

SEQUENCE LISTING

<110> VIB VZW
VRIJE UNIVERSITEIT BRUSSEL
OXFORD NANOPORE TECHNOLOGIES LIMITED

<120> NOVEL PROTEIN PORES

<130> N414031WO

<150> EP17179099.1

<151> 2017-06-30

<160> 120

<170> PatentIn version 3.5

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<211> 834

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<213> Escherichia coli

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gttcaggccg gggttttccg ctttattgac taccagcgct tgcttgaagg ggaagtgggt      660
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20

25

30

Ala Gln Ser Tyr Lys Asp Leu Thr His Leu Pro Ala Pro Thr Gly Lys
 35 40 45

Ile Phe Val Ser Val Tyr Asn Ile Gln Asp Glu Thr Gly Gln Phe Lys
 50 55 60

Pro Tyr Pro Ala Ser Asn Phe Ser Thr Ala Val Pro Gln Ser Ala Thr
 65 70 75 80

Ala Met Leu Val Thr Ala Leu Lys Asp Ser Arg Trp Phe Ile Pro Leu
 85 90 95

Glu Arg Gln Gly Leu Gln Asn Leu Leu Asn Glu Arg Lys Ile Ile Arg
 100 105 110

Ala Ala Gln Glu Asn Gly Thr Val Ala Ile Asn Asn Arg Ile Pro Leu
 115 120 125

Gln Ser Leu Thr Ala Ala Asn Ile Met Val Glu Gly Ser Ile Ile Gly
 130 135 140

Tyr Glu Ser Asn Val Lys Ser Gly Gly Val Gly Ala Arg Tyr Phe Gly
 145 150 155 160

Ile Gly Ala Asp Thr Gln Tyr Gln Leu Asp Gln Ile Ala Val Asn Leu
 165 170 175

Arg Val Val Asn Val Ser Thr Gly Glu Ile Leu Ser Ser Val Asn Thr
 180 185 190

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

Ile Asp Tyr Gln Arg Leu Leu Glu Gly Glu Val Gly Tyr Thr Ser Asn
 210 215 220

Glu Pro Val Met Leu Cys Leu Met Ser Ala Ile Glu Thr Gly Val Ile
 225 230 235 240

Phe Leu Ile Asn Asp Gly Ile Asp Arg Gly Leu Trp Asp Leu Gln Asn
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Lys Ala Glu Arg Gln Asn Asp Ile Leu Val Lys Tyr Arg His Met Ser
 260 265 270

Val Pro Pro Glu Ser

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 <213> Escherichia coli

<400> 3

Cys Leu Thr Ala Pro Pro Lys Glu Ala Ala Arg Pro Thr Leu Met Pro
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Arg Ala Gln Ser Tyr Lys Asp Leu Thr His Leu Pro Ala Pro Thr Gly
 20 25 30

Lys Ile Phe Val Ser Val Tyr Asn Ile Gln Asp Glu Thr Gly Gln Phe
 35 40 45

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

Thr Ala Met Leu Val Thr Ala Leu Lys Asp Ser Arg Trp Phe Ile Pro
 65 70 75 80

Leu Glu Arg Gln Gly Leu Gln Asn Leu Leu Asn Glu Arg Lys Ile Ile
 85 90 95

Arg Ala Ala Gln Glu Asn Gly Thr Val Ala Ile Asn Asn Arg Ile Pro
 100 105 110

Leu Gln Ser Leu Thr Ala Ala Asn Ile Met Val Glu Gly Ser Ile Ile
 115 120 125

Gly Tyr Glu Ser Asn Val Lys Ser Gly Gly Val Gly Ala Arg Tyr Phe
 130 135 140

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

Leu Arg Val Val Asn Val Ser Thr Gly Glu Ile Leu Ser Ser Val Asn
 165 170 175

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

Phe Ile Asp Tyr Gln Arg Leu Leu Glu Gly Glu Val Gly Tyr Thr Ser
 195 200 205

Asn Glu Pro Val Met Leu Cys Leu Met Ser Ala Ile Glu Thr Gly Val
 210 215 220

Ile Phe Leu Ile Asn Asp Gly Ile Asp Arg Gly Leu Trp Asp Leu Gln
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Gly Cys Thr Thr Ala Thr Thr Thr Cys Gly Cys Cys Ala Thr Thr Ala
35 40 45

