln Gln Leu Phe Lys Leu Leu Glu Asp
100 105 110

Met Arg Val Leu Asn Ser Ile Lys Val Glu Arg Pro Ser Thr Ala Lys
115 120 125

Leu Ile Asp Leu Arg Leu Asp Thr Arg Ile Ser Tyr Thr Glu Ser Gln
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135

140

Ile Lys Val Tyr Arg Thr Lys Thr Gln Tyr Thr Asp Leu Leu Phe Leu
145 150 155 160

Tyr Leu Glu His Ala Phe Leu Ser Gln Asp Phe Phe Asp Ile Pro Ser
165 170 175

Ile His Ser Asp Leu Asp Asp Ile Leu Val Asn Met Phe Leu Tyr Leu
180 185 190

Pro Asn Phe Phe Gln Asn Gln Asn Ser Glu Asp Asn Met Tyr Leu Ala
195 200 205

Gln Arg Ile Met Tyr Gln Val Asp Asp Ile Leu Lys Glu Asp Met Leu
210 215 220

Asn Glu Tyr Tyr Tyr Leu Pro Lys Thr Leu Tyr Asn Thr Leu Ala Ser
225 230 235 240

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

Gln Asp Asp Thr Ser Glu Asp Asp Asp Asn Glu Ser Glu Lys Ala Asp
260 265 270

Ser Lys Ser Ala Asp Ser Glu Ser Lys Gly Gly Ala Tyr Leu Glu Met
275 280 285

Glu Leu His Glu Gly Gln Asn Ser Glu Thr Leu Gly Asn Asp Glu Ala
290 295 300

Arg Glu Gly Asp Ala Thr Asp Asp Met Thr Asp Met Met Thr Lys Lys
305 310 315 320

Gly Lys Gly Ser Asn Asp Thr Leu Asn Arg Glu Glu Gly Asp Ala Val
325 330 335

Gly Gln Ser Gln Ala Phe Gln Leu Asp Gly Val Asn Lys Asn Val Glu
340 345 350

Ile Lys Trp Gln Ile Pro Glu Ile Glu Pro Gln Tyr Val Leu Glu Tyr
355 360 365

Gln Glu Ser Lys Gln Asp Val Gln Tyr Glu Ile Lys Asp Leu Ile Gln
370 375 380

Ile Ile Lys Lys Thr Ile Glu Arg Glu Gln Arg Asp Ala Arg Phe Asn
385 390 395 400

Leu Thr Lys Gly Arg Leu Gln Lys Asp Leu Ile Asn Trp Phe Ile Asp
Page 88

Asp Gln Tyr Lys Leu Phe Tyr Lys Lys Gln Asp Leu Ser Lys Ser Phe
420 425 430

Asp Ala Thr Phe Thr Leu Leu Ile Asp Ala Ser Ala Ser Met His Asp
435 440 445

Lys Met Ala Glu Thr Lys Lys Gly Val Val Leu Phe His Glu Thr Leu
450 455 460

Lys Ala Leu Asn Ile Lys His Glu Ile Leu Ser Phe Ser Glu Asp Ala
465 470 475 480

Phe Asp Ser Asp Glu His Ala Gln Pro Asn Ile Ile Asn Glu Ile Ile
485 490 495

Asn Tyr Asp Tyr Ser Thr Phe Glu Lys Asp Gly Pro Arg Ile Met Ala
500 505 510

Leu Glu Pro Gln Asp Asp Asn Arg Asp Gly Val Ala Ile Arg Val Ala
515 520 525

Ser Glu Arg Leu Met Arg Arg Asn Gln His Gln Arg Phe Leu Ile Val
530 535 540

Phe Ser Asp Gly Glu Pro Ser Ala Phe Asn Tyr Ser Gln Asp Gly Ile
545 550 555 560

Ile Asp Thr Tyr Glu Ala Val Glu Met Ser Arg Lys Phe Gly Ile Glu
565 570 575

Val Phe Asn Val Phe Leu Ser Gln Asp Pro Ile Thr Glu Asp Val Glu
580 585 590

Gln Thr Ile His Asn Ile Tyr Gly Gln Tyr Ala Ile Phe Val Glu Gly
595 600 605

Val Ala His Leu Pro Gly His Leu Ser Pro Leu Leu Lys Lys Leu Leu
610 615 620

Leu Lys Ser Leu
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<211> 154
<212> PRT
<213> Staphylococcus sp.

