SEQUENCE LISTING

<110> ANDERSON, ANNALIESA
PAVLIAK, VILIAM
JANSEN, KATHRIN UTE
DODGE, INGRID LEA
BAKER, STEVEN MORRIS
NANRA, JASDEEP SINGH
MURPHY, ELLEN
GREEN, BRUCE ARTHUR
RUPPEN, MARK EDWARD
TIMOFEYEVA, YEKATERINA

<120> IMMUNOGENIC COMPOSITIONS OF STAPHYLOCOCCUS AUREUS ANTIGENS

<130> AM102183

<140>
<141>

<160> 131

<170> PatentIn version 3.5

<210> 1
<211> 927
<212> DNA
<213> Staphylococcus aureus

<400> 1
atgaaaaaat tagtaccttt attattagcc ttattacttc tagttgctgc atgtggtact 60

ggtggtaaac aaagcagtga taagtcaaat ggcaaattaa aagtagtaac gacgaattca 120

attttatatg atatggctaa aaatgttggt ggagacaacg tcgatattca tagtattgta 180

cctgttggtc aagatcctca tgaatatgaa gttaaaccta aagatattaa aaagttaact 240

gacgctgacg ttattttata caacggatta aatttagaga ctggtaacgg ttggtttgaa 300

aaagccttag aacaggctgg taaatcatta aaagataaaa aagttatcgc agtatcaaaa 360

gatgttaaac ctatctattt aaacggtgaa gaaggcaaca aagataaaca agatccacac 420

gcatggttaa gtttagataa cggtattaaa tacgtaaaaa caattcaaca aacatttatc 480

gataacgaca aaaaacataa agcagattat gaaaagcaag gtaacaaata cattgctcaa 540

ttggaaaaat taaataatga cagtaaagac aaatttaatg acattccaaa agaacaacgt 600

gccatgatta caagtgaagg tgccttcaag tacttctcaa aacaatacgg tattacacca 660

ggttatattt gggaaattaa cactgaaaaa caaggtacac cagaacaaat gagacaagct 720

attgagtttg ttaaaaagca caaattaaaa cacttattag tagaaacaag tgttgataag 780

aaagcaatgg aaagtttatc tgaagaaacg aagaaagata tctttggtga agtgtacaca 840

gattcaatcg gtaaagaagg cactaaaggt gactcttact acaaaatgat gaaatcaaat 900

attgaaactg tacacggaag catgaaa 927

<210> 2
<211> 309
<212> PRT
<213> Staphylococcus aureus

<400> 2

```
Met Lys Lys Leu Val Pro Leu Leu Leu Ala Leu Leu Leu Leu Val Ala
1               5                  10                  15

Ala Cys Gly Thr Gly Gly Lys Gln Ser Ser Asp Lys Ser Asn Gly Lys
            20                  25                  30

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

Val Gly Gly Asp Asn Val Asp Ile His Ser Ile Val Pro Val Gly Gln
    50                  55                  60

Asp Pro His Glu Tyr Glu Val Lys Pro Lys Asp Ile Lys Lys Leu Thr
65                  70                  75                  80

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

Gly Trp Phe Glu Lys Ala Leu Glu Gln Ala Gly Lys Ser Leu Lys Asp
            100                 105                 110

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

Gly Glu Glu Gly Asn Lys Asp Lys Gln Asp Pro His Ala Trp Leu Ser
    130                 135                 140

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

Asp Asn Asp Lys Lys His Lys Ala Asp Tyr Glu Lys Gln Gly Asn Lys
                165                 170                 175

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

Asn Asp Ile Pro Lys Glu Gln Arg Ala Met Ile Thr Ser Glu Gly Ala
        195                 200                 205

Phe Lys Tyr Phe Ser Lys Gln Tyr Gly Ile Thr Pro Gly Tyr Ile Trp
    210                 215                 220

Glu Ile Asn Thr Glu Lys Gln Gly Thr Pro Glu Gln Met Arg Gln Ala
225                 230                 235                 240

Ile Glu Phe Val Lys Lys His Lys Leu Lys His Leu Leu Val Glu Thr
                245                 250                 255

Ser Val Asp Lys Lys Ala Met Glu Ser Leu Ser Glu Glu Thr Lys Lys
            260                 265                 270
```

Asp Ile Phe Gly Glu Val Tyr Thr Asp Ser Ile Gly Lys Glu Gly Thr
275 280 285

Lys Gly Asp Ser Tyr Tyr Lys Met Met Lys Ser Asn Ile Glu Thr Val
290 295 300

His Gly Ser Met Lys
305

<210> 3
<211> 927
<212> DNA
<213> Staphylococcus aureus

<400> 3
atgaaaaaat tagtaccttt attattagcc ttattacttc tagttgctgc atgtggtact 60

ggtggtaaac aaagcagtga taagtcaaat ggcaaattaa aagtagtaac gacgaattca 120

attttatatg atatggctaa aaatgttggt ggagacaacg tcgatattca tagtattgta 180

cctgttggtc aagatcctca tgaatatgaa gttaaaccta aagatattaa aaagttaact 240

gacgctgaca ttattttata caacggatta aatttagaga ctggtaacgg ttggtttgaa 300

aaagccttag aacaggctgg taaatcatta aaagataaaa aagttatcgc agtatcaaaa 360

gatgttaaac ctatctattt aaacggtgaa gaaggcaaca aagataaaca agatccacac 420

gcatggttaa gtttagataa tggtattaaa tacgtaaaaa caattcaaca aacatttatc 480

gataacgaca aaaaacataa agcagattat gaaaagcaag gtaacaaata cattgctcaa 540

ttggaaaaat taaataatga cagtaaagac aaatttaatg acattccaaa agaacaacgt 600

gccatgatta caagtgaagg tgccttcaag tacttctcaa aacaatacgg tattacacca 660

ggttatattt gggaaattaa cactgaaaaa caaggtacac ctgaacaaat gagacaagct 720

attgagtttg ttaaaaagca caaattaaaa cacttattag tagaaacaag tgttgataag 780

aaagcaatgg aaagtttatc tgaagaaacg aagaaagata tctttggtga agtgtacaca 840

gattcaatcg gtaaagaagg cactaaaggt gactcttatt acaaaatgat gaaatcaaat 900

attgaaactg tacacggaag catgaaa 927

<210> 4
<211> 309
<212> PRT
<213> Staphylococcus aureus

<400> 4
Met Lys Lys Leu Val Pro Leu Leu Leu Ala Leu Leu Leu Leu Val Ala
1 5 10 15

Ala Cys Gly Thr Gly Gly Lys Gln Ser Ser Asp Lys Ser Asn Gly Lys
20 25 30

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

```
Val Gly Gly Asp Asn Val Asp Ile His Ser Ile Val Pro Val Gly Gln
    50                  55                  60

Asp Pro His Glu Tyr Glu Val Lys Pro Lys Asp Ile Lys Lys Leu Thr
65                  70                  75                  80

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

Gly Trp Phe Glu Lys Ala Leu Glu Gln Ala Gly Lys Ser Leu Lys Asp
            100                 105                 110

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

Gly Glu Glu Gly Asn Lys Asp Lys Gln Asp Pro His Ala Trp Leu Ser
    130                 135                 140

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

Asp Asn Asp Lys Lys His Lys Ala Asp Tyr Glu Lys Gln Gly Asn Lys
                165                 170                 175

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

Asn Asp Ile Pro Lys Glu Gln Arg Ala Met Ile Thr Ser Glu Gly Ala
        195                 200                 205

Phe Lys Tyr Phe Ser Lys Gln Tyr Gly Ile Thr Pro Gly Tyr Ile Trp
    210                 215                 220

Glu Ile Asn Thr Glu Lys Gln Gly Thr Pro Glu Gln Met Arg Gln Ala
225                 230                 235                 240

Ile Glu Phe Val Lys Lys His Lys Leu Lys His Leu Leu Val Glu Thr
                245                 250                 255

Ser Val Asp Lys Lys Ala Met Glu Ser Leu Ser Glu Glu Thr Lys Lys
            260                 265                 270

Asp Ile Phe Gly Glu Val Tyr Thr Asp Ser Ile Gly Lys Glu Gly Thr
        275                 280                 285

Lys Gly Asp Ser Tyr Tyr Lys Met Met Lys Ser Asn Ile Glu Thr Val
    290                 295                 300

His Gly Ser Met Lys
305
```

<210> 5
<211> 936
<212> DNA
<213> Staphylococcus aureus

<400> 5
atgaaaaaat tagtaccttt attattagcc ttattacttc tagttgctgc atgtggtact 60

ggtggtaaac aaagcagtga taagtcaaat ggcaaattaa aagtagtaac gacgaattca 120

attttatatg atatggctaa aaatgttggt ggagacaacg tcgatattca tagtattgta 180

cctgttggtc aagatcctca tgaatatgaa gttaaaccta aagatattaa aaagttaact 240

gacgctgacg ttattttata caacggatta aatttagaga ctggtaacgg ttggtttgaa 300

aaagccttag aacaggctgg taaatcatta aaagataaaa aagttatcgc agtatcaaaa 360

gatgttaaac ctatctattt aaacggtgaa gaaggcaaca aagataaaca agatccacac 420

gcatggttaa gtttagataa cggtattaaa tacgtaaaaa caattcaaca aacatttatc 480

gataacgaca aaaaacataa agcagattat gaaaagcaag gtaacaaata cattgctcaa 540

ttggaaaaat taaataatga cagtaaagac agtaaagaca aatttaatga cattccaaaa 600

gaacaacgtg ccatgattac aagtgaaggt gccttcaagt acttctcaaa acaatacggt 660

attacaccag gttatatttg ggaaattaac actgaaaaac aaggtacacc tgaacaaatg 720

agacaagcta ttgagtttgt taaaaagcac aaattaaaac acttattagt agaaacaagt 780

gttgataaga aagcaatgga aagtttatct gaagaaacga agaaagatat ctttggtgaa 840

gtgtacacag attcaatcgg taaagaaggc actaaaggtg actcttacta caaaatgatg 900

aaatcaaata ttgaaactgt acacggaagc atgaaa 936

<210> 6
<211> 312
<212> PRT
<213> Staphylococcus aureus

<400> 6
Met Lys Lys Leu Val Pro Leu Leu Leu Ala Leu Leu Leu Leu Val Ala
1 5 10 15

Ala Cys Gly Thr Gly Gly Lys Gln Ser Ser Asp Lys Ser Asn Gly Lys
20 25 30

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

Val Gly Gly Asp Asn Val Asp Ile His Ser Ile Val Pro Val Gly Gln
50 55 60

Asp Pro His Glu Tyr Glu Val Lys Pro Lys Asp Ile Lys Lys Leu Thr
65 70 75 80

Asp Ala Asp Val Ile Leu Tyr Asn Gly Leu Asn Leu Glu Thr Gly Asn

85 90 95

Gly Trp Phe Glu Lys Ala Leu Glu Gln Ala Gly Lys Ser Leu Lys Asp
100 105 110

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

Gly Glu Glu Gly Asn Lys Asp Lys Gln Asp Pro His Ala Trp Leu Ser
130 135 140

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

Asp Asn Asp Lys Lys His Lys Ala Asp Tyr Glu Lys Gln Gly Asn Lys
165 170 175

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

Asp Lys Phe Asn Asp Ile Pro Lys Glu Gln Arg Ala Met Ile Thr Ser
195 200 205

Glu Gly Ala Phe Lys Tyr Phe Ser Lys Gln Tyr Gly Ile Thr Pro Gly
210 215 220

Tyr Ile Trp Glu Ile Asn Thr Glu Lys Gln Gly Thr Pro Glu Gln Met
225 230 235 240

Arg Gln Ala Ile Glu Phe Val Lys Lys His Lys Leu Lys His Leu Leu
245 250 255

Val Glu Thr Ser Val Asp Lys Lys Ala Met Glu Ser Leu Ser Glu Glu
260 265 270

Thr Lys Lys Asp Ile Phe Gly Glu Val Tyr Thr Asp Ser Ile Gly Lys
275 280 285

Glu Gly Thr Lys Gly Asp Ser Tyr Tyr Lys Met Met Lys Ser Asn Ile
290 295 300

Glu Thr Val His Gly Ser Met Lys
305 310

<210> 7
<211> 927
<212> DNA
<213> Staphylococcus aureus

<400> 7
atgaaaaaat tagtaccttt attattagcc ttattacttt tagttgctgc atgtggtact 60

ggtggtaaac aaagcagtga taagtcaaat ggcaaactaa aagtagtaac gacgaattca 120

attttatatg atatggctaa aaatgttggt ggagacaacg tcgatattca tagtattgta 180

cctgttggtc aagatcctca tgaatatgaa gttaaaccta aagatattaa aaagttaact 240

gacgctgacg ttattttata caacggatta aatttagaga ctggtaacgg ttggtttgaa 300

aaagccttag aacaggctgg taaatcatta aaagataaaa aagttatcgc agtatcaaaa 360

gatgttaaac ctatctattt aaacggtgaa gaaggcaaca aagataaaca agatccacac 420

gcatggttaa gtttagataa cggtattaaa tacgtaaaaa caattcaaca aacatttatc 480

gataacgaca aaaaacataa agcagattat gaaaagcaag gtaacaaata cattgctcaa 540

ttggaaaaat taaataatga cagtaaagac aaatttaatg acattccaaa agaacaacgt 600

gccatgatta caagtgaagg tgccttcaaa tacttctcaa aacaatacgg tattacacca 660

ggttatattt gggaaattaa cactgaaaaa caaggtacac cagaacaaat gagacaagct 720

attgagtttg ttaaaaaaca caaattaaaa cacttattag tagaaacaag tgttgataag 780

aaagcaatgg aaagtttatc tgaagaaacg aagaaagata tctttggtga agtgtacaca 840

gattcaatcg gtaaagaagg cactaaaggt gactcttact acaaaatgat gaaatcaaat 900

attgatactg tacacggaag catgaaa 927

<210> 8
<211> 309
<212> PRT
<213> Staphylococcus aureus

<400> 8

```
Met Lys Lys Leu Val Pro Leu Leu Leu Ala Leu Leu Leu Leu Val Ala
1               5                  10                  15

Ala Cys Gly Thr Gly Gly Lys Gln Ser Ser Asp Lys Ser Asn Gly Lys
            20                  25                  30

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

Val Gly Gly Asp Asn Val Asp Ile His Ser Ile Val Pro Val Gly Gln
    50                  55                  60

Asp Pro His Glu Tyr Glu Val Lys Pro Lys Asp Ile Lys Lys Leu Thr
65                  70                  75                  80

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

Gly Trp Phe Glu Lys Ala Leu Glu Gln Ala Gly Lys Ser Leu Lys Asp
            100                 105                 110

Lys Lys Val Ile Ala Val Ser Lys Asp Val Lys Pro Ile Tyr Leu Asn
        115                 120                 125
```

Gly Glu Glu Gly Asn Lys Asp Lys Gln Asp Pro His Ala Trp Leu Ser
130 135 140

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

Asp Asn Asp Lys Lys His Lys Ala Asp Tyr Glu Lys Gln Gly Asn Lys
165 170 175

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

Asn Asp Ile Pro Lys Glu Gln Arg Ala Met Ile Thr Ser Glu Gly Ala
195 200 205

Phe Lys Tyr Phe Ser Lys Gln Tyr Gly Ile Thr Pro Gly Tyr Ile Trp
210 215 220

Glu Ile Asn Thr Glu Lys Gln Gly Thr Pro Glu Gln Met Arg Gln Ala
225 230 235 240

Ile Glu Phe Val Lys Lys His Lys Leu Lys His Leu Leu Val Glu Thr
245 250 255

Ser Val Asp Lys Lys Ala Met Glu Ser Leu Ser Glu Glu Thr Lys Lys
260 265 270

Asp Ile Phe Gly Glu Val Tyr Thr Asp Ser Ile Gly Lys Glu Gly Thr
275 280 285

Lys Gly Asp Ser Tyr Tyr Lys Met Met Lys Ser Asn Ile Asp Thr Val
290 295 300

His Gly Ser Met Lys
305

<210> 9
<211> 927
<212> DNA
<213> Staphylococcus aureus

<400> 9
atgaaaaaat tagtaccttt attattagcc ttattacttc tagttgctgc atgtggtact 60

gatggtaaac aaagcagtga taagtcaaat ggcaaattaa aagtagtaac gacgaattca 120

attttatatg atatggctaa aaatgttggt ggagacaacg tcgatattca tagtattgta 180

cctgttggtc aagatcctca tgaatatgaa gttaaaccta aagatattaa aaagttaact 240

gacgctgacg ttattttata caacggatta aatttagaga ctggtaacgg ttggtttgaa 300

aaagccttag aacaggctgg taaatcatta aaagataaaa aagttatcgc agtatcaaaa 360

gatgttaaac ctatctattt aaacggtgaa gaaggcaaca aagataaaca agatccacac 420

gcatggttaa gtttagataa cggtattaaa tacgtaaaaa caattcaaca aacatttatc 480

gataacgaca aaaaacataa agcagattat gaaaagcaag gtaacaaata cattgctcaa 540

ttggaaaaat taaataatga cagtaaagac aaatttaatg acattccaaa agaacaacgt 600

gccatgatta caagtgaagg tgccttcaag tacttctcaa aacaatacgg tattacacca 660

ggttatattt gggaaattaa cactgaaaaa caaggtacac ctgaacaaat gagacaagct 720

attgagtttg ttaaaaagca caaattaaaa cacttattag tagaaacaag tgttgataag 780

aaagcaatgg aaagtttatc tgaagaaacg aagaaagata tctttggtga agtgtacaca 840

gattcaatcg gtaaagaagg cactaaaggt gactcttact acaaaatgat gaaatcaaat 900

attgaaactg tacacggaag catgaaa 927

<210> 10
<211> 309
<212> PRT
<213> Staphylococcus aureus

<400> 10

```
Met Lys Lys Leu Val Pro Leu Leu Leu Ala Leu Leu Leu Leu Val Ala
1               5                  10                  15

Ala Cys Gly Thr Asp Gly Lys Gln Ser Ser Asp Lys Ser Asn Gly Lys
            20                  25                  30

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

Val Gly Gly Asp Asn Val Asp Ile His Ser Ile Val Pro Val Gly Gln
    50                  55                  60

Asp Pro His Glu Tyr Glu Val Lys Pro Lys Asp Ile Lys Lys Leu Thr
65                  70                  75                  80

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

Gly Trp Phe Glu Lys Ala Leu Glu Gln Ala Gly Lys Ser Leu Lys Asp
            100                 105                 110

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

Gly Glu Glu Gly Asn Lys Asp Lys Gln Asp Pro His Ala Trp Leu Ser
    130                 135                 140

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

Asp Asn Asp Lys Lys His Lys Ala Asp Tyr Glu Lys Gln Gly Asn Lys
                165                 170                 175
```

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

Asn Asp Ile Pro Lys Glu Gln Arg Ala Met Ile Thr Ser Glu Gly Ala
195 200 205

Phe Lys Tyr Phe Ser Lys Gln Tyr Gly Ile Thr Pro Gly Tyr Ile Trp
210 215 220

Glu Ile Asn Thr Glu Lys Gln Gly Thr Pro Glu Gln Met Arg Gln Ala
225 230 235 240

Ile Glu Phe Val Lys Lys His Lys Leu Lys His Leu Leu Val Glu Thr
245 250 255

Ser Val Asp Lys Lys Ala Met Glu Ser Leu Ser Glu Glu Thr Lys Lys
260 265 270

Asp Ile Phe Gly Glu Val Tyr Thr Asp Ser Ile Gly Lys Glu Gly Thr
275 280 285

Lys Gly Asp Ser Tyr Tyr Lys Met Met Lys Ser Asn Ile Glu Thr Val
290 295 300

His Gly Ser Met Lys
305

<210> 11
<211> 927
<212> DNA
<213> Staphylococcus aureus

<400> 11
atgaaaaaat tagtaccttt attattagcc ttattacttc tagttgctgc atgtggtact 60

ggtggtaaac aaagcagtga taagtcaaat ggcaaattaa aagtagtaac gacgaattca 120

attttatatg atatggctaa aaatgttggt ggagacaacg tcgatattca tagtattgta 180

cctgttggtc aagatcctca tgaatatgaa gttaaaccta aagatattaa aaagttaact 240

gacgctgacg ttattttata caacggatta aatttagaga ctggtaacgg ttggtttgaa 300

aaagccttag aacaggctgg taaatcatta aaagataaaa aagttatcgc agtatcaaaa 360

gatgttaaac ctatctattt aaacggtgaa gaaggcaaca aagataaaca agatccacac 420

gcatggttaa gtttagataa cggtattaaa tacgtaaaaa caattcaaca aacatttatc 480

gataacgaca aaaaacataa agcatattat gaaaagcaag gtaacaaata cattgctcaa 540

ttggaaaaat taaataatga cagtaaagac aaatttaatg acattccaaa agaacaacgt 600

gccatgatta caagtgaagg tgccttcaag tacttctcaa aacaatacgg tattacacca 660

ggttatattt gggaaattaa cactgaaaaa caaggtacac ctgaacaaat gagacaagct 720

attgagtttg ttaaaaagca caaattaaaa cacttattag tagaaacaag tgttgataag 780

aaagcaatgg aaagtttatc tgaagaaacg aagaaagata tctttggtga agtgtacaca 840

gattcaatcg gtaaagaagg cactaaaggt gactcttact acaaaatgat gaaatcaaat 900

attgatactg tacacggaag catgaaa 927

<210> 12
<211> 309
<212> PRT
<213> Staphylococcus aureus

<400> 12

```
Met Lys Lys Leu Val Pro Leu Leu Leu Ala Leu Leu Leu Leu Val Ala
1               5                  10                  15

Ala Cys Gly Thr Gly Gly Lys Gln Ser Ser Asp Lys Ser Asn Gly Lys
            20                  25                  30

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

Val Gly Gly Asp Asn Val Asp Ile His Ser Ile Val Pro Val Gly Gln
    50                  55                  60

Asp Pro His Glu Tyr Glu Val Lys Pro Lys Asp Ile Lys Lys Leu Thr
65                  70                  75                  80

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

Gly Trp Phe Glu Lys Ala Leu Glu Gln Ala Gly Lys Ser Leu Lys Asp
            100                 105                 110

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

Gly Glu Glu Gly Asn Lys Asp Lys Gln Asp Pro His Ala Trp Leu Ser
    130                 135                 140

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

Asp Asn Asp Lys Lys His Lys Ala Tyr Tyr Glu Lys Gln Gly Asn Lys
                165                 170                 175

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

Asn Asp Ile Pro Lys Glu Gln Arg Ala Met Ile Thr Ser Glu Gly Ala
        195                 200                 205

Phe Lys Tyr Phe Ser Lys Gln Tyr Gly Ile Thr Pro Gly Tyr Ile Trp
    210                 215                 220
```

Glu Ile Asn Thr Glu Lys Gln Gly Thr Pro Glu Gln Met Arg Gln Ala
225 230 235 240

Ile Glu Phe Val Lys Lys His Lys Leu Lys His Leu Leu Val Glu Thr
245 250 255

Ser Val Asp Lys Lys Ala Met Glu Ser Leu Ser Glu Glu Thr Lys Lys
260 265 270

Asp Ile Phe Gly Glu Val Tyr Thr Asp Ser Ile Gly Lys Glu Gly Thr
275 280 285

Lys Gly Asp Ser Tyr Tyr Lys Met Met Lys Ser Asn Ile Asp Thr Val
290 295 300

His Gly Ser Met Lys
305

<210> 13
<211> 927
<212> DNA
<213> Staphylococcus aureus

<400> 13
atgaaaaaat tagtaccttt attattagcc ttattacttc tagttgctgc atgtggtact 60

ggtggtaaac aaagcagtga taagtcaaat ggcaaattaa aagtagtaac gacgaattca 120

attttatatg atatggctaa aaatgttggt ggagacaacg tcgatattca tagtattgta 180

cctgttggtc aagatcctca tgaatatgaa gttaaaccta aagatattaa aaagttaact 240

gacgctgacg ttattttata caacggatta aatttagaga ctggtaacgg ttggtttgaa 300

aaagccttag aacaggctgg taaatcatta aaagataaaa aagttatcgc agtatcaaaa 360

gatgttaaac ctatctattt aaacggtgaa gaaggcaaca aagataaaca agatccacac 420

gcatggttaa gtttagataa cggtattaaa tacgtaaaaa caattcaaca aacatttatc 480

gataacgaca aaaaacataa agcagattat gaaaagcaag gtaacaaata cattgctcaa 540

ttggaaaaat taaataatga cagtaaagac aaatttaatg acrttccaaa agaacaacgt 600

gccatgatta caagtgaagg tgccttcaag tacttctcaa aacaatacgg tattacacca 660

ggttatattt gggaaattaa cactgaaaaa caaggtacac ctgaacaaat gagacaagct 720

attgagtttg ttaaaaagca caaattaaaa cacttattag tagaaacaag tgttgataag 780

aaagcaatgg aaagtttatc tgaagaaacg aagaaagata tctttggtga agtgtacaca 840

gattcaatcg gtaaagaagg cactaaaggt gactcttact acaaaatgat gaaatcaaat 900

attgatactg tacacggaag catgaaa 927

<210> 14
<211> 309
<212> PRT

<213> Staphylococcus aureus

<220>
<221> MOD_RES
<222> (195)..(195)
<223> Any amino acid

<400> 14

```
Met Lys Lys Leu Val Pro Leu Leu Leu Ala Leu Leu Leu Leu Val Ala
1               5                  10                  15

Ala Cys Gly Thr Gly Gly Lys Gln Ser Ser Asp Lys Ser Asn Gly Lys
            20                  25                  30

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

Val Gly Gly Asp Asn Val Asp Ile His Ser Ile Val Pro Val Gly Gln
    50                  55                  60

Asp Pro His Glu Tyr Glu Val Lys Pro Lys Asp Ile Lys Lys Leu Thr
65                  70                  75                  80

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

Gly Trp Phe Glu Lys Ala Leu Glu Gln Ala Gly Lys Ser Leu Lys Asp
            100                 105                 110

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

Gly Glu Glu Gly Asn Lys Asp Lys Gln Asp Pro His Ala Trp Leu Ser
    130                 135                 140

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

Asp Asn Asp Lys Lys His Lys Ala Asp Tyr Glu Lys Gln Gly Asn Lys
                165                 170                 175

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

Asn Asp Xaa Pro Lys Glu Gln Arg Ala Met Ile Thr Ser Glu Gly Ala
        195                 200                 205

Phe Lys Tyr Phe Ser Lys Gln Tyr Gly Ile Thr Pro Gly Tyr Ile Trp
    210                 215                 220

Glu Ile Asn Thr Glu Lys Gln Gly Thr Pro Glu Gln Met Arg Gln Ala
225                 230                 235                 240
```

Ile Glu Phe Val Lys Lys His Lys Leu Lys His Leu Leu Val Glu Thr
245 250 255

Ser Val Asp Lys Lys Ala Met Glu Ser Leu Ser Glu Glu Thr Lys Lys
260 265 270

Asp Ile Phe Gly Glu Val Tyr Thr Asp Ser Ile Gly Lys Glu Gly Thr
275 280 285

Lys Gly Asp Ser Tyr Tyr Lys Met Met Lys Ser Asn Ile Asp Thr Val
290 295 300

His Gly Ser Met Lys
305

<210> 15
<211> 1626
<212> DNA
<213> Staphylococcus aureus

<400> 15
ttgaaaaaaa gaattgatta tttgtcgaat aagcagaata agtattcgat tagacgtttt 60

acagtaggta ccacatcagt aatagtaggg gcaacgatac tatttgggat aggcaatcat 120

caagcacaag cttcagaaca atcgaacgat acaacgcaat cttcgaaaaa taatgcaagt 180

gcagattccg aaaaaaacaa tacgatagaa acacctcaat taaatacaac ggctaatgat 240

acatctgata ttagtgcaaa cacaaacagt gcgaatgtag atagcacagc aaaaccaatg 300

tctacacaaa cgagcaatac cactacaaca gagccagctt caacaaatga aacacctcac 360

ccgacggcaa ttaaagatca agcaactgct gcaaaaatgc aagatcaaac tgttcctcaa 420

gaagcaaatt ctcaagtaga taataaaaca acgaatgatg ctaatagcat agcaacaaac 480

agtgagctta aaaatcctca aacattagat ttaccacaat catcaccaca aacgatttcc 540

aatgcgcaag gaactagtaa accaagtgtt agaacgagag ctgtacgtag tcttgcagtt 600

actgaacctg tagtaaatgc tgctgatgct aaaggtacaa atgtaaatgg tcaagttacg 660

gcaagtgatt tcaagttaga aaagactaca tttgacccta accaaagtgg taacacattt 720

atggcggcaa attttaaagt ggcagggaaa gtgaaatcag gggattattt tacagcgaag 780

ttaccagata gtgtaactgg taatggagat gtggattact ctaactcgaa taatacgatg 840

ccaattgcag atattaaaag tacgaatggc gatgttgtag ctaaagcaac atatgatatc 900

ttgactaaga cgtatacatt tgtctttaca gattatgtaa atgataaaga aaatattaac 960

ggacaatttt cattaccatt atttacagac agagcaaagg cacctaaatc aggaacatat 1020

gatgcaaata ttaatattgc ggatgaaatg tttaataata aaattactta taactatagt 1080

tcaccaattg caggaattga taagccaaat ggcgcgaaca tttcttctca aattattggt 1140

gtagatacag cttcaggtca aaacacatac aagcaaacgg tatttgttaa ccctaagcaa 1200

cgagttttag gtaatacgtg ggtgtatatt aaaggttacc aagataaaat cgaagaaagt 1260

agcggtaaag taagtgctac agatacaaaa ctgagaattt ttgaagtgaa tgatacatct 1320

aaattatcag atagctacta tgcagaccca aatgactcta accttaaaga agtaactgat 1380

caatttaaag ataaaatttc atacaaatac gataacgtag caagtattaa ttttggtgat 1440

ataaataaaa cgtatgtcgt tttagtcgaa ggtcattatg ataatactgg taaaaacttg 1500

aaaacacagg ttattcaaga aaatattgac ccagcgacag gtaaagatta cagtattttc 1560

ggttggaata atgagaatgt tgtacgttat ggaggcggaa gtgctgatgg tgattcagca 1620

gtaaat 1626

<210> 16
<211> 542
<212> PRT
<213> Staphylococcus aureus

<400> 16

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

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 Thr 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

Ala 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 His Pro Thr Ala Ile Lys Asp 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 Pro 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 Thr Glu Pro Val Val Asn Ala Ala
        195                 200                 205

Asp Ala Lys Gly Thr Asn Val Asn Gly Gln Val Thr Ala Ser Asp 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 Lys Val Ala Gly Lys Val Lys Ser Gly Asp Tyr
                245                 250                 255

Phe Thr Ala Lys Leu Pro Asp Ser Val 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