Ala Gly Thr Thr Gly Gly Gly Cys Thr Gly Gly Ala Ala Cys Cys Ala
50 55 60

Thr Gly Ala Cys Thr Thr Thr Cys Cys Ala Gly Thr Thr Cys Cys Gly
65 70 75 80

Thr Ala Ala Thr Cys Cys Ala Ala Ala Cys Thr Thr Thr Gly Gly Thr
85 90 95

Gly Gly Thr Ala Ala Cys Cys Cys Ala Ala Ala Thr Ala Ala Thr Gly
100 105 110

Gly Cys Gly Cys Thr Thr Thr Thr Thr Thr Ala Thr Thr Ala Ala Ala
115 120 125

Thr Ala Gly Cys Gly Cys Thr Cys Ala Gly Gly Cys Cys Cys Ala Ala
130 135 140

Ala Ala Cys Thr Cys Thr Thr Ala Thr Ala Ala Ala Gly Ala Thr Cys
145 150 155 160

Cys Gly Ala Gly Cys Thr Ala Thr Ala Ala Cys Gly Ala Thr Gly Ala
165 170 175

Cys Thr Thr Thr Gly Gly Thr Ala Thr Thr Gly Ala Ala Ala Cys Ala
 180 185 190

Cys Cys Cys Thr Cys Ala Gly Cys Gly Thr Thr Ala Gly Ala Thr Ala
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 210 215 220

Cys Cys Ala Gly Thr Cys Ala Cys Ala Ala Ala Thr Thr Thr Thr Ala
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Gly Gly Thr Gly Gly Gly Cys Thr Ala Cys Thr Gly Thr Cys Gly Ala
 245 250 255

Ala Thr Ala Thr Thr Ala Ala Thr Ala Cys Cys Gly Gly Thr Ala Ala
 260 265 270

Ala Cys Cys Gly Gly Gly Cys Cys Gly Cys Ala Thr Gly Gly Thr Gly
 275 280 285

Ala Cys Cys Ala Ala Cys Gly Ala Thr Thr Ala Thr Ala Thr Thr Gly
 290 295 300

Thr Cys Gly Ala Thr Ala Thr Thr Gly Cys Cys Ala Ala Cys Cys Gly
 305 310 315 320

Cys Gly Ala Thr Gly Gly Thr Cys Ala Ala Thr Thr Gly Cys Ala Gly
 325 330 335

Thr Thr Gly Ala Ala Cys Gly Thr Gly Ala Cys Ala Gly Ala Thr Cys
 340 345 350

Gly Thr Ala Ala Ala Ala Cys Cys Gly Gly Ala Cys Ala Ala Ala Cys
 355 360 365

Cys Thr Cys Gly Ala Cys Cys Ala Thr Cys Cys Ala Gly Gly Thr Thr
 370 375 380

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Ala Cys Thr Cys Ala Ala Cys Cys Gly Ala Thr Thr Thr Thr
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<213> Escherichia coli

<400> 5

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20 25 30

Gly Asn Pro Asn Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln
35 40 45

Asn Ser Tyr Lys Asp Pro Ser Tyr Asn Asp Asp Phe Gly Ile Glu Thr
50 55 60

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

Gly Gly Leu Leu Ser Asn Ile Asn Thr Gly Lys Pro Gly Arg Met Val
85 90 95

Thr Asn Asp Tyr Ile Val Asp Ile Ala Asn Arg Asp Gly Gln Leu Gln
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Leu Asn Val Thr Asp Arg Lys Thr Gly Gln Thr Ser Thr Ile Gln Val
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<210> 6

<211> 119

<212> PRT

<213> Escherichia coli

<400> 6

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20 25 30

Lys Asp Pro Ser Tyr Asn Asp Asp Phe Gly Ile Glu Thr Pro Ser Ala
35 40 45

Leu Asp Asn Phe Thr Gln Ala Ile Gln Ser Gln Ile Leu Gly Gly Leu
50 55 60

Leu Ser Asn Ile Asn Thr Gly Lys Pro Gly Arg Met Val Thr Asn Asp

65 70 75 80

Tyr Ile Val Asp Ile Ala Asn Arg Asp Gly Gln Leu Gln Leu Asn Val
 85 90 95

Thr Asp Arg Lys Thr Gly Gln Thr Ser Thr Ile Gln Val Ser Gly Leu
 100 105 110

Gln Asn Asn Ser Thr Asp Phe
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<210> 7
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<220>
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and a C-terminal 6 His tag