<400> 30

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

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

Lys Pro Gln Ala Lys Gln Asp Ile Ile Gln Ala Val Thr Thr Arg Lys
35 40 45

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

Ala Asn Asp Lys Ile Gly Lys Ile Glu Thr Lys Ala Ile Lys Asp Ile
65 70 75 80

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

Ile Asn Asp Ile Asn Gln Thr Thr Pro Ala Thr Thr Ala Lys Ala Ala
100 105 110

Ala Leu Glu Glu Phe Asp Glu Val Val Gln Ala Gln Ile Asp Gln Ala
115 120 125

Pro Leu Asn Pro Asp Thr Thr Asn Glu Glu Val Ala Glu Ala Ile Glu
130 135 140

Arg Ile Asn Ala Ala Lys Val Ser Gly Val
145 150

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<211> 584
<212> PRT
<213> Staphylococcus sp.

<400> 31

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1 5 10 15

Ala Ser Thr Gly Ala Asn Phe Asn Asn Asn Glu Ala Ser Ala Ala Ala
20 25 30

Lys Pro Leu Asp Lys Ser Ser Ser Ser Leu His His Gly Tyr Ser Lys
35 40 45

Val His Val Pro Tyr Ala Ile Thr Val Asn Gly Thr Ser Gln Asn Ile
50 55 60

Leu Ser Ser Leu Thr Phe Asn Lys Asn Gln Asn Ile Ser Tyr Lys Asp
65 70 75 80

Leu Glu Asp Arg Val Lys Ser Val Leu Lys Ser Asp Arg Gly Ile Ser
85 90 95

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Asp Ile Asp Leu Arg Leu Ser Lys Gln Ala Lys Tyr Thr Val Tyr Phe
 100 105 110
 Lys Asn Gly Thr Lys Lys Val Ile Asp Leu Lys Ala Gly Ile Tyr Thr
 115 120 125
 Ala Asp Leu Ile Asn Thr Ser Glu Ile Lys Ala Ile Asn Ile Asn Val
 130 135 140
 Asp Thr Lys Lys Gln Val Glu Asp Lys Lys Lys Asp Lys Ala Asn Tyr
 145 150 155 160
 Gln Val Pro Tyr Thr Ile Thr Val Asn Gly Thr Ser Gln Asn Ile Leu
 165 170 175
 Ser Asn Leu Thr Phe Asn Lys Asn Gln Asn Ile Ser Tyr Lys Asp Leu
 180 185 190
 Glu Asp Lys Val Lys Ser Val Leu Glu Ser Asn Arg Gly Ile Thr Asp
 195 200 205
 Val Asp Leu Arg Leu Ser Lys Gln Ala Lys Tyr Thr Val Asn Phe Lys
 210 215 220
 Asn Gly Thr Lys Lys Val Ile Asp Leu Lys Ser Gly Ile Tyr Thr Ala
 225 230 235 240
 Asn Leu Ile Asn Ser Ser Asp Ile Lys Ser Ile Asn Ile Asn Val Asp
 245 250 255
 Thr Lys Lys His Ile Glu Asn Lys Ala Lys Arg Asn Tyr Gln Val Pro
 260 265 270
 Tyr Ser Ile Asn Leu Asn Gly Thr Ser Thr Asn Ile Leu Ser Asn Leu
 275 280 285
 Ser Phe Ser Asn Lys Pro Trp Thr Asn Tyr Lys Asn Leu Thr Ser Gln
 290 295 300
 Ile Lys Ser Val Leu Lys His Asp Arg Gly Ile Ser Glu Gln Asp Leu
 305 310 315 320
 Lys Tyr Ala Lys Lys Ala Tyr Tyr Thr Val Tyr Phe Lys Asn Gly Gly
 325 330 335
 Lys Arg Ile Leu Gln Leu Asn Ser Lys Asn Tyr Thr Ala Asn Leu Val
 340 345 350
 His Ala Lys Asp Val Lys Arg Ile Glu Ile Thr Val Lys Thr Gly Thr
 355 360 365