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 Asp 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 Asp
    450                 455                 460
```

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

Ile Asn 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 Ile Asp Pro Ala
500 505 510

Thr Gly Lys 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
530 535 540

<210> 17
<211> 1626
<212> DNA
<213> Staphylococcus aureus

<400> 17
ttgaaaaaaa gaattgatta tttgtcgaat aagcagaata agtattcgat tagacgtttt 60
acagtaggta ccacatcagt aatagtaggg gcaactatac tatttgggat aggcaatcat 120
caagcacaag cttcagaaca atcgaacgat acaacgcaat cttcgaaaaa taatgcaagt 180
gcagattccg aaaaaaacaa tacgatagaa acacctcaat taaatacaac ggctaatgat 240
acatctgata ttagtgcaaa cacaaacagt gcgaatgtag atagcacagc aaaaacaatg 300
tctacacaaa cgagcaatac cactacaaca gagccagctt caacaaatga aacacctcaa 360
ccgacggcaa ttaaagatca agcaactgct gcaaaaatgc aagatcaaac tgttcctcaa 420
gaagcaaatt ctcaagtaga taataaaaca acgaatgatg ctaataacat agcaacaaac 480
agtgagctta aaaatcctca aacattagat ttaccacaat catcaccaca aacgatttcc 540
aatgcgcaag gaactagtaa accaagtgtt agaacgagag ctgtacgtag tcttgcagtt 600
gctgaacctg tagtaaatgc tgctgatgct aaaggtacaa atgtaaatga taaagttacg 660
gcaagtgatt tcaagttaga aaagactgca tttgacccta accaaagtgg taacacattt 720
atggcggcaa attttaaagt gactggacaa gtgaaatcag gggattattt tacagcgaag 780
ttaccagata gtgtaactgg taatggagac gtggattact ctaattcaaa taatacgatg 840
ccaattgcag acattaaaag tacgaatggc gatgttgtag ctaaagcaac atatgatatc 900
ttgactaaga cgtatacatt tgtctttaca gattatgtaa atgataaaga aaatattaac 960
ggacaatttt cattaccttt atttacagac cgagcaaagg cacctaaatc aggaacatat 1020
gatgcaaata ttaatattgc ggatgaaatg tttgataata aaattactta taactatagt 1080
tcgccaattg caggaattga taagccaaat ggcgcgaaca tttcttctca aattattggt 1140
gtagatacag cttcaggtca aaacacatac aagcaaacgg tatttgttaa ccctaagcaa 1200

cgagttttag gtaatacgtg ggtgtatatt aaaggttacc aagataaaat cgaagaaagt 1260

agcggtaaag taagtgctac agatacaaaa ctgagaattt ttgaagtgaa tgatacatct 1320

aaattatcag atagctacta tgcagaccca aatgactcta accttaaaga agtgactggt 1380

gagtttaaag ataaaatttc atacaaatac gataacgtag caagtattaa ttttggtgat 1440

ataaataaaa cgtatgttgt attagtggaa ggtcactatg ataatactgg taaaaacttg 1500

aaaacacagg ttattcaaga aaatattgac ccagcgacag gtaaagacta cagtattttc 1560

ggttggaata atgagaatgt tgtacgttat ggaggcggaa gtgctgatgg tgattcagca 1620

gtaaat 1626

<210> 18
<211> 542
<212> PRT
<213> Staphylococcus aureus

<400> 18

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

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 Thr 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

Ala Lys Thr 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 Asp 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 Asn Ile Ala Thr Asn
145 150 155 160

Ser Glu Leu Lys Asn Pro 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 Asp Phe
210 215 220

Lys Leu Glu Lys Thr Ala Phe Asp Pro Asn Gln Ser Gly Asn Thr Phe
225 230 235 240

Met Ala Ala Asn Phe Lys Val Thr Gly Gln Val Lys Ser Gly Asp Tyr
245 250 255

Phe Thr Ala Lys Leu Pro Asp Ser Val 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

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 Asp 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 Asp
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 Gly Glu Phe Lys Asp

450 455 460

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

Ile Asn 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 Ile Asp Pro Ala
500 505 510

Thr Gly Lys 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
530 535 540

<210> 19
<211> 1626
<212> DNA
<213> Staphylococcus aureus

<400> 19
ttgaaaaaaa gaattgatta tttgtcgaat aagcagaata agtattcgat tagacgtttt 60

acagtaggta ccacatcagt aatagtaggg gcaactatac tatttgggat aggcaatcat 120

caagcacaag cttcagaaca atcgaacgat acaacgcaat cttcgaaaaa taatgcaagt 180

gcagattccg aaaaaaacaa tacgatagaa acacctcaat taaatacaac ggctaatgat 240

acatctgata ttagtgcaaa cacaaacagt gcgaatgtag atagcacagc aaaaccaatg 300

tctacacaaa cgagcaatac cactacaaca gagccagctt caacaaatga aacacctcaa 360

ccgacggcaa ttaaagatca agcaactgct gcaaaaatgc aagatcaaac tgttcctcaa 420

gaagcaaatt ctcaagtaga taataaaaca acgaatgatg ctaatagcat agcgacaaac 480

agcgagctta aaaatcctca atcattagat ttaccacaat catcaccaca aacgatttcc 540

aatgcgcaag gaactagtaa accaagtgtt agaacgagag ctgtacgtag tcttgcagtt 600

gctgaacctg tagtaaatgc tgctgatgct aaaggtacaa atgtaaatga taaagttacg 660

gcaaaagatt ttcaattaga aaagactaca tttgacccta accaaagtgg taatactttt 720

atggcggcaa actttacagt gactggacaa gtgaaatcag gggattattt tacagcgaag 780

ttaccagata gtgtaactgg taatggagac gtggattact ctaattcaaa taatacgatg 840

ccaattgcag atatagtaaa cgataaaaat gaagttgtag caaaagcgac atatgatatt 900

ttgactaaga catatacatt tgtctttaca gattatgtaa atgataagca aaatattaat 960

gggaaatttt cattaccatt atttacagac cgagcaaagg cacctaaatc aggaatatat 1020

gatgcgaata ttaatattgc ggatgaaatg tttaataata aaattactta taactatagt 1080

tcgccaattg caggaattga taagccaaat ggcgcgaaca tttcttctca aattattggt 1140

gtagatacag cttcaggtca aaatacatac aagcaaacgg tatttgttaa ccctaagcaa 1200

cgagttttag gtaatacgtg ggtgtatatt aaaggttacc aagataaaat cgaagaaagt 1260

agcggtaaag taagtgctac agatacaaaa ctgagaattt ttgaagtgaa tgatacatct 1320

aaattatcag atagctacta tgcggaccca aatgactcta accttaaaga agtgactggt 1380

gagtttaata atagaatttt ttatgaacat ccaaacgtag caagtattaa ttttggtgat 1440

ataaataaaa cgtatgtcgt tttagttgaa ggtcactatg ataatactgg taaaaacttg 1500

aaaacacagg ttattcaaga aaatattgac ccagcgacag gtaaagacta cagtattttc 1560

ggatggaata atgagaatgt tgtacgttat ggtggtggaa gtgctgatgg tgattcagca 1620

gtaaat 1626

<210> 20
<211> 542
<212> PRT
<213> Staphylococcus aureus

<400> 20

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

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 Thr 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

Ala 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 Asp 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 Pro Gln Ser 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 Lys Asp Phe
    210                 215                 220

Gln 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 Gly Gln Val Lys Ser Gly Asp Tyr
                245                 250                 255

Phe Thr Ala Lys Leu Pro Asp Ser Val Thr Gly Asn Gly Asp Val Asp
            260                 265                 270

Tyr Ser Asn Ser Asn Asn Thr Met Pro Ile Ala Asp Ile Val Asn Asp
        275                 280                 285

Lys Asn Glu 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 Asp Lys Gln Asn Ile Asn
305                 310                 315                 320

Gly Lys Phe Ser Leu Pro Leu Phe Thr Asp Arg Ala Lys Ala Pro Lys
                325                 330                 335

Ser Gly Ile 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 Gly Glu Phe Asn Asn
450 455 460

Arg Ile Phe Tyr Glu His Pro Asn Val Ala Ser Ile Asn Phe Gly Asp
465 470 475 480

Ile Asn 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 Ile Asp Pro Ala
500 505 510

Thr Gly Lys 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
530 535 540

<210> 21
<211> 1626
<212> DNA
<213> Staphylococcus aureus

<400> 21
ttgaaaaaaa gaattgatta tttgtcgaat aagcagaata agtattcgat tagacgtttt 60

acagtaggta ccacatcagt aatagtaggg gcaactatac tatttgggat aggcaatcat 120

caagcacaag cttcagaaca atcgaacgat acaacgcaat cttcgaaaaa taatgcaagt 180

gcagattccg aaaaaaacaa tacgatagaa acacctcaat taaatacaac ggctaatgat 240

acatctgata ttagtgcaaa cacaaacagt gcgaatgtag atagcacagc aaaaccaatg 300

tctacacaaa cgagcaatac cactacaaca gagccagctt caacaaatga aacacctcaa 360

ccgacggcaa ttaaagatca agcaactgct gcaaaaatgc aagatcgaac tgttcctcaa 420

gaagcaaatt ctcaagtaga taataaaaca acgaatgatg ctaatagcat aacaacaaac 480

agtgagctta aaaatcctca aacattagat ttaccacaat catcaccaca aacgatttcc 540

aatgcgcaag gaactagtaa accaagtgtt agaacgagag ctgtacgtag tcttgcagtt 600

gctgaacctg tagtaaatgc tgctgatgct aaaggcacaa atgtaaatga taaagttacg 660

gcaaaagatt ttcaattaga aaagactaca tttgacccta accaaagtgg taatactttt 720

atggcggcaa actttacagt gactggacaa gtgaaatcag gggattattt tacagcgaag 780

ttaccagaaa gtttaactgg taatggagac gtggattact ctaactcgaa taatacgatg 840

ccaattgcag atattaaaag tacgaatggc aatgttgtag ctaaagcaac atatgatatc 900

ttgactaaga cgtatacatt tgtctttaca gattatgtaa atgataaaga aaatattaac 960

ggacaatttt cattaccttt atttacagac cgagcaaagg cacctaaatc aggaacatat 1020

gatgcaaata ttaatattgc ggatgaaatg tttaacaata aaattactta taactatagt 1080

tcaccaattg caggaattga taagccaaat ggcgcgaaca tttcttctca aattattggt 1140

gtagatacag cttcaggtca aaacacatac aagcaaacgg tatttgttaa ccctaagcaa 1200

cgagttttag gtaatacgtg ggtgtatatt aaaggttacc aagataaaat cgaagaaagt 1260

agcggtaaag taagtgctac agatacaaaa ctgagaattt ttgaagtgaa tgatacatct 1320

aaattatcag atagctacta tgcggaccca aatgactcta atcttaaaga agtaactgat 1380

caatttaagg ataaaatcac ttataaatac caaaatgtag caagtattaa ttttggtgat 1440

attactaaaa cgtatgttgt attagtggaa ggtcactatg ataatactgg taaaaacttg 1500

aaaacacagg ttattcaaga aaatattgac ccagcgacag gtaaagacta cagtattttc 1560

ggatggaata atgagaatgt tgtacgttat ggtggtggaa gtgctgatgg tgattcagca 1620

gtaaat 1626

<210> 22
<211> 542
<212> PRT
<213> Staphylococcus aureus

<400> 22

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

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 Thr 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

Ala 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 Asp Gln Ala
        115                 120                 125

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

Gln Val Asp Asn Lys Thr Thr Asn Asp Ala Asn Ser Ile Thr Thr Asn
145                 150                 155                 160

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

Gln 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 Gly Gln Val Lys Ser Gly Asp Tyr
                245                 250                 255

Phe Thr Ala Lys Leu Pro Glu 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

Asn Gly Asn 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 Asp 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 Asp
    450                 455                 460

Lys Ile Thr Tyr Lys Tyr Gln Asn Val Ala Ser Ile Asn 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 Ile Asp Pro Ala
            500                 505                 510

Thr Gly Lys 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
    530                 535                 540
```

<210> 23
<211> 1620
<212> DNA
<213> Staphylococcus aureus

<400> 23

```
ttgaaaaaaa gaattgatta tttgtcgaat aagcagaata agtattcgat tagacgtttt     60
acagtaggta ccacatcagt aatagtaggg gcaactatac tatttgggat aggcaatcat    120
caagcacaag cttcagaaca atcgaacgat acaacgcaat cttcgaaaaa taatgcaagt    180
gcagattccg aaaaaaacaa tacgatagaa acacctcaat taaatactaa tgatacatct    240
gatattagtg caaacacaaa cagtgcgaat gtagatagca cagcaaaacc aatgtctaca    300
caaacgagca ataccactac aacagagcca gcttcaacaa atgaaacacc tcaaccgacg    360
gcaattaaag atcaagcaac tgctgcaaaa atgcaagatc gaactgttcc tcaagaagca    420
aattctcaag tagataataa aacaacgaat gatgctaata gcataacaac aaacagtgag    480
cttaaaaatc ctcaaacatt agatttacca caatcatcac cacaaacgat ttccaatgcg    540
caaggaacta gtaaaccaag tgttagaacg agagctgtac gtagtcttgc agttgctgaa    600
cctgtagtaa atgctgctga tgctaaaggc acaaatgtaa atgataaagt tacggcaaaa    660
gattttcaat tagaaaagac tacatttgac cctaaccaaa gtggtaatac ttttatggcg    720
gcaaacttta cagtgactgg acaagtgaaa tcaggggatt attttacagc gaagttacca    780
gaaagtttaa ctggtaatgg agacgtggat tactctaact cgaataatac gatgccaatt    840
gcagatatta aaagtacgaa tggcaatgtt gtagctaaag caacatatga tatcttgact    900
aagacgtata catttgtctt tacagattat gtaaatgata aagaaaatat taacggacaa    960
ttttcattac ctttatttac agaccgagca aaggcaccta aatcaggaac atatgatgca   1020
aatattaata ttgcggatga aatgtttaac aataaaatta cttataacta tagttcacca   1080
attgcaggaa ttgataagcc aaatggcgcg aacatttctt ctcaaattat tggtgtagat   1140
```

acagcttcag gtcaaaacac atacaagcaa acggtatttg ttaaccctaa gcaacgagtt 1200

ttaggtaata cgtgggtgta tattaaaggt taccaagata aaatcgaaga aagtagcggt 1260

aaagtaagtg ctacagatac aaaactgaga atttttgaag tgaatgatac atctaaatta 1320

tcagatagct actatgcgga cccaaatgac tctaatctta aagaagtaac tgatcaattt 1380

aaggataaaa tcacttataa ataccaaaat gtagcaagta ttaattttgg tgatattact 1440

aaaacgtatg ttgtattagt ggaaggtcac tatgataata ctggtaaaaa cttgaaaaca 1500

caggttattc aagaaaatat tgacccagcg acaggtaaag actacagtat tttcggatgg 1560

aataatgaga atgttgtacg ttatggtggt ggaagtgctg atggtgattc agcagtaaat 1620

<210> 24
<211> 540
<212> PRT
<213> Staphylococcus aureus

<400> 24

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

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

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

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

Thr Asn Glu Thr Pro Gln Pro Thr Ala Ile Lys Asp Gln Ala Thr Ala
115 120 125

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

Asp Asn Lys Thr Thr Asn Asp Ala Asn Ser Ile Thr Thr Asn Ser Glu
145 150 155 160

Leu Lys Asn Pro Gln Thr Leu Asp Leu Pro Gln Ser Ser Pro Gln Thr
165 170 175

```
Ile Ser Asn Ala Gln Gly Thr Ser Lys Pro Ser Val Arg Thr Arg Ala
            180                 185                 190

Val Arg Ser Leu Ala Val Ala Glu Pro Val Val Asn Ala Ala Asp Ala
        195                 200                 205

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

Glu Lys Thr Thr Phe Asp Pro Asn Gln Ser Gly Asn Thr Phe Met Ala
225                 230                 235                 240

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

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

Asn Ser Asn Asn Thr Met Pro Ile Ala Asp Ile Lys Ser Thr Asn Gly
        275                 280                 285

Asn Val Val Ala Lys Ala Thr Tyr Asp Ile Leu Thr Lys Thr Tyr Thr
    290                 295                 300

Phe Val Phe Thr Asp Tyr Val Asn Asp Lys Glu Asn Ile Asn Gly Gln
305                 310                 315                 320

Phe Ser Leu Pro Leu Phe Thr Asp Arg Ala Lys Ala Pro Lys Ser Gly
                325                 330                 335

Thr Tyr Asp Ala Asn Ile Asn Ile Ala Asp Glu Met Phe Asn Asn Lys
            340                 345                 350

Ile Thr Tyr Asn Tyr Ser Ser Pro Ile Ala Gly Ile Asp Lys Pro Asn
        355                 360                 365

Gly Ala Asn Ile Ser Ser Gln Ile Ile Gly Val Asp Thr Ala Ser Gly
    370                 375                 380

Gln Asn Thr Tyr Lys Gln Thr Val Phe Val Asn Pro Lys Gln Arg Val
385                 390                 395                 400

Leu Gly Asn Thr Trp Val Tyr Ile Lys Gly Tyr Gln Asp Lys Ile Glu
                405                 410                 415

Glu Ser Ser Gly Lys Val Ser Ala Thr Asp Thr Lys Leu Arg Ile Phe
            420                 425                 430

Glu Val Asn Asp Thr Ser Lys Leu Ser Asp Ser Tyr Tyr Ala Asp Pro
        435                 440                 445
```

```
Asn Asp Ser Asn Leu Lys Glu Val Thr Asp Gln Phe Lys Asp Lys Ile
    450                 455                 460

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

Lys Thr Tyr Val Val Leu Val Glu Gly His Tyr Asp Asn Thr Gly Lys
                485                 490                 495

Asn Leu Lys Thr Gln Val Ile Gln Glu Asn Ile Asp Pro Ala Thr Gly
            500                 505                 510

Lys Asp Tyr Ser Ile Phe Gly Trp Asn Asn Glu Asn Val Val Arg Tyr
        515                 520                 525

Gly Gly Gly Ser Ala Asp Gly Asp Ser Ala Val Asn
    530                 535                 540
```

<210> 25
<211> 1626
<212> DNA
<213> Staphylococcus aureus

<400> 25

```
ttgaaaaaaa gaattgatta tttgtcgaat aagcagaata agtattcgat tagacgtttt     60

acagtaggta ccacatcagt aatagtaggg gcaactatac tatttgggat aggcaatcat    120

caagcacaag cttcagaaca atcgaacgat acaacgcaat cttcgaaaaa taatgcaagt    180

gcagattccg aaaaaaacaa tatgatagaa acacctcaat taaatacaac ggctaatgat    240

acatctgata ttagtgcaaa cacaaacagt gcgaatgtag atagcacaac aaaaccaatg    300

tctacacaaa cgagcaatac cactacaaca gagccagctt caacaaatga aacacctcaa    360

ccgacggcaa ttaaaaatca agcaactgct gcaaaaatgc aagatcaaac tgttcctcaa    420

gaagcaaatt ctcaagtaga taataaaaca acgaatgatg ctaatagcat agcaacaaac    480

agtgagctta aaaattctca aacattagat ttaccacaat catcaccaca aacgatttcc    540

aatgcgcaag gaactagtaa accaagtgtt agaacgagag ctgtacgtag tttagctgtt    600

gctgaaccgg tagtaaatgc tgctgatgct aaaggtacaa atgtaaatga taaagttacg    660

gcaagtaatt tcaagttaga aaagactaca tttgacccta atcaaagtgg taacacattt    720

atggcggcaa attttacagt gacagataaa gtgaaatcag gggattattt tacagcgaag    780

ttaccagata gtttaactgg taatggagac gtggattatt ctaattcaaa taatacgatg    840

ccaattgcag acattaaaag tacgaatggc gatgttgtag ctaaagcaac atatgatatc    900

ttgactaaga cgtatacatt tgtctttaca gattatgtaa ataataaaga aaatattaac    960

ggacaatttt cattaccttt atttacagac cgagcaaagg cacctaaatc aggaacatat   1020

gatgcgaata ttaatattgc ggatgaaatg tttaataata aaattactta taactatagt   1080

tcgccaattg caggaattga taaaccaaat ggcgcgaaca tttcttctca aattattggt   1140
```

gtagatacag cttcaggtca aaacacatac aagcaaacag tatttgttaa ccctaagcaa 1200

cgagttttag gtaatacgtg ggtgtatatt aaaggctacc aagataaaat cgaagaaagt 1260

agcggtaaag taagtgctac agatacaaaa ctgagaattt ttgaagtgaa tgatacatct 1320

aaattatcag atagctacta tgcagatcca aatgactcta accttaaaga agtaacagac 1380

caatttaaaa atagaatcta ttatgagcat ccaaatgtag ctagtattaa atttggtgat 1440

attactaaaa catatgtagt attagtagaa gggcattacg acaatacagg taagaactta 1500

aaaactcagg ttattcaaga aaatgttgat cctgtaacaa atagagacta cagtattttc 1560

ggttggaata atgagaatgt tgtacgttat ggtggtggaa gtgctgatgg tgattcagca 1620

gtaaat 1626

<210> 26
<211> 542
<212> PRT
<213> Staphylococcus aureus

<400> 26

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

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

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
530 535 540

<210> 27
<211> 1626
<212> DNA
<213> Staphylococcus aureus

<400> 27
ttgaaaaaaa gaattgatta tttgtcgaat aagcagaata agtattcgat tagacgtttt 60

acagtaggta ccacatcagt aatagtaggg gcaactatac tatttgggat aggcaatcat 120

caagcacaag cttcagaaca atcgaacgat acaacgcaat cttcgaaaaa taatgcaagt 180

gcagattccg aaaaaaacaa tatgatagaa acacctcaat taaatacaac ggctaatgat 240

acatctgata ttagtgcaaa cacaaacagt gcgaatgtag atagcacaac aaaaccaatg 300

tctacacaaa cgagcaatac cactacaaca gagccagctt caacaaatga aacacctcaa 360

ccgacggcaa ttaaaaatca agcaactgct gcaaaaatgc aagatcaaac tgttcctcaa 420

gaagcaaatt ctcaagtaga taataaaaca acgaatgatg ctaatagcat agcaacaaac 480

agtgagctta aaaattctca aacattagat ttaccacaat catcaccaca aacgatttcc 540

aatgcgcaag gaactagtaa accaagtgtt agaacgagag ctgtacgtag tttagctgtt 600

gctgaaccgg tagtaaatgc tgctgatgct aaaggtacaa atgtaaatga taaagttacg 660

gcaagtaatt tcaagttaga aaagactaca tttgacccta atcaaagtgg taacacattt 720

atggcggcaa attttacagt gacagataaa gtgaaatcag gggattattt tacagcgaag 780

ttaccagata gtttaactgg taatggagac gtggattatt ctaattcaaa taatacgatg 840

ccaattgcag acattaaaag tacgaatggc gatgttgtag ctaaagcaac atatgatatc 900

ttgactaaga cgtatacatt tgtctttaca gattatgtaa ataataaaga aaatattaac 960

ggacaatttt cattaccttt atttacagac cgagcaaagg cacctaaatc aggaacatat 1020

gatgcgaata ttaatattgc ggatgaaatg tttaataata aaattactta taactatagt 1080

tcgccaattg caggaattga taaaccaaat ggcgcgaaca tttcttctca aattattggt 1140

gtagatacag cttcaggtca aaacacatac aagcaaacag tatttgttaa ccctaagcaa 1200

cgagttttag gtaatacgtg ggtgtatatt aaaggctacc aagataaaat cgaagaaagt 1260

agcggtaaag taagtgctac agatacaaaa ctgagaattt ttgaagtgaa tgatatatct 1320

aaattatcag atagctacta tgcagatcca aatgactcta accttaaaga agtaacagac 1380

caatttaaaa atagaatcta ttatgagcat ccaaatgtag ctagtattaa atttggtgat 1440

attactaaaa catatgtagt attagtagaa gggcattacg acaatacagg taagaactta 1500

aaaactcagg ttattcaaga aaatgttgat cctgtaacaa atagagacta cagtattttc 1560

ggttggaata atgagaatgt tgtacgttat ggtggtggaa gtgctgatgg tgattcagca 1620

gtaaat 1626

<210> 28
<211> 542
<212> PRT
<213> Staphylococcus aureus

<400> 28

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

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

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 Ile 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
530 535 540

<210> 29
<211> 1626
<212> DNA
<213> Staphylococcus aureus

<400> 29
ttgaaaaaaa gaattgatta tttgtcgaat aagcagaata agtattcgat tagacgtttt 60
acagtaggta ccacatcagt aatagtaggg gcaactatac tatttgggat aggcaatcat 120
caagcacaag cttcagaaca atcgaacgat acaacgcaat cttcgaaaaa taatgcaagt 180
gcagattccg aaaaaaacaa tatgatagaa acacctcaat taaatacaac ggctaatgat 240
acatctgata ttagtgcaaa cacaaacagt gcgaatgtag atagcacagc aaaaccaatg 300
tctacacaaa cgagcaatac cactacaaca gagccagctt caacaaatga aacacctcaa 360
ccgacggcaa ttaaagatca agcaactgct gcaaaaatgc aagatcaaac tgttcctcaa 420
gaagcaaatt ctcaagtaga taataaaaca acgaatgatg ctaatagcat agcgacaaac 480
agtgagctta aaaatcctca aacattagat ttaccacaat catcaccaca aacgatttcc 540
aatgcgcaaa gaactagtaa accaagtgtt agaacgagag ctgtacgtag tttagctgtt 600
gctgaaccgg tagtaaatgc tgctgatgct aaaggtacaa atgtaaatgg tcaagttacg 660
gcaagtgatt tcaagttaga aaagactaca tttgacccta accaaagtgg taacacattt 720
atggcggtaa attttaaagt ggcagggaaa gtgaaatcag gggattatta tacagcgaag 780
ttaccagata gtttaactgg taatggagac gtggattact ctaattcaaa taatacgatg 840
ccaattgcag atattaaaag tacgaatggc gatgttgtag ctaaagcaac atatgatatc 900
ttgactaaga cgtatacatt tgtctttaca gattatgtaa atgataaaga aaatattaac 960
ggacaatttt cattaccttt atttacagac cgagcaaagg cacctaaatc aggaacatac 1020
gatgcaaata ttaatattgc ggatgaaatg tttaataata aaattactta taactatagt 1080

tcgccaattg caggaattga taagccaaat ggcgcgaaca tttcttctca aattattggt 1140

gtagatacag cttcaggtca aaacacatac aagcaaacgg tatttgttaa ccctaagcaa 1200

cgagttttag gtaatacgtg ggtgtatatt aaaggttacc aagataaaat cgaagaaagt 1260

agcggtaaag taagtgctac agatacaaaa ctgagaattt ttgaagtgaa tgatacatct 1320

aaattatcag atagctacta tgcagatcca aatgactcta accttaaaga agtaacgaat 1380

gagtttaagg ataaaatcac ttataaatac caaaatgtag caagtattaa ttttggcgat 1440

attactaaaa cgtatgttgt attagtggaa ggtcactatg ataatactgg taaaaacttg 1500

aaaacacagg ttattcaaga aaatattgac ccagcgacag gtaaagacta cagtattttc 1560

ggttggaata atgagaatgt tgtacgttat ggtggtggaa gtgctgatgg tgattcagca 1620

gtaaat 1626

<210> 30
<211> 542
<212> PRT
<213> Staphylococcus aureus

<400> 30

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

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

Ala 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 Asp 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 Pro Gln Thr Leu Asp Leu Pro Gln Ser Ser Pro

165 170 175

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

Tyr 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

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 Asp 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 Asn Glu Phe Lys Asp
450 455 460

Lys Ile Thr Tyr Lys Tyr Gln Asn Val Ala Ser Ile Asn 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 Ile Asp Pro Ala
500 505 510

Thr Gly Lys 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
530 535 540

<210> 31
<211> 1626
<212> DNA
<213> Staphylococcus aureus

<400> 31
ttgaaaaaaa gaattgatta tttgtcgaat aagcagaata agtattcgat tagacgtttt 60

acagtaggta ccacatcagt aatagtaggg gcaactatac tatttgggat aggcaatcat 120

caagcacaag cttcagaaca atcgaacgat acaacgcaat cttcgaaaaa taatgcaagt 180

gcagattccg aaaaaaacaa tatgatagaa acacctcaat taaatacaac ggctaatgat 240

acatctgata ttagtgcaaa cacaaacagt gcgaatgtag atagcacagc aaaaccaatg 300

tctacacaaa cgagcaatac cactacaaca gagccagctt caacaaatga aacacctcaa 360

ctgacggcaa ttaaagatca agcaactgct gcaaaaatgc aagatcaaac tgttcctcaa 420

gaagcaaatt ctcaagtaga taataaaaca acgaatgatg ctaatagcat agcgacaaac 480

agtgagctta aaaatcctca aacattagat ttaccacaat catcaccaca aacaatttcc 540

aatgcgcaag gaactagtaa accaagtgtt agaacgagag ctgtacgtag tcttgcagtt 600

gctgaacctg tagtaaatgc tgctgatgct aaaggtacaa atgtaaatga taaagttacg 660

gcaaaagatt ttcaattaga aaagactaca tttgacccta accaaagtgg taatactttt 720

atggcggcaa actttacagt gactggacaa gtgaaatcag gggattattt tacagcgaag 780

ttaccagata gtgtaactgg taatggagac gtggattact ctaattcgaa taatacgatg 840

ccaattgcag atatagtaaa cgataaaaat gaagttgtag caaaagcgac atatgatatt 900

ttgactaaga catatacatt tgtctttaca gattatgtaa atgataagca aaatattaat 960

gggaaatttt cattaccact atttacagac agagcaaagg cacctaaatc aggaacatat 1020

gatgcaaata ttaatattgc ggatgaaatg tttaataata aaattactta taactatagt 1080

tcgccaattg caggaattga taagccaaat ggcgcgaaca tttcttctca aattattggt 1140

gtagatacag cttcaggtca aaatacatac aagcaaacgg tatttgttaa ccctaagcaa 1200

cgagttttag gtaatacgtg ggtgtatatt aaaggttacc aagataaaat cgaagaaagt 1260

agcggtaaag taagtgctac agatacaaaa ctgagaattt ttgaagtgaa tgatacatct 1320

aaattatcag atagctacta tgcagaccca aatgactcta atcttaaaga agtaactgat 1380

caatttaagg ataaaatcac ttataaatac caaaatgtag caagtattaa ttttggtgat 1440

ataaataaaa cgtatgtcgt tttagtcgaa ggtcattatg ataaaacagg taaaaacttg 1500

aaaacgcaag tcattcaaga aaatgttgac ccagcgacag gtaaagacta cagtattttc 1560

ggttggaata atgagaatgt tgtacgttat ggtggtggaa gtgctgatgg tgattcagca 1620

gtaaat 1626

<210> 32
<211> 542
<212> PRT
<213> Staphylococcus aureus

<400> 32

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

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

Ala 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 Leu Thr Ala Ile Lys Asp 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 Pro 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 Lys Asp Phe
    210                 215                 220

Gln 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 Gly Gln Val Lys Ser Gly Asp Tyr
                245                 250                 255

Phe Thr Ala Lys Leu Pro Asp Ser Val Thr Gly Asn Gly Asp Val Asp
            260                 265                 270

Tyr Ser Asn Ser Asn Asn Thr Met Pro Ile Ala Asp Ile Val Asn Asp
        275                 280                 285

Lys Asn Glu 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 Asp Lys Gln Asn Ile Asn
305                 310                 315                 320

Gly Lys 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 Asp
450 455 460

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

Ile Asn Lys Thr Tyr Val Val Leu Val Glu Gly His Tyr Asp Lys Thr
485 490 495

Gly Lys Asn Leu Lys Thr Gln Val Ile Gln Glu Asn Val Asp Pro Ala
500 505 510

Thr Gly Lys 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
530 535 540

<210> 33
<211> 1626
<212> DNA
<213> Staphylococcus aureus

<400> 33
ttgaaaaaaa gaattgatta tttgtcgaat aagcagaata agtattcgat tagacgtttt 60

acagtaggta ccacatcagt aatagtaggg gcaactatac tatttgggat aggcaatcat 120

caagcacaag cttcagaaca atcgaacgat acaacgcaat cttcgaaaaa taatgcaagt 180

gcagattccg aaaaaaacaa tatgatagaa acacctcaat taaatacaac ggctaatgat 240

acatctgata ttagtgcaaa cacaaacagt gcgaatgtag atagcacagc aaaaccaatg 300

tctacacaaa cgagcaatac cactacaaca gagccagctt caacaaatga aacacctcaa 360

ctgacggcaa ttaaagatca agcaactgct gcaaaaatgc aagatcaaac tgttcctcaa 420

gaagcaaatt ctcaagtaga taataaaaca acgaatgatg ctaatagcat agcgacaaac 480

agtgagctta aaaatcctca aacattagat ttaccacaat catcaccaca aacaatttcc 540

aatgcgcaag gaactagtaa accaagtgtt agaacgagag ctgtacgtag tcttgcagtt 600

gctgaacctg tagtaaatgc tgctgatgct aaaggtacaa atgtaaatga taaagttacg 660

gcaaaagatt ttcaattaga aaagactaca tttgacccta accaaagtgg taatactttt 720

atggcggcaa actttacagt gactggacaa gtgaaatcag gggattattt tacagcgaag 780

ttaccagata gtgtaactgg taatggagac gtggattact ctaattcgaa taatacgatg 840

ccaattgcag atattaaaag cacgaatggt gatgttgtag ctaaagcaac atatgatatc 900

ttgactaaga catatacatt tgtctttaca gattatgtaa atgaaaaaga aaatattaac 960

ggacaatttt cattaccttt atttacagac agagcaaagg cacctaaatc aggaacatac 1020

gatgcaaata ttaatattgc ggatgaaatg tttgataata aaattactta taactatagt 1080

tcgcctattg caggaattga taaaccaaat ggcgcaaata tttcttctca aattattggt 1140

gtagatacag cttcaggtca aaacacatac aagcaaacag tatttgttaa ccctaagcaa 1200

cgagttttag gtaatacgtg ggtgtatatt aaaggttacc aagataaaat cgaagaaagt 1260

agcggtaaag taagtgctac agatacaaaa ctgagaattt ttgaagtgaa tgatacatct 1320

aaattatcag atagctacta tgcggaccca aatgactcta accttaaaga agtaacgaat 1380

gaatttaagg ataaaatcac ttataaatac caaaatgtag caagtattaa ttttggcgat 1440

attactaaaa cgtatgttgt attagtggaa ggtcactatg ataatactgg taaaaacttg 1500

aaaacacagg ttattcaaga aaatattgac ccagcgacag gtaaagacta cagtattttc 1560

ggttggaata atgagaatgt tgtacgttat ggtggtggaa gtgctgatgg tgattcagca 1620

gtaaat 1626

<210> 34
<211> 542
<212> PRT
<213> Staphylococcus aureus

<400> 34

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

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

Ala 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 Leu Thr Ala Ile Lys Asp 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 Pro 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 Lys Asp Phe
    210                 215                 220

Gln 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 Gly Gln Val Lys Ser Gly Asp Tyr
                245                 250                 255

Phe Thr Ala Lys Leu Pro Asp Ser Val 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

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 Glu 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 Asp
            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 Asn Glu Phe Lys Asp
450 455 460

Lys Ile Thr Tyr Lys Tyr Gln Asn Val Ala Ser Ile Asn 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 Ile Asp Pro Ala
500 505 510