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<210> 8
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<212> PRT
<213> Artificial Sequence

<220>
<223> fragment of wild-type E. coli CsgF encompassing amino acids 1 to
27 and a C-terminal 6 His tag

<400> 8

Met Arg Val Lys His Ala Val Val Leu Leu Met Leu Ile Ser Pro Leu
1 5 10 15

Ser Trp Ala Gly Thr Met Thr Phe Gln Phe Arg His His His His His
 20 25 30

His

<210> 9
<211> 139
<212> DNA
<213> Artificial Sequence

<220>
<223> fragment of wild-type E. coli CsgF encoding amino acids 1 to 38
and a C-terminal 6 His tag

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accatgactt tccagttccg taatccaaac tttggtggta acccaaataa tggccatcac 120

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<210> 10

<211> 44

<212> PRT

<213> Artificial Sequence

<220>

<223> fragment of wild-type E. coli CsgF encompassing amino acids 1 to 38 and a C-terminal 6 His tag

<400> 10

Met Arg Val Lys His Ala Val Val Leu Leu Met Leu Ile Ser Pro Leu
1 5 10 15

Ser Trp Ala Gly Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly
20 25 30

Gly Asn Pro Asn Asn Gly His His His His His His
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<210> 11

<211> 169

<212> DNA

<213> Artificial Sequence

<220>

<223> fragment of wild-type E. coli CsgF encoding amino acids 1 to 48 and a C-terminal 6 His tag

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accatgactt tccagttccg taatccaaac tttggtggta acccaaataa tggcgctttt 120

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<210> 12

<211> 54

<212> PRT

<213> Artificial Sequence

<220>

<223> fragment of wild-type E. coli CsgF encompassing amino acids 1 to 48 and a C-terminal 6 His tag

<400> 12

Met Arg Val Lys His Ala Val Val Leu Leu Met Leu Ile Ser Pro Leu
1 5 10 15

Ser Trp Ala Gly Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly
20 25 30

Gly Asn Pro Asn Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln
35 40 45

His His His His His His
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<210> 13
<211> 217
<212> DNA
<213> Artificial Sequence

<220>
<223> fragment of wild-type E. coli CsgF encoding amino acids 1 to 64
and a C-terminal 6 His tag

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accatgactt tccagttccg taatccaaac tttggtggta acccaaataa tggcgctttt 120
ttattaaata gcgctcaggc ccaaaactct tataaagatc cgagctataa cgatgacttt 180
ggtattgaaa cacatcacca tcaccatcac taagccc 217

<210> 14
<211> 70
<212> PRT
<213> Artificial Sequence

<220>
<223> fragment of wild-type E. coli CsgF encompassing amino acids 1 to
64 and a C-terminal 6 His tag

<400> 14

Met Arg Val Lys His Ala Val Val Leu Leu Met Leu Ile Ser Pro Leu
1 5 10 15

Ser Trp Ala Gly Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly
20 25 30

Gly Asn Pro Asn Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln
35 40 45

Asn Ser Tyr Lys Asp Pro Ser Tyr Asn Asp Asp Phe Gly Ile Glu Thr
50 55 60

His His His His His His
65 70

<210> 15
<211> 34
<212> PRT
<213> Artificial Sequence

<220>

<223> residues 20 to 53 of E. coli CsgF

<400> 15

Gly Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly Gly Asn Pro
1 5 10 15

Asn Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln Asn Ser Tyr
20 25 30

Lys Asp

<210> 16

<211> 25

<212> PRT

<213> Artificial Sequence

<220>

<223> residues 20 to 42 of E. coli CsgF, including KD at its C-terminus

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Gly Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly Gly Asn Pro
1 5 10 15

Asn Asn Gly Ala Phe Leu Leu Lys Asp
20 25

<210> 17

<211> 32

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<223> residues 23 to 55 of CsgF homologue Q88H88

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Thr Glu Leu Val Tyr Thr Pro Val Asn Pro Ala Phe Gly Gly Asn Pro
1 5 10 15

Leu Asn Gly Thr Trp Leu Leu Asn Asn Ala Gln Ala Gln Asn Asp Tyr
20 25 30

<210> 18

<211> 32

<212> PRT

<213> Artificial Sequence

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<223> residues 25 to 57 of CsgF homologue A0A143HJA0