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Lys Ala Lys Ala Asp Arg Tyr Val Pro Tyr Thr Ile Ala Val Asn Gly
370 375 380

Thr Ser Thr Pro Ile Leu Ser Asp Leu Lys Phe Thr Gly Asp Pro Arg
385 390 395 400

Val Gly Tyr Lys Asp Ile Ser Lys Lys Val Lys Ser Val Leu Lys His
405 410 415

Asp Arg Gly Ile Gly Glu Arg Glu Leu Lys Tyr Ala Lys Lys Ala Thr
420 425 430

Tyr Thr Val His Phe Lys Asn Gly Thr Lys Lys Val Ile Asn Ile Asn
435 440 445

Ser Asn Ile Ser Gln Leu Asn Leu Leu Tyr Val Gln Asp Ile Lys Lys
450 455 460

Ile Asp Ile Asp Val Lys Thr Gly Thr Lys Ala Lys Ala Asp Ser Tyr
465 470 475 480

Val Pro Tyr Thr Ile Ala Val Asn Gly Thr Ser Thr Pro Ile Leu Ser
485 490 495

Lys Leu Lys Ile Ser Asn Lys Gln Leu Ile Ser Tyr Lys Tyr Leu Asn
500 505 510

Asp Lys Val Lys Ser Val Leu Lys Ser Glu Arg Gly Ile Ser Asp Leu
515 520 525

Asp Leu Lys Phe Ala Lys Gln Ala Lys Tyr Thr Val Tyr Phe Lys Asn
530 535 540

Gly Lys Lys Gln Val Val Asn Leu Lys Ser Asp Ile Phe Thr Pro Asn
545 550 555 560

Leu Phe Ser Ala Lys Asp Ile Lys Lys Ile Asp Ile Asp Val Lys Gln
565 570 575

Tyr Thr Lys Ser Lys Lys Asn Lys
580

<210> 32
<211> 508
<212> PRT
<213> Staphylococcus sp.

<400> 32

Met Lys Asn Lys Leu Leu Val Leu Ser Leu Gly Ala Leu Cys Val Ser
1 5 10 15

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Gln Ile Trp Glu Ser Asn Arg Ala Ser Ala Val Val Ser Gly Glu Lys
20 25 30

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

Ser Arg Thr Val Glu Glu Tyr Lys Lys Ser Leu Asp Asp Leu Ile Trp
50 55 60

Ser Phe Pro Asn Leu Asp Asn Glu Arg Phe Asp Asn Pro Glu Tyr Lys
65 70 75 80

Glu Ala Met Lys Lys Tyr Gln Gln Arg Phe Met Ala Glu Asp Glu Ala
85 90 95

Leu Lys Lys Phe Phe Ser Glu Glu Lys Lys Ile Lys Asn Gly Asn Thr
100 105 110

Asp Asn Leu Asp Tyr Leu Gly Leu Ser His Glu Arg Tyr Glu Ser Val
115 120 125

Phe Asn Thr Leu Lys Lys Gln Ser Glu Glu Phe Leu Lys Glu Ile Glu
130 135 140

Asp Ile Lys Lys Asp Asn Pro Glu Leu Lys Asp Phe Asn Glu Glu Glu
145 150 155 160

Gln Leu Lys Cys Asp Leu Glu Leu Asn Lys Leu Glu Asn Gln Ile Leu
165 170 175

Met Leu Gly Lys Thr Phe Tyr Gln Asn Tyr Arg Asp Asp Val Glu Ser
180 185 190

Leu Tyr Ser Lys Leu Asp Leu Ile Met Gly Tyr Lys Asp Glu Glu Arg
195 200 205

Ala Asn Lys Lys Ala Val Asn Lys Arg Met Leu Glu Asn Lys Lys Glu
210 215 220

Asp Leu Glu Thr Ile Ile Asp Glu Phe Phe Ser Asp Ile Asp Lys Thr
225 230 235 240

Arg Pro Asn Asn Ile Pro Val Leu Glu Asp Glu Lys Gln Glu Glu Lys
245 250 255

Asn His Lys Asn Met Ala Gln Leu Lys Ser Asp Thr Glu Ala Ala Lys
260 265 270

Ser Asp Glu Ser Lys Arg Ser Lys Arg Ser Lys Arg Ser Leu Asn Thr
275 280 285

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Gln Asn His Lys Pro Ala Ser Gln Glu Val Ser Glu Gln Gln Lys Ala
290 295 300