Thr Gly Lys 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
530 535 540

<210> 35
<211> 1626
<212> DNA
<213> Staphylococcus aureus

<400> 35
ttgaaaaaaa gaattgatta tttgtcgaat aagcagaata agtattcgat tagacgtttt 60

acagtaggta ccacatcagt aatagtaggg gcaactatac tatttgggat aggcaatcat 120

caagcacaag cttcagaaca atcgaacgat acaacgcaat cttcgaaaaa taatgcaagt 180

gcagattccg aaaaaaataa tatgatagaa acacctcaat taaatacaac ggctaatgat 240

acatctgata ttagtgcaaa cacaaacagt gcgaatgtag atagcacagc aaaaccaatg 300

tctacacaaa cgagcaatac cactacaaca gagccagctt caacaaatga aacacctcaa 360

ccgacggcaa ttaaagatca agcaactgct gcaaaaatgc aagatcaaac tgttcctcaa 420

gaagcaaatt ctcaagtaga taataaaaca acgaatgatg ctaatagcat agcaacaaac 480

agtgaactta aaaatcctca aacattagat ttaccacaat catcaccaca aacgatttcc 540

aatgcgcaag gaactagtaa accaagtgtt agaacgagag ctgtacgtag tcttgcagtt 600

gctgaacctg tagtaaatgc tgctgatgct aaaggtacaa atgtaaatga taaagttacg 660

gcaagtaatc tacagttgca aaagactaca tttgacccta accaaagtgg aaatacattt 720

atggcggcaa attttacagt gacagataaa gtgaaatcag gggattattt tacagcgaag 780

ttaccagata gtttaactgg taatggagac gtggattact ctaattcaaa taatacgatg 840

ccaattgcag atattaaaag tacgaatggc gatgttgtag ctaaagcaac atatgatatc 900

ttgactaaga cgtatacatt tgtctttaca gattatgtaa atgataaaga aaatattaac 960

gggcaatttt cattaccttt atttacagac cgagcaaagg cacctaaatc aggaacatat 1020

gatgcaaata ttaatattgc ggatgaaatg tttaataata aaattactta taactatagt 1080

tcgccaattg caggaattga taagccaaat ggcgcgaaca tttcttctca aattattggt 1140

gtagatacag cttcaggtca aaacacatac aagcaaacgg tatttgttaa ccctaagcaa 1200

cgagttttag gtaatacgtg ggtgtatatt aaaggttacc aagataaaat cgaagaaagt 1260

agcggtaaag taagtgctac agatacaaaa ctgagaattt ttgaagtgaa tgatacatct 1320

aaattatcag atagctacta tgcagaccca aatgactcta accttaaaga agtaactgat 1380

caatttaagg ataaaatcac ttataaatac caaaacgtag caagtattaa ttttggtgat 1440

ataaataaaa cgtatgtcgt tttagttgaa ggtcactatg ataatactgg aaaaaacttg 1500

aaaacacagg ttattcaaga aaatattgac ccagcgacag gtaaagacta cagtattttc 1560

ggatggaata atgagaatgt tgtacgttat ggtggtggaa gtgctgatgg tgattcagca 1620

gtaaat 1626

<210> 36
<211> 542
<212> PRT
<213> Staphylococcus aureus

<400> 36

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

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

Ala 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 Asp 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 Pro 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 Leu
    210                 215                 220

Gln Leu Gln 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

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 Asp 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 Asp
450 455 460

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

Ile Asn 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 Ile Asp Pro Ala
500 505 510

Thr Gly Lys 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
530 535 540

<210> 37
<211> 1626
<212> DNA
<213> Staphylococcus aureus

<400> 37
ttgaaaaaaa gaattgatta tttgtcgaat aagcagaata agtattcgat tagacgtttt 60
acagtaggta ccacatcagt aatagtaggg gcaactatac tatttgggat aggcaatcat 120
caagcacaag cttcagaaca atcgaacgat acaacgcaat cttcgaaaaa taatgcaagt 180
gcagattccg aaaaaaacaa tatgatagaa acacctcaat taaatacaac ggctaatgat 240
acatctgata ttagtgcaaa cacaaacagt gcgaatgtag atagcacaac aaaaccaatg 300
tctacacaaa cgagcaatac cactacaaca gagccagctt caacaaatga aacacctcaa 360
ccgacggcaa ttaaagatca agcaactgct gcaaaaatgc aagatcaaac tgttcctcaa 420
gaagcaaatt ctcaagtaga taataaaaca acgaatgatg ctaatagcat agcgacaaac 480
agtgagctta aaaatcctca aacattagat ttaccacaat catcaccaca aacaatttcc 540
aatgcgcaag gaactagtaa accaagtgtt agaacgagag ctgtacgtag tcttgcagtt 600
gctgaacctg tagtaaatgc tgctgatgct aaaggtacaa atgtaaatga taaagttacg 660
gcaaaagatt ttcaattaga aaagactaca tttgacccta accaaagtgg taatactttt 720
atggcggcaa actttacagt gactggacaa gtgaaatcag gggattattt tacagcgaag 780
ttaccagata gtgtaactgg taatggagac gtggattact ctaattcgaa taatacgatg 840
ccaattgcag atattaaaag cacgaatggt gatgttgtag ctaaagcaac atatgatatc 900
ttgactaaga catatacatt tgtctttaca gattatgtaa atgaaaaaga aaatattaac 960

ggacaatttt cattaccttt atttacagac agagcaaagg cacctaaatc aggaacatac 1020

gatgcaaata ttaatattgc ggatgaaatg tttgataata aaattactta taactatagt 1080

tcgcctattg caggaattga taaaccaaat ggcgcaaata tttcttctca aattattggt 1140

gtagatacag cttcaggtca aaacacatac aagcaaacag tatttgttaa ccctaagcaa 1200

cgagttttag gtaatacgtg ggtgtatatt aaaggttacc aagataaaat cgaagaaagt 1260

agcggtaaag taagtgctac agatacaaaa ctgagaattt ttgaagtgaa tgatacatct 1320

aaattatcag atagctacta tgcggaccca aatgactcta accttaaaga agtaacgaat 1380

gaatttaagg ataaaatcac ttataaatac caaaatgtag caagtattaa ttttggcgat 1440

attactaaaa cgtatgttgt attagtggaa ggtcactatg ataatactgg taaaaacttg 1500

aaaacacagg ttattcaaga aaatattgac ccagcgacag gtaaagacta cagtattttc 1560

ggttggaata atgagaatgt tgtacgttat ggtggtggaa gtgctgatgg tgattcagca 1620

gtaaat 1626

<210> 38
<211> 542
<212> PRT
<213> Staphylococcus aureus

<400> 38

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

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 Asp 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 Pro 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 Lys Asp Phe
210 215 220

Gln 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 Gly Gln Val Lys Ser Gly Asp Tyr
245 250 255

Phe Thr Ala Lys Leu Pro Asp Ser Val 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

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 Glu 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 Asp
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 Asn Glu Phe Lys Asp
450 455 460

Lys Ile Thr Tyr Lys Tyr Gln Asn Val Ala Ser Ile Asn 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 Ile Asp Pro Ala
500 505 510

Thr Gly Lys 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
530 535 540

<210> 39
<211> 1626
<212> DNA
<213> Staphylococcus aureus

<400> 39
ttgaaaaaaa gaattgatta tttgtcgaat aagcagaata agtattcgat tagacgtttt 60

acagtaggta ccacatcagt aatagtaggg gcaactatac tatttgggat aggcaatcat 120

caagcacaag cttcagaaca atcgaacgat acaacacaat cttcgaaaaa taatgcaagt 180

gcagattccg aaaaaaacaa tatgatagaa acacctcaat taaatacaac ggctaatgat 240

acatctgata ttagtgcaaa cacaaacagt gcgaatgtag atagcacagc aaaaccaatg 300

tctacacaaa cgagcaatac cactacaaca gagccagctt caacaaatga aacacctcaa 360

ccgacggcaa ttaaagatca agcaactgct gcaaaaatgc aagatcaaac tgttcctcaa 420

gaagcaaatt ctcaagtaga taataaaaca acgaatgatg ctaatagcat agcaacaaac 480

agtgagctta aaaatcctca aacattagat ttaccacaat catcaccaca aacgatttcc 540

aatgcgcaag gaactagtaa accgagtgtt agaacgagag ctgtacgtag tcttgcagtt 600

gctgaacctg tagtaaatgc tgctgatgct aaaggtacaa atgtaaatgg tcaagttacg 660

gcaagtgatt tcaagttaga aaagactaca tttgacccta accaaagtgg taacacattt 720

atggcggcaa aatttacagt gactggacaa gtgaaagcag gggattattt tacagcgaag 780

ttaccagata gtgtaaatgg taatggagat gtggattact ctaattcaaa taatacgatg 840

ccaattgcag atattaaaag tacgaatggc gatgttgtag ctaaagcaac atatgatatc 900

ttgactaaga cgtatacatt tgtctttaca gattatgtaa ataataaaga aaatattaac 960

ggacaatttt cattaccttt atttacagac cgagcaaagg cacctaaatc aggaacatat 1020

gatgcgaata ttaatattgc ggatgaaatg tttaataata aaattactta taactatagt 1080

tcgccaattg caggaattga taaaccaaat ggcgcgaaca tttcttctca aattattggt 1140

gtagatacag cttcaggtca aaacacatac aagcaaacag tatatgttaa ccctaagcaa 1200

cgagttttag gtaatacgtg ggtgtatatt aaaggttacc aagataaaat cgaagaaagt 1260

agcggtaaag taagtgctac agatacaaaa ctgagaattt ttgaagtgaa tgatacatct 1320

aaattatcag atagctacta tgcagaccca aatgattcga atcttaaaga agtaacgaat 1380

gagtttaagg ataaaatcac ttataaatac caaaatgtag caagtattaa ttttggcgat 1440

attactaaaa cgtatgttgt attagtggaa ggtcactatg ataatactgg taaaaacttg 1500

aaaacacagg ttattcaaga aaatattgac ccagcgacag gtaaagacta cagtattttc 1560

ggttggaata atgagaatgt tgtacgttat ggtggtggaa gtgctgatgg tgattcagca 1620

gtaaat 1626

<210> 40
<211> 542
<212> PRT
<213> Staphylococcus aureus

<400> 40

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

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

Ala 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 Asp 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 Pro 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 Gly Gln Val Thr Ala Ser Asp 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 Lys Phe Thr Val Thr Gly Gln Val Lys Ala Gly Asp Tyr
245 250 255

Phe Thr Ala Lys Leu Pro Asp Ser Val Asn 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

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 Tyr 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 Asn Glu Phe Lys Asp
450 455 460

Lys Ile Thr Tyr Lys Tyr Gln Asn Val Ala Ser Ile Asn 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 Ile Asp Pro Ala
500 505 510

Thr Gly Lys 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
530 535 540

<210> 41
<211> 1626
<212> DNA
<213> Staphylococcus aureus

<400> 41
ttgaaaaaaa gaattgatta tttgtcgaat aggcagaata agtattcgat tagacgtttt 60

acagtaggta ccacatcagt aatagtaggg gcaactatac tatttgggat aggcaatcat 120

caagcacaag cttcagaaca atcgaacgat acaacgcaat cttcgaaaaa taatgcaagt 180

gcagattccg aaaaaaacaa tatgatagaa acacctcaat taaatacaac ggctaatgat 240

acatctgata ttagtgcaaa cacaaacagt gcgaatgtag atagcacaac aaaaccaatg 300

tctacacaaa cgagcaatac cactacaaca gagccagctt caacaaatga aacacctcaa 360

ccgacggcaa ttaaaaatca agcaactgct gcaaaaatgc aagatcaaac tgttcctcaa 420

gaagcaaatt ctcaagtaga taataaaaca acgaatgatg ctaatagcat agcaacaaac 480

agtgagctta aaaattctca aacattagat ttaccacaat catcaccaca aacgatttcc 540

aatgcgcaag gaactagtaa accaagtgtt agaacgagag ctgtacgtag tttagctgtt 600

gctgaaccgg tagtaaatgc tgctgatgct aaaggtacaa atgtaaatga taaagttacg 660

gcaagtaatt tcaagttaga aaagactaca tttgacccta atcaaagtgg taacacattt 720

atggcggcaa attttacagt gacagataaa gtgaaatcag gggattattt tacagcgaag 780

ttaccagata gtttaactgg taatggagac gtggattatt ctaattcaaa taatacgatg 840

ccaattgcag acattaaaag tacgaatggc gatgttgtag ctaaagcaac atatgatatc 900

ttgactaaga cgtatacatt tgtctttaca gattatgtaa ataataaaga aaatattaac 960

ggacaatttt cattaccttt atttacagac cgagcaaagg cacctaaatc aggaacatat 1020

gatgcgaata ttaatattgc ggatgaaatg tttaataata aaattactta taactatagt 1080

tcgccaattg caggaattga taaaccaaat ggcgcgaaca tttcttctca aattattggt 1140

gtagatacag cttcaggtca aaacacatac aagcaaacag tatttgttaa ccctaagcaa 1200

cgagttttag gtaatacgtg ggtgtatatt aaaggctacc aagataaaat cgaagaaagt 1260

agcggtaaag taagtgctac agatacaaaa ctgagaattt ttgaagtgaa tgatacatct 1320

aaattatcag atagctacta tgcagatcca aatgactcta accttaaaga agtaacagac 1380

caatttaaaa atagaatcta ttatgagcat ccaaatgtag ctagtattaa atttggtgat 1440

attactaaaa catatgtagt attagtagaa gggcattacg acaatacagg taagaactta 1500

aaaactcagg ttattcaaga aaatgttgat cctgtaacaa atagagacta cagtattttc 1560

ggttggaata atgagaatgt tgtacgttat ggtggtggaa gtgctgatgg tgattcagca 1620

gtaaat 1626

<210> 42
<211> 542
<212> PRT
<213> Staphylococcus aureus

<400> 42

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

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

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
530 535 540

<210> 43
<211> 1626
<212> DNA
<213> Staphylococcus aureus

<400> 43
ttgaaaaaaa gaattgatta tttgtcgaat aagcagaata agtattcgat tagacgtttt 60

acagtaggta ccacatcagt aatagtaggg gcaactatac tatttgggat aggcaatcat 120

caagcacaag cttcagaaca atcgaacgat acaacgcaat cttcgaaaaa taatgcaagt 180

gcagattccg aaaaaaacaa tatgatagaa acacctcaat taaatacaac ggctaatgat 240

acatctgata ttagtgcaaa cacaaacagt gcgaatgtag atagcacaac aaaaccaatg 300

tctacacaaa cgagcaatac cactacaaca gagccagctt caacaaatga aacacctcaa 360

ccgacggcaa ttaaaaatca agcaactgct gcaaaaatgc aagatcaaac tgttcctcaa 420

gaagcaaatt ctcaagtaga taataaaaca acgaatgatg ctaatagcat agcaacaacc 480

agtgagctta aaaattctca aacattagat ttaccacaat catcaccaca aacgatttcc 540

aatgcgcaag gaactagtaa accaagtgtt agaacgagag ctgtacgtag tttagctgtt 600

gctgaaccgg tagtaaatgc tgctgatgct aaaggtacaa atgtaaatga taaagttacg 660

gcaagtaatt tcaagttaga aaagactaca tttgacccta atcaaagtgg taacacattt 720

atggcggcaa attttacagt gacagataaa gtgaaatcag gggattattt tacagcgaag 780

ttaccagata gtttaactgg taatggagac gtggattatt ctaattcaaa taatacgatg 840

ccaattgcag acattaaaag tacgaatggc gatgttgtag ctaaagcaac atatgatatc 900

ttgactaaga cgtatacatt tgtctttaca gattatgtaa ataataaaga aaatattaac 960

ggacaatttt cattaccttt atttacagac cgagcaaagg cacctaaatc aggaacatat 1020

gatgcgaata ttaatattgc ggatgaaatg tttaataata aaattactta taactatagt 1080

tcgccaattg caggaattga taaaccaaat ggcgcgaaca tttcttctca aattattggt 1140

gtagatacag cttcaggtca aaacacatac aagcaaacag tatttgttaa ccctaagcaa 1200

cgagttttag gtaatacgtg ggtgtatatt aaaggctacc aagataaaat cgaagaaagt 1260

agcggtaaag taagtgctac agatacaaaa ctgagaattt ttgaagtgaa tgatacatct 1320

aaattatcag atagctacta tgcagatcca aatgactcta accttaaaga agtaacagac 1380

caatttaaaa atagaatcta ttatgagcat ccaaatgtag ctagtattaa atttggtgat 1440

attactaaaa catatgtagt attagtagaa gggcattacg acaatacagg taagaactta 1500

aaaactcagg ttattcaaga aaatgttgat cctgtaacaa atagagacta cagtattttc 1560

ggttggaata atgagaatgt tgtacgttat ggtggtggaa gtgctgatgg tgattcagca 1620

gtaaat 1626

<210> 44
<211> 542
<212> PRT
<213> Staphylococcus aureus

<400> 44

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

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 Thr
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

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
530 535 540

<210> 45
<211> 1626
<212> DNA
<213> Staphylococcus aureus

<400> 45
ttgaaaaaaa gaattgatta tttgtcgaat aagcagaata agtattcgat tagacgtttt 60

acagtaggta ccacatcagt aatagtaggg gcaactatac tatttgggat aggcaatcat 120

caagcacaag cttcagaaca atcgaacgat acaacgcaat cttcgaaaaa taatgcaagt 180

gcagattccg aaaaaaacaa tatgatagaa acacctcaat taaatacaac ggctaatgat 240

acatctgata ttagtgcaaa cacaaacagt gcgaatgtag atagcacagc aaaaccaatg 300

tctacacaaa cgagcaatac cactacaaca gagccagctt caacaaatga aacacctcaa 360

ccgacggcaa ttaaagatca agcaactgct gcaaaaatgc aagatcaaac tgttcctcaa 420

gaagcaaatt ctcaagtaga taataaaaca acgaatgatg ctaatagcat agcgacaaac 480

tgtgagctta aaaatcctca aacattagat ttaccacaat catcaccaca aacaatttcc 540

aatgcgcaag gaactagtaa accaagtgtt agaacgagag ctgtacgtag tcttgcagtt 600

gctgaacctg tagtaaatgc tgctgatgct aaaggtacaa atgtaaatga taaagttacg 660

gcaaaagatt ttcaattaga aaagaccaca tttgacccta accaaagtgg taatactttt 720

atggcggcaa actttacagt gactggacaa gtgaaatcag gggattattt tacagcgaag 780

ttaccagata gtgtaactgg taatggagac gtggattact ctaattcgaa taatacgatg 840

ccaattgcag atattaaaag tacgaatggc gatgttgtag ctaaagcaac atatgatatc 900

ttgactaaga cgtatacatt tgtctttaca gattatgtaa ataataaaga aaatattaac 960

ggacaatttt cattaccttt atttacagac cgagcaaagg cacctaaatc aggaacatat 1020

gatgcgaata ttaatattgc ggatgaaatg tttaataata aaattactta taactatagt 1080

tcgccaattg caggaattga taaaccaaat ggcgcgaaca tttcttctca aattattggt 1140

gtagatacag cttcaggtca aaacacatac aagcaaacag tatttgttaa ccctaagcaa 1200

cgagttttag gtaatacgtg ggtgtatatt aaaggttacc aagataaaat cgaagaaagt 1260

agcggtaaag taagtgctac agatacaaaa ctgagaattt ttgaagtgaa tgatacatct 1320

aaattatcag atagctacta tgcggaccca aatgactcta accttaaaga agtaacgaat 1380

gagtttaagg ataaaatcac ttataaatac caaaatgtag caagtattaa ttttggcgat 1440

attactaaaa cgtatgttgt attagtggaa ggtcactatg ataatactgg taaaaacttg 1500

aaaacacagg ttattcaaga aaatattgac ccagcgacag gtaaagacta cagtattttc 1560

ggttggaata atgagaatgt tgtacgttat ggtggtggaa gtgctgatgg tgattcagca 1620

gtaaat 1626

<210> 46
<211> 542
<212> PRT
<213> Staphylococcus aureus

<400> 46

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

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

Ala 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 Asp 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

Cys Glu Leu Lys Asn Pro 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 Lys Asp Phe
210 215 220

Gln 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 Gly Gln Val Lys Ser Gly Asp Tyr
245 250 255

Phe Thr Ala Lys Leu Pro Asp Ser Val 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

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 Asn Glu Phe Lys Asp
450 455 460

Lys Ile Thr Tyr Lys Tyr Gln Asn Val Ala Ser Ile Asn 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 Ile Asp Pro Ala
500 505 510

Thr Gly Lys 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
530 535 540

<210> 47
<211> 1626
<212> DNA
<213> Staphylococcus aureus

<400> 47
ttgaaaaaaa gaattgatta tttgtcgaat aagcagaata agtattcgat tagacgtttt 60

acagtaggta ccacatcagt aatagtaggg gcaactatac tatttgggat aggcaatcat 120

caagcacaag cttcagaaca atcgaacgat acaacgcaat cttcgaaaaa taatgcaagt 180

gcagattccg aaaaaaacaa tacgatagaa acacctcaat taaatacaac ggctaatgat 240

acatctgata ttagtgcaaa cacaaacagt gcgaatgtag atagcacagc aaaaccaatg 300

tctacacaaa cgagcaatac cactacaaca gagccagctt caacaaatga aacacctcaa 360

ccgacggcaa ttaaagatca agcaactgct gcaaaaatgc aagatcaaac tgttcctcaa 420

gaagcaaatt ctcaagtaga taataaaaca acgaatgatg ctaatagcat agcgacaaac 480

agcgagctta aaaatcctca gacattagat ttaccacaat catcaccaca aacgatttcc 540

aatgcgcaag gaactagtga accaagtgtt agaacgagag ctgtacgtag tcttgcagtt 600

gctgaacctg tagtaaatgc tgctgatgct aaaggtacaa atgtaaatga taaagttacg 660

gcaagtgatt tcaagttaga aaagactaca tttgacccta accaaagtgg taacacattt 720

atggcggcaa attttaaagt ggcagggaaa gtgaaatcag gggattattt tacagcgaag 780

ttaccagata gtgtaactgg taatggagac gtggattact ctaattcaaa taatacgatg 840

ccaattgcag atatagtgaa tgataaaaaa gaagttgtag ctaaagcaac atatgatatc 900

ttgactaaga cgtatacatt tgtctttaca gattatgtaa atgataaaga aaatattaac 960

ggacaatttt cattaccttt atttacagac cgagcaaagg cacctaaatc aggaacatat 1020

gatgcaaata ttaatattgc ggatgaaatg tttaacaatc aaattactta taactatagt 1080

tcaccaattg caggaattga taagccaaat ggcgcgaaca tttcttctca aattattggt 1140

gtagatacag cttcaggtca aaacacatac aagcaaacgg tatttgttaa ccctaagcaa 1200

cgagttttag gtaatacgtg ggtgtatatt aaaggttacc aagataaaat cgaagaaagt 1260

agcggtaaag taagtgctac agatacaaaa ctgagaattt ttgaagtgaa tgatacatct 1320

aaattatcag atagctacta tgcagaccca aatgactcta accttaaaga agtaactaat 1380

gagtttaagg ataaaatcac ttataaatac caaaacgtag caagtattaa ttttggtgat 1440

ataaataaaa cgtatgtcgt tttagtcgaa ggtcattatg ataatactgg taaaaacttg 1500

aaaacacagg ttattcaaga aaatattgac ccagcgacag gtaaagatta cagtattttc 1560

ggttggaata atgagaatgt tgtacgttat ggaggcggaa gtgctgatgg tgattcagca 1620

gtaaat 1626

<210> 48
<211> 542
<212> PRT
<213> Staphylococcus aureus

<400> 48

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

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 Thr 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

Ala 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 Asp 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 Pro Gln Thr Leu Asp Leu Pro Gln Ser Ser Pro
                165                 170                 175

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

Phe Thr Ala Lys Leu Pro Asp Ser Val Thr Gly Asn Gly Asp Val Asp
            260                 265                 270

Tyr Ser Asn Ser Asn Asn Thr Met Pro Ile Ala Asp Ile Val Asn Asp
        275                 280                 285

Lys Lys Glu 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 Asp 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 Gln 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 Asn Glu Phe Lys Asp
450 455 460

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

Ile Asn 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 Ile Asp Pro Ala
500 505 510

Thr Gly Lys 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
530 535 540

<210> 49
<211> 1626
<212> DNA
<213> Staphylococcus aureus

<400> 49
ttgaaaaaaa gaattgatta tttgtcgaat aagcagaata agtattcgat tagacgtttt 60

acagtaggta ccacatcagt aatagtaggg gcaactatac tatttgggat aggcaatcat 120

caagcacaag cttcagaaca atcgaacgat acaacgcaat cttcgaaaaa taatgcaagt 180

gcagattccg aaaaaaacaa tatgatagaa acacctcaat taaatacaac ggctaatgat 240

acatctgata ttagtgcaaa cacaaacagt gcgaatgtag atagcacagc aaaaccaatg 300

tctacacaaa cgagcaatac cactacaaca gagccagctt caacaaatga aacacctcaa 360

ccgacggcaa ttaaagatca agcaactgct gcaaaaatgc aagatcaaac tgttcctcaa 420

gaagcaaatt ctcaagtaga taataaaaca acgaatgatg ctaatagcat agcgacaaac 480

agtgagctta aaaatcctca aacattagat ttaccacaat catcaccaca aacgatttcc 540

aatgcgcaaa gaactagtaa accaagtgtt agaaccagag ctgtacgtag tttagctgtt 600

gctgaaccgg tagtaaatgc tgctgatgct aaaggtacaa atgtaaatga taaagttacg 660

gcaagtaatc tacagttgca aaagactacg tttgacccta accaaagtgg taacacattt 720

atggcggcaa attttacagt gacagataaa gtgaaatcag gagattattt tacagcgaag 780

ttaccagata gtttaactgg taatggagac gtggattact ctaattcaaa taatacgatg 840

ccaattgcag atattaaaag tacgaatggc gatgttgtag ctaaagcaac atatgatatc 900

ttgactaaga cgtatacatt tgtctttaca gattatgtaa atgataaaga aaatattaac 960

ggacaatttt cattaccttt atttacagac cgagcaaagg cacctaaatc aggaacatac 1020

gatgcaaata ttaatattgc ggatgaaatg tttaataata aaattactta taactatagt 1080

tcgccaattg caggaattga taagccaaat ggcgcgaaca tttcttctca gattattggt 1140

gtagatacag cttcaggtca aaacacatac aagcaaacgg tatttgttaa ccctaagcaa 1200

cgagttttag gtaatacgtg ggtgtatatt aaaggctacc aagataaaat cgaagaaagt 1260

agcggtaaag taagtgctaa agatacaaaa ctgagaattt ttgaagtgaa tgatacatct 1320

aaattatcag atagctacta tgcagaccca aatgattcga atcttaaaga agtaacagac 1380

caatttaaaa atagaatcta ttatgagcat ccaaatgtag ctagtattaa ttttggcgat 1440

attactaaaa cgtatgttgt attagtggaa ggtcactatg ataatactgg taaaaacttg 1500

aaaacacagg ttattcaaga aaatattgac ccagcgacag gtaaagacta cagtattttc 1560

ggttggaata atgagaatgt tgtacgttat ggtggtggaa gtgctgatgg tgattcagca 1620

gtaaat 1626

<210> 50
<211> 542
<212> PRT
<213> Staphylococcus aureus

<400> 50

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

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

Ala 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 Asp 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 Pro Gln Thr Leu Asp Leu Pro Gln Ser Ser Pro
                165                 170                 175

Gln Thr Ile Ser Asn Ala Gln Arg 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 Leu
    210                 215                 220

Gln Leu Gln 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

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 Asp 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 Lys 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 Asn 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 Ile Asp Pro Ala
500 505 510

Thr Gly Lys 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
530 535 540

<210> 51
<211> 1626
<212> DNA
<213> Staphylococcus aureus

<400> 51
ttgaaaaaaa gaattgatta tttgtcgaat aagcagaata agtattcgat tagacgtttt 60

acagtaggta ccacatcagt aatagtaggg gcaactatac tatttgggat aggcaatcat 120

caagcacaag cttcagaaca atcgaacgat acaacgcaat cttcgaaaaa taatgcaagt 180

gcagattccg aaaaaaacaa tatgatagaa acacctcaat taaatacaac ggctaatgat 240

acatctgata ttagtgcaaa cacaaacagt gcgaatgtag atagcacagc aaaaccaatg 300

tctacacaaa cgagcaatac cactacaaca gagccagctt caacaaatga aacacctcaa 360

ccgacggcaa ttaaagatca agcaactgct gcaaaaatgc aagatcaaac tgttcctcaa 420

gaagcaaatt ctcaagtaga taataaaaca acgaatgatg ctaataacat agcaacaaac 480

agtgggctta aaaatcctca aacattagat ttaccacaat catcaccaca aacgatttcc 540

aatgcgcaag gaactagtaa accaagtgtt agaacgagag ctgtacgtag tcttgcagtt 600

gctgaacctg tagtaaatgc tgctgatgct aaaggtacaa atgtaaatga taaagttacg 660

gcaagtgatt tcaagttaga aaagactaca ttcgacccta accaaagtgg taacacattt 720

atggcggcaa attttacagt gacagataaa gtgaaatcag gggattattt tacagcgaag 780

ttaccagata gtttaactgg taatggagac gtggattact ctaattcaaa taatacgatg 840

ccaattgcag acattaaaag tacgaatggt gatgttgtag cgacagcgac ttataatatc 900

ttgactaaga cgtatacatt tgtctttaca gattatgtaa atgataaaga aaatattaac 960

ggacaatttt cattaccttt atttacagac cgagcaaagg cacctaaatc aggaacatat 1020

gatgcaaata ttaatattgc ggatgaaatg tttaataata aaattactta taactatagt 1080

tcgccaattg caggaattga taagccaaat ggcgcgaaca tttcttctca aattattggt 1140

gtagatacag cttcaggcca aaacacatac aagcaaacgg tatttgttaa ccctaagcaa 1200

cgagttttag gtaatacgtg ggtgtatatt aaaggctacc aagataaaat cgaagaaagt 1260

agcggtaaag taagtgctac agatacaaaa ctgagaattt ttgaagtgaa tgatacatct 1320

aaattatcag atagctacta tgcggaccca aatgactcta atcttaaaga agtaacgaat 1380

gagtttaagg ataaaatcac ttataaatac caaaatgtag caagtattaa ttttggcgat 1440

attactaaaa cgtatgttgt attagtggaa ggtcactatg ataatactgg taaaaacttg 1500

aaaacacagg ttattcaaga aaatattgac ccagcgacag gtaaagatta cagtattttc 1560

ggttggaata atgagaatgt tgtacgttat ggaggcggaa gtgctgatgg tgattcagca 1620

gtaaat 1626

<210> 52
<211> 542
<212> PRT
<213> Staphylococcus aureus

<400> 52

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

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

Ala 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 Asp 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 Asn Ile Ala Thr Asn
145                 150                 155                 160

Ser Gly Leu Lys Asn Pro 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 Asp 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

Asn Gly Asp Val Val Ala Thr Ala Thr Tyr Asn Ile Leu Thr Lys Thr
    290                 295                 300

Tyr Thr Phe Val Phe Thr Asp Tyr Val Asn Asp 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 Asn Glu Phe Lys Asp
450 455 460

Lys Ile Thr Tyr Lys Tyr Gln Asn Val Ala Ser Ile Asn 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 Ile Asp Pro Ala
500 505 510

Thr Gly Lys 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
530 535 540

<210> 53
<211> 1626
<212> DNA
<213> Staphylococcus aureus

<400> 53
ttgaaaaaaa gaattgatta tttgtcgaat aagcagaata agtattcgat tagacgtttt 60

acagtaggta ccacatcagt aatagtaggg gcaactatac tatttgggat aggcaatcat 120

caagcacaag cttcagaaca atcgaacgat acaacgcaat cttcgaaaaa taatgcaagt 180

gcagattccg aaaaaaacaa tatgatagaa acacctcaat taaatacaac ggctaatgat 240

acatctgata ttagtgcaaa cacaaacagt gcgaatgtag atagcacagc aaaaccaatg 300

tctacacaaa cgagcaatac cactacaaca gagccagctt caacaaatga aacacctcaa 360

ccgacggcaa ttaaagatca agcaactgct gcaaaaatgc aagatcaaac tgttcctcaa 420

gaagcaaatt ctcaagtaga taataaaaca acgaatgatg ctaataacat agcaacaaac 480

agtgagctta aaaatcctca aacattagat ttaccacaat catcaccaca aacgatttcc 540

aatgcgcaag gaactagtaa accaagtgtt agaacgagag ctgtacgtag tcttgcagtt 600

gctgaacctg tagtaaatgc tgctgatgct aaaggtacaa atgtaaatga taaagttacg 660

gcaagtgatt tcaagttaga aaagactaca ttcgacccta accaaagtgg taacacattt 720

atggcggcaa attttacagt gacagataaa gtgaaatcag gggattattt tacagcgaag 780

ttaccagata gtttaactgg taatggagac gtggattact ctaattcaaa taatacgatg 840

ccaattgcag acattaaaag tacgaatggt gatgttgtag cgacagcgac ttataatatc 900

ttgactaaga cgtatacatt tgtctttaca gattatgtaa atgataaaga aaatattaac 960

ggacaatttt cattaccttt atttacagac cgagcaaagg cacctaaatc aggaacatat 1020

gatgcaaata ttaatattgc ggatgaaatg tttaataata aaattactta taactatagt 1080

tcgccaattg caggaattga taagccaaat ggcgcgaaca tttcttctca aattattggt 1140

gtagatacag cttcaggcca aaacacatac aagcaaacgg tatttgttaa ccctaagcaa 1200

cgagttttag gtaatacgtg ggtgtatatt aaaggctacc aagataaaat cgaagaaagt 1260

agcggtaaag taagtgctac agatacaaaa ctgagaattt ttgaagtgaa tgatacatct 1320

aaattatcag atagctacta tgcggaccca aatgactcta atcttaaaga agtaacgaat 1380

gagtttaagg ataaaatcac ttataaatac caaaatgtag caagtattaa ttttggcgat 1440

attactaaaa cgtatgttgt attagtggaa ggtcactatg ataatactgg taaaaacttg 1500

aaaacacagg ttattcaaga aaatattgac ccagcgacag gtaaagatta cagtattttc 1560

ggttggaata atgagaatgt tgtacgttat ggaggcggaa gtgctgatgg tgattcagca 1620

gtaaat 1626

<210> 54
<211> 542
<212> PRT
<213> Staphylococcus aureus

<400> 54

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

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

Ala 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 Asp 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 Asn Ile Ala Thr Asn
145 150 155 160

Ser Glu Leu Lys Asn Pro 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 Asp 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

Asn Gly Asp Val Val Ala Thr Ala Thr Tyr Asn Ile Leu Thr Lys Thr
290 295 300

Tyr Thr Phe Val Phe Thr Asp Tyr Val Asn Asp 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 Asn Glu Phe Lys Asp
450 455 460

Lys Ile Thr Tyr Lys Tyr Gln Asn Val Ala Ser Ile Asn 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 Ile Asp Pro Ala
500 505 510