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Thr Glu Leu Ile Tyr Glu Pro Val Asn Pro Asn Phe Gly Gly Asn Pro

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 <213> Artificial Sequence

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Ser Glu Leu Val Tyr Thr Pro Val Asn Pro Asn Phe Gly Gly Asn Pro	1	5	10	15
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Leu Asn Thr Ser His Leu Phe Gly Gly Ala Asn Ala Ile Asn Asp Tyr	20	25	30
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<210> 20
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 <223> residues 19 to 51 of CsgF homologue Q084E5
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Thr Gln Leu Val Tyr Thr Pro Val Asn Pro Ala Phe Gly Gly Ser Tyr	1	5	10	15
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Leu Asn Gly Ser Tyr Leu Leu Ala Asn Ala Ser Ala Gln Asn Glu His	20	25	30
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Ser Ser Leu Val Tyr Glu Pro Val Asn Pro Thr Phe Gly Gly Asn Pro	1	5	10	15
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Leu Asn Thr Thr His Leu Phe Ser Arg Ala Glu Ala Ile Asn Asp Tyr	20	25	30
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<210> 22
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<220>

<223> residues 26 to 58 of CsgF homologue A0A136HQR0

<400> 22

Thr Glu Leu Val Tyr Glu Pro Ile Asn Pro Ser Phe Gly Gly Asn Pro
1 5 10 15

Leu Asn Gly Ser Phe Leu Leu Ser Lys Ala Asn Ser Gln Asn Ala His
20 25 30

<210> 23

<211> 32

<212> PRT

<213> Artificial Sequence

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<223> residues 21 to 53 of CsgF homologue A0A0W1SRL3

<400> 23

Thr Glu Ile Val Tyr Gln Pro Ile Asn Pro Ser Phe Gly Gly Asn Pro
1 5 10 15

Met Asn Gly Ser Phe Leu Leu Gln Lys Ala Gln Ser Gln Asn Ala His
20 25 30

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<211> 33

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<223> residues 26 to 59 of CsgF homologue B0UH01

<400> 24

Ser Ser Leu Val Tyr Gln Pro Val Asn Pro Ala Phe Gly Gly Pro Gln
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Leu Asn Gly Ser Trp Leu Gln Ala Glu Ala Asn Ala Gln Asn Ile Pro
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Gln

<210> 25

<211> 31

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<220>

<223> residues 22 to 53 of CsgF homologue Q6NAU5

<400> 25

Gly Ser Leu Val Tyr Thr Pro Thr Asn Pro Ala Phe Gly Gly Ser Pro
1 5 10 15

Leu Asn Gly Ser Trp Gln Met Gln Gln Ala Thr Ala Gly Asn His
20 25 30

<210> 26
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<223> residues 7 to 38 of CsgF homologue G8PUY5

<400> 26

Gln Gln Leu Ile Tyr Gln Pro Thr Asn Pro Ser Phe Gly Gly Tyr Ala
1 5 10 15

Ala Asn Thr Thr His Leu Phe Ala Thr Ala Asn Ala Gln Lys Thr Ala
20 25 30

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<223> residues 25 to 57 of CsgF homologue A0A0S2ETP7

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Gly Asp Leu Val Tyr Thr Pro Val Asn Pro Ser Phe Gly Gly Ser Pro
1 5 10 15

Leu Asn Ser Ala His Leu Leu Ser Ile Ala Gly Ala Gln Lys Asn Ala
20 25 30

<210> 28
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<212> PRT
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<220>
<223> residues 19 to 51 of CsgF homologue E3I1Z1

<400> 28

Ala Glu Leu Gly Tyr Thr Pro Val Asn Pro Ser Phe Gly Gly Ser Pro
1 5 10 15

Leu Asn Gly Ser Thr Leu Leu Ser Glu Ala Ser Ala Gln Lys Pro Asn
20 25 30

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<220>
<223> residues 24 to 55 of CsgF homologue F3Z094

<400> 29

Thr Glu Leu Val Phe Ser Phe Thr Asn Pro Ser Phe Gly Gly Asp Pro
1 5 10 15

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

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<220>
<223> residues 21 to 53 of CsgF homologue A0A176T7M2

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1 5 10 15

Ser Phe Ala Tyr Gln Gln Leu Leu Ala Ser Ala Asn Ala Gln Asn Asp
20 25 30

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<223> residues 14 to 45 of CsgF homologue D2QPP8