Glu Tyr Asp Lys Arg Ala Glu Glu Arg Lys Ala Arg Phe Leu Asp Asn
305 310 315 320

Gln Lys Ile Lys Lys Thr Pro Val Val Ser Leu Glu Tyr Asp Phe Glu
325 330 335

His Lys Gln Arg Ile Asp Asn Glu Asn Asp Lys Lys Leu Val Val Ser
340 345 350

Ala Pro Thr Lys Lys Pro Thr Ser Pro Thr Thr Tyr Thr Glu Thr Thr
355 360 365

Thr Gln Val Pro Met Pro Thr Val Glu Arg Gln Thr Gln Gln Gln Ile
370 375 380

Ile Tyr Asn Ala Pro Lys Gln Leu Ala Gly Leu Asn Gly Glu Ser His
385 390 395 400

Asp Phe Thr Thr Thr His Gln Ser Pro Thr Thr Ser Asn His Thr His
405 410 415

Asn Asn Val Val Glu Phe Glu Glu Thr Ser Ala Leu Pro Gly Arg Lys
420 425 430

Ser Gly Ser Leu Val Gly Ile Ser Gln Ile Asp Ser Ser His Leu Thr
435 440 445

Glu Arg Glu Lys Arg Val Ile Lys Arg Glu His Val Arg Glu Ala Gln
450 455 460

Lys Leu Val Asp Asn Tyr Lys Asp Thr His Ser Tyr Lys Asp Arg Ile
465 470 475 480

Asn Ala Gln Gln Lys Val Asn Thr Leu Ser Glu Gly His Gln Lys Arg
485 490 495

Phe Asn Lys Gln Ile Asn Lys Val Tyr Asn Gly Lys
500 505

<210> 33

<211> 520

<212> PRT

<213> Staphylococcus sp.

<400> 33

Met Leu Thr Leu Gln Ile His Thr Gly Gly Ile Asn Leu Lys Lys Lys
1 5 10 15

Asn Ile Tyr Ser Ile Arg Lys Leu Gly Val Gly Ile Ala Ser Val Thr
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20

25

30

Leu Gly Thr Leu Leu Ile Ser Gly Gly Val Thr Pro Ala Ala Asn Ala
 35 40 45
 Ala Gln His Asp Glu Ala Gln Gln Asn Ala Phe Tyr Gln Val Leu Asn
 50 55 60
 Met Pro Asn Leu Asn Ala Asp Gln Arg Asn Gly Phe Ile Gln Ser Leu
 65 70 75 80
 Lys Asp Asp Pro Ser Gln Ser Ala Asn Val Leu Gly Glu Ala Gln Lys
 85 90 95
 Leu Asn Asp Ser Gln Ala Pro Lys Ala Asp Ala Gln Gln Asn Asn Phe
 100 105 110
 Asn Lys Asp Gln Gln Ser Ala Phe Tyr Glu Ile Leu Asn Met Pro Asn
 115 120 125
 Leu Asn Glu Ala Gln Arg Asn Gly Phe Ile Gln Ser Leu Lys Asp Asp
 130 135 140
 Pro Ser Gln Ser Thr Asn Val Leu Gly Glu Ala Lys Lys Leu Asn Glu
 145 150 155 160
 Ser Gln Ala Pro Lys Ala Asp Asn Asn Phe Asn Lys Glu Gln Gln Asn
 165 170 175
 Ala Phe Tyr Glu Ile Leu Asn Met Pro Asn Leu Asn Glu Glu Gln Arg
 180 185 190
 Asn Gly Phe Ile Gln Ser Leu Lys Asp Asp Pro Ser Gln Ser Ala Asn
 195 200 205
 Leu Leu Ser Glu Ala Lys Lys Leu Asn Glu Ser Gln Ala Pro Lys Ala
 210 215 220
 Asp Asn Lys Phe Asn Lys Glu Gln Gln Asn Ala Phe Tyr Glu Ile Leu
 225 230 235 240
 His Leu Pro Asn Leu Asn Glu Glu Gln Arg Asn Gly Phe Ile Gln Ser
 245 250 255
 Leu Lys Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala Lys
 260 265 270
 Lys Leu Asn Asp Ala Gln Ala Pro Lys Ala Asp Asn Lys Phe Asn Lys
 275 280 285
 Glu Gln Gln Asn Ala Phe Tyr Glu Ile Leu His Leu Pro Asn Leu Thr
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295