Thr Gly Lys 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
530 535 540

<210> 55
<211> 1626
<212> DNA
<213> Staphylococcus aureus

<400> 55
ttgaaaaaaa gaattgatta tttgtcgaat aagcagaata agtattcgat tagacgtttt 60

acagtaggta ccacatcagt aatagtaggg gcaactatac tatttgggat aggcaatcat 120

caagcacaag cttcagaaca atcgaacgat acaacgcaat cttcgaaaaa taatgcaagt 180

gcagattccg aaaaaaacaa tatgatagaa acacctcaat taaatacaac ggctaatgat 240

acatctgata ttagtgcaaa cacaaacagt gcgaatgtag atagcacagc aaaaccaatg 300

tctacacaaa cgagcaatac cactacaaca gagccagctt caacaaatga aacacctcaa 360

ccgacggcaa ttaaagatca agcaactgct gcaaaaatgc aagatcaaac tgttcctcaa 420

gaagcaaatt ctcaagtaga taataaaaca acgaatgatg ctaatagcat agcgacaaac 480

agtgagctta aaaatcctca aacattagat ttaccacaat catcaccaca aacaatttcc 540

aatgcgcaag gaactagtaa accaagtgtt agaacgagag ctgtacgtag tcttgcagtt 600

gctgaacctg tagtaaatgc tgctgatgct aaaggtacaa atgtaaatga taaagttacg 660

gcaaaagatt ttcaattaga aaagaccaca tttgacccta accaaagtgg taatactttt 720

atggcggcaa actttacagt gactggacaa gtgaaatcag gggattattt tacagcgaag 780

ttaccagata gtgtaactgg taatggagac gtggattact ctaattcgaa taatacgatg 840

ccaattgcag atattaaaag tacgaatggc gatgttgtag ctaaagcaac atatgatatc 900

ttgactaaga cgtatacatt tgtctttaca gattatgtaa ataataaaga aaatattaac 960

ggacaatttt cattaccttt atttacagac cgagcaaagg cacctaaatc aggaacatat 1020

gatgcgaata ttaatattgc ggatgaaatg tttaataata aaattactta taactatagt 1080

tcgccaattg caggaattga taaaccaaat ggcgcgaaca tttcttctca aattattggt 1140

gtagatacag cttcaggtca aaacacatac aagcaaacag tatttgttaa ccctaagcaa 1200

cgagttttag gtaatacgtg ggtgtatatt aaaggttacc aagataaaat cgaagaaagt 1260

agcggtaaag taagtgctac agatacaaaa ctgagaattt ttgaagtgaa tgatacatct 1320

aaattatcag atagctacta tgcggaccca aatgactcta accttaaaga agtaacgaat 1380

gagtttaagg ataaaatcac ttataaatac caaaatgtag caagtattaa ttttggcgat 1440

attactaaaa cgtatgttgt attagtggaa ggtcactatg ataatactgg taaaaacttg 1500

aaaacacagg ttattcaaga aaatattgac ccagcgacag gtaaagacta cagtattttc 1560

ggttggaata atgagaatgt tgtacgttat ggtggtggaa gtgctgatgg tgattcagca 1620

gtaaat 1626

<210> 56
<211> 542
<212> PRT
<213> Staphylococcus aureus

<400> 56

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

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

Ala 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 Asp 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 Pro 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 Lys Asp Phe
210 215 220

Gln 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 Gly Gln Val Lys Ser Gly Asp Tyr
245 250 255

Phe Thr Ala Lys Leu Pro Asp Ser Val 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

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 Asn Glu Phe Lys Asp
450 455 460

Lys Ile Thr Tyr Lys Tyr Gln Asn Val Ala Ser Ile Asn 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 Ile Asp Pro Ala
500 505 510

Thr Gly Lys 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
530 535 540

<210> 57
<211> 1626
<212> DNA
<213> Staphylococcus aureus

<400> 57
ttgaaaaaaa gaattgatta tttgtcgaat aagcagaata agtattcgat tagacgtttt 60

acagtaggta ccacatcagt aatagtaggg gcaactatac tatttgggat aggcaatcat 120

caagcacaag cttcagaaca atcgaacgat acaacgcaat cttcgaaaaa taatgcaagt 180

gcagattccg aaaaaaacaa tacgatagaa acacctcaat taaatacaac ggctaatgat 240

acatctgata ttagtgcaaa cacaaacagt gcgaatgtag atagcacagc aaaaacaatg 300

tctacacaaa cgagcaatac cactacaaca gagccagctt caacaaatga aacacctcaa 360

ccgacggcaa ttaaagatca agcaactgct gcaaaaatgc aagatcaaac tgttcctcaa 420

gaagcaaatt ctcaagtaga taataaaaca acgaatgatg ctaataacat agcaacaaac 480

agtgagctta aaaatcctca aacattagat ttaccacaat catcaccaca aacgatttcc 540

aatgcgcaag gaactagtaa accaagtgtt agaacgagag ctgtacgtag tcttgcagtt 600

gctgaacctg tagtaaatgc tgctgatgct aaaggtacaa atgtaaatga taaagttacg 660

gcaagtgatc tcaagttaga aaagactgca tttgacccta accaaagtgg taacacattt 720

atggcggcaa attttaaagt gactggacaa gtgaaatcag gggattattt tacagcgaag 780

ttaccagata gtgtaactgg taatggagac gtggattact ctaattcaaa taatacgatg 840

ccaattgcag acattaaaag tacgaatggc gatgttgtag ctaaagcaac atatgatatc 900

ttgactaaga cgtatacatt tgtctttaca gattatgtaa atgataaaga aaatattaac 960

ggacaatttt cattaccttt atttacagac cgagcaaagg cacctaaatc aggaacatat 1020

gatgcaaata ttaatattgc ggatgaaatg tttgataata aaattactta taactatagt 1080

tcgccaattg caggaattga taagccaaat ggcgcgaaca tttcttctca aattattggt 1140

gtagatacag cttcaggtca aaacacatac aagcaaacgg tatttgttaa ccctaagcaa 1200

cgagttttag gtaatacgtg ggtgtatatt aaaggttacc aagataaaat cgaagaaagt 1260

agcggtaaag taagtgctac agatacaaaa ctgagaattt ttgaagtgaa tgatacatct 1320

aaattatcag atagctacta tgcagaccca aatgactcta accttaaaga agtgactggt 1380

gagtttaaag ataaaatttc atacaaatac gataacgtag caagtattaa ttttggtgat 1440

ataaataaaa cgtatgttgt attagtggaa ggtcactatg ataatactgg taaaaacttg 1500

aaaacacagg ttattcaaga aaatattgac tcagcgacag gtaaagacta cagtattttc 1560

ggttggaata atgagaatgt tgtacgttat ggaggcggaa gtgctgatgg tgattcagca 1620

gtaaat 1626

<210> 58
<211> 542
<212> PRT
<213> Staphylococcus aureus

<400> 58

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

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 Thr 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

Ala Lys Thr 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 Asp 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 Asn Ile Ala Thr Asn
145                 150                 155                 160

Ser Glu Leu Lys Asn Pro 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 Asp Leu
    210                 215                 220

Lys Leu Glu Lys Thr Ala Phe Asp Pro Asn Gln Ser Gly Asn Thr Phe
225                 230                 235                 240

Met Ala Ala Asn Phe Lys Val Thr Gly Gln Val Lys Ser Gly Asp Tyr
                245                 250                 255

Phe Thr Ala Lys Leu Pro Asp Ser Val 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

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 Asp 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 Asp
            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 Gly Glu Phe Lys Asp
    450                 455                 460

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

Ile Asn 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 Ile Asp Ser Ala
            500                 505                 510

Thr Gly Lys 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
    530                 535                 540
```

<210> 59
<211> 1626
<212> DNA
<213> Staphylococcus aureus

<400> 59

```
ttgaaaaaaa gaattgatta tttgtcgaat aagcagaata agtattcgat tagacgtttt     60
acagtaggta ccacatcagt aatagtaggg gcaactatac tatttgggat aggcaatcat    120
caagcacaag cttcagaaca atcgaacgat acaacgcaat cttcgaaaaa taatgcaagt    180
gcagattccg aaaaaaacaa tatgatagaa acacctcaat taaatacaac ggctaatgat    240
acatctgata ttagtgcaaa cacaaacagt gcgaatgtag atagcacaac aaaaccaatg    300
tctacacaaa cgagcaatac cactacaaca gagccagctt caacaaatga aacacctcaa    360
ccgacggcaa ttaaaaatca agcaactgct gcaaaaatgc aagatcaaac tgttcctcaa    420
gaagcaaatt ctcaagtaga taataaaaca acgaatgatg ctaatagcat agcaacaaac    480
agtgagctta aaaattctca aacattagat ttaccacaat catcaccaca aacgatttcc    540
aatgcgcaag gaactagtaa accaagtgtt agaacgagag ctgtacgtag tttagctgtt    600
gctgaaccgg tagtaaatgc tgctgatgct aaagatacaa atgtaaatga taaagttacg    660
```

gcaagtaatt tcaagttaga aaagactaca tttgacccta atcaaagtgg taacacattt 720

atggcggcaa attttacagt gacagataaa gtgaaatcag gggattattt tacagcgaag 780

ttaccagata gtttaactgg taatggagac gtggattatt ctaattcaaa taatacgatg 840

ccaattgcag acattaaaag tacgaatggc gatgttgtag ctaaagcaac atatgatatc 900

ttgactaaga cgtatacatt tgtctttaca gattatgtaa ataataaaga aaatattaac 960

ggacaatttt cattaccttt atttacagac cgagcaaagg cacctaaatc aggaacatat 1020

gatgcgaata ttaatattgc ggatgaaatg tttaataata aaattactta taactatagt 1080

tcgccaattg caggaattga taaaccaaat ggcgcgaaca tttcttctca aattattggt 1140

gtagatacag cttcaggtca aaacacatac aagcaaacag tatttgttaa ccctaagcaa 1200

cgagttttag gtaatacgtg ggtgtataat aaaggctacc aagataaaat cgaagaaagt 1260

agcggtaaag taagtgctac agatacaaaa ctgagaattt ttgaagtgaa tgatacatct 1320

aaattatcag atagctacta tgcagatcca aatgactcta accttaaaga agtaacagac 1380

caatttaaaa atagaatcta ttatgagcat ccaaatgtag ctagtattaa atttggtgat 1440

attactaaaa catatgtagt attagtagaa gggcattacg acaatacagg taagaactta 1500

aaaactcagg ttattcaaga aaatgttgat cctgtaacaa atagagacta cagtattttc 1560

ggttggaata atgagaatgt tgtacgttat ggtggtggaa gtgctgatgg tgattcagca 1620

gtaaat 1626

<210> 60
<211> 542
<212> PRT
<213> Staphylococcus aureus

<400> 60

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

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 Asp 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

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
530 535 540

<210> 61
<211> 1677
<212> DNA
<213> Staphylococcus aureus

<400> 61
atgaatatga agaaaaaaga aaaacacgca attcggaaaa aatcgattgg cgtggcttca 60

gtgcttgtag gtacgttaat cggttttgga ctactcagca gtaaagaagc agatgcaagt 120

gaaaatagtg ttacgcaatc tgatagcgca agtaacgaaa gcaaaagtaa tgattcaagt 180

agcgttagtg ctgcacctaa aacagacgac acaaacgtga gtgatactaa aacatcgtca 240

aacactaata atggcgaaac gagtgtggcg caaaatccag cacaacagga aacgacacaa 300

tcatcatcaa caaatgcaac tacggaagaa acgccggtaa ctggtgaagc tactactacg 360

acaacgaatc aagctaatac accggcaaca actcaatcaa gcaatacaaa tgcggaggaa 420

ttagtgaatc aaacaagtaa tgaaacgact tctaatgata ctaatacagt atcatctgta 480

aattcacctc aaaattctac aaatgcggaa aatgtttcaa caacgcaaga tacttcaact 540

gaagcaacac cttcaaacaa tgaatcagct ccacagagta cagatgcaag taataaagat 600

gtagttaatc aagcggttaa tacaagtgcg cctagaatga gagcatttag tttagcggca 660

gtagctgcag atgcaccggc agctggcaca gatattacga atcagttgac gaatgtgaca 720

gttggtattg actctggtac gactgtgtat ccgcaccaag caggttatgt caaactgaat 780

tatggttttt cagtgcctaa ttctgctgtt aaaggtgaca cattcaaaat aactgtacct 840

aaagaattaa acttaaatgg tgtaacttca actgctaaag tgccaccaat tatggctgga 900

gatcaagtat tggcaaatgg tgtaatcgat agtgatggta atgttattta tacatttaca 960

gactatgtaa atactaaaga tgatgtaaaa gcaactttga ccatgcccgc ttatattgac 1020

cctgaaaatg ttaaaaagac aggtaatgtg acattggcta ctggcatagg tagtacaaca 1080

gcaaacaaaa cagtattagt agattatgaa aaatatggta agttttataa cttatctatt 1140

aaaggtacaa ttgaccaaat cgataaaaca aataatacgt atcgtcagac aatttatgtc 1200

aatccaagtg gagataacgt tattgcgccg gttttaacag gtaatttaaa accaaatacg 1260

gatagtaatg cattaataga tcagcaaaat acaagtatta aagtatataa agtagataat 1320

gcagctgatt tatctgaaag ttactttgtg aatccagaaa actttgagga tgtcactaat 1380

agtgtgaata ttacattccc aaatccaaat caatataaag tagagtttaa tacgcctgat 1440

gatcaaatta caacaccgta tatagtagtt gttaatggtc atattgatcc gaatagcaaa 1500

ggtgatttag ctttacgttc aactttatat gggtataact cgaatataat ttggcgctct 1560

atgtcatggg acaacgaagt agcatttaat aacggatcag gttctggtga cggtatcgat 1620

aaaccagttg ttcctgaaca acctgatgag cctggtgaaa ttgaaccaat tccagag 1677

<210> 62
<211> 559
<212> PRT
<213> Staphylococcus aureus

<400> 62

```
Met Asn Met Lys Lys Lys Glu Lys His Ala Ile Arg Lys Lys Ser Ile
1               5                  10                  15

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

Ser Ser Lys Glu Ala Asp Ala Ser Glu Asn Ser Val Thr Gln Ser Asp
        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 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

Asp Thr Ser Thr Glu Ala Thr Pro Ser Asn Asn Glu Ser Ala Pro Gln
180 185 190

Ser Thr Asp Ala Ser Asn Lys Asp Val Val Asn Gln Ala Val Asn Thr
195 200 205

Ser Ala 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 Asn Val Thr
225 230 235 240

Val Gly 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 Asn Thr Lys Asp Asp Val Lys Ala Thr Leu Thr Met Pro
325 330 335

Ala Tyr Ile Asp Pro Glu Asn Val Lys Lys Thr Gly Asn Val Thr Leu
340 345 350

Ala Thr Gly Ile Gly Ser Thr Thr Ala Asn Lys Thr Val Leu Val Asp
355 360 365

Tyr Glu Lys Tyr Gly Lys Phe Tyr 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 Ile Ala Pro Val Leu Thr Gly Asn Leu
405 410 415

Lys Pro Asn Thr Asp Ser Asn Ala Leu Ile Asp Gln Gln Asn Thr Ser
420 425 430

Ile Lys Val Tyr Lys Val Asp Asn Ala Ala Asp Leu Ser Glu Ser Tyr
435 440 445

Phe Val Asn Pro Glu Asn Phe Glu Asp Val Thr Asn Ser Val Asn Ile
450 455 460

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

Asn Ser Asn Ile 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
545 550 555

<210> 63
<211> 1677
<212> DNA
<213> Staphylococcus aureus

<400> 63
atgaatatga agaaaaaaga aaaacacgca attcggaaaa aatcgattgg cgtggcttca 60

gtgcttgtag gtacgttaat cggttttgga ctactcagca gtaaagaagc agatgcaagt 120

gaaaatagtg ttacgcaatc tgatagcgca agtaacgaaa gcaaaagtaa tgattcaagt 180

agcgttagtg ctgcacctaa aacagacgac acaaacgtga gtgatactaa aacatcgtca 240

aacactaata atggcgaaac gagtgtggcg caaaatccag cacaacagga aacgacacaa 300

tcatcatcaa caaatgcaac tacggaagaa acgccggtaa ctggtgaagc tactactacg 360

acaacgaatc aagctaatac accggcaaca actcaatcaa gcaatacaaa tgcggaggaa 420

ttagtgaatc aaacaagtaa tgaaacgact tctaatgata ctaatacagt atcatctgta 480

aattcacctc aaaattctac aaatgcggaa aatgtttcaa caacgcaaga tacttcaact 540

gaagcaacac cttcaaacaa tgaatcagct ccacagaata cagatgcaag taataaagat 600

gtagttagtc aagcggttaa tccaagtacg cctagaatga gagcatttag tttagcggca 660

gtagctgcag atgcaccggc agctggcaca gatattacga atcagttgac agatgtgaaa 720

gttactattg actctggtac gactgtgtat ccgcaccaag caggttatgt caaactgaat 780

tatggttttt cagtgcctaa ttctgctgtt aaaggtgaca cattcaaaat aactgtacct 840

aaagaattaa acttaaatgg tgtaacttca actgctaaag tgccaccaat tatggctgga 900

gatcaagtat tggcaaatgg tgtaatcgat agtgatggta atgttattta tacatttaca 960

gactatgttg ataataaaga aaatgtaaca gctaatatta ctatgccagc ttatattgac 1020

cctgaaaatg ttacaaagac aggtaatgtg acattgacaa ctggcatagg aaccaatact 1080

gctagtaaga cagtattaat cgactatgag aaatatggac aattccataa tttatcaatt 1140

aaaggtacga ttgatcaaat cgataaaaca aataatacgt atcgccaaac aatttatgtc 1200

aatccaagcg gagataacgt tgtgttacct gccttaacag gtaatttaat tcctaataca 1260

aagagtaatg cgttaataga tgcaaaaaac actgatatta aagtttatag agtcgataat 1320

gctaatgatt tatctgaaag ttattatgtg aatcctagcg attttgaaga tgtaactaat 1380

caagttagaa tttcatttcc aaatgctaat caatacaaag tagaatttcc tacggacgat 1440

gaccaaatta caacaccgta tattgtagtt gttaatggcc atattgatcc tgctagtaca 1500

ggtgatttag cactacgttc gacattttat ggttatgatt ctaattttat atggagatct 1560

atgtcatggg acaacgaagt agcatttaat aacggatcag gttctggtga cggtatcgat 1620

aaaccagttg ttcctgaaca acctgatgag cctggtgaaa ttgaaccaat tccagag 1677

<210> 64
<211> 559
<212> PRT
<213> Staphylococcus aureus

<400> 64

```
Met Asn Met Lys Lys Lys Glu Lys His Ala Ile Arg Lys Lys Ser Ile
1               5                  10                  15

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

Ser Ser Lys Glu Ala Asp Ala Ser Glu Asn Ser Val Thr Gln Ser Asp
        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

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

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
545 550 555

<210> 65
<211> 1677
<212> DNA
<213> Staphylococcus aureus

<400> 65
atgaatatga agaaaaaaga aaaacacgca attcggaaaa aatcgattgg cgtggcttca 60

gtgcttgtag gtacgttaat cggttttgga ctactcagca gtaaagaagc agatgcaagt 120

gaaaatagtg ttacgcaatc tgatagcgca agtaacgaaa gcaaaagtaa tgattcaagt 180

agcgttagtg ctgcacctaa aacagacgac acaaacgtga gtgatactaa aacatcgtca 240

aacactaata atggcgaaac gagtgtggcg caaaatccag cacaacagga aacgacacaa 300

tcatcatcaa caaatgcaac tacggaagaa acgccggtaa ctggtgaagc tactactacg 360

acaacgaatc aagctaatac accggcaaca actcaatcaa gcaatacaaa tgcggaggaa 420

ttagtgaatc aaacaagtaa tgaaacgact tctaatgata ctaatacagt atcatctgta 480

aattcacctc aaaattctac aaatgcggaa aatgtttcaa caacgcaaga tacttcaact 540

gaagcaacac cttcaaacaa tgaatcagct ccacagagta cagatgcaag taataaagat 600

gtagttaatc aagcggttaa tacaagtgcg cctagaatga gagcatttag tttagcggca 660

gtagctgcag atgcaccggc agctggcaca gatattacga atcagttgac gaatgtgaca 720

gttggtattg actctggtac gactgtgtat ccgcaccaag caggttatgt caaactgaat 780

tatggttttt cagtgcctaa ttctgctgtt aaaggtgaca cattcaaaat aactgtacct 840

aaagaattaa acttaaatgg tgtaacttca actgctaaag tgccaccaat tatggctgga 900

gatcaagtat tggcaaatgg tgtaatcgat agtgatggta atgttattta tacatttaca 960

gactatgtaa atactaaaga tgatgtaaaa gcaactttga ccatgcccgc ttatattaac 1020

cctgaaaatg ttaaaaagac aggtaatgtg acattggcta ctggcatagg tagtacaaca 1080

gcaaacaaaa cagtattagt agattatgaa aaatatggta agttttataa cttatctatt 1140

aaaggtacaa ttgaccaaat cgataaaaca aataatacgt atcgtcagac aatttatgtc 1200

aatccaagtg gagataacgt tattgcgccg gttttaacag gtaatttaaa accaaatacg 1260

gatagtaatg cattaataga tcagcaaaat acaagtatta aagtatataa agtagataat 1320

gcagctgatt tatctgaaag ttactttgtg aatccagaaa actttgagga tgtcactaat 1380

agtgtgaata ttacattccc aaatccaaat caatataaag tagagtttaa tacgcctgat 1440

gatcaaatta caacaccgta tatagtagtt gttaatggtc atattgatcc gaatagcaaa 1500

ggtgatttag ctttacgttc aactttatat gggtataact cgaatataat ttggcgctct 1560

atgtcatggg acaacgaagt agcatttaat aacggatcag gttctggtga cggtatcgat 1620

aaaccagttg ttcctgaaca acctgatgag cctggtgaaa ttgaaccaat tccagag 1677

<210> 66
<211> 559
<212> PRT
<213> Staphylococcus aureus

<400> 66

```
Met Asn Met Lys Lys Lys Glu Lys His Ala Ile Arg Lys Lys Ser Ile
1               5                  10                  15

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

Ser Ser Lys Glu Ala Asp Ala Ser Glu Asn Ser Val Thr Gln Ser Asp
        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

Asp Thr Ser Thr Glu Ala Thr Pro Ser Asn Asn Glu Ser Ala Pro Gln
            180                 185                 190

Ser Thr Asp Ala Ser Asn Lys Asp Val Val Asn Gln Ala Val Asn Thr
        195                 200                 205

Ser Ala 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 Asn Val Thr
225                 230                 235                 240

Val Gly 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 Asn Thr Lys Asp Asp Val Lys Ala Thr Leu Thr Met Pro
                325                 330                 335
```

```
Ala Tyr Ile Asn Pro Glu Asn Val Lys Lys Thr Gly Asn Val Thr Leu
            340                 345                 350

Ala Thr Gly Ile Gly Ser Thr Thr Ala Asn Lys Thr Val Leu Val Asp
        355                 360                 365

Tyr Glu Lys Tyr Gly Lys Phe Tyr 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 Ile Ala Pro Val Leu Thr Gly Asn Leu
                405                 410                 415

Lys Pro Asn Thr Asp Ser Asn Ala Leu Ile Asp Gln Gln Asn Thr Ser
            420                 425                 430

Ile Lys Val Tyr Lys Val Asp Asn Ala Ala Asp Leu Ser Glu Ser Tyr
        435                 440                 445

Phe Val Asn Pro Glu Asn Phe Glu Asp Val Thr Asn Ser Val Asn Ile
    450                 455                 460

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

Asn Ser Asn Ile 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
545                 550                 555


<210> 67
<211> 1677
<212> DNA
<213> Staphylococcus aureus

<400> 67
atgaatatga agaaacaaga aaaacacgca attcgtaaaa aatcgattgg cgtggcttca     60

gtgcttgtag gtacgttaat cggttttgga ctactcagca gtaaagaagc agatgcaagt    120

gaaaatagta tgacacaaac ggaaaatacg agtaatgaga gcaaaagtaa tgatccaagt    180
```

agcgttaatg ctgcacctaa aacagacaac acaaacgtga gtgattctaa tacaacgaca 240

aacactaata gtgacgaaac gaatgtagcg caaaatccag cacaacagga aacgacacaa 300

tcagcatcaa caaatgcaac tacagaagaa acaccggtaa ctggtgaagt tactactacg 360

gcaacgaatc aagctaatac accggcaaca actcaatcaa gcaatacaaa tgcggaagaa 420

tcagtgaatc aaacaagtaa tgaaacgact tctaatgata ctaatacagt atcatctgta 480

aattcacctc aaaattctac aaatgcggaa aatgtttcaa caacgcaaga catttcaact 540

gaagcaacac cttcaaacaa tgaatcagct ccacagagta cagatgcaag taataaagat 600

gtagttaatc aagcggttaa tacaagtgcg cctagaatga gagcatttag tttagcggct 660

gtagctgcag atgcaccggc tgctggcaaa gatattacga atcagttgac gaatgtgaca 720

gttggtattg actctggaga tacagtttat ccgcaccaag caggctatgt caaactgaat 780

tatgggttct cagtaccaaa tgaggctgtt caaggtgaca cattcaaaat aactgtgccc 840

aaagaattaa acttaaatgg tgtaacttca actgctaaag tgccaccaat tatggccgga 900

gatcaagtat tggcaaatgg tgtaatcgat agtgatggta atgttattta tacatttaca 960

gactatgtaa atactaaaga tgatgttaaa gcaactttga ccatgcccgc ttatattgac 1020

cctgaaaatg ttacaaagac aggtaatgtg acattggcta ctggcatagg tagtacaaca 1080

gcaaacaaaa cagtattagt agattatgaa aaatatggta agttttataa cttatctatt 1140

aaaggtacaa ttgaccaaat cgataaaaca aataatacgt atcgtcagac aatttatgtc 1200

aatccaagtg gagataacgt tattgcgccg gttttaacag gtaatttaaa accaaatacg 1260

gatagtaatg cattaataga tgcacaaaat actagtatta aagtatataa agttgataat 1320

gcatcagact tgtctgaaag ttattatgtg aatccagata actttgaaga tgtcactgat 1380

agtgtgaata ttacattccc aaatccaaat caatataaag tagagttcaa tacgcctgat 1440

gatcaaataa caacaccata tattgtagtt gttaatgggc atattgatcc taatagtaaa 1500

ggtgatttag ctttacgttc aactttatat ggatataatt cgaatataat ttggcgatca 1560

atgtcatggg ataatgaagt agcatttaat aacggatcag gttctggtga cggtatcgat 1620

aaacctgttg ttcctgaaca acctgatgag ccgggtgaaa ttgaaccaat tccagag 1677

<210> 68
<211> 559
<212> PRT
<213> Staphylococcus aureus

<400> 68
Met Asn Met Lys Lys Gln Glu Lys His Ala Ile Arg Lys Lys Ser Ile
1 5 10 15

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

Ser Ser Lys Glu Ala Asp Ala Ser Glu Asn Ser Met Thr Gln Thr Glu
35 40 45

```
Asn Thr Ser Asn Glu Ser Lys Ser Asn Asp Pro Ser Ser Val Asn Ala
    50                  55                  60

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

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

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

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

Ala Thr Thr Gln Ser Ser Asn Thr Asn Ala Glu Glu Ser 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

Asp Ile Ser Thr Glu Ala Thr Pro Ser Asn Asn Glu Ser Ala Pro Gln
            180                 185                 190

Ser Thr Asp Ala Ser Asn Lys Asp Val Val Asn Gln Ala Val Asn Thr
        195                 200                 205

Ser Ala Pro Arg Met Arg Ala Phe Ser Leu Ala Ala Val Ala Ala Asp
    210                 215                 220

Ala Pro Ala Ala Gly Lys Asp Ile Thr Asn Gln Leu Thr Asn Val Thr
225                 230                 235                 240

Val Gly Ile Asp Ser Gly Asp Thr Val Tyr Pro His Gln Ala Gly Tyr
                245                 250                 255

Val Lys Leu Asn Tyr Gly Phe Ser Val Pro Asn Glu Ala Val Gln 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 Asn Thr Lys Asp Asp Val Lys Ala Thr Leu 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

Ala Thr Gly Ile Gly Ser Thr Thr Ala Asn Lys Thr Val Leu Val Asp
355 360 365

Tyr Glu Lys Tyr Gly Lys Phe Tyr 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 Ile Ala Pro Val Leu Thr Gly Asn Leu
405 410 415

Lys Pro Asn Thr Asp Ser Asn Ala Leu Ile Asp Ala Gln Asn Thr Ser
420 425 430

Ile Lys Val Tyr Lys Val Asp Asn Ala Ser Asp Leu Ser Glu Ser Tyr
435 440 445

Tyr Val Asn Pro Asp Asn Phe Glu Asp Val Thr Asp Ser Val Asn Ile
450 455 460

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

Asn Ser Asn Ile 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
545 550 555

<210> 69
<211> 1677
<212> DNA
<213> Staphylococcus aureus

<400> 69

atgaatatga agaaaaaaga aaaacacgca attcggaaaa aatcgattgg cgtggcttca 60

gtgcttgtag gtacgttaat cggttttgga ctactcagca gtaaagaagc agatgcaagt 120

gaaaatagtg ttacgcaatc tgatagcgca agtaacgaaa gcaaaagtaa tgattcaagt 180

agcattaatg ctgcacctaa aacagacaac acaaacgtga gtgatactaa accaacgtca 240

aacactaata atggcgaaac gagtgtggcg caaaatccag cacaacagga aacgacacaa 300

tcagcatcaa caaatgcaac tacggaagaa acgccggtaa ctggtgaagc tactactacg 360

acaacgaatc aagctaatac accggcaaca actcaatcaa gcaatacaaa tgcggaggaa 420

ttagtgaatc aaacaagtaa tgaaacgact tctaatgata ctaatacagt atcatctgta 480

aattcacctc aaaattctac aaatgcggaa aatgtttcaa caacgcaaga tacttcaact 540

gaagcaacac cttcaaacaa tgaatcagct ccacagagta cagatgcaag taataaagat 600

gtagttaatc aagcggttaa tacaagtgcg cctagaaaga gagcatttag tttagcggct 660

gtagctgcag atgcaccggc agctggcaca gatattacga atcagttgac agatgtgaaa 720

gttactattg actctggtac gactgtgtat ccgcaccaag caggttatgt caaactgaat 780

tatggttttt cagtgcctaa ttctgctgtt aaaggtgaca cattcaaaat aactgtacct 840

aaagaattaa acttaaatgg tgtaacttca actgctaaag tgccaccaat tatggctgga 900

gatcaagtat tggcaaatgg tgtaatcgat agtgatggta atgttattta tacatttaca 960

gactatgttg ataataaaga aaatgtaaca gctaatatta ctatgccagc ttatattgac 1020

cctgaaaatg ttacaaagac aggtaatgtg acattgacaa ctggcatagg aaccaatact 1080

gctagtaaga cagtattaat cgactatgag aaatatggac aattccataa tttatcaatt 1140

aaaggtacga ttgatcaaat cgataaaaca aataatacgt atcgccaaac aatttatgtc 1200

aatccaagcg gagataacgt tgtgttacct gccttaacag gtaatttaat tcctaataca 1260

aagagtaatg cgttaataga tgcaaaaaac actgatatta aagtttatag agtcgataat 1320

gctaatgatt tatctgaaag ttattatgtg aatcctagcg attttgaaga tgtaactaat 1380

caagttagaa tttcatttcc aaatgctaat caatacaaag tagaatttcc tacggacgat 1440

gaccaaatta caacaccgta tattgtagtt gttaatggcc atattgatcc tgctagtaca 1500

ggtgatttag cactacgttc gacattttat ggttatgatt ctaattttat atggagatct 1560

atgtcatggg acaacgaagt agcatttaat aacggatcag gttctggtga cggtatcgat 1620

aaaccagttg ttcctgaaca acctgatgag cctggtgaaa ttgaaccaat tccagag 1677

<210> 70
<211> 559
<212> PRT
<213> Staphylococcus aureus

<400> 70
Met Asn Met Lys Lys Lys Glu Lys His Ala Ile Arg Lys Lys Ser Ile
1 5 10 15

Gly Val Ala Ser Val Leu Val Gly Thr Leu Ile Gly Phe Gly Leu Leu

```
            20                  25                  30

Ser Ser Lys Glu Ala Asp Ala Ser Glu Asn Ser Val Thr Gln Ser Asp
        35                  40                  45

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

Ala Pro Lys Thr Asp Asn Thr Asn Val Ser Asp Thr Lys Pro Thr 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 Ala 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

Asp Thr Ser Thr Glu Ala Thr Pro Ser Asn Asn Glu Ser Ala Pro Gln
            180                 185                 190

Ser Thr Asp Ala Ser Asn Lys Asp Val Val Asn Gln Ala Val Asn Thr
        195                 200                 205

Ser Ala Pro Arg Lys 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

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
545 550 555

<210> 71

<211> 1677
<212> DNA
<213> Staphylococcus aureus

<400> 71
atgaatatga agaaaaaaga aaaacacgca attcggaaaa aatcgattgg cgtggcttca 60

gtgcttgtag gtacgttaat cggttttgga ctactcagca gtaaagaagc agatgcaagt 120

gaaaatagtg ttacgcaatc tgatagcgca agtaacgaaa gcaaaagtaa tgattcaagt 180

agcgttagtg ctgcacctaa aacagacgac acaaacgtga gtgatactaa aacatcgtca 240

aacactaata atggcgaaac gagtgtggcg caaaatccag cacaacagga aacgacacaa 300

tcatcatcaa caaatgcaac tacggaagaa acgccggtaa ctggtgaagc tactactacg 360

acaacgaatc aagctaatac accggcaaca actcaatcaa gcaatacaaa tgcggaggaa 420

ttagtgaatc aaacaagtaa tgaaacgact tctaatgata ctaatacagt atcatctgta 480

aattcacctc aaaattctac aaatgcggaa aatgtttcaa caacgcaaga tacttcaact 540

gaagcaacac cttcaaacaa tgaatcagct ccacagaata cagatgcaag taataaagat 600

gtagttagtc aagcggttaa tccaagtacg cctagaatga gagcatttag tttagcggca 660

gtagctgcag atgcaccggc agctggcaca gatattacga atcagttgac agatgtgaaa 720

gttactattg actctggtac gactgtgtat ccgcaccaag caggttatgt caaactgaat 780

tatggttttt cagtgcctaa ttctcctgtt aaaggtgaca cattcaaaat aactgtacct 840

aaagaattaa acttaaatgg tgtaacttca actgctaaag tgccaccaat tatggctgga 900

gatcaagtat tggcaaatgg tgtaatcgat agtgatggta atgttattta tacatttaca 960

gactatgttg ataataaaga aaatgtaaca gctaatatta ctatgccagc ttatattgac 1020

cctgaaaatg ttacaaagac aggtaatgtg acattgacaa ctggcatagg aaccaatact 1080

gctagtaaga cagtattaat cgactatgag aaatatggac aattccataa tttatcaatt 1140

aaaggtacga ttgatcaaat cgataaaaca aataatacgt atcgccaaac aatttatgtc 1200

aatccaagcg gagataacgt tgtgttacct gccttaacag gtaatttaat tcctaataca 1260

aagagtaatg cgttaataga tgcaaaaaac actgatatta aagtttatag agtcgataat 1320

gctaatgatt tatctgaaag ttattatgtg aatcctagcg attttgaaga tgtaactaat 1380

caagttagaa tttcatttcc aaatgctaat caatacaaag tagaatttcc tacggacgat 1440

gaccaaatta caacaccgta tattgtagtt gttaatggcc atattgatcc tgctagtaca 1500

ggtgatttag cactacgttc gacattttat ggttatgatt ctaattttat atggagatct 1560

atgtcatggg acaacgaagt agcatttaat aacggatcag gttctggtga cggtatcgat 1620

aaaccagttg ttcctgaaca acctgatgag cctggtgaaa ttgaaccaat tccagag 1677

<210> 72
<211> 559
<212> PRT
<213> Staphylococcus aureus

<400> 72

```
Met Asn Met Lys Lys Lys Glu Lys His Ala Ile Arg Lys Lys Ser Ile
1               5                  10                  15

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

Ser Ser Lys Glu Ala Asp Ala Ser Glu Asn Ser Val Thr Gln Ser Asp
        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

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 Pro 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

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
545 550 555

<210> 73
<211> 1677
<212> DNA
<213> Staphylococcus aureus

<400> 73
atgaatatga agaaaaaaga aaaacacgca attcggaaaa aatcgattgg cgtggcttca 60

gtgcttgtag gtacgttaat cggttttgga ctactcagca gtaaagaagc agatgcaagt 120

gaaaatagtg ttacgcaatc tgatagcgca agtaacgaaa gcaaaagtaa tgattcaagt 180

agcattaatg ctgcacctaa aacagacaac acaaacgtga gtgatactaa aacaacgtca 240

aacactaata atggcgaaac gagtgtggcg caaaatccag cacaacagga aacgacacaa 300

tcagcatcaa caaatgcaac tacggaagaa acgccggtaa ctggtgaaac tactactacg 360

gcaacgaatc aagctaatac accggcaaca actcaatcaa gcaatacaaa tgcggaggaa 420

ttagtgaatc aaacaagtaa tgaaacgact tctaatgata ctaatacagt atcatctgta 480

aattcacctc aaaattctac aaatgcggaa aatgtttcaa caacgcaaga tacttcaact 540

gaagcaacac cttcaaacaa tgaatcagct ccacagagta cagatgcaag taataaagat 600

gtagttaatc aagcggttaa tacaagtgcg cctagaatga gagcatttag tttagcggca 660

gtagctgcag atgcaccggc agctggcaca gatattacga atcagttgac agatgtgaaa 720

gttactattg actctggtac gactgtgtat ccgcaccaag caggttatgt caaactgaat 780

tatggttttt cagtgcctaa ttctgctgtt aaaggtgaca cattcaaaat aactgtacct 840

aaagaattaa acttaaatgg tgtaacttca actgctaaag tgccaccaat tatggctgga 900

gatcaagtat tggcaaatgg tgtaatcgat agtgatggta atgttattta tacatttaca 960

gactatgttg ataataaaga aaatgtaaca gctaatatta ctatgccagc ttatattgac 1020

cctgaaaatg ttacaaagac aggtaatgtg acattgacaa ctggcatagg aaccaatact 1080

gctagtaaga cagtattaat cgactatgag aaatatggac aattccataa tttatcaatt 1140

aaaggtacga ttgatcaaat cgataaaaca aataatacgt atcgccaaac aatttatgtc 1200

aatccaagcg gagataacgt tgtgttacct gccttaacag gtaatttaat tcctaataca 1260

aagagtaatg cgttaataga tgcaaaaaac actgatatta aagtttatag agtcgataat 1320

gctaatgatt tatctgaaag ttattatgtg aatcctagcg attttgaaga tgtaactaat 1380

caagttagaa tttcatttcc aaatgctaat caatacaaag tagaatttcc tacggacgat 1440

gaccaaatta caacaccgta tattgtagtt gttaatggcc atattgatcc tgctagtaca 1500

ggtgatttag cactacgttc gacattttat ggttatgatt ctaattttat atggagatct 1560

atgtcatggg acaacgaagt agcatttaat aacggatcag gttctggtga cggtatcgat 1620

aaaccagttg ttcctgaaca acctgatgag cctggtgaaa ttgaaccaat tccagag 1677

<210> 74

<211> 559
<212> PRT
<213> Staphylococcus aureus

<400> 74

```
Met Asn Met Lys Lys Lys Glu Lys His Ala Ile Arg Lys Lys Ser Ile
1               5                  10                  15

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

Ser Ser Lys Glu Ala Asp Ala Ser Glu Asn Ser Val Thr Gln Ser Asp
        35                  40                  45

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

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

Val Thr Gly Glu Thr Thr Thr Thr Ala 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

Asp Thr Ser Thr Glu Ala Thr Pro Ser Asn Asn Glu Ser Ala Pro Gln
            180                 185                 190

Ser Thr Asp Ala Ser Asn Lys Asp Val Val Asn Gln Ala Val Asn Thr
        195                 200                 205

Ser Ala 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

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 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
545 550 555

<210> 75
<211> 1677
<212> DNA
<213> Staphylococcus aureus

<400> 75
atgaatatga agaaaaaaga aaaacacgca attcggaaaa aatcgattgg cgtggcttca 60

gtgcttgtag gtacgttaat cggtttcgga ttacttagca gtaaagaagc agatgcaagt 120

gaaaatagtg ttacgcaatc tgatagcgca agtaacgaaa gcaaaagtaa tgattcaagt 180

agcgttaatg ctgcacctaa aacagacaac acaaacgtga gtgatactaa aacaacgtca 240

aacactaata atggcgaaac gagtgtggcg caaaatccag cacaacagga aacgatacaa 300

tcagcatcaa caaatgcaac tacggaagaa acaccggtaa ctggtgaagc tactactacg 360

gcaacgaagc aagctaatac accggcaaca actcaatcaa gcaatacaaa tgcggaggaa 420

ttagtgaatc aaacaagtaa tgaaacgact tctaatgata ctaatacagt atcatctgta 480

aattcacctc aaaattctac aaatgcggaa aatgtttcaa caacgcaaga tacttcaact 540

gaagcaacac cttcaaacaa tgaatcagct ccacagagta cagatgcaag taataaagat 600

gtagttaatc aagcggttaa tacaagtgcg cctagaatga gagcatttag tttagcggct 660

gtagctgcag atgcaccggc tgctggcaca gatattacga atcagttgac agatgtgaaa 720

gttactattg actctggtac gactgtgtat ccgcaccaag caggttatgt caaactgaat 780

tatggttttt cagtgcctaa ttctgctgtt aaaggtgaca cattcaaaat aactgtacct 840

aaagaattaa acttaaatgg tgtaacttca actgctaaag tgccaccaat tatggccgga 900

gatcaagtat tggcaaatgg tgtaatcgat agtgatggta atgttattta tacatttaca 960

gactatgtaa atactaaaga tgatgttaaa gcaactttga ccatgcccgc ttatattgac 1020

cctgaaaatg ttacaaagac aggtaatgtg acattggcta ctggcatagg tagtacaaca 1080

gcaaacaaaa cagtattagt agattatgaa aaatatggta agttttataa cttatctatt 1140

aaaggtacaa ttgaccaaat cgataaaaca aataatacgt atcgtcagac aatttatgtc 1200

aatccaagtg gagataacgt tattgcgccg gttttaacag gtaatttaaa accaaatacg 1260

gatagtaatg cattaataga tcagcaaaat acaagtatta aagtatataa agtagataat 1320

gcagctgatt tatctgaaag ttactttgtg aatccagaaa actttgagga tgtcactaat 1380

agtgtgaata ttacattccc aaatccaaat caatataaag tagagtttaa tacgcctgat 1440

gatcaaatta caacaccgta tattgtagtt gttaatggtc atattgatcc gaatagcaaa 1500

ggtgatttag ctttacgttc aactttatat gggtatgact caaggtttgt atggagatct 1560

atgtcatggg acaacgaagt agcatttaat aacggatcag gttctggtga cggtatcgat 1620

aaaccagttg ttcctgaaca acctgatgag cctggtgaaa ttgaaccaat tccagag 1677

<210> 76
<211> 559
<212> PRT
<213> Staphylococcus aureus

<400> 76
Met Asn Met Lys Lys Lys Glu Lys His Ala Ile Arg Lys Lys Ser Ile
1 5 10 15

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

Ser Ser Lys Glu Ala Asp Ala Ser Glu Asn Ser Val Thr Gln Ser Asp
35 40 45

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

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

Val Thr Gly Glu Ala Thr Thr Thr Ala Thr Lys 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

Asp Thr Ser Thr Glu Ala Thr Pro Ser Asn Asn Glu Ser Ala Pro Gln
180 185 190

Ser Thr Asp Ala Ser Asn Lys Asp Val Val Asn Gln Ala Val Asn Thr
195 200 205

Ser Ala 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 Asn Thr Lys Asp Asp Val Lys Ala Thr Leu 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

Ala Thr Gly Ile Gly Ser Thr Thr Ala Asn Lys Thr Val Leu Val Asp
        355                 360                 365

Tyr Glu Lys Tyr Gly Lys Phe Tyr 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 Ile Ala Pro Val Leu Thr Gly Asn Leu
                405                 410                 415

Lys Pro Asn Thr Asp Ser Asn Ala Leu Ile Asp Gln Gln Asn Thr Ser
            420                 425                 430

Ile Lys Val Tyr Lys Val Asp Asn Ala Ala Asp Leu Ser Glu Ser Tyr
        435                 440                 445

Phe Val Asn Pro Glu Asn Phe Glu Asp Val Thr Asn Ser Val Asn Ile
    450                 455                 460

Thr Phe Pro Asn Pro Asn Gln Tyr Lys Val Glu Phe Asn Thr Pro 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 Asn Ser Lys Gly Asp Leu Ala Leu Arg Ser Thr Leu Tyr Gly Tyr
            500                 505                 510
```

Asp Ser Arg Phe Val 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
545 550 555

<210> 77
<211> 1677
<212> DNA
<213> Staphylococcus aureus

<400> 77
atgaatatga agaaacaaga aaaacacgca attcgtaaaa aatcgattgg cgtggcttca 60

gtgcttgtag gtacgttaat cggttttgga ctactcagca gtaaagaagc agatgcaagt 120

gaaaatagtg ttacgcaaac ggaaaatacg agtaatgaga gcaaaagtaa tgattcgagt 180

agcgttaatg ctgcacctaa aacagacaac acaaacgtga gtgattctaa tacaacgaca 240

aacactaata gtgacgaaac gaatgtagcg caaaatccag cacaacagga aacgacacaa 300

tcagcatcaa caaatgcaac tacagaagaa acaccggtaa ctggtgaagt tactactacg 360

gcaacgaatc aagctaatac accggcaaca actcaatcaa gcaatacaaa tgcggaaaaa 420

tcagtgaatc aaacaagtaa tgaaacgact tctaatgata ctaatacagt atcatctgta 480

aattcacctc aaaattctac aaatgcggaa aatgtttcaa caacgcaaga tacttcaact 540

gaagcaaaac cttcaaacaa tgaatcagct ccacagagta cagatgcaag taataaagat 600

gtagttaatc aagcggttaa tacaagtgcg cctagaatga gagcatttag tttagcggct 660

gtagctgcag atgcaccggc tgctggcaca gatattacga atcagttgac gaatgtgaca 720

gttggtattg actctggaga tacagtttat ccgcaccaag caggctatgt caaactgaat 780

tatgggttct cagtacccaa ttctgcggtt caaggtgaca catttaaaat aactgtacct 840

aaagaattaa acttaaatgg tgtaacctca actgctaaag tgccaccaat tatggccgga 900

gatcaagtat tggcaaatgg tgtaatcgat agtgatggta atgttattta tacatttaca 960

gactatgtaa atactaaaga tgatgttaaa gcaacattaa ctgtgccggc ttatattgac 1020

cctgaatatg ttacacatac tggtaatgtg acattggcta ctggcatagg aaatacaaca 1080

gcaaacaaaa cagtattagt agattatgaa aaatatggta agttttataa cttatctatt 1140

aaaggtacaa ttgaccaaat cgataaaaca aataatacgt atcgtcagac aatttatgtc 1200

aatccaagtg gagataacgt tattgcaccg gttttaacag gtaatttaaa accaaatacg 1260

gaaagtaatg cattaataga tcagcaaaat acaagtatta aagtatataa agtagataat 1320

gcagctgatt tatctgaaag ttactttgtg aatccagaaa actttgagga tgtcactaat 1380

agtgtaaata ttacattccc aaatccaaat caatataaag tagagtttaa tacgcctgat 1440

gatcaaataa caacaccata tattgtagtt gttaatgggc atattgatcc taatagtaaa 1500

ggtgatttag ctttacgttc aactttatat ggatataatt cgaatataat ttggagatct 1560

atgtcatggg acaacgaagt agcatttaat aacggatcag gttctggtga cggtatcgat 1620

aaacctgttg ttcctgaaca acctgatgag cctggtgaaa ttgaaccaat tccagag 1677

<210> 78
<211> 559
<212> PRT
<213> Staphylococcus aureus

<400> 78

```
Met Asn Met Lys Lys Gln Glu Lys His Ala Ile Arg Lys Lys Ser Ile
1               5                  10                  15

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

Ser Ser Lys Glu Ala Asp Ala Ser Glu Asn Ser Val Thr Gln Thr Glu
        35                  40                  45

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

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

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

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

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

Ala Thr Thr Gln Ser Ser Asn Thr Asn Ala Glu Lys Ser 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

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

Ser Thr Asp Ala Ser Asn Lys Asp Val Val Asn Gln Ala Val Asn Thr
        195                 200                 205

Ser Ala 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 Asn Val Thr
225 230 235 240

Val Gly Ile Asp Ser Gly Asp 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 Gln 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 Asn Thr Lys Asp Asp Val Lys Ala Thr Leu Thr Val Pro
325 330 335

Ala Tyr Ile Asp Pro Glu Tyr Val Thr His Thr Gly Asn Val Thr Leu
340 345 350

Ala Thr Gly Ile Gly Asn Thr Thr Ala Asn Lys Thr Val Leu Val Asp
355 360 365

Tyr Glu Lys Tyr Gly Lys Phe Tyr 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 Ile Ala Pro Val Leu Thr Gly Asn Leu
405 410 415

Lys Pro Asn Thr Glu Ser Asn Ala Leu Ile Asp Gln Gln Asn Thr Ser
420 425 430

Ile Lys Val Tyr Lys Val Asp Asn Ala Ala Asp Leu Ser Glu Ser Tyr
435 440 445

Phe Val Asn Pro Glu Asn Phe Glu Asp Val Thr Asn Ser Val Asn Ile
450 455 460

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

Asn Ser Asn Ile 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
545 550 555

<210> 79
<211> 1677
<212> DNA
<213> Staphylococcus aureus

<400> 79
atgaatatga agaaaaaaga aaaacacgca attcggaaaa aatcgattgg cgtggcttca 60

gtgcttgtag gtacgttaat cggttttgga ctactcagca gtaaagaagc agatgcaagt 120

gaaaatagtg ttacgcaatc tgatagcgca agtaacgaaa gcaaaagtaa tgattcaagt 180

agcgttagtg ctgcacctaa aacagacgac acaaacgtga gtgatactaa aacatcgtca 240

aacactaata atggcgaaac gagtgtggcg caaaatccag cacaacagga aacgacacaa 300

tcatcatcaa caaatgcaac tacggaagaa acgccggtaa ctggtgaagc tactactacg 360

acaacgaatc aagctaatac accggcaaca actcaatcaa gcaatacaaa tgcggaggaa 420

ttagtgaatc aaacaagtaa tgaaacgact tctaatgata ctaatacagt atcatctgta 480

aattcacctc aaaattctac aaatgcggaa aatgtttcaa caacgcaaga tacttcaact 540

gaagcaacac cttcaaacaa tgaatcagct ccacagagta cagatgcaag taataaagat 600

gtagttaatc aagcggttaa tacaagtgcg cctagaatga gagcatttag tttagcggca 660

gtagctgcag atgcaccggt agctggcaca gatattacga atcagttgac gaatgtgaca 720

gttggtattg actctggtac gactgtgtat ccgcaccaag caggttatgt caaactgaat 780

tatggttttt cagtgcctaa ttctgctgtt aaaggtgaca cattcaaaat aactgtacct 840

aaagaattaa acttaaatgg tgtaacttca actgctaaag tgccaccaat tatggctgga 900

gatcaagtat tggcaaatgg tgtaatcgat agtgatggta atgttattta tacatttaca 960

gactatgtaa atactaaaga tgatgtaaaa gcaactttga ccatgcccgc ttatattgac 1020

cctgaaaatg ttaaaaagac aggtaatgtg acattggcta ctggcatagg tagtacaaca 1080

gcaaacaaaa cagtattagt agattatgaa aaatatggta agttttataa cttatctatt 1140

aaaggtacaa ttgaccaaat cgataaaaca aataatacgt atcgtcagac aatttatgtc 1200

aatccaagtg gagataacgt tattgcgccg gttttaacag gtaatttaaa accaaatacg 1260

gatagtaatg cattaataga tcagcaaaat acaagtatta aagtatataa agtagataat 1320

gcagctgatt tatctgaaag ttactttgtg aatccagaaa actttgagga tgtcactaat 1380

agtgtgaata ttacattccc aaatccaaat caatataaag tagagtttaa tacgcctgat 1440

gatcaaatta caacaccgta tatagtagtt gttaatggtc atattgatcc gaatagcaaa 1500

ggtgatttag ctttacgttc aactttatat gggtataact cgaatataat ttggcgctct 1560

atgtcatggg acaacgaagt agcatttaat aacggatcag gttctggtga cggtatcgat 1620

aaaccagttg ttcctgaaca acctgatgag cctggtgaaa ttgaaccaat tccagag 1677

<210> 80
<211> 559
<212> PRT
<213> Staphylococcus aureus

<400> 80

Met Asn Met Lys Lys Lys Glu Lys His Ala Ile Arg Lys Lys Ser Ile
1 5 10 15

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

Ser Ser Lys Glu Ala Asp Ala Ser Glu Asn Ser Val Thr Gln Ser Asp
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

Asp Thr Ser Thr Glu Ala Thr Pro Ser Asn Asn Glu Ser Ala Pro Gln
180 185 190

```
Ser Thr Asp Ala Ser Asn Lys Asp Val Val Asn Gln Ala Val Asn Thr
        195                 200                 205

Ser Ala Pro Arg Met Arg Ala Phe Ser Leu Ala Ala Val Ala Ala Asp
    210                 215                 220

Ala Pro Val Ala Gly Thr Asp Ile Thr Asn Gln Leu Thr Asn Val Thr
225                 230                 235                 240

Val Gly 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 Asn Thr Lys Asp Asp Val Lys Ala Thr Leu Thr Met Pro
                325                 330                 335

Ala Tyr Ile Asp Pro Glu Asn Val Lys Lys Thr Gly Asn Val Thr Leu
            340                 345                 350

Ala Thr Gly Ile Gly Ser Thr Thr Ala Asn Lys Thr Val Leu Val Asp
        355                 360                 365

Tyr Glu Lys Tyr Gly Lys Phe Tyr 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 Ile Ala Pro Val Leu Thr Gly Asn Leu
                405                 410                 415

Lys Pro Asn Thr Asp Ser Asn Ala Leu Ile Asp Gln Gln Asn Thr Ser
            420                 425                 430

Ile Lys Val Tyr Lys Val Asp Asn Ala Ala Asp Leu Ser Glu Ser Tyr
        435                 440                 445

Phe Val Asn Pro Glu Asn Phe Glu Asp Val Thr Asn Ser Val Asn Ile
    450                 455                 460
```

```
Thr Phe Pro Asn Pro Asn Gln Tyr Lys Val Glu Phe Asn Thr Pro 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 Asn Ser Lys Gly Asp Leu Ala Leu Arg Ser Thr Leu Tyr Gly Tyr
            500                 505                 510

Asn Ser Asn Ile 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
545                 550                 555
```

<210> 81
<211> 1677
<212> DNA
<213> Staphylococcus aureus

<400> 81

```
atgaatatga agaaaaaaga aaaacacgca attcggaaaa aatcgattgg cgtggcttca     60

gtgcttgtag gtacgttaat cggttttgga ctactcagca gtaaagaagc agatgcaagt    120

gaaaatagtg ttacgcaatc tgatagcgca agtaacgaaa gcaaaagtaa tgattcaagt    180

agcgttagtg ctgcacctaa aacagacgac acaaacgtga gtgatactaa aacatcgtca    240

aacactaata atggcgaaac gagtgtggcg caaaatccag cacaacagga aacgacacaa    300

tcatcatcaa caaatgcaac tacggaagaa acgccggtaa ctggtgaagc tactactacg    360

acaacgaatc aagctaatac accggcaaca actcaatcaa gcaatacaaa tgcggaggaa    420

ttagtgaatc aaacaagtaa tgaaacgact tttaatgata ctaatacagt atcatctgta    480

aattcacctc aaaattctac aaatgcggaa aatgtttcaa caacgcaaga tacttcaact    540

gaagcaacac cttcaaacaa tgaatcagct ccacagagta cagatgcaag taataaagat    600

gtagttaatc aagcggttaa tacaagtgcg cctagaatga gagcatttag tttagcggca    660

gtagctgcag atgcaccggc agctggcaca gatattacga atcagttgac gaatgtgaca    720

gttggtattg actctggtac gactgtgtat ccgcaccaag caggttatgt caaactgaat    780

tatggttttt cagtgcctaa ttctgctgtt aaaggtgaca cattcaaaat aactgtacct    840

aaagaattaa acttaaatgg tgtaacttca actgctaaag tgccaccaat tatggctgga    900

gatcaagtat tggcaaatgg tgtaatcgat agtgatggta atgttattta tacatttaca    960

gactatgtaa atactaaaga tgatgtaaaa gcaactttga ccatgcccgc ttatattgac   1020

cctgaaaatg ttaaaaagac aggtaatgtg acattggcta ctggcatagg tagtacaaca   1080

gcaaacaaaa cagtattagt agattatgaa aaatatggta agttttataa cttatctatt   1140
```

aaaggtacaa ttgaccaaat cgataaaaca aataatacgt atcgtcagac aatttatgtc 1200

aatccaagtg gagataacgt tattgcgccg gttttaacag gtaatttaaa accaaatacg 1260

gatagtaatg cattaataga tcagcaaaat acaagtatta aagtatataa agtagataat 1320

gcagctgatt tatctgaaag ttactttgtg aatccagaaa actttgagga tgtcactaat 1380

agtgtgaata ttacattccc aaatccaaat caatataaag tagagtttaa tacgcctgat 1440

gatcaaatta caacaccgta tatagtagtt gttaatggtc atattgatcc gaatagcaaa 1500

ggtgatttag ctttacgttc aactttatat gggtataact cgaatataat ttggcgctct 1560

atgtcatggg acaacgaagt agcatttaat aacggatcag gttctggtga cggtatcgat 1620

aaaccagttg ttcctgaaca acctgatgag cctggtgaaa ttgaaccaat tccagag 1677

<210> 82
<211> 559
<212> PRT
<213> Staphylococcus aureus

<400> 82

Met Asn Met Lys Lys Lys Glu Lys His Ala Ile Arg Lys Lys Ser Ile
1 5 10 15

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

Ser Ser Lys Glu Ala Asp Ala Ser Glu Asn Ser Val Thr Gln Ser Asp
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 Phe 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

```
Asp Thr Ser Thr Glu Ala Thr Pro Ser Asn Asn Glu Ser Ala Pro Gln
            180                 185                 190

Ser Thr Asp Ala Ser Asn Lys Asp Val Val Asn Gln Ala Val Asn Thr
        195                 200                 205

Ser Ala 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 Asn Val Thr
225                 230                 235                 240

Val Gly 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 Asn Thr Lys Asp Asp Val Lys Ala Thr Leu Thr Met Pro
                325                 330                 335

Ala Tyr Ile Asp Pro Glu Asn Val Lys Lys Thr Gly Asn Val Thr Leu
            340                 345                 350

Ala Thr Gly Ile Gly Ser Thr Thr Ala Asn Lys Thr Val Leu Val Asp
        355                 360                 365

Tyr Glu Lys Tyr Gly Lys Phe Tyr 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 Ile Ala Pro Val Leu Thr Gly Asn Leu
                405                 410                 415

Lys Pro Asn Thr Asp Ser Asn Ala Leu Ile Asp Gln Gln Asn Thr Ser
            420                 425                 430

Ile Lys Val Tyr Lys Val Asp Asn Ala Ala Asp Leu Ser Glu Ser Tyr
        435                 440                 445
```

Phe Val Asn Pro Glu Asn Phe Glu Asp Val Thr Asn Ser Val Asn Ile
450 455 460

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

Asn Ser Asn Ile 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
545 550 555

<210> 83
<211> 1674
<212> DNA
<213> Staphylococcus aureus

<400> 83
atgaatatga agaaaaaaga aaaacacgca attcggaaaa aatcgattgg cgtggcttca 60

gtgcttgtag gtacgttaat cggttttgga ctactcagca gtaaagaagc agatgcaagt 120

gaaaatagtg ttacgcaatc tgatagcgca agtaacgaaa gcaaaagtaa tgattcaagt 180

agcgttagtg ctgcacctaa aacagacgac acaaacgtga gtgatactaa aacatcgtca 240

aacactaata atggcgaaac gagtgtggcg caaaatccag cacaacagga aacgacacaa 300

tcagcattaa caaatgcaac tacggaagaa actccggtaa ctggtgaagc tactacggca 360

acgaatcaag ctaatacacc ggcaacaact caatcaagca atacaaatgc ggaggaatta 420

gtgaatcaaa caagtaatga aacgacttct aatgatacta atacagtatc atctgtaaat 480

tcacctcaaa attctacaaa tgcggaaaat gtttcaacaa cgcaagatac ttcaactgaa 540

gcaacacctt caaacaatga atcagctcca cagagtacag atgcaagtaa taaagatgta 600

gttaatcaag cggttaatac aagtgcgcct agaatgagag catttagttt atcggcagta 660

gctgcagatg caccggcagc tggcaaagat attacgaatc agttgacgaa tgtgacagtt 720

ggtattgact ctggagatac agtttatccg caccaagcag gctatgtcaa actgaattat 780

ggtttttcag tgcctaattc tgctgttaaa ggtgacacat tcaaaataac tgtacctaaa 840

gaattaaact taaatggtgt aacttcaact gctaaagtgc ctccaattat ggccggagat 900

caagtattgg caaatggtgt aatcgatagt gatggtaatg ttatttatac atttacagac 960

tatgttgata ctaaagaaaa tgtaacagct aatattacta tgccagctta tattgaccct 1020

gaaaatgtta caaagacagg taatgtaaca ttgacaactg gcataggtag tacaacagca 1080

aacaaaacag tattagtaga ttatgaaaaa tatggtaagt tttataactt atctattaaa 1140

ggtacaattg accaaatcga taaaacaaat aatacgtatc gtcagacaat ttatgtcaat 1200

ccaagtggag ataatgttat tgcgccggtt ttaacaggta atttaaaacc aaatacggat 1260

agtaatgcat taatagatca gcaaaataca agtattaaag tatataaagt agataatgca 1320

gctgatttat ctgaaagtta ctttgtgaat ccagaaaact ttgaggatgt cactaatagt 1380

gtgaatatta cattcccaaa tccaaatcaa tataaagtag agtttaatac gcctgatgat 1440

caaattacaa caccgtatat tgtagttgtt aatggtcata ttgatccgaa tagcaaaggt 1500

gatttagctt tacgttcaac tttatatgga tatgactcaa ggtttgtatg gagatctatg 1560

tcatgggaca acgaagtagc atttaataac ggatcaggtt ctggtgacgg tatcgataaa 1620

ccagttgttc ctgaacaacc tgatgagcct ggtgaaattg aaccaattcc agag 1674

<210> 84
<211> 558
<212> PRT
<213> Staphylococcus aureus

<400> 84

```
Met Asn Met Lys Lys Lys Glu Lys His Ala Ile Arg Lys Lys Ser Ile
1               5                  10                  15

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

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

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

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

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

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

Thr Ser Thr Glu Ala Thr Pro Ser Asn Asn Glu Ser Ala Pro Gln Ser
            180                 185                 190

Thr Asp Ala Ser Asn Lys Asp Val Val Asn Gln Ala Val Asn Thr Ser
        195                 200                 205

Ala Pro Arg Met Arg Ala Phe Ser Leu Ser Ala Val Ala Ala Asp Ala
    210                 215                 220

Pro Ala Ala Gly Lys Asp Ile Thr Asn Gln Leu Thr Asn Val Thr Val
225                 230                 235                 240

Gly Ile Asp Ser Gly Asp Thr Val Tyr Pro His Gln Ala Gly Tyr Val
                245                 250                 255

Lys Leu Asn Tyr Gly Phe Ser Val Pro Asn Ser Ala Val Lys Gly Asp
            260                 265                 270

Thr Phe Lys Ile Thr Val Pro Lys Glu Leu Asn Leu Asn Gly Val Thr
        275                 280                 285

Ser Thr Ala Lys Val Pro Pro Ile Met Ala Gly Asp Gln Val Leu Ala
    290                 295                 300

Asn Gly Val Ile Asp Ser Asp Gly Asn Val Ile Tyr Thr Phe Thr Asp
305                 310                 315                 320

Tyr Val Asp Thr Lys Glu Asn Val Thr Ala Asn Ile Thr Met Pro Ala
                325                 330                 335

Tyr Ile Asp Pro Glu Asn Val Thr Lys Thr Gly Asn Val Thr Leu Thr
            340                 345                 350

Thr Gly Ile Gly Ser Thr Thr Ala Asn Lys Thr Val Leu Val Asp Tyr
        355                 360                 365

Glu Lys Tyr Gly Lys Phe Tyr Asn Leu Ser Ile Lys Gly Thr Ile Asp
    370                 375                 380

Gln Ile Asp Lys Thr Asn Asn Thr Tyr Arg Gln Thr Ile Tyr Val Asn
385                 390                 395                 400

Pro Ser Gly Asp Asn Val Ile Ala Pro Val Leu Thr Gly Asn Leu Lys
                405                 410                 415

Pro Asn Thr Asp Ser Asn Ala Leu Ile Asp Gln Gln Asn Thr Ser Ile
            420                 425                 430
```

Lys Val Tyr Lys Val Asp Asn Ala Ala Asp Leu Ser Glu Ser Tyr Phe
435 440 445

Val Asn Pro Glu Asn Phe Glu Asp Val Thr Asn Ser Val Asn Ile Thr
450 455 460

Phe Pro Asn Pro Asn Gln Tyr Lys Val Glu Phe Asn Thr Pro Asp Asp
465 470 475 480

Gln Ile Thr Thr Pro Tyr Ile Val Val Asn Gly His Ile Asp Pro
485 490 495

Asn Ser Lys Gly Asp Leu Ala Leu Arg Ser Thr Leu Tyr Gly Tyr Asp
500 505 510

Ser Arg Phe Val Trp Arg Ser Met Ser Trp Asp Asn Glu Val Ala Phe
515 520 525

Asn Asn Gly Ser Gly Ser Gly Asp Gly Ile Asp Lys Pro Val Val Pro
530 535 540

Glu Gln Pro Asp Glu Pro Gly Glu Ile Glu Pro Ile Pro Glu
545 550 555

<210> 85
<211> 1674
<212> DNA
<213> Staphylococcus aureus

<400> 85
atgaatatga agaaaaaaga aaaacacgca attcggaaaa aatcgattgg cgtggcttca 60

gtgcttgtag gtacgttaat cggttttgga ctactcagca gtaaagaagc agatgcaagt 120

gaaaatagtg ttacgcaatc tgatagcgca agtaacgaaa gcaaaagtaa tgattcaagt 180

agcgttagtg ctgcacctaa aacagacgac acaaacgtga gtgatactaa aacatcgtca 240

aacactaata atggcgaaac gagtgtggcg caaaatccag cacaacagga aacgacacaa 300

tcagcattaa caaatgcaac tacggaagaa actccgttaa ctggtgaagc tactacggca 360

acgaatcaag ctaatacacc ggcaacaact caatcaagca atacaaatgc ggaggaatta 420

gtgaatcaaa caagtaatga aacgacttct aatgatacta atacagtatc atctgtaaat 480

tcacctcaaa attctacaaa tgcggaaaat gtttcaacaa cgcaagatac ttcaactgaa 540

gcaacacctt caaacaatga atcagctcca cagagtacag atgcaagtaa taaagatgta 600

gttaatcaag cggttaatac aagtgcgcct agaatgagag catttagttt agcggcagta 660

gctgcagatg caccggcagc tggcacagat attacgaatc agttgacaga tgtgaaagtt 720

actattgact ctggtacgac tgtgtatccg caccaagcag gttatgtcaa actgaattat 780

ggtttttcag tgcctaattc tgctgttaaa ggtgacacat tcaaaataac tgtacctaaa 840

gaattaaact taaatggtgt aacttcaact gctaaagtgc ctccaattat ggccggagat 900

caagtattgg caaatggtgt aatcgatagt gatggtaatg ttatttatac atttacagac 960

tatgttgata ctaaaaatga tgttaaagca acactaactg tgcctgcata cattgatcca 1020

gaaaatgtta caaagacggg taatgtaaca ttgaaaactg gcataggaac caatactgat 1080

agtaagacag ttttaatcga ctatgagaaa tatggacaat tccataattt atcaattaaa 1140

ggtacgattg atcaaatcga taaaacaaat aatacgtatc gtcaaacaat ttatgtcaat 1200

ccaagcggag ataacgttgt gttacctgcc ttaacaggta atttaattcc taatacaaag 1260

agtaatgcgt taatagatgc aaaaaacact gatattaaag tttatagagt agataatgct 1320

aatgatttat ctgaaagtta ttatgtgaat cctagcgatt ttgaagatgt aactaatcaa 1380

gttagaattt catttccaaa tgctaatcaa tacaaagtag aatttcctac ggacgatgat 1440

caaattacaa caccgtatat tgtagttgtt aatggccata ttgatcctgc tagcacaggt 1500

gatttagcac tacgttcgac attttatggt tatgattcta attttatatg gagatctatg 1560

tcatgggaca acgaagtagc atttaataac ggatcaggtt caggtgacgg tatcgataaa 1620

cctgttgttc ctgaacaacc tgatgagcct ggtgaaattg aaccaattcc agag 1674

<210> 86
<211> 558
<212> PRT
<213> Staphylococcus aureus

<400> 86