Glu Glu Gln Arg Asn Gly Phe Ile Gln Ser Leu Lys Asp Asp Pro Ser
305 310 315 320

Val Ser Lys Glu Ile Leu Ala Glu Ala Lys Lys Leu Asn Asp Ala Gln
325 330 335

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

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

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

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

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

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

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

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

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

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

Gly Thr Thr Val Phe Gly Gly Leu Ser Leu Ala Leu Gly Ala Ala Leu
500 505 510

Leu Ala Gly Arg Arg Arg Glu Leu
515 520

<210> 34
<211> 291
<212> PRT
<213> Staphylococcus sp.

<400> 34

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

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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
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
275 280 285

Ala Pro Lys
290

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<212> DNA
<213> Staphylococcus sp.

<400> 35
gctgcacata tggcgcaaca cgatgaagct caac 34

<210> 36
<211> 30
<212> DNA
<213> Staphylococcus sp.

<400> 36
agtggatcct tatgctttgt tagcatctgc 30

<210> 37
<211> 19
<212> PRT
<213> Staphylococcus sp.

<400> 37

Met Gly Ser Ser His His His His His His Ser Ser Gly Leu Val Pro
1 5 10 15

Arg Gly Ser

<210> 38
<211> 29
<212> DNA
<213> Staphylococcus sp.

<400> 38
aacatatggt caacaaagat caacaaagc 29

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<213> Staphylococcus sp.

<400> 39
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<210> 40
<211> 43
<212> DNA
<213> Staphylococcus sp.

<400> 40
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<210> 41
<211> 43

<212> DNA
 <213> Staphylococcus sp.
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<210> 42
 <211> 42
 <212> DNA
 <213> Staphylococcus sp.
 <400> 42
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<210> 43
 <211> 42
 <212> DNA
 <213> Staphylococcus sp.
 <400> 43
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<210> 44
 <211> 42
 <212> DNA
 <213> Staphylococcus sp.
 <400> 44
 catatgttca acaaagatgg aggaagcgcc ttctatgaaa tc 42

<210> 45
 <211> 42
 <212> DNA
 <213> Staphylococcus sp.
 <400> 45
 gatttcatag aaggcgcttc ctccatcttt gttgaacata tg 42

<210> 46
 <211> 52
 <212> DNA
 <213> Staphylococcus sp.
 <400> 46
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<210> 47
 <211> 28
 <212> DNA
 <213> Staphylococcus sp.
 <400> 47
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<210> 48
 <211> 30
 <212> DNA
 <213> Staphylococcus sp.
 <400> 48
 aaggatccgt ttgtaactct atccaaagac 30

<210> 49
 <211> 49
 <212> DNA
 <213> Staphylococcus sp.
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<210> 50
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 <212> DNA
 <213> Staphylococcus sp.
 <400> 50
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<210> 51
 <211> 31
 <212> DNA
 <213> Staphylococcus sp.
 <400> 51
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<210> 52
 <211> 30
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Lys Glu Ala Ala Ala Ser Glu Gln Asn Asn Thr Thr Val Glu Glu Ser
 35 40 45

Gly Ser Ser Ala Thr Glu Ser Lys Ala Ser Glu Thr Gln Thr Thr Thr
 50 55 60

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

Ser Glu Lys Val Ala Asp Lys Glu Thr Thr Gly Thr Gln Val Asp Ile
 115 120 125

Ala Gln Pro Ser Asn Val Ser Glu Ile Lys Pro Arg Met Lys Arg Ser
 130 135 140

Thr Asp Val Thr Ala Val Ala Glu Lys Glu Val Val Glu Glu Thr Lys
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Ala Thr Gly Thr Asp Val Thr Asn Lys Val Glu Val Glu Glu Gly Ser
 165 170 175