```
Met Asn Met Lys Lys Lys Glu Lys His Ala Ile Arg Lys Lys Ser Ile
1               5                  10                  15

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

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

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

Thr Thr Gln Ser Ser Asn Thr Asn Ala Glu Glu Leu Val Asn Gln Thr
```

130 135 140

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

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

Thr Ser Thr Glu Ala Thr Pro Ser Asn Asn Glu Ser Ala Pro Gln Ser
180 185 190

Thr Asp Ala Ser Asn Lys Asp Val Val Asn Gln Ala Val Asn Thr Ser
195 200 205

Ala Pro Arg Met Arg Ala Phe Ser Leu Ala Ala Val Ala Ala Asp Ala
210 215 220

Pro Ala Ala Gly Thr Asp Ile Thr Asn Gln Leu Thr Asp Val Lys Val
225 230 235 240

Thr Ile Asp Ser Gly Thr Thr Val Tyr Pro His Gln Ala Gly Tyr Val
245 250 255

Lys Leu Asn Tyr Gly Phe Ser Val Pro Asn Ser Ala Val Lys Gly Asp
260 265 270

Thr Phe Lys Ile Thr Val Pro Lys Glu Leu Asn Leu Asn Gly Val Thr
275 280 285

Ser Thr Ala Lys Val Pro Pro Ile Met Ala Gly Asp Gln Val Leu Ala
290 295 300

Asn Gly Val Ile Asp Ser Asp Gly Asn Val Ile Tyr Thr Phe Thr Asp
305 310 315 320

Tyr Val Asp Thr Lys Asn Asp Val Lys Ala Thr Leu Thr Val Pro Ala
325 330 335

Tyr Ile Asp Pro Glu Asn Val Thr Lys Thr Gly Asn Val Thr Leu Lys
340 345 350

Thr Gly Ile Gly Thr Asn Thr Asp Ser Lys Thr Val Leu Ile Asp Tyr
355 360 365

Glu Lys Tyr Gly Gln Phe His Asn Leu Ser Ile Lys Gly Thr Ile Asp
370 375 380

Gln Ile Asp Lys Thr Asn Asn Thr Tyr Arg Gln Thr Ile Tyr Val Asn
385 390 395 400

Pro Ser Gly Asp Asn Val Val Leu Pro Ala Leu Thr Gly Asn Leu Ile

405 410 415

Pro Asn Thr Lys Ser Asn Ala Leu Ile Asp Ala Lys Asn Thr Asp Ile
420 425 430

Lys Val Tyr Arg Val Asp Asn Ala Asn Asp Leu Ser Glu Ser Tyr Tyr
435 440 445

Val Asn Pro Ser Asp Phe Glu Asp Val Thr Asn Gln Val Arg Ile Ser
450 455 460

Phe Pro Asn Ala Asn Gln Tyr Lys Val Glu Phe Pro Thr Asp Asp Asp
465 470 475 480

Gln Ile Thr Thr Pro Tyr Ile Val Val Val Asn Gly His Ile Asp Pro
485 490 495

Ala Ser Thr Gly Asp Leu Ala Leu Arg Ser Thr Phe Tyr Gly Tyr Asp
500 505 510

Ser Asn Phe Ile Trp Arg Ser Met Ser Trp Asp Asn Glu Val Ala Phe
515 520 525

Asn Asn Gly Ser Gly Ser Gly Asp Gly Ile Asp Lys Pro Val Val Pro
530 535 540

Glu Gln Pro Asp Glu Pro Gly Glu Ile Glu Pro Ile Pro Glu
545 550 555

<210> 87
<211> 1674
<212> DNA
<213> Staphylococcus aureus

<400> 87
atgaatatga agaaaaaaga aaaacacgca attcggaaaa aatcgattgg cgtggcttca 60

gtgcttgtag gtacgttaat cggttttgga ctactcagca gtaaagaagc agatgcaagt 120

gaaaatagtg ttacgcaatc tgatagcgca agtaacgaaa gcaaaagtaa tgattcaagt 180

agcgttaatg ctgcacctaa aacagacaac acaaacgtga gtgatactaa aacaacgtca 240

aacactaata atggcgaaac gagtgtggcg caatatctag cacaacagga aacgacacaa 300

tcagtatcaa caaatgcaac tacggaagaa acaccggtaa ctggtgaagc tactacggca 360

acgaatcaag ctaatacacc ggcaacaact caatcaagca atacaaatgc ggaggaatta 420

gtgaatcaaa caagtaatga aacgacttct aatgatacta atacagtatc atctgtaaat 480

tcacctcaaa attctacaaa tgcggaaaat gtttcaacaa cgcaagatac ttcaactgaa 540

gcaacacctt caaacaatga atcagctcca cagagtacag atgcaagtaa taaagatgta 600

gttaatcaag cggttaatac aagtgcgcct agaatgagag catttagttt agcggctgta 660

gctgcagatg caccggcagc tggcacagat attacgaatc agttgacgaa tgtgacagtt 720

ggtattgact ctggtacgac tgtgtatccg caccaagcag gttatgtcaa actgaattat 780

ggtttttcag tgcctaattc tgctgttaaa ggtgacacat tcaaaataac tgtacctaaa 840

gaattaaact taaatggtgt aacttcaact gctaaagtgc ctccaattat ggctggagat 900

caagtattgg caaatggtgt aatcgataat gatggtaatg ttatttatac atttacagac 960

tatgtaaata ctaaagatga tgttaaagca actttgacta tgcccgctta tattgaccct 1020

gaaaatgtta caaagacagg taatgtgaca ttggctactg gcataggtag tacaacagca 1080

aacaaaacag tattagtaga ttatgaaaaa tatggtaagt tttataactt atctattaaa 1140

ggtacaattg accaaatcga taaaacaaat aatacgtatc gtcagacaat ttatgtcaat 1200

ccaagtggag ataacgttat tgcgccggtt ttaacaggta atttaaaacc aaatacggat 1260

agtaatgcat taatagatca gcaaaataca agtattaaag tatataaagt agataatgca 1320

gctgatttat ctgaaagtta ctttgtgaat ccagaaaact ttgaggatgt cactaatagt 1380

gtgaatatta cattcccaaa tccaaatcaa tataaagtag agtttccaac agacgatgat 1440

caaattacaa caccgtatat tgtagttgtt aatggtcata ttgatccgaa tagcaaaggt 1500

gatttagctt tacgttcaac tttatatggg tataactcga atataatttg gcgctctatg 1560

tcatgggaca acgaagtagc atttaataac ggatcaggtt ctggtgacgg tatcgataaa 1620

cctgttgttc ctgaacaacc tgatgagcct ggtgaaattg aaccaattcc agag 1674

<210> 88
<211> 558
<212> PRT
<213> Staphylococcus aureus

<400> 88

```
Met Asn Met Lys Lys Lys Glu Lys His Ala Ile Arg Lys Lys Ser Ile
1               5                   10                  15

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

Ser Ser Lys Glu Ala Asp Ala Ser Glu Asn Ser Val Thr Gln Ser Asp
        35                  40                  45

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

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

Asn Thr Asn Asn Gly Glu Thr Ser Val Ala Gln Tyr Leu Ala Gln Gln
                85                  90                  95

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

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

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

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

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

Thr Ser Thr Glu Ala Thr Pro Ser Asn Asn Glu Ser Ala Pro Gln Ser
            180                 185                 190

Thr Asp Ala Ser Asn Lys Asp Val Val Asn Gln Ala Val Asn Thr Ser
        195                 200                 205

Ala Pro Arg Met Arg Ala Phe Ser Leu Ala Ala Val Ala Ala Asp Ala
    210                 215                 220

Pro Ala Ala Gly Thr Asp Ile Thr Asn Gln Leu Thr Asn Val Thr Val
225                 230                 235                 240

Gly Ile Asp Ser Gly Thr Thr Val Tyr Pro His Gln Ala Gly Tyr Val
                245                 250                 255

Lys Leu Asn Tyr Gly Phe Ser Val Pro Asn Ser Ala Val Lys Gly Asp
            260                 265                 270

Thr Phe Lys Ile Thr Val Pro Lys Glu Leu Asn Leu Asn Gly Val Thr
        275                 280                 285

Ser Thr Ala Lys Val Pro Pro Ile Met Ala Gly Asp Gln Val Leu Ala
    290                 295                 300

Asn Gly Val Ile Asp Asn Asp Gly Asn Val Ile Tyr Thr Phe Thr Asp
305                 310                 315                 320

Tyr Val Asn Thr Lys Asp Asp Val Lys Ala Thr Leu Thr Met Pro Ala
                325                 330                 335

Tyr Ile Asp Pro Glu Asn Val Thr Lys Thr Gly Asn Val Thr Leu Ala
            340                 345                 350

Thr Gly Ile Gly Ser Thr Thr Ala Asn Lys Thr Val Leu Val Asp Tyr
        355                 360                 365

Glu Lys Tyr Gly Lys Phe Tyr Asn Leu Ser Ile Lys Gly Thr Ile Asp
    370                 375                 380
```

Gln Ile Asp Lys Thr Asn Asn Thr Tyr Arg Gln Thr Ile Tyr Val Asn
385 390 395 400

Pro Ser Gly Asp Asn Val Ile Ala Pro Val Leu Thr Gly Asn Leu Lys
405 410 415

Pro Asn Thr Asp Ser Asn Ala Leu Ile Asp Gln Gln Asn Thr Ser Ile
420 425 430

Lys Val Tyr Lys Val Asp Asn Ala Ala Asp Leu Ser Glu Ser Tyr Phe
435 440 445

Val Asn Pro Glu Asn Phe Glu Asp Val Thr Asn Ser Val Asn Ile Thr
450 455 460

Phe Pro Asn Pro Asn Gln Tyr Lys Val Glu Phe Pro Thr Asp Asp Asp
465 470 475 480

Gln Ile Thr Thr Pro Tyr Ile Val Val Val Asn Gly His Ile Asp Pro
485 490 495

Asn Ser Lys Gly Asp Leu Ala Leu Arg Ser Thr Leu Tyr Gly Tyr Asn
500 505 510

Ser Asn Ile Ile Trp Arg Ser Met Ser Trp Asp Asn Glu Val Ala Phe
515 520 525

Asn Asn Gly Ser Gly Ser Gly Asp Gly Ile Asp Lys Pro Val Val Pro
530 535 540

Glu Gln Pro Asp Glu Pro Gly Glu Ile Glu Pro Ile Pro Glu
545 550 555

<210> 89
<211> 1674
<212> DNA
<213> Staphylococcus aureus

<400> 89
atgaatatga agaaaaaaga aaaacacgca attcggaaaa aatcgattgg cgtggcttca 60

gtgcttgtag gtacgttaat cggttttgga ctactcagca gtaaagaagc agatgcaagt 120

gaaaatagtg ttacgcaatc tgatagcgca agtaacgaaa gcaaaagtaa tgattcaagt 180

agcgttagtg ctgcacctaa aacagacgac acaaacgtga gtgatactaa aacatcgtca 240

aacactaata atggcgaaac gagtgtggcg caaaatccag cacaacagga aacgacacaa 300

tcagcattaa caaatgcaac tacggaagaa actccggtaa ctggtgaagc tactacggca 360

acgaatcaag ctaatacacc ggcaacaact caatcaagca atacaaatgc ggaggaatta 420

gtgaatcaaa caagtaatga aacgacttct aatgatacta atacagtatc atctgtaaat 480

tcacctcaaa attctacaaa tgcggaaaat gtttcaacaa cgcaagatac ttcaactgaa 540

gcaacacctt caaacaatga atcagctcca cagaatacag atgcaagtaa taaagatgta 600

gttaatcaag cggttaatac aagtgcgcct agaaagagag catttagttt agcggctgta 660

gctgcagatg caccggcagc tggcacagat attacgaatc agttgacaga tgtgaaagtt 720

actattgact ctggtacgac tgtgtatccg caccaagcag gttatgtcaa actgaattat 780

ggtttttcag tgcctaattc tgctgttaaa ggtgacacat tcaaaataac tgtacctaaa 840

gaattaaact taaatggtgt aacttcaact gctaaagtgc caccaattat ggctggagat 900

caagtattgg caaatggtgt aatcgatagt gatggtaatg ttatttatac atttacagac 960

tatgttgata ataaagaaaa tgtaacagct aatattacta tgccagctta tattgaccct 1020

gaaaatgtta caaagacagg taatgtgaca ttgacaactg gcataggaac caatactgct 1080

agtaagacag tattaatcga ctatgagaaa tatggacaat tccataattt atcaattaaa 1140

ggtacgattg atcaaatcga taaaacaaat aatacgtatc gccaaacaat ttatgtcaat 1200

ccaagcggag ataacgttgt gttacctgcc ttaacaggta atttaattcc taatacaaag 1260

agtaatgcgt taatagatgc aaaaaacact gatattaaag tttatagagt cgataatgct 1320

aatgatttat ctgaaagtta ttatgtgaat cctagcgatt ttgaagatgt aactaatcaa 1380

gttagaattt catttccaaa tgctaatcaa tacaaagtag aatttcctac ggacgatgac 1440

caaattacaa caccgtatat tgtagttgtt aatggccata ttgatcctgc tagtacaggt 1500

gatttagcac tacgttcgac attttatggt tatgattcta attttatatg gagatctatg 1560

tcatgggaca acgaagtagc atttaataac ggatcaggtt ctggtgacgg tatcgataaa 1620

ccagttgttc ctgaacaacc tgatgagcct ggtgaaattg aaccaattcc agag 1674

<210> 90
<211> 558
<212> PRT
<213> Staphylococcus aureus

<400> 90

```
Met Asn Met Lys Lys Lys Glu Lys His Ala Ile Arg Lys Lys Ser Ile
1               5                  10                  15

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

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

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

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

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

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

Thr Ser Thr Glu Ala Thr Pro Ser Asn Asn Glu Ser Ala Pro Gln Asn
            180                 185                 190

Thr Asp Ala Ser Asn Lys Asp Val Val Asn Gln Ala Val Asn Thr Ser
        195                 200                 205

Ala Pro Arg Lys Arg Ala Phe Ser Leu Ala Ala Val Ala Ala Asp Ala
    210                 215                 220

Pro Ala Ala Gly Thr Asp Ile Thr Asn Gln Leu Thr Asp Val Lys Val
225                 230                 235                 240

Thr Ile Asp Ser Gly Thr Thr Val Tyr Pro His Gln Ala Gly Tyr Val
                245                 250                 255

Lys Leu Asn Tyr Gly Phe Ser Val Pro Asn Ser Ala Val Lys Gly Asp
            260                 265                 270

Thr Phe Lys Ile Thr Val Pro Lys Glu Leu Asn Leu Asn Gly Val Thr
        275                 280                 285

Ser Thr Ala Lys Val Pro Pro Ile Met Ala Gly Asp Gln Val Leu Ala
    290                 295                 300

Asn Gly Val Ile Asp Ser Asp Gly Asn Val Ile Tyr Thr Phe Thr Asp
305                 310                 315                 320

Tyr Val Asp Asn Lys Glu Asn Val Thr Ala Asn Ile Thr Met Pro Ala
                325                 330                 335

Tyr Ile Asp Pro Glu Asn Val Thr Lys Thr Gly Asn Val Thr Leu Thr
            340                 345                 350

Thr Gly Ile Gly Thr Asn Thr Ala Ser Lys Thr Val Leu Ile Asp Tyr
        355                 360                 365
```

```
Glu Lys Tyr Gly Gln Phe His Asn Leu Ser Ile Lys Gly Thr Ile Asp
    370                 375                 380

Gln Ile Asp Lys Thr Asn Asn Thr Tyr Arg Gln Thr Ile Tyr Val Asn
385                 390                 395                 400

Pro Ser Gly Asp Asn Val Val Leu Pro Ala Leu Thr Gly Asn Leu Ile
                405                 410                 415

Pro Asn Thr Lys Ser Asn Ala Leu Ile Asp Ala Lys Asn Thr Asp Ile
            420                 425                 430

Lys Val Tyr Arg Val Asp Asn Ala Asn Asp Leu Ser Glu Ser Tyr Tyr
        435                 440                 445

Val Asn Pro Ser Asp Phe Glu Asp Val Thr Asn Gln Val Arg Ile Ser
    450                 455                 460

Phe Pro Asn Ala Asn Gln Tyr Lys Val Glu Phe Pro Thr Asp Asp Asp
465                 470                 475                 480

Gln Ile Thr Thr Pro Tyr Ile Val Val Val Asn Gly His Ile Asp Pro
                485                 490                 495

Ala Ser Thr Gly Asp Leu Ala Leu Arg Ser Thr Phe Tyr Gly Tyr Asp
            500                 505                 510

Ser Asn Phe Ile Trp Arg Ser Met Ser Trp Asp Asn Glu Val Ala Phe
        515                 520                 525

Asn Asn Gly Ser Gly Ser Gly Asp Gly Ile Asp Lys Pro Val Val Pro
    530                 535                 540

Glu Gln Pro Asp Glu Pro Gly Glu Ile Glu Pro Ile Pro Glu
545                 550                 555
```

<210> 91
<211> 1674
<212> DNA
<213> Staphylococcus aureus

<400> 91

```
atgaatatga agaaaaaaga aaaacacgca attcggaaaa aatcgattgg cgtggcttca     60

gtgcttgtag gtacgttaat cggttttgga ctactcagca gtaaagaagc agatgcaagt    120

gaaaatagtg ttacgcaatc tgatagcgca agtaacgaaa gcaaaagtaa tgattcaagt    180

agcgttagtg ctgcacctaa aacagacgac acaaacgtga gtgatactaa aacatcgtca    240

aacactaata atggcgaaac gagtgtggcg caaaatccag cacaacagga aacgacacaa    300

tcatcattaa caaatgcaac tacggaagaa actccggtaa ctggtgaagc tactacggca    360

acgaatcaag ctaatacacc ggcaacaact caatcaagca atacaaatgc ggaggaatta    420
```

gtgaatcaaa caagtaatga aacgacttct aatgatacta atacagtatc atctgtaaat 480

tcacctcaaa attctacaaa tgcggaaaat gtttcaacaa cgcaagatac ttcaactgaa 540

gcaacacctt caaacaatga atcagctcca cagagtacag atgcaagtaa taaagattta 600

gttaatcaag cggttaatac aagtgcgcct agaatgagag catttagttt agcggcagta 660

gctgcagatg cacctgcagc tggcacagat attacgaatc agttgacaga tgttaaagtt 720

actattgact ctggtacgac tgtgtatccg caccaagcag gttatgtcaa actgaattat 780

ggtttttcag tgcctaattc tgctgttaaa ggtgacacat tcaaaataac tgtacctaaa 840

gaattaaact taaatggtgt aacttcaact gctaaagtgc caccaattat ggctggagat 900

caagtattgg caaatggtgt aatcgatagt gatggtaatg ttatttatac atttacagac 960

tatgttgata ataaaaacga tgttaaagca actttgacca tgcccgctta tattgatcca 1020

gaaaatgtaa cgaaaacagg taatgtaaca ttgacaactg gcataggtag tacaacagca 1080

aacaaaacag tattagtaga ttatgaaaaa tatggtaagt tttataactt atctattaaa 1140

ggtacaattg accaaatcga taaaacaaat aatacgtatc gtcagacaat ttatgtcaat 1200

ccaagtggag ataacgttat tgcgccggtt ttaacaggta atttaaaacc aaatacggat 1260

agtaatgcat taatagatca gcaaaataca agtattaaag tatataaagt agataatgca 1320

gctgatttat ctgaaagtta ctttgtaaat ccagaaaact ttgaggatgt cactaatagt 1380

gtgaatatta cattcccaaa tccaaatcaa tataaagtag agtttaatac gcctgatgat 1440

caaattacaa caccgtatat tgtagttgtt aatggtcata ttgatccgaa tagcaaaggt 1500

gatttagctt tacgttcaac tttatatggg tataactcga atataatttg gcgctctatg 1560

tcatgggaca acgaagtagc atttaataac ggatcaggtt ctggtgacgg tatcgataaa 1620

cctgttgtcc ctgaacaacc tgatgagcct ggtgaaattg aaccaattcc agag 1674

<210> 92
<211> 558
<212> PRT
<213> Staphylococcus aureus

<400> 92

```
Met Asn Met Lys Lys Lys Glu Lys His Ala Ile Arg Lys Lys Ser Ile
1               5                  10                  15

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

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

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

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

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

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

Thr Ser Thr Glu Ala Thr Pro Ser Asn Asn Glu Ser Ala Pro Gln Ser
            180                 185                 190

Thr Asp Ala Ser Asn Lys Asp Leu Val Asn Gln Ala Val Asn Thr Ser
        195                 200                 205

Ala Pro Arg Met Arg Ala Phe Ser Leu Ala Ala Val Ala Ala Asp Ala
    210                 215                 220

Pro Ala Ala Gly Thr Asp Ile Thr Asn Gln Leu Thr Asp Val Lys Val
225                 230                 235                 240

Thr Ile Asp Ser Gly Thr Thr Val Tyr Pro His Gln Ala Gly Tyr Val
                245                 250                 255

Lys Leu Asn Tyr Gly Phe Ser Val Pro Asn Ser Ala Val Lys Gly Asp
            260                 265                 270

Thr Phe Lys Ile Thr Val Pro Lys Glu Leu Asn Leu Asn Gly Val Thr
        275                 280                 285

Ser Thr Ala Lys Val Pro Pro Ile Met Ala Gly Asp Gln Val Leu Ala
    290                 295                 300

Asn Gly Val Ile Asp Ser Asp Gly Asn Val Ile Tyr Thr Phe Thr Asp
305                 310                 315                 320

Tyr Val Asp Asn Lys Asn Asp Val Lys Ala Thr Leu Thr Met Pro Ala
                325                 330                 335

Tyr Ile Asp Pro Glu Asn Val Thr Lys Thr Gly Asn Val Thr Leu Thr
            340                 345                 350
```

Thr Gly Ile Gly Ser Thr Thr Ala Asn Lys Thr Val Leu Val Asp Tyr
355 360 365

Glu Lys Tyr Gly Lys Phe Tyr Asn Leu Ser Ile Lys Gly Thr Ile Asp
370 375 380

Gln Ile Asp Lys Thr Asn Asn Thr Tyr Arg Gln Thr Ile Tyr Val Asn
385 390 395 400

Pro Ser Gly Asp Asn Val Ile Ala Pro Val Leu Thr Gly Asn Leu Lys
405 410 415

Pro Asn Thr Asp Ser Asn Ala Leu Ile Asp Gln Gln Asn Thr Ser Ile
420 425 430

Lys Val Tyr Lys Val Asp Asn Ala Ala Asp Leu Ser Glu Ser Tyr Phe
435 440 445

Val Asn Pro Glu Asn Phe Glu Asp Val Thr Asn Ser Val Asn Ile Thr
450 455 460

Phe Pro Asn Pro Asn Gln Tyr Lys Val Glu Phe Asn Thr Pro Asp Asp
465 470 475 480

Gln Ile Thr Thr Pro Tyr Ile Val Val Val Asn Gly His Ile Asp Pro
485 490 495

Asn Ser Lys Gly Asp Leu Ala Leu Arg Ser Thr Leu Tyr Gly Tyr Asn
500 505 510

Ser Asn Ile Ile Trp Arg Ser Met Ser Trp Asp Asn Glu Val Ala Phe
515 520 525

Asn Asn Gly Ser Gly Ser Gly Asp Gly Ile Asp Lys Pro Val Val Pro
530 535 540

Glu Gln Pro Asp Glu Pro Gly Glu Ile Glu Pro Ile Pro Glu
545 550 555

<210> 93
<211> 1674
<212> DNA
<213> Staphylococcus aureus

<400> 93
atgaatatga agaaaaaaga aaaacacgca attcggaaaa aatcgattgg cgtggcttca 60

gtgcttgtag gtacgttaat cggttttgga ctactcagca gtaaagaagc agatgcaagt 120

gaaaatagtg ttacgcaatc tgatagcgca agtaacgaaa gcaaaagtaa tgatccaagt 180

agcgttaatg ctgcacctaa aacagacaac acaaacgtga gtgatactaa aacatcgtca 240

aacactaata atggcgaaac gagtgtggcg caaaatccag cacaacagga aacgacacaa 300

tcatcattaa caaatgcaac tacggaagaa actccggtaa ctggtgaagc tactacggca 360

acgaatcaag ctaatacacc ggcaacaact caatcaagca atacaaatgc ggaggaatta 420

gtgaatcaaa caagtaatga aacgacttct aatgatacta atacagtatc atctgtaaat 480

tcacctcaaa attctacaaa tgcggaaaat gtttcaacaa cgcaagatac ttcaactgaa 540

gcaacacctt caaacaatga atcagctcca cagagtacag atgcaagtaa taaagattta 600

gttaatcaag cggttaatac aagtgcgcct agaatgagag catttagttt agcggcagta 660

gctgcagatg cacctgcagc tggcacagat attacgaatc agttgacaga tgttaaagtt 720

actattgact ctggtacgac tgtgtatccg caccaagcag gttatgtcaa actgaattat 780

ggtttttcag tgcctaattc tgctgttaaa ggtgacacat tcaaaataac tgtacctaaa 840

gaattaaact taaatggtgt aacttcaact gctaaagtgc ctccaattat ggccggagat 900

caagtattgg caaatggtgt aatcgatagt gatggtaatg ttatttatac atttacagac 960

tatgttgata ctaaagaaaa tgtaacagct aatattacta tgccagctta tattgaccct 1020

gaaaatgtta caaagacagg taatgtaaca ttgacaactg gcataggtag tacaacagca 1080

aacaaaacag tattagtaga ttatgaaaaa tatggtaagt tttataactt atctattaaa 1140

ggtacaattg accaaatcga taaaacaaat aatacgtatc gtcagacaat ttatgtcaat 1200

ccaagtggag ataacgttat tgcgccggtt ttaacaggta atttaaaacc caatacggat 1260

agtaatgcat taatagatca gcaaaataca agtattaaag tatataaagt agataatgca 1320

gctgatttat ctgaaagtta ctttgtaaat ccagaaaact ttgaggatgt cactaatagt 1380

gtgaatatta cattcccaaa tccaaatcaa tataaagtag agtttaatac gcctgatgat 1440

caaattacaa caccgtatat tgtagttgtt aatggtcata ttgatccgaa tagcaaaggt 1500

gatttagctt tacgttcaac tttatatggg tataactcga atataatttg gcgctctatg 1560

tcatgggaca acgaagtagc atttaataac ggatcaggtt ctggtgacgg tatcgataaa 1620

cctgttgtcc ctgaacaacc tgatgagcct ggtgaaattg aaccaattcc agag 1674

<210> 94
<211> 558
<212> PRT
<213> Staphylococcus aureus

<400> 94

Met Asn Met Lys Lys Lys Glu Lys His Ala Ile Arg Lys Lys Ser Ile
1 5 10 15

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

Ser Ser Lys Glu Ala Asp Ala Ser Glu Asn Ser Val Thr Gln Ser Asp
35 40 45

Ser Ala Ser Asn Glu Ser Lys Ser Asn Asp Pro Ser Ser Val Asn Ala

```
    50                  55                  60

Ala Pro Lys Thr Asp Asn 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 Leu Thr Asn Ala Thr Thr Glu Glu Thr Pro
            100                 105                 110

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

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

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

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

Thr Ser Thr Glu Ala Thr Pro Ser Asn Asn Glu Ser Ala Pro Gln Ser
            180                 185                 190

Thr Asp Ala Ser Asn Lys Asp Leu Val Asn Gln Ala Val Asn Thr Ser
        195                 200                 205

Ala Pro Arg Met Arg Ala Phe Ser Leu Ala Ala Val Ala Ala Asp Ala
    210                 215                 220

Pro Ala Ala Gly Thr Asp Ile Thr Asn Gln Leu Thr Asp Val Lys Val
225                 230                 235                 240

Thr Ile Asp Ser Gly Thr Thr Val Tyr Pro His Gln Ala Gly Tyr Val
                245                 250                 255

Lys Leu Asn Tyr Gly Phe Ser Val Pro Asn Ser Ala Val Lys Gly Asp
            260                 265                 270

Thr Phe Lys Ile Thr Val Pro Lys Glu Leu Asn Leu Asn Gly Val Thr
        275                 280                 285

Ser Thr Ala Lys Val Pro Pro Ile Met Ala Gly Asp Gln Val Leu Ala
    290                 295                 300

Asn Gly Val Ile Asp Ser Asp Gly Asn Val Ile Tyr Thr Phe Thr Asp
305                 310                 315                 320

Tyr Val Asp Thr Lys Glu Asn Val Thr Ala Asn Ile Thr Met Pro Ala
```

325 330 335

Tyr Ile Asp Pro Glu Asn Val Thr Lys Thr Gly Asn Val Thr Leu Thr
340 345 350

Thr Gly Ile Gly Ser Thr Thr Ala Asn Lys Thr Val Leu Val Asp Tyr
355 360 365

Glu Lys Tyr Gly Lys Phe Tyr Asn Leu Ser Ile Lys Gly Thr Ile Asp
370 375 380

Gln Ile Asp Lys Thr Asn Asn Thr Tyr Arg Gln Thr Ile Tyr Val Asn
385 390 395 400

Pro Ser Gly Asp Asn Val Ile Ala Pro Val Leu Thr Gly Asn Leu Lys
405 410 415

Pro Asn Thr Asp Ser Asn Ala Leu Ile Asp Gln Gln Asn Thr Ser Ile
420 425 430

Lys Val Tyr Lys Val Asp Asn Ala Ala Asp Leu Ser Glu Ser Tyr Phe
435 440 445

Val Asn Pro Glu Asn Phe Glu Asp Val Thr Asn Ser Val Asn Ile Thr
450 455 460

Phe Pro Asn Pro Asn Gln Tyr Lys Val Glu Phe Asn Thr Pro Asp Asp
465 470 475 480

Gln Ile Thr Thr Pro Tyr Ile Val Val Val Asn Gly His Ile Asp Pro
485 490 495

Asn Ser Lys Gly Asp Leu Ala Leu Arg Ser Thr Leu Tyr Gly Tyr Asn
500 505 510

Ser Asn Ile Ile Trp Arg Ser Met Ser Trp Asp Asn Glu Val Ala Phe
515 520 525

Asn Asn Gly Ser Gly Ser Gly Asp Gly Ile Asp Lys Pro Val Val Pro
530 535 540

Glu Gln Pro Asp Glu Pro Gly Glu Ile Glu Pro Ile Pro Glu
545 550 555

<210> 95
<211> 1677
<212> DNA
<213> Staphylococcus aureus

<400> 95
atgaatatga agaaaaaaga aaaacacgca attcggaaaa aatcgattgg cgtggcttca 60

gtgcttgtag gtacgttaat cggttttgga ctactcagca gtaaagaagc agatgcaagt 120

gaaaatagtg ttacgcaatc tgatagcgca agtaacgaaa gcaaaagtaa tgattcaagt 180
agcgttagtg ctgcacctaa aacagacgac acaaacgtga gtgatactaa aacatcgtca 240
aacactaata atggcgaaac gagtgtggcg caaaatctag cacaacagga aacgacacaa 300
tcatcatcaa caaatgcaac tacggaagaa acgccggtaa ctggtgaagc tactactacg 360
acaacgaatc aagctaatac accggcaaca actcaatcaa gcaatacaaa tgcggaggaa 420
ttagtgaatc aaacaagtaa tgaaacgact tctaatgata ctaatacagt atcatctgta 480
aattcacctc aaaattctac aaatgcggaa aatgtttcaa caacgcaaga tacttcaact 540
gaagcaacac cttcaaacaa tgaatcagct ccacagagta cagatgcaag taataaagat 600
gtagttaatc aagcggttaa tacaagtgcg cctagaatga gagcatttag tttagcggca 660
gtagctgcag atgcaccggc agctggcaca gatattacga atcagttgac gaatgtgaca 720
gttggtattg actctggtac gactgtgtat ccgcaccaag caggttatgt caaactgaat 780
tatggttttt cagtgcctaa ttctgctgtt aaaggtgaca cattcaaaat aactgtacct 840
aaagaattaa acttaaatgg tgtaacttca actgctaaag tgccaccaat tatggctgga 900
gatcaagtat tggcaaatgg tgtaatcgat agtgatggta atgttattta tacatttaca 960
gactatgtaa atactaaaga tgatgttaaa gcaactttga ccatgcccgc ttatattgac 1020
cctgaaaatg ttacaaagac aggtaatgtg acattggcta ctggcatagg aaatacaaca 1080
gcaaacaaaa cagtattagt agattatgaa aaatatggta agttttataa cttatctatt 1140
aaaggtacaa ttgaccaaat cgataaaaca aataatacgt atcgtcagac aatttatgtc 1200
aatccaagtg gagataacgt tattgcgccg gttttaacag gtaatttaaa accaaatacg 1260
gatagtaatg cattaataga tcagcaaaat acaagtatta aagtatataa agtagataat 1320
gcagctgatt tatctgaaag ttactttgtg aatccagaaa actttgagga tgtcactaat 1380
agtgtgaata ttacattccc aaatccaaat caatataaag tagagtttaa tacgcctgat 1440
gatcaaatta caacaccgta tatagtagtt gttaatggtc atattgatcc gaatagcaaa 1500
ggtgatttag ctttacgttc aactttatat gggtataact cgaatataat ttggcgctct 1560
atgtcatggg acaacgaagt agcatttaat aacggatcag gttctggtga cggtatcgat 1620
aaacctgttg ttcctgaaca acctgatgag cctggtgaaa ttgaaccaat tccagag 1677

<210> 96
<211> 559
<212> PRT
<213> Staphylococcus aureus

<400> 96
Met Asn Met Lys Lys Lys Glu Lys His Ala Ile Arg Lys Lys Ser Ile
1 5 10 15

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

```
Ser Ser Lys Glu Ala Asp Ala Ser Glu Asn Ser Val Thr Gln Ser Asp
        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 Leu 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

Asp Thr Ser Thr Glu Ala Thr Pro Ser Asn Asn Glu Ser Ala Pro Gln
            180                 185                 190

Ser Thr Asp Ala Ser Asn Lys Asp Val Val Asn Gln Ala Val Asn Thr
        195                 200                 205

Ser Ala 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 Asn Val Thr
225                 230                 235                 240

Val Gly 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 Asn Thr Lys Asp Asp Val Lys Ala Thr Leu 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

Ala Thr Gly Ile Gly Asn Thr Thr Ala Asn Lys Thr Val Leu Val Asp
        355                 360                 365

Tyr Glu Lys Tyr Gly Lys Phe Tyr 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 Ile Ala Pro Val Leu Thr Gly Asn Leu
                405                 410                 415

Lys Pro Asn Thr Asp Ser Asn Ala Leu Ile Asp Gln Gln Asn Thr Ser
            420                 425                 430

Ile Lys Val Tyr Lys Val Asp Asn Ala Ala Asp Leu Ser Glu Ser Tyr
        435                 440                 445

Phe Val Asn Pro Glu Asn Phe Glu Asp Val Thr Asn Ser Val Asn Ile
    450                 455                 460

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

Asn Ser Asn Ile 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
545                 550                 555

<210> 97
<211> 1674
<212> DNA
<213> Staphylococcus aureus
```

<400> 97
atgaatatga agaaaaaaga aaaacacgca attcggaaaa aatcgattgg cgtggcttca 60

gtgcttgtag gtacgttaat cggttttgga ctactcagca gtaaagaagc agatgcaagt 120

gaaaatagtg ttacgcaatc tgatagcgca agtaacgaaa gcaaaagtaa tgattcaagt 180

agcgttagtg ctgcacctaa aacagacgac acaaacgtga gtgatactaa aacatcgtca 240

aacactaata atggcgaaac gagtgtggcg caaaatccag cacaacagga aacgacacaa 300

tcagcattaa caaatgcaac tacggaagaa actccgttaa ctggtgaagc tactacggca 360

acgaatcaag ctaatacacc ggcaacaact caatcaagca atacaaatgc ggaggaatta 420

gtgaatcaaa caagtaatga aacgacttct aatgatacta atacagtatc atctgtaaat 480

tcacctcaaa attctacaaa tgcggaaaat gtttcaacaa cgcaagatac ttcaactgaa 540

gcaacacctt caaacaatga atcagctcca cagagtacag atgcaagtaa taaagatgta 600

gttaatcaag cggttaatac aagtgcgcct agaatgagag catttagttt agcggcagta 660

gctgcagatg caccggcagc tggcacagat attacgaatc agttgacaga tgtgaaagtt 720

actattgact ctggtacgac tgtgtatccg caccaagcag gttatgtcaa actgaattat 780

ggtttttcag tgcctaattc tgctgttaaa ggtgacacat tcaaaataac tgtacctaaa 840

gaattaaact taaatggtgt aacttcaact gctaaagtgc ctccaattat ggccggagat 900

caagtattgg caaatggtgt aatcgatagt gatggtaatg ttatttatac atttacagac 960

tatgttgata ataaaaacga tgttaaagca acactaactg ttcctgcata cattgatcca 1020

gaaaatgtaa cgaaaacagg taatgtaaca ttgacaactg gcataggaac caatactgct 1080

agtaagacag ttttaatcga ctatgagaaa tatggacaat tccataattt atcaattaaa 1140

ggtacaattg atcaaatcga caaaacaaac aatacgtatc gtcaaacgat ttatgtcaat 1200

ccaagtggag acaatgttgt attaccagtg ttaactggta atctaattcc taagagtaat 1260

agtaatgctt taatagatgc caacaatact aatattaaag tttataaagt ggataatgct 1320

aatgatttat ctgaaagtta ttatgtgaat cctagcgatt ttgaagatgt aactaatcaa 1380

gttagaattt catttccaaa tgctaatcaa tacaaagtag aatttcctac ggacgatgac 1440

caaattacaa caccgtatat tgtagttgtt aatggccata ttgatcctgc tagtacaggt 1500

gatttagcac tacgttcgac attttatggt tatgattcta attttatatg gagatctatg 1560

tcatgggaca acgaagtagc atttaataac ggatcaggtt ctggtgacgg tatcgataaa 1620

ccagttgttc ctgaacaacc tgatgagcct ggtgaaattg aaccaattcc agag 1674

<210> 98
<211> 558
<212> PRT
<213> Staphylococcus aureus

<400> 98
Met Asn Met Lys Lys Lys Glu Lys His Ala Ile Arg Lys Lys Ser Ile
1 5 10 15

```
Gly Val Ala Ser Val Leu Val Gly Thr Leu Ile Gly Phe Gly Leu Leu
            20                  25                  30

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

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

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

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

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

Thr Ser Thr Glu Ala Thr Pro Ser Asn Asn Glu Ser Ala Pro Gln Ser
            180                 185                 190

Thr Asp Ala Ser Asn Lys Asp Val Val Asn Gln Ala Val Asn Thr Ser
        195                 200                 205

Ala Pro Arg Met Arg Ala Phe Ser Leu Ala Ala Val Ala Ala Asp Ala
    210                 215                 220

Pro Ala Ala Gly Thr Asp Ile Thr Asn Gln Leu Thr Asp Val Lys Val
225                 230                 235                 240

Thr Ile Asp Ser Gly Thr Thr Val Tyr Pro His Gln Ala Gly Tyr Val
                245                 250                 255

Lys Leu Asn Tyr Gly Phe Ser Val Pro Asn Ser Ala Val Lys Gly Asp
            260                 265                 270

Thr Phe Lys Ile Thr Val Pro Lys Glu Leu Asn Leu Asn Gly Val Thr
        275                 280                 285
```

```
Ser Thr Ala Lys Val Pro Pro Ile Met Ala Gly Asp Gln Val Leu Ala
    290                 295                 300

Asn Gly Val Ile Asp Ser Asp Gly Asn Val Ile Tyr Thr Phe Thr Asp
305                 310                 315                 320

Tyr Val Asp Asn Lys Asn Asp Val Lys Ala Thr Leu Thr Val Pro Ala
                325                 330                 335

Tyr Ile Asp Pro Glu Asn Val Thr Lys Thr Gly Asn Val Thr Leu Thr
            340                 345                 350

Thr Gly Ile Gly Thr Asn Thr Ala Ser Lys Thr Val Leu Ile Asp Tyr
        355                 360                 365

Glu Lys Tyr Gly Gln Phe His Asn Leu Ser Ile Lys Gly Thr Ile Asp
    370                 375                 380

Gln Ile Asp Lys Thr Asn Asn Thr Tyr Arg Gln Thr Ile Tyr Val Asn
385                 390                 395                 400

Pro Ser Gly Asp Asn Val Val Leu Pro Val Leu Thr Gly Asn Leu Ile
                405                 410                 415

Pro Lys Ser Asn Ser Asn Ala Leu Ile Asp Ala Asn Asn Thr Asn Ile
            420                 425                 430

Lys Val Tyr Lys Val Asp Asn Ala Asn Asp Leu Ser Glu Ser Tyr Tyr
        435                 440                 445

Val Asn Pro Ser Asp Phe Glu Asp Val Thr Asn Gln Val Arg Ile Ser
    450                 455                 460

Phe Pro Asn Ala Asn Gln Tyr Lys Val Glu Phe Pro Thr Asp Asp Asp
465                 470                 475                 480

Gln Ile Thr Thr Pro Tyr Ile Val Val Val Asn Gly His Ile Asp Pro
                485                 490                 495

Ala Ser Thr Gly Asp Leu Ala Leu Arg Ser Thr Phe Tyr Gly Tyr Asp
            500                 505                 510

Ser Asn Phe Ile Trp Arg Ser Met Ser Trp Asp Asn Glu Val Ala Phe
        515                 520                 525

Asn Asn Gly Ser Gly Ser Gly Asp Gly Ile Asp Lys Pro Val Val Pro
    530                 535                 540

Glu Gln Pro Asp Glu Pro Gly Glu Ile Glu Pro Ile Pro Glu
545                 550                 555
```

<210> 99
<211> 1674
<212> DNA
<213> Staphylococcus aureus

<400> 99
atgaatatga agaaaaaaga aaaacacgca attcggaaaa aatcgattgg cgtggcttca 60

gtgcttgtag gtacgttaat cggttttgga ctactcagca gtaaagaagc agatgcaagt 120

gaaaatagtg ttacgcaatc tgatagcgca agtaacgaaa gcaaaagtaa tgattcaagt 180

agcgttagtg ctgcacctaa aacagacgac acaaacgtga gtgatactaa aacatcgtca 240

aacactaata atggcgaaac gagtgtggcg caaaatccag cacaacaaga aacgacacaa 300

tcagcattaa caaatgcaac tacggaagaa actccggtaa ctggtgaagc tactacggca 360

acgaatcaag ctaatacacc ggcaacaact caatcaagca atacaaatgc ggaggaatta 420

gtgaatcaaa caagtaatga aacgacttct aatgatacta atacagtatc atctgtaaat 480

tcacctcaaa attctacaaa tgcggaaaat gtttcaacaa cgcaagatac ttcaactgaa 540

gcaacacctt caaacaatga atcagctcca cagaatacag atgcaagtaa taaagatgta 600

gttaatcaag cggttaatac aagtgcgcct agaaagagag catttagttt agcggctgta 660

gctgcagatg caccggcagc tggcacagat attacgaatc agttgacaga tgtgaaagtt 720

actattgact ctggtacgac tgtgtatccg caccaagcag gttatgtcaa actgaattat 780

ggtttttcag tgcctaattc tgctgttaaa ggtgacacat tcaaaataac tgtacctaaa 840

gaattaaact taaatggtgt aacttcaact gctaaagcgc caccaattat ggctggagat 900

caagtattgg caaatggtgt aatcgatagt gatggtaatg ttatttatac atttacagac 960

tatgttgata ataaagaaaa tgtaacagct aatattacta tgccagctta tattgaccct 1020

gaaaatgtta caaagacagg taatgtgaca ttgacaactg gcataggaac caatactgct 1080

agtaagacag tattaatcga ctatgagaaa tatggacaat tccataattt atcaattaaa 1140

ggtacgattg atcaaatcga taaaacaaat aatacgtatc gccaaacaat ttatgtcaat 1200

ccaagcggag ataacgttgt gttacctgcc ttaacaggta atttaattcc taatacaaag 1260

agtaatgcgt taatagatgc aaaaaacact gatattaaag tttatagagt cgataatgct 1320

aatgatttat ctgaaagtta ttatgtgaat cctagcgatt ttgaagatgt aactaatcaa 1380

gttagaattt catttccaaa tgctaatcaa tacaaagtag aatttcctac ggacgatgac 1440

caaattacaa caccgtatat tgtagttgtt aatggccata ttgatcctgc tagtacaggt 1500

gatttagcac tacgttcgac attttatggt tatgattcta attttatatg gagatctatg 1560

tcatgggaca acgaagtagc atttaataac ggatcaggtt ctggtgacgg tatcgataaa 1620

ccagttgttc ctgaacaacc tgatgagcct ggtgaaattg aaccaattcc agag 1674

<210> 100
<211> 558
<212> PRT
<213> Staphylococcus aureus

<400> 100

```
Met Asn Met Lys Lys Lys Glu Lys His Ala Ile Arg Lys Lys Ser Ile
1               5                  10                  15

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

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

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

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

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

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

Thr Ser Thr Glu Ala Thr Pro Ser Asn Asn Glu Ser Ala Pro Gln Asn
            180                 185                 190

Thr Asp Ala Ser Asn Lys Asp Val Val Asn Gln Ala Val Asn Thr Ser
        195                 200                 205

Ala Pro Arg Lys Arg Ala Phe Ser Leu Ala Ala Val Ala Ala Asp Ala
    210                 215                 220

Pro Ala Ala Gly Thr Asp Ile Thr Asn Gln Leu Thr Asp Val Lys Val
225                 230                 235                 240

Thr Ile Asp Ser Gly Thr Thr Val Tyr Pro His Gln Ala Gly Tyr Val
                245                 250                 255

Lys Leu Asn Tyr Gly Phe Ser Val Pro Asn Ser Ala Val Lys Gly Asp
            260                 265                 270
```

```
Thr Phe Lys Ile Thr Val Pro Lys Glu Leu Asn Leu Asn Gly Val Thr
        275                 280                 285

Ser Thr Ala Lys Ala Pro Pro Ile Met Ala Gly Asp Gln Val Leu Ala
    290                 295                 300

Asn Gly Val Ile Asp Ser Asp Gly Asn Val Ile Tyr Thr Phe Thr Asp
305                 310                 315                 320

Tyr Val Asp Asn Lys Glu Asn Val Thr Ala Asn Ile Thr Met Pro Ala
                325                 330                 335

Tyr Ile Asp Pro Glu Asn Val Thr Lys Thr Gly Asn Val Thr Leu Thr
            340                 345                 350

Thr Gly Ile Gly Thr Asn Thr Ala Ser Lys Thr Val Leu Ile Asp Tyr
        355                 360                 365

Glu Lys Tyr Gly Gln Phe His Asn Leu Ser Ile Lys Gly Thr Ile Asp
    370                 375                 380

Gln Ile Asp Lys Thr Asn Asn Thr Tyr Arg Gln Thr Ile Tyr Val Asn
385                 390                 395                 400

Pro Ser Gly Asp Asn Val Val Leu Pro Ala Leu Thr Gly Asn Leu Ile
                405                 410                 415

Pro Asn Thr Lys Ser Asn Ala Leu Ile Asp Ala Lys Asn Thr Asp Ile
            420                 425                 430

Lys Val Tyr Arg Val Asp Asn Ala Asn Asp Leu Ser Glu Ser Tyr Tyr
        435                 440                 445

Val Asn Pro Ser Asp Phe Glu Asp Val Thr Asn Gln Val Arg Ile Ser
    450                 455                 460

Phe Pro Asn Ala Asn Gln Tyr Lys Val Glu Phe Pro Thr Asp Asp Asp
465                 470                 475                 480

Gln Ile Thr Thr Pro Tyr Ile Val Val Val Asn Gly His Ile Asp Pro
                485                 490                 495

Ala Ser Thr Gly Asp Leu Ala Leu Arg Ser Thr Phe Tyr Gly Tyr Asp
            500                 505                 510

Ser Asn Phe Ile Trp Arg Ser Met Ser Trp Asp Asn Glu Val Ala Phe
        515                 520                 525

Asn Asn Gly Ser Gly Ser Gly Asp Gly Ile Asp Lys Pro Val Val Pro
    530                 535                 540
```

Glu Gln Pro Asp Glu Pro Gly Glu Ile Glu Pro Ile Pro Glu
545 550 555

<210> 101
<211> 1677
<212> DNA
<213> Staphylococcus aureus

<400> 101
atgaatatga agaaaaaaga aaaacacgca attcggaaaa aatcgattgg cgtggcttca 60

gtgcttgtag gtacgttaat cggttttgga ctactcagca gtaaagaagc agatgcaagt 120

gaaaatagtg ttacgcaatc tgatagcgca agtaacgaaa gcaaaagtaa tgattcaagt 180

agcgttagtg ctgcacctaa aacagacgac acaaacgtga gtgatactaa aacatcgtca 240

aacactaata atggcgaaac gagtgtggcg caaaatccag cacaacagga aacgacacaa 300

tcatcatcaa caaatgcaac tacggaagaa acgccggtaa ctggtgaagc tactactacg 360

acaacgaatc aagctaatac accggcaaca actcaatcaa gcaatacaaa tgcggaggaa 420

ttagtgaatc aaacaagtaa tgaaacgact tctaatgata ctaatacagt atcatctgta 480

aattcacctc aaaattctac aaatgcggaa aatgtttcaa caacgcaaga tacttcaact 540

gaagcaacac cttcaaacaa tgaatcagct ccacagagta cagatgcaag taataaagat 600

gtagttaatc aagcggttaa tacaagtgcg cctagaatga gagcatttag tttagcggca 660

gtagctgcag atgcaccggc agctggcaca gatattacga atcagttgac gaatgtgaca 720

gttggtattg actctggaga tacagtttat ccgcaccaag caggctatgt caaactgaat 780

tatggttttt cagtgcctaa ttctgctgtt aaaggtgaca cattcaaaat aactgtacct 840

aaagaattaa acttaaatgg tgtaacttca actgctaaag tgccaccaat tatggctgga 900

gatcaagtat tggcaaatgg tgtaatcgat agtgatggta atgttattta tacatttaca 960

gactatgtaa atactaaaga tgatgttaaa gcaactttga ccatgcccgc ttatattgac 1020

cctgaaaatg ttacaaagac aggtaatgtg acattggcta ctggcatagg aaatacaaca 1080

gcaaacaaaa cagtattagt agattatgaa aaatatggta agttttataa cttatctatt 1140

aaaggtacaa ttgaccaaat cgataaaaca aataatacgt atcgtcagac aatttatgtc 1200

aatccaagtg gagataacgt tattgcgccg gttttaacag gtaatttaaa accaaatacg 1260

gatagtaatg cattaataga tcagcaaaat acaagtatta aagtatataa agtagataat 1320

gcagctgatt tatctgaaag ttactttgtg aatccagaaa actttgagga tgtcactaat 1380

agtgtgaata ttacattccc aaatccaaat caatataaag tagagtttaa tacgcctgat 1440

gatcaaatta caacaccgta tatagtagtt gttaatggtc atattgatcc gaatagcaaa 1500

ggtgatttag ctttacgttc aactttatat gggtatgact caaggtttgt atggagatct 1560

atgtcatggg acaacgaagt agcatttaat aacggatcag gttctggtga cggtatcgat 1620

aaaccagttg ttcctgaaca acctgatgag cctggtgaaa ttgaaccaat tccagag 1677

<210> 102
<211> 559
<212> PRT
<213> Staphylococcus aureus

<400> 102
Met Asn Met Lys Lys Lys Glu Lys His Ala Ile Arg Lys Lys Ser Ile
1 5 10 15

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

Ser Ser Lys Glu Ala Asp Ala Ser Glu Asn Ser Val Thr Gln Ser Asp
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

Asp Thr Ser Thr Glu Ala Thr Pro Ser Asn Asn Glu Ser Ala Pro Gln
180 185 190

Ser Thr Asp Ala Ser Asn Lys Asp Val Val Asn Gln Ala Val Asn Thr
195 200 205

Ser Ala 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 Asn Val Thr
225 230 235 240

Val Gly Ile Asp Ser Gly Asp 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 Asn Thr Lys Asp Asp Val Lys Ala Thr Leu 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

Ala Thr Gly Ile Gly Asn Thr Thr Ala Asn Lys Thr Val Leu Val Asp
355 360 365

Tyr Glu Lys Tyr Gly Lys Phe Tyr 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 Ile Ala Pro Val Leu Thr Gly Asn Leu
405 410 415

Lys Pro Asn Thr Asp Ser Asn Ala Leu Ile Asp Gln Gln Asn Thr Ser
420 425 430

Ile Lys Val Tyr Lys Val Asp Asn Ala Ala Asp Leu Ser Glu Ser Tyr
435 440 445

Phe Val Asn Pro Glu Asn Phe Glu Asp Val Thr Asn Ser Val Asn Ile
450 455 460

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

Asp Ser Arg Phe Val 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
545 550 555

<210> 103
<211> 1677
<212> DNA
<213> Staphylococcus aureus

<400> 103
atgaatatga agaaaaaaga aaaacacgca attcggaaaa aatcgattgg cgtggcttca 60

gtgcttgtag gtacgttaat cggttttgga ctactcagca gtaaagaagc agatgcaagt 120

gaaaatagtg ttacgcaatc cgatagcgca agtaacgaaa gcaaaagtaa tgattcaagt 180

agcgttagtg ctgcacctaa aacagtcgac acaaacgtga gtgatactaa aacaacgtca 240

aacactaata gtggcgaaac aagtgtggcg caaaatccgg cacaacagga aacgacacaa 300

tcagcatcaa caaatgcaac tacggaagaa actccggcaa ctggtgaagc tactactacg 360

gcaacgaatc aagctaatac accggcaaca actcaatcaa gcaatacaaa tgcggaggaa 420

ttagtgaatc aaacaaataa tgaaacgact tctaatgata ctaatacagt atcatctgta 480

aattcacctc aaaattctac aaatgcggaa aatgtttcaa caacgcaaga tacttcaact 540

gaagcaacac cttcaaacaa tgaatcagct ccacagagta cagatgcaag taataaagat 600

gtagttaatc aagcggttaa tacaagtgcg cctagaatga gagcatttag tttagcggca 660

gtagctgcag atgcaccggc tgctggcaca gatattacga atcagttgac agatgtgaaa 720

gttactattg actctggtac gactgtgtat ccgcaccaag caggttatgt caaactgaat 780

tatggttttt cagtccctaa ttctgctgtt aaaggtgaca cattcaaaat aactgtacct 840

aaagaattaa acttaaatgg tgtaacttca actgctaagg tgccaccaat tatggccgga 900

gatcaagtat tggcaaatgg tgtaatcgat agtgatggta atgttattta tacatttaca 960

gactatgttg ataataaaga aaatgtaaca gctaatatta ctatgccagc ttatattgac 1020

cctgaaaatg ttacaaagac aggtaatgtg acattgacaa ctggcatagg aaccaatact 1080

gctagtaaga cagtattaat cgactatgag aaatatggac aattccataa tttatcaatt 1140

aaaggtacga ttgatcaaat cgataaaaca aataatacgt atcgccaaac aatttatgtc 1200

aatccaagcg gagataacgt tgtgttacct gccttaacag gtaatttaat tcctaataca 1260

aagagtaatg cgttaataga tgcaaaaaac actgatatta aagtttatag agtcgataat 1320

gctaatgatt tatctgaaag ttattatgtg aatcctagcg attttgaaga tgtaactaat 1380

caagttagaa tttcatttcc aaatgctaat caatacaaag tagaatttcc tacggacgat 1440

gaccaaatta caacaccgta tattgtagtt gttaatggcc atattgatcc tgctagtaca 1500

ggtgatttag cactacgttc gacattttat ggttatgatt ctaattttat atggagatct 1560

atgtcatggg acaacgaagt agcatttaat aacggatcag gctctggtga cggtatcgat 1620

aaaccagttg ttcctgaaca acctgatgag cctggtgaaa ttgaaccaat tccagag 1677

<210> 104
<211> 559
<212> PRT
<213> Staphylococcus aureus

<400> 104

```
Met Asn Met Lys Lys Lys Glu Lys His Ala Ile Arg Lys Lys Ser Ile
1               5                  10                  15

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

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

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

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

Ala Thr Gly Glu Ala Thr Thr Thr Ala 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 Asn 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

Asp Thr Ser Thr Glu Ala Thr Pro Ser Asn Asn Glu Ser Ala Pro Gln
            180                 185                 190

Ser Thr Asp Ala Ser Asn Lys Asp Val Val Asn Gln Ala Val Asn Thr
        195                 200                 205

Ser Ala 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

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
545 550 555

<210> 105
<211> 1677
<212> DNA
<213> Staphylococcus aureus

<400> 105
atgaatatga agaaaaaaga aaaacacgca attcggaaaa aatcgattgg cgtggcttca 60

gtgcttgtag gtacgttaat cggttttgga ctactcagca gtaaagaagc agatgcaagt 120

gaaaatagtg ttacgcaatc cgatagcgca agtaacgaaa gcaaaagtaa taatccaagt 180

agcgttaacg ctgcacctaa aacagacaac acaaacgtga gtgatactaa aacaacgtca 240

aacactaata atagcgaaac gagtgtggca caaaatccag cacaacagga aacgacacaa 300

tcagcatcaa caaatgcaac tacggaagaa acaccggtaa ctggtgaagg tactactacg 360

gcaacgaatc aagctaatac accggcagca actcaatcaa acaatacaaa tgcggaggaa 420

ttagtgaatc aaacaagtaa tgaaacgact tctaatgata ctaatacagt atcatctgta 480

aattcacctc aaaattctac aaatgcggaa aatgtttcaa caacgcaaga cacttcaact 540

gaagcaacac cttcaaacaa tgaatcagct ccacagagta cagatgcaag taataaagat 600

gtagttagtc aagccgttaa tccaagtgcg cctagaatga gagcatttag tttagcggct 660

gtagctgcag atgcaccggc tgctggcaca gatattacga atcagttgac agatgttact 720

gttggtattg aatctggaga tacagtttat ccgcaccaag caggttatgt caaactgaat 780

tatggttttt ccgtgcctaa ttctgctgtt aaaggtgaca cattcaaaat aactgtacct 840

aaagaattaa acttaaatgg tgtaacttca actgctaaag ttcctccaat tatggctgga 900

gatcaagtat tagctaatgg tgtaatcgat agtgatggta atgttattta tacatttaca 960

gactatgtaa atactaaaga tgatgttaaa gcaacactaa ctgtgcctgc atacattgac 1020

cctgaatatg ttacacatac tggtaatgtg acattggcta ctggcatagg aaatacaaca 1080

gcaaacaaaa cagtattagt agattatgaa aaatatggta agttttataa cttatctatt 1140

aaaggtacaa ttgaccaagt cgataaaaca aataatacgt atcgtcagac aatttatgtc 1200

aatccaagtg gagataacgt tattgcaccg gttttaacag gtaatttaaa accaaatacg 1260

gatagtaatg cattaataga tcagcaaaat acaagtatta aagtatataa agtagataat 1320

gcagctgatt tatctgaaag ttactttgtg aatccagaaa actttgagga tgtcactaat 1380

agtgtaaata ttacattccc aaatccaaat caatataaag tagagtttaa tacgcctgat 1440

gatcaaatta caacaccgta tattgtagtt gttaatggtc atattgatcc gaatagcaaa 1500

ggtgatttag ctttacgttc aactttatat ggatataact caaatataat ttggcgctct 1560

atgtcatggg acaacgaagt agcatttaat aacggatcag gttctggtga cggtatcgat 1620

aaacctgttg ttcctgaaca acctgatgag ccgggtgaaa ttgaaccaat tccagag 1677

<210> 106
<211> 559
<212> PRT
<213> Staphylococcus aureus

<400> 106

Met Asn Met Lys Lys Lys Glu Lys His Ala Ile Arg Lys Lys Ser Ile
1 5 10 15

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

Ser Ser Lys Glu Ala Asp Ala Ser Glu Asn Ser Val Thr Gln Ser Asp
35 40 45

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

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

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

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

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

Ala Ala Thr Gln Ser Asn 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

Asp Thr Ser Thr Glu Ala Thr Pro Ser Asn Asn Glu Ser Ala Pro Gln
180 185 190

Ser Thr Asp Ala Ser Asn Lys Asp Val Val Ser Gln Ala Val Asn Pro
195 200 205

```
Ser Ala 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 Thr
225                 230                 235                 240

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

Ala Tyr Ile Asp Pro Glu Tyr Val Thr His Thr Gly Asn Val Thr Leu
            340                 345                 350

Ala Thr Gly Ile Gly Asn Thr Thr Ala Asn Lys Thr Val Leu Val Asp
        355                 360                 365

Tyr Glu Lys Tyr Gly Lys Phe Tyr Asn Leu Ser Ile Lys Gly Thr Ile
    370                 375                 380

Asp Gln Val Asp Lys Thr Asn Asn Thr Tyr Arg Gln Thr Ile Tyr Val
385                 390                 395                 400

Asn Pro Ser Gly Asp Asn Val Ile Ala Pro Val Leu Thr Gly Asn Leu
                405                 410                 415

Lys Pro Asn Thr Asp Ser Asn Ala Leu Ile Asp Gln Gln Asn Thr Ser
            420                 425                 430

Ile Lys Val Tyr Lys Val Asp Asn Ala Ala Asp Leu Ser Glu Ser Tyr
        435                 440                 445

Phe Val Asn Pro Glu Asn Phe Glu Asp Val Thr Asn Ser Val Asn Ile
    450                 455                 460

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

Asn Ser Asn Ile 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
545 550 555

<210> 107
<211> 1677
<212> DNA
<213> Staphylococcus aureus

<400> 107
atgaatatga agaaacaaga aaaacacgca attcgtaaaa aatcgattgg cgtggcttca 60

gtgcttgtag gtacgttaat cggttttgga ctactcagca gtaaagaagc agatgcaagt 120

gaaaatagta tgacacaaac ggaaaatacg agtaatgaga gcaaaagtaa tgatccaagt 180

agcgttaatg ctgcacctaa aacagacaac acaaacgtga gtgattctaa tacaacgaca 240

aacactaata gtgacgaaac gaatgtagcg caaaatccag cacaacagga aacgacacaa 300

tcagcatcaa caaatgcaac tacagaagaa acaccggtaa ctggtgaagt tactactacg 360

gcaacgaatc aagctaatac accggcaaca actcaatcaa gcaatacaaa tgcggaagaa 420

tcagtgaatc aaacaagtaa tgaaacgact tctaatgata ctaatacagt atcatctgta 480

aattcacctc aaaattctac aaatgcggaa aatgtttcaa caacgcaaga catttcaact 540

gaagcaacac cttcaaacaa tgaatcagct ccacagagta cagatgcaag taataaagat 600

gtagttaatc aagcggttaa tacaagtgcg cctagaatga gagcatttag tttagcggct 660

gtagctgcag atgcaccggc tgctggcaaa gatattacga atcagttgac gaatgtgaca 720

gttggtattg actctggaga tacagtttat ccgcaccaag caggctatgt caaactgaat 780

tatgggttct cagtaccaaa tgaggctgtt caaggtgaca cattcaaaat aactgtgccc 840

aaagaattaa acttaaatgg tgtaacttca actgctaaag tgccaccaat tatggccgga 900

gatcaagtat tggcaaatgg tgtaatcgat agtgatggta atgttattta tacatttaca 960

gactatgtaa atactaaaga tgatgttaaa gcaactttga ccatgcccgc ttatattgac 1020

cctgaaaatg ttacaaagac aggtaatgtg acattggcta ctggcatagg tagtacaaca 1080

gcaaacaaaa cagtattagt agattatgaa aaatatggta agttttataa cttatctatt 1140

aaaggtacaa ttgaccaaat cgataaaaca aataatacgt atcgtcagac aatttatgtc 1200

aatccaagtg gagataacgt tattgcgccg gttttaacag gtaatttaaa accaaatacg 1260

gatagtaatg cattaataga tgcacaaaat actagtatta aagtatataa agttgataat 1320

gcatcagact tgtctgaaag ttattatgtg aatccagata actttgaaga tgtcactgat 1380

agtgtgaata ttacattccc aaatccaaat caatataaag tagagttcaa tacgcctgat 1440

gatcaaataa caacaccata tattgtagtt gttaatgggc atattgatcc taatagtaaa 1500

ggtgatttag ctttacgttc aactttatat ggatataatt cgaatataat ttggcgatca 1560

atgtcatggg ataatgaagt agcatttaat aacggatcag gttttggtga cggtatcgat 1620

aaacctgttg ttcctgaaca acctgatgag ccgggtgaaa ttgaaccaat tccagag 1677

<210> 108
<211> 559
<212> PRT
<213> Staphylococcus aureus

<400> 108

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

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

Ser Ser Lys Glu Ala Asp Ala Ser Glu Asn Ser Met Thr Gln Thr Glu
35 40 45

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

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

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

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

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

Ala Thr Thr Gln Ser Ser Asn Thr Asn Ala Glu Glu Ser 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

Asp Ile Ser Thr Glu Ala Thr Pro Ser Asn Asn Glu Ser Ala Pro Gln
180 185 190

```
Ser Thr Asp Ala Ser Asn Lys Asp Val Val Asn Gln Ala Val Asn Thr
        195                 200                 205

Ser Ala Pro Arg Met Arg Ala Phe Ser Leu Ala Ala Val Ala Ala Asp
    210                 215                 220

Ala Pro Ala Ala Gly Lys Asp Ile Thr Asn Gln Leu Thr Asn Val Thr
225                 230                 235                 240

Val Gly Ile Asp Ser Gly Asp Thr Val Tyr Pro His Gln Ala Gly Tyr
                245                 250                 255

Val Lys Leu Asn Tyr Gly Phe Ser Val Pro Asn Glu Ala Val Gln 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 Asn Thr Lys Asp Asp Val Lys Ala Thr Leu 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

Ala Thr Gly Ile Gly Ser Thr Thr Ala Asn Lys Thr Val Leu Val Asp
        355                 360                 365