Glu Ile Val Gly His Lys Gln Asp Thr Asn Val Val Asn Pro His Asn
 180 185 190

Ala Glu Arg Val Thr Leu Lys Tyr Lys Trp Lys Phe Gly Glu Gly Ile
 195 200 205

Lys Ala Gly Asp Tyr Phe Asp Phe Thr Leu Ser Asp Asn Val Glu Thr
 210 215 220

His Gly Ile Ser Thr Leu Arg Lys Val Pro Glu Ile Lys Ser Thr Asp
 225 230 235 240

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Gly Gln Val Met Ala Thr Gly Glu Ile Ile Gly Glu Arg Lys Val Arg
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 Tyr Thr Phe Lys Glu Tyr Val Gln Glu Lys Lys Asp Leu Thr Ala Glu
 260 265 270
 Leu Ser Leu Asn Leu Phe Ile Asp Pro Thr Thr Val Thr Gln Lys Gly
 275 280 285
 Asn Gln Asn Val Glu Val Lys Leu Gly Glu Thr Thr Val Ser Lys Ile
 290 295 300
 Phe Asn Ile Gln Tyr Leu Gly Gly Val Arg Asp Asn Trp Gly Val Thr
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 Ala Asn Gly Arg Ile Asp Thr Leu Asn Lys Val Asp Gly Lys Phe Ser
 325 330 335
 His Phe Ala Tyr Met Lys Pro Asn Asn Gln Ser Leu Ser Ser Val Thr
 340 345 350
 Val Thr Gly Gln Val Thr Lys Gly Asn Lys Pro Gly Val Asn Asn Pro
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 Thr Val Lys Val Tyr Lys His Ile Gly Ser Asp Asp Leu Ala Glu Ser
 370 375 380
 Val Tyr Ala Lys Leu Asp Asp Val Ser Lys Phe Glu Asp Val Thr Asp
 385 390 395 400
 Asn Met Ser Leu Asp Phe Asp Thr Asn Gly Gly Tyr Ser Leu Asn Phe
 405 410 415
 Asn Asn Leu Asp Gln Ser Lys Asn Tyr Val Ile Lys Tyr Glu Gly Tyr
 420 425 430
 Tyr Asp Ser Asn Ala Ser Asn Leu Glu Phe Gln Thr His Leu Phe Gly
 435 440 445
 Tyr Tyr Asn Tyr Tyr Tyr Thr Ser Asn Leu Thr Trp Lys Asn Gly Val
 450 455 460
 Ala Phe Tyr Ser Asn Asn Ala Gln Gly Asp Gly Lys Asp Lys Leu Lys
 465 470 475 480
 Glu Pro Ile Ile Glu His Ser Thr Pro Ile Glu Leu Glu Phe Lys Ser
 485 490 495
 Glu Pro Pro Val Glu Lys His Glu Leu Thr Gly Thr Ile Glu Glu Ser
 500 505 510

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Asn Asp Ser Lys Pro Ile Asp Phe Glu Tyr His Thr Ala Val Glu Gly
 515 520 525

Ala Glu Gly His Ala Glu Gly Thr Ile Glu Thr Glu Glu Asp Ser Ile
 530 535 540

His Val Asp Phe Glu Glu Ser Thr His Glu Asn Ser Lys His His Ala
 545 550 555 560

Asp Val Val Glu Tyr Glu Glu Asp Thr Asn Pro Gly Gly Gly Gln Val
 565 570 575

Thr Thr Glu Ser Asn Leu Val Glu Phe Asp Glu Asp Ser Thr Lys Gly
 580 585 590

Ile Val Thr Gly Ala Val Ser Asp His Thr Thr Ile Glu Asp Thr Lys
 595 600 605

Glu Tyr Thr Thr Glu Ser Asn Leu Ile Glu Leu Val Asp Glu Leu Pro
 610 615 620

Glu Glu His Gly Gln Ala Gln Gly Pro Ile Glu Glu Ile Thr Glu Asn
 625 630 635 640

Asn His His Ile Ser His Ser Gly Leu Gly Thr Glu Asn Gly His Gly
 645 650 655

Asn Tyr Gly Val Ile Glu Glu Ile Glu Glu Asn Ser His Val Asp Ile
 660 665 670

Lys Ser Glu Leu Gly
 675