Tyr Glu Lys Tyr Gly Lys Phe Tyr 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 Ile Ala Pro Val Leu Thr Gly Asn Leu
                405                 410                 415

Lys Pro Asn Thr Asp Ser Asn Ala Leu Ile Asp Ala Gln Asn Thr Ser
            420                 425                 430

Ile Lys Val Tyr Lys Val Asp Asn Ala Ser Asp Leu Ser Glu Ser Tyr
        435                 440                 445

Tyr Val Asn Pro Asp Asn Phe Glu Asp Val Thr Asp Ser Val Asn Ile
    450                 455                 460
```

Thr Phe Pro Asn Pro Asn Gln Tyr Lys Val Glu Phe Asn Thr Pro Asp
465 470 475 480

Asp Gln Ile Thr Thr Pro Tyr Ile Val Val Asn Gly His Ile Asp
485 490 495

Pro Asn Ser Lys Gly Asp Leu Ala Leu Arg Ser Thr Leu Tyr Gly Tyr
500 505 510

Asn Ser Asn Ile Ile Trp Arg Ser Met Ser Trp Asp Asn Glu Val Ala
515 520 525

Phe Asn Asn Gly Ser Gly Phe 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
545 550 555

<210> 109
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic primer

<400> 109
cacaaaattt acgaatagaa agaaacgag 29

<210> 110
<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic primer

<400> 110
aaaatattgg agataccaat attttaggtt g 31

<210> 111
<211> 37
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic primer

<400> 111
tttcttggat ccggtactgg tggtaaacaa agcagtg 37

<210> 112
<211> 39
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic primer

<400> 112
tttcttgcat gcttatttca tgcttccgtg tacagtttc 39

<210> 113
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic primer

<400> 113
tttcttccat gggtactggt ggtaaacaaa gcag 34

<210> 114
<211> 37
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic primer

<400> 114
tttcttgctc agcattattt catgcttccg tgtacag 37

<210> 115
<211> 309
<212> PRT
<213> Staphylococcus epidermidis

<400> 115

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

Gly Glu Glu Gly Asn Lys Asn Lys Gln Asp Pro His Ala Trp Leu Ser
130 135 140

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

His His Asp Lys Lys Asp Lys Ser Thr Tyr Glu Lys Gln Gly Asn Ala
165 170 175

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

Asp Asp Ile Pro Lys Asn Gln Arg Ala Met Met Thr Ser Glu Gly Ala
195 200 205

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

Glu Ile Asn Thr Glu Lys Gln Gly Thr Pro Gly Gln Met Lys Gln Ala
225 230 235 240

Ile Lys Phe Val Lys Asp Asn His Leu Lys His Leu Leu Val Glu Thr
245 250 255

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

Asp Ile Tyr Gly Glu Val Phe Thr Asp Ser Ile Gly Lys Ala Gly Thr
275 280 285

Lys Gly Asp Ser Tyr Tyr Lys Met Met Lys Ser Asn Ile Asp Thr Ile
290 295 300

His Gly Ser Met Lys
305

<210> 116
<211> 930
<212> DNA
<213> Staphylococcus epidermidis

<400> 116
gtgaaaaaaa ttctcgcttt agcaatagca tttttaatta tccttgccgc atgtgggaat 60

cacagtaacc atgaacatca ctcacatgaa ggaaaattaa aagttgtaac tacaaactct 120

attctctatg acatggttaa acgtgtcggt ggaaataagg tcgatgttca tagcatcgtt 180

ccagtaggac aagatccaca tgaatatgag gttaaaccta aagatattaa agcattaaca 240

gatgctgacg ttgtatttta taatggttta aacctagaaa ctggaaatgg ttggtttgaa 300

aaagcacttg accaagcagg aaaatcaaca aaagataaaa atgtgatagc agcatcaaat 360

aatgttaaac caatatactt aaatggtgag gaaggtaaca aaaacaaaca agatccacat 420

gcatggttaa gtttagagaa tggaattaaa tacgtaaaaa caatacaaaa atcactagaa 480

catcatgata aaaaagataa gtctacatat gaaaaacaag ggaatgcata tatatcaaaa 540

ttagaagaac ttaataaaga tagtaaaaat aaatttgatg acatacccaa aaatcaacgt 600

gccatgatga caagtgaagg tgcatttaaa tattttgctc aacaattcga tgttaaacca 660

ggttatattt gggagataaa cacagaaaaa caaggtacac ctggtcaaat gaaacaagcc 720

attaaatttg ttaaagataa tcatttaaaa catttattag tcgaaacaag cgtagataaa 780

aaagctatgc aaagtttatc agaagaaact aagaaagata tttatggtga agtatttacc 840

gactctatag gtaaggcagg tactaaaggt gactcatact ataaaatgat gaaatctaat 900

attgatacaa tacatggtag tatgaaataa 930

<210> 117
<211> 510
<212> PRT
<213> Staphylococcus aureus

<400> 117

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

Asn Asp Thr Thr Gln Ser Ser Lys Asn Asn Ala Ser Ala Asp Ser Glu
20 25 30

Lys Asn Asn Met Ile Glu Thr Pro Gln Leu Asn Thr Thr Ala Asn Asp
35 40 45

Thr Ser Asp Ile Ser Ala Asn Thr Asn Ser Ala Asn Val Asp Ser Thr
50 55 60

Thr Lys Pro Met Ser Thr Gln Thr Ser Asn Thr Thr Thr Thr Glu Pro
65 70 75 80

Ala Ser Thr Asn Glu Thr Pro Gln Pro Thr Ala Ile Lys Asn Gln Ala
85 90 95

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

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

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

Gln Thr Ile Ser Asn Ala Gln Gly Thr Ser Lys Pro Ser Val Arg Thr
145 150 155 160

Arg Ala Val Arg Ser Leu Ala Val Ala Glu Pro Val Val Asn Ala Ala
165 170 175

Asp Ala Lys Gly Thr Asn Val Asn Asp Lys Val Thr Ala Ser Asn Phe
180 185 190

Lys Leu Glu Lys Thr Thr Phe Asp Pro Asn Gln Ser Gly Asn Thr Phe
195 200 205

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

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

Tyr Ser Asn Ser Asn Asn Thr Met Pro Ile Ala Asp Ile Lys Ser Thr
245 250 255

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

Tyr Thr Phe Val Phe Thr Asp Tyr Val Asn Asn Lys Glu Asn Ile Asn
275 280 285

Gly Gln Phe Ser Leu Pro Leu Phe Thr Asp Arg Ala Lys Ala Pro Lys
290 295 300

Ser Gly Thr Tyr Asp Ala Asn Ile Asn Ile Ala Asp Glu Met Phe Asn
305 310 315 320

Asn Lys Ile Thr Tyr Asn Tyr Ser Ser Pro Ile Ala Gly Ile Asp Lys
325 330 335

Pro Asn Gly Ala Asn Ile Ser Ser Gln Ile Ile Gly Val Asp Thr Ala
340 345 350

Ser Gly Gln Asn Thr Tyr Lys Gln Thr Val Phe Val Asn Pro Lys Gln
355 360 365

Arg Val Leu Gly Asn Thr Trp Val Tyr Ile Lys Gly Tyr Gln Asp Lys
370 375 380

Ile Glu Glu Ser Ser Gly Lys Val Ser Ala Thr Asp Thr Lys Leu Arg
385 390 395 400

Ile Phe Glu Val Asn Asp Thr Ser Lys Leu Ser Asp Ser Tyr Tyr Ala
405 410 415

Asp Pro Asn Asp Ser Asn Leu Lys Glu Val Thr Asp Gln Phe Lys Asn
420 425 430

Arg Ile Tyr Tyr Glu His Pro Asn Val Ala Ser Ile Lys Phe Gly Asp
435 440 445

```
Ile Thr Lys Thr Tyr Val Val Leu Val Glu Gly His Tyr Asp Asn Thr
    450                 455                 460

Gly Lys Asn Leu Lys Thr Gln Val Ile Gln Glu Asn Val Asp Pro Val
465                 470                 475                 480

Thr Asn Arg Asp Tyr Ser Ile Phe Gly Trp Asn Asn Glu Asn Val Val
                485                 490                 495

Arg Tyr Gly Gly Gly Ser Ala Asp Gly Asp Ser Ala Val Asn
            500                 505                 510
```

<210> 118
<211> 1533
<212> DNA
<213> Staphylococcus aureus

<400> 118

```
atggctagca tgactggtgg acagcaaatg ggtgcttcag aacaatcgaa cgatacaacg     60
caatcttcga aaaataatgc aagtgcagat tccgaaaaaa acaatatgat agaaacacct    120
caattaaata caacggctaa tgatacatct gatattagtg caaacacaaa cagtgcgaat    180
gtagatagca caacaaaacc aatgtctaca caaacgagca ataccactac aacagagcca    240
gcttcaacaa atgaaacacc tcaaccgacg gcaattaaaa atcaagcaac tgctgcaaaa    300
atgcaagatc aaactgttcc tcaagaagca aattctcaag tagataataa aacaacgaat    360
gatgctaata gcatagcaac aaacagtgag cttaaaaatt ctcaaacatt agatttacca    420
caatcatcac cacaaacgat ttccaatgcg caaggaacta gtaaaccaag tgttagaacg    480
agagctgtac gtagtttagc tgttgctgaa ccggtagtaa atgctgctga tgctaaaggt    540
acaaatgtaa atgataaagt tacggcaagt aatttcaagt tagaaaagac tacatttgac    600
cctaatcaaa gtggtaacac atttatggcg gcaaatttta cagtgacaga taaagtgaaa    660
tcaggggatt attttacagc gaagttacca gatagtttaa ctggtaatgg agacgtggat    720
tattctaatt caaataatac gatgccaatt gcagacatta aaagtacgaa tggcgatgtt    780
gtagctaaag caacatatga tatcttgact aagacgtata catttgtctt tacagattat    840
gtaaataata aagaaaatat taacggacaa ttttcattac ctttatttac agaccgagca    900
aaggcaccta aatcaggaac atatgatgcg aatattaata ttgcggatga aatgtttaat    960
aataaaatta cttataacta tagttcgcca attgcaggaa ttgataaacc aaatggcgcg   1020
aacatttctt ctcaaattat tggtgtagat acagcttcag gtcaaaacac atacaagcaa   1080
acagtatttg ttaaccctaa gcaacgagtt ttaggtaata cgtgggtgta tattaaaggc   1140
taccaagata aaatcgaaga aagtagcggt aaagtaagtg ctacagatac aaaactgaga   1200
atttttgaag tgaatgatac atctaaatta tcagatagct actatgcaga tccaaatgac   1260
tctaacctta aagaagtaac agaccaattt aaaaatagaa tctattatga gcatccaaat   1320
gtagctagta ttaaatttgg tgatattact aaaacatatg tagtattagt agaagggcat   1380
```

tacgacaata caggtaagaa cttaaaaact caggttattc aagaaaatgt tgatcctgta 1440

acaaatagag actacagtat tttcggttgg aataatgaga atgttgtacg ttatggtggt 1500

ggaagtgctg atggtgattc agcagtaaat taa 1533

<210> 119
<211> 292
<212> PRT
<213> Staphylococcus aureus

<400> 119

```
Met Gly Thr Gly Gly Lys Gln Ser Ser Asp Lys Ser Asn Gly Lys Leu
1               5                  10                  15

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

Gly Gly Asp Asn Val Asp Ile His Ser Ile Val Pro Val Gly Gln Asp
        35                  40                  45

Pro His Glu Tyr Glu Val Lys Pro Lys Asp Ile Lys Lys Leu Thr Asp
    50                  55                  60

Ala Asp Val Ile Leu Tyr Asn Gly Leu Asn Leu Glu Thr Gly Asn Gly
65                  70                  75                  80

Trp Phe Glu Lys Ala Leu Glu Gln Ala Gly Lys Ser Leu Lys Asp Lys
                85                  90                  95

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

Glu Glu Gly Asn Lys Asp Lys Gln Asp Pro His Ala Trp Leu Ser Leu
        115                 120                 125

Asp Asn Gly Ile Lys Tyr Val Lys Thr Ile Gln Gln Thr Phe Ile Asp
    130                 135                 140

Asn Asp Lys Lys His Lys Ala Asp Tyr Glu Lys Gln Gly Asn Lys Tyr
145                 150                 155                 160

Ile Ala Gln Leu Glu Lys Leu Asn Asn Asp Ser Lys Asp Lys Phe Asn
                165                 170                 175

Asp Ile Pro Lys Glu Gln Arg Ala Met Ile Thr Ser Glu Gly Ala Phe
            180                 185                 190

Lys Tyr Phe Ser Lys Gln Tyr Gly Ile Thr Pro Gly Tyr Ile Trp Glu
        195                 200                 205

Ile Asn Thr Glu Lys Gln Gly Thr Pro Glu Gln Met Arg Gln Ala Ile
    210                 215                 220
```

Glu Phe Val Lys Lys His Lys Leu Lys His Leu Leu Val Glu Thr Ser
225 230 235 240

Val Asp Lys Lys Ala Met Glu Ser Leu Ser Glu Glu Thr Lys Lys Asp
245 250 255

Ile Phe Gly Glu Val Tyr Thr Asp Ser Ile Gly Lys Glu Gly Thr Lys
260 265 270

Gly Asp Ser Tyr Tyr Lys Met Met Lys Ser Asn Ile Glu Thr Val His
275 280 285

Gly Ser Met Lys
290

<210> 120
<211> 879
<212> DNA
<213> Staphylococcus aureus

<400> 120
atgggtactg gtggtaaaca aagcagtgat aagtcaaatg gcaaattaaa agtagtaacg 60

acgaattcaa ttttatatga tatggctaaa aatgttggtg gagacaacgt cgatattcat 120

agtattgtac ctgttggtca agatcctcat gaatatgaag ttaaacctaa agatattaaa 180

aagttaactg acgctgacgt tattttatac aacggattaa atttagagac tggtaacggt 240

tggtttgaaa aagccttaga acaggctggt aaatcattaa aagataaaaa agttatcgca 300

gtatcaaaag atgttaaacc tatctattta aacggtgaag aaggcaacaa agataaacaa 360

gatccacacg catggttaag tttagataat ggtattaaat acgtaaaaac aattcaacaa 420

acatttatcg ataacgacaa aaaacataaa gcagattatg aaaagcaagg taacaaatac 480

attgctcaat tggaaaaatt aaataatgac agtaaagaca aatttaatga cattccaaaa 540

gaacaacgtg ccatgattac aagtgaaggt gccttcaagt acttctcaaa acaatacggt 600

attacaccag gttatatttg ggaaattaac actgaaaaac aaggtacacc tgaacaaatg 660

agacaagcta ttgagtttgt taaaaagcac aaattaaaac acttattagt agaaacaagt 720

gttgataaga aagcaatgga aagtttatct gaagaaacga agaaagatat ctttggtgaa 780

gtgtacacag attcaatcgg taaagaaggc actaaaggtg actcttacta caaaatgatg 840

aaatcaaata ttgaaactgt acacggaagc atgaaataa 879

<210> 121
<211> 292
<212> PRT
<213> Staphylococcus epidermidis

<400> 121
Met Gly Asn His Ser Asn His Glu His His Ser His Glu Gly Lys Leu
1 5 10 15

```
Lys Val Val Thr Thr Asn Ser Ile Leu Tyr Asp Met Val Lys Arg Val
            20                  25                  30

Gly Gly Asn Lys Val Asp Val His Ser Ile Val Pro Val Gly Gln Asp
        35                  40                  45

Pro His Glu Tyr Glu Val Lys Pro Lys Asp Ile Lys Ala Leu Thr Asp
    50                  55                  60

Ala Asp Val Val Phe Tyr Asn Gly Leu Asn Leu Glu Thr Gly Asn Gly
65                  70                  75                  80

Trp Phe Glu Lys Ala Leu Asp Gln Ala Gly Lys Ser Thr Lys Asp Lys
                85                  90                  95

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

Glu Glu Gly Asn Lys Asn Lys Gln Asp Pro His Ala Trp Leu Ser Leu
        115                 120                 125

Glu Asn Gly Ile Lys Tyr Val Lys Thr Ile Gln Lys Ser Leu Glu His
    130                 135                 140

His Asp Lys Lys Asp Lys Ser Thr Tyr Glu Lys Gln Gly Asn Ala Tyr
145                 150                 155                 160

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

Asp Ile Pro Lys Asn Gln Arg Ala Met Met Thr Ser Glu Gly Ala Phe
            180                 185                 190

Lys Tyr Phe Ala Gln Gln Phe Asp Val Lys Pro Gly Tyr Ile Trp Glu
        195                 200                 205

Ile Asn Thr Glu Lys Gln Gly Thr Pro Gly Gln Met Lys Gln Ala Ile
    210                 215                 220

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

Val Asp Lys Lys Ala Met Gln Ser Leu Ser Glu Glu Thr Lys Lys Asp
                245                 250                 255

Ile Tyr Gly Glu Val Phe Thr Asp Ser Ile Gly Lys Glu Gly Thr Lys
            260                 265                 270

Gly Asp Ser Tyr Tyr Lys Met Met Lys Ser Asn Ile Asp Thr Ile His
        275                 280                 285
```

Gly Ser Met Lys
290

<210> 122
<211> 879
<212> DNA
<213> Staphylococcus epidermidis

<400> 122
atggggaatc acagtaacca tgaacatcac tcacatgaag gaaaattaaa agttgtaact 60

acaaactcta ttctctatga catggttaaa cgtgtcggtg gaaataaggt cgatgttcat 120

agcatcgttc cagtaggaca agatccacat gaatatgagg ttaaacctaa agatattaaa 180

gcattaacag atgctgacgt tgtattttat aatggtttaa acctagaaac tggaaatggt 240

tggtttgaaa aagcacttga ccaagcagga aaatcaacaa aagataaaaa tgtgatagca 300

gcatcaaata atgttaaacc aatatactta aatggtgagg aaggtaacaa aaacaaacaa 360

gatccacatg catggttaag tttagagaat ggaattaaat acgtaaaaac aatacaaaaa 420

tcactagaac atcatgataa aaaagataag tctacatatg aaaaacaagg gaatgcatat 480

atatcaaaat tagaagaact taataaagat agtaaaaata aatttgatga catacccaaa 540

aatcaacgtg ccatgatgac aagtgaaggt gcatttaaat attttgctca acaattcgat 600

gttaaaccag gttatatttg ggagataaac acagaaaaac aaggtacacc tggtcaaatg 660

aaacaagcca ttaaatttgt taaagataat catttaaaac atttattagt cgaaacaagc 720

gtagataaaa aagctatgca aagtttatca gaagaaacta agaaagatat ttatggtgaa 780

gtatttaccg actctatagg taaggaaggt actaaaggtg actcatacta taaaatgatg 840

aaatctaata ttgatacaat acatggtagt atgaaataa 879

<210> 123
<211> 531
<212> PRT
<213> Staphylococcus aureus

<400> 123
Met Ala Ser Met Thr Gly Gly Gln Gln Met Gly Ser Glu Asn Ser Val
1 5 10 15

Thr Gln Ser Asp Ser Ala Ser Asn Glu Ser Lys Ser Asn Asp Ser Ser
20 25 30

Ser Val Ser Ala Ala Pro Lys Thr Asp Asp Thr Asn Val Ser Asp Thr
35 40 45

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

Pro Ala Gln Gln Glu Thr Thr Gln Ser Ser Ser Thr Asn Ala Thr Thr
65 70 75 80

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

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

Leu Val Asn Gln Thr Ser Asn Glu Thr Thr Phe Asn Asp Thr Asn Thr
        115                 120                 125

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

Ser Thr Thr Gln Asp Thr Ser Thr Glu Ala Thr Pro Ser Asn Asn Glu
145                 150                 155                 160

Ser Ala Pro Gln Ser Thr Asp Ala Ser Asn Lys Asp Val Val Asn Gln
                165                 170                 175

Ala Val Asn Thr Ser Ala Pro Arg Met Arg Ala Phe Ser Leu Ala Ala
            180                 185                 190

Val Ala Ala Asp Ala Pro Ala Ala Gly Thr Asp Ile Thr Asn Gln Leu
        195                 200                 205

Thr Asn Val Thr Val Gly Ile Asp Ser Gly Thr Thr Val Tyr Pro His
    210                 215                 220

Gln Ala Gly Tyr Val Lys Leu Asn Tyr Gly Phe Ser Val Pro Asn Ser
225                 230                 235                 240

Ala Val Lys Gly Asp Thr Phe Lys Ile Thr Val Pro Lys Glu Leu Asn
                245                 250                 255

Leu Asn Gly Val Thr Ser Thr Ala Lys Val Pro Pro Ile Met Ala Gly
            260                 265                 270

Asp Gln Val Leu Ala Asn Gly Val Ile Asp Ser Asp Gly Asn Val Ile
        275                 280                 285

Tyr Thr Phe Thr Asp Tyr Val Asn Thr Lys Asp Asp Val Lys Ala Thr
    290                 295                 300

Leu Thr Met Pro Ala Ala Ile Asp Pro Glu Asn Val Lys Lys Thr Gly
305                 310                 315                 320

Asn Val Thr Leu Ala Thr Gly Ile Gly Ser Thr Thr Ala Asn Lys Thr
                325                 330                 335

Val Leu Val Asp Tyr Glu Lys Tyr Gly Lys Phe Tyr Asn Leu Ser Ile
            340                 345                 350
```

```
Lys Gly Thr Ile Asp Gln Ile Asp Lys Thr Asn Asn Thr Tyr Arg Gln
        355                 360                 365

Thr Ile Tyr Val Asn Pro Ser Gly Asp Asn Val Ile Ala Pro Val Leu
    370                 375                 380

Thr Gly Asn Leu Lys Pro Asn Thr Asp Ser Asn Ala Leu Ile Asp Gln
385                 390                 395                 400

Gln Asn Thr Ser Ile Lys Val Tyr Lys Val Asp Asn Ala Ala Asp Leu
                405                 410                 415

Ser Glu Ser Tyr Phe Val Asn Pro Glu Asn Phe Glu Asp Val Thr Asn
            420                 425                 430

Ser Val Asn Ile Thr Phe Pro Asn Pro Asn Gln Tyr Lys Val Glu Phe
        435                 440                 445

Asn Thr Pro Asp Asp Gln Ile Thr Thr Pro Tyr Ile Val Val Val Asn
    450                 455                 460

Gly His Ile Asp Pro Asn Ser Lys Gly Asp Leu Ala Leu Arg Ser Thr
465                 470                 475                 480

Leu Tyr Gly Tyr Asn Ser Asn Ile Ile Trp Arg Ser Met Ser Trp Asp
                485                 490                 495

Asn Glu Val Ala Phe Asn Asn Gly Ser Gly Ser Gly Asp Gly Ile Asp
            500                 505                 510

Lys Pro Val Val Pro Glu Gln Pro Asp Glu Pro Gly Glu Ile Glu Pro
        515                 520                 525

Ile Pro Glu
    530
```

<210> 124
<211> 1596
<212> DNA
<213> Staphylococcus aureus

<400> 124

```
atggctagca tgactggtgg acagcaaatg ggtagtgaaa atagtgttac gcaatctgat     60

agcgcaagta acgaaagcaa aagtaatgat tcaagtagcg ttagtgctgc acctaaaaca    120

gacgacacaa acgtgagtga tactaaaaca tcgtcaaaca ctaataatgg cgaaacgagt    180

gtggcgcaaa atccagcaca acaggaaacg acacaatcat catcaacaaa tgcaactacg    240

gaagaaacgc cggtaactgg tgaagctact actacgacaa cgaatcaagc taatacaccg    300

gcaacaactc aatcaagcaa tacaaatgct gaagaattag tgaatcaaac aagtaatgaa    360

acgactttta atgatactaa tacagtatca tctgtaaatt cacctcaaaa ttctacaaat    420
```

gcggaaaatg tttcaacaac gcaagatact tcaactgaag caacaccttc aaacaatgaa 480

tcagctccac agagtacaga tgcaagtaat aaagatgtag ttaatcaagc ggttaataca 540

agtgcgccta gaatgagagc atttagttta gcggcagtag ctgcagatgc accggcagct 600

ggcacagata ttacgaatca gttgacgaat gtgacagttg gtattgactc tggtacgact 660

gtgtatccac accaagcagg ttatgtcaaa ctgaattatg gtttttcagt gcctaattct 720

gctgttaaag gtgacacatt caaaataact gtacctaaag aattaaactt aaatggtgta 780

acttcaactg ctaaagtgcc accaattatg gctggagatc aagtattggc aaatggtgta 840

atcgatagtg atggtaatgt tatttataca tttacagact atgtaaatac taaagatgat 900

gtaaaagcaa ctttgaccat gcccgctgct attgaccctg aaaatgttaa aaagacaggt 960

aatgtgacat tggctactgg cataggtagt acaacagcaa acaaaacagt attagtagat 1020

tatgaaaaat atggtaagtt ttataactta tctattaaag gtacaattga ccaaatcgat 1080

aaaacaaata atacgtatcg tcagacaatt tatgtcaatc caagtggaga taacgttatt 1140

gcgccggttt taacaggtaa tttaaaacca aatacggata gtaatgcatt aatagatcag 1200

caaaatacaa gtattaaagt atataaagta gataatgcag ctgatttatc tgaaagttac 1260

tttgtgaatc cagaaaactt tgaggatgtc actaatagtg tgaatattac attcccaaat 1320

ccaaatcaat ataaagtaga gtttaatacg cctgatgatc aaattacaac accgtatata 1380

gtagttgtta atggtcatat tgatccgaat agcaaaggtg atttagcttt acgttcaact 1440

ttatatgggt ataactcgaa tataatttgg cgctctatgt catgggacaa cgaagtagca 1500

tttaataacg gatcaggttc tggtgacggt atcgataaac cagttgttcc tgaacaacct 1560

gatgagcctg gtgaaattga accaattcca gagtag 1596

<210> 125
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<220>
<221> MOD_RES
<222> (3)..(3)
<223> Any amino acid

<400> 125
Leu Pro Xaa Thr Gly
1 5

<210> 126
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 126
Thr Tyr Thr Phe Thr Asp Tyr Val Asp
1 5

<210> 127
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 127
Met Arg Gly Ser His His His His His His Gly Ser
1 5 10

<210> 128
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 128
Met Ala Ser Met Thr Gly Gly Gln Gln Met Gly Arg Gly Ser
1 5 10

<210> 129
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 129
Met Ala Ser Met Thr Gly Gly Gln Gln Met Gly
1 5 10

<210> 130
<211> 933
<212> PRT
<213> Staphylococcus aureus

<400> 130
Met Asn Met Lys Lys Lys Glu Lys His Ala Ile Arg Lys Lys Ser Ile
1 5 10 15

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

Ser Ser Lys Glu Ala Asp Ala Ser Glu Asn Ser Val Thr Gln Ser Asp
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 Phe 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

Asp Thr Ser Thr Glu Ala Thr Pro Ser Asn Asn Glu Ser Ala Pro Gln
180 185 190

Ser Thr Asp Ala Ser Asn Lys Asp Val Val Asn Gln Ala Val Asn Thr
195 200 205

Ser Ala 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 Asn Val Thr
225 230 235 240

Val Gly 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 Asn Thr Lys Asp Asp Val Lys Ala Thr Leu Thr Met Pro
325 330 335

Ala Tyr Ile Asp Pro Glu Asn Val Lys Lys Thr Gly Asn Val Thr Leu
340 345 350

```
Ala Thr Gly Ile Gly Ser Thr Thr Ala Asn Lys Thr Val Leu Val Asp
        355                 360                 365

Tyr Glu Lys Tyr Gly Lys Phe Tyr 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 Ile Ala Pro Val Leu Thr Gly Asn Leu
                405                 410                 415

Lys Pro Asn Thr Asp Ser Asn Ala Leu Ile Asp Gln Gln Asn Thr Ser
            420                 425                 430

Ile Lys Val Tyr Lys Val Asp Asn Ala Ala Asp Leu Ser Glu Ser Tyr
        435                 440                 445

Phe Val Asn Pro Glu Asn Phe Glu Asp Val Thr Asn Ser Val Asn Ile
    450                 455                 460

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

Asn Ser Asn Ile 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 Asp
    610                 615                 620
```

Asn Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp
625 630 635 640

Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp
645 650 655

Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp
660 665 670

Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp
675 680 685

Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp
690 695 700

Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp
705 710 715 720

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

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

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

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

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

Ser Asp Ser Asp Ser Ala Ser Asp Ser Asp Ser Gly Ser Asp Ser Asp
835 840 845

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

Ser Gly Ser Asn Asn Asn Val Val Pro Pro Asn Ser Pro Lys Asn Gly
865 870 875 880

Thr Asn Ala Ser Asn Lys Asn Glu Ala Lys Asp Ser Lys Glu Pro Leu
885 890 895

Pro Asp Thr Gly Ser Glu Asp Glu Ala Asn Thr Ser Leu Ile Trp Gly
900 905 910

Leu Leu Ala Ser Ile Gly Ser Leu Leu Leu Phe Arg Arg Lys Lys Glu
915 920 925

Asn Lys Asp Lys Lys
930

<210> 131
<211> 2802
<212> DNA
<213> Staphylococcus aureus

<400> 131
atgaatatga agaaaaaaga aaaacacgca attcggaaaa aatcgattgg cgtggcttca 60

gtgcttgtag gtacgttaat cggttttgga ctactcagca gtaaagaagc agatgcaagt 120

gaaaatagtg ttacgcaatc tgatagcgca agtaacgaaa gcaaaagtaa tgattcaagt 180

agcgttagtg ctgcacctaa aacagacgac acaaacgtga gtgatactaa aacatcgtca 240

aacactaata atggcgaaac gagtgtggcg caaaatccag cacaacagga aacgacacaa 300

tcatcatcaa caaatgcaac tacggaagaa acgccggtaa ctggtgaagc tactactacg 360

acaacgaatc aagctaatac accggcaaca actcaatcaa gcaatacaaa tgcggaggaa 420

ttagtgaatc aaacaagtaa tgaaacgact tttaatgata ctaatacagt atcatctgta 480

aattcacctc aaaattctac aaatgcggaa aatgtttcaa caacgcaaga tacttcaact 540

gaagcaacac cttcaaacaa tgaatcagct ccacagagta cagatgcaag taataaagat 600

gtagttaatc aagcggttaa tacaagtgcg cctagaatga gagcatttag tttagcggca 660

gtagctgcag atgcaccggc agctggcaca gatattacga atcagttgac gaatgtgaca 720

gttggtattg actctggtac gactgtgtat ccgcaccaag caggttatgt caaactgaat 780

tatggttttt cagtgcctaa ttctgctgtt aaaggtgaca cattcaaaat aactgtacct 840

aaagaattaa acttaaatgg tgtaacttca actgctaaag tgccaccaat tatggctgga 900

gatcaagtat tggcaaatgg tgtaatcgat agtgatggta atgttattta tacatttaca 960

gactatgtaa atactaaaga tgatgtaaaa gcaactttga ccatgcccgc ttatattgac 1020

cctgaaaatg ttaaaaagac aggtaatgtg acattggcta ctggcatagg tagtacaaca 1080

gcaaacaaaa cagtattagt agattatgaa aaatatggta agttttataa cttatctatt 1140

aaaggtacaa ttgaccaaat cgataaaaca aataatacgt atcgtcagac aatttatgtc 1200

aatccaagtg gagataacgt tattgcgccg gttttaacag gtaatttaaa accaaatacg 1260

gatagtaatg cattaataga tcagcaaaat acaagtatta aagtatataa agtagataat 1320

gcagctgatt tatctgaaag ttactttgtg aatccagaaa actttgagga tgtcactaat 1380

agtgtgaata ttacattccc aaatccaaat caatataaag tagagtttaa tacgcctgat 1440

gatcaaatta caacaccgta tatagtagtt gttaatggtc atattgatcc gaatagcaaa 1500

ggtgatttag ctttacgttc aactttatat gggtataact cgaatataat ttggcgctct 1560

atgtcatggg acaacgaagt agcatttaat aacggatcag gttctggtga cggtatcgat 1620

aaaccagttg ttcctgaaca acctgatgag cctggtgaaa ttgaaccaat tccagaggat 1680

tcagattctg acccaggttc agattctggc agcgattcta attcagatag cggttcagat 1740

tcgggtagtg attctacatc agatagtggt tcagattcag cgagtgattc agattcagca 1800

agtgattcag actcagcgag tgattcagat tcagcaagcg attccgactc agcgagcgat 1860

tccgactcag acaatgactc ggattcagat agcgattctg actcagacag tgactcagat 1920

tccgacagtg actcagattc agatagcgat tctgactcag acagtgactc agattcagat 1980

agcgattcag attcagatag cgattcagat tccgacagtg attccgactc agacagcgat 2040

tctgactccg acagtgattc cgactcagac agcgattcag attccgacag tgattccgac 2100

tcagatagcg attccgactc agatagcgac tcagattcag acagcgattc agattcagac 2160

agcgattcag attcagatag cgattcagat tccgacagtg actcagattc cgacagtgac 2220

tcggattcag atagcgattc agattccgac agtgactcag attccgacag tgactcagac 2280

tcagacagtg attcggattc agcgagtgat tcggattcag atagtgattc cgactccgac 2340

agtgactcgg attcagatag cgactcagac tcggatagcg actcggattc agatagcgat 2400

tcggactcag atagcgattc agaatcagac agcgattcag aatcagacag cgattcagat 2460

tcagacagcg actcagacag tgactcagat tcagatagtg actcggattc agcgagtgat 2520

tcagactcag gtagtgactc cgattcatca agtgattccg actcagaaag tgattcaaat 2580

agcgattccg agtcaggttc taacaataat gtagttccgc ctaattcacc taaaaatggt 2640

actaatgctt ctaataaaaa tgaggctaaa gatagtaaag aaccattacc agatacaggt 2700

tctgaagatg aagcaaatac gtcactaatt tggggattat tagcatcaat aggttcatta 2760

ctacttttca gaagaaaaaa agaaaataaa gataagaaat aa 2802