<400> 31

Gln Ala Leu Val Tyr His Pro Asn Asn Pro Ala Phe Gly Gly Asn Thr
1 5 10 15

Phe Asn Tyr Gln Trp Met Leu Ser Ser Ala Gln Ala Gln Asp Arg
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<223> residues 28 to 58 of CsgF homologue N2IYT1

<400> 32

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1 5 10 15

Leu Asn Gly Ser Tyr Leu Leu Gly Asn Ala Gln Ala Gln Asn Asp Tyr
20 25 30

Gly Gln Leu Ile Tyr Gln Pro Ile Asn Pro Ser Phe Gly Gly Asp Pro
1 5 10 15

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<213> Artificial Sequence

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<223> residues 20 to 51 of CsgF homologue A0A167UJA2

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1 5 10 15

Phe Asn Tyr Gln Trp Leu Ala Ser Ser Ala Glu Ser Gln Asn Lys
20 25 30

<210> 37

<211> 8

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<213> Artificial Sequence

<220>

<223> residues 20 to 27 of wild-type E. coli CsgF

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Gly Thr Met Thr Phe Gln Phe Arg
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<210> 38

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<220>

<223> residues 20 to 38 of wild-type E. coli CsgF

<400> 38

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Asn Asn Gly

<210> 39

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<220>

<223> residues 20 to 48 of wild-type E. coli CsgF

<400> 39

Gly Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly Gly Asn Pro
1 5 10 15

Asn Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln
20 25

<210> 40
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<212> PRT
<213> Artificial Sequence

<220>
<223> residues 20 to 64 of wild-type E. coli CsgF

<400> 40

Gly Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly Gly Asn Pro
1 5 10 15

Asn Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln Asn Ser Tyr
20 25 30

Lys Asp Pro Ser Tyr Asn Asp Asp Phe Gly Ile Glu Thr
35 40 45

<210> 41
<211> 24
<212> DNA
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<220>
<223> primer CsgF_d27_end

<400> 41
acggaactgg aaagtcattg ttcc 24

<210> 42
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> primer CsgF_d38_end

<400> 42
gccattattt gggttaccac caaagtttgg 30

<210> 43
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> primer CsgF_d48_end

<400> 43
ttgggcctga gcgctattta ataaaaaagc 30

<210> 44
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
 <223> primer CsgF_d64_end

 <400> 44
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 <210> 45
 <211> 25
 <212> DNA
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 <220>
 <223> primer pNa62_CsgF_histag_Fw

 <400> 45
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 <210> 46
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 <220>
 <223> primer CsgF-His_pET22b_FW

 <400> 46
 ccccatatg ggaacatga ctttccagtt cc 32

 <210> 47
 <211> 55
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> primer CsgF-His_pET22b_Rev

 <400> 47
 ccccgaaattc ctaatggtga tggatgatggt ggtaaaaatc ggtagagta ttttg 55

 <210> 48
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 <212> DNA
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 <223> primer csgEFG_pDONR221_FW

 <400> 48
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 <210> 49
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 <212> DNA
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 <220>
 <223> primer csgEFG_pDONR221_Rev

 <400> 49

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tccaagcgct gg 72

<210> 50

<211> 59

<212> DNA

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<223> primer Mut_csgF_His_FW

<400> 50

caaaataact caaccgattt tcatcaccat caccatcact aagccccagc ttcataagg 59

<210> 51

<211> 59

<212> DNA

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<223> primer Mut_csgF_His_Rev

<400> 51

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<210> 52

<211> 21

<212> DNA

<213> Artificial Sequence

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<223> primer DelCsgE_Rev

<400> 52

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<210> 53

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<212> DNA

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<223> primer DelCsgE FW

<400> 53

ataaaaaatt gttcggaggc tgc 23

<210> 54

<211> 30

<212> PRT

<213> Artificial Sequence

<220>

<223> residues 1 to 29 of mature E. coli CsgF

<400> 54

Gly Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly Gly Asn Pro

1 5 10 15

Asn Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln Asn
20 25 30

<210> 55
<211> 35
<212> PRT
<213> Artificial Sequence

<220>
<223> residues 1 to 45 of mature E. coli CsgF

<400> 55

Gly Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly Gly Asn Pro
1 5 10 15

Asn Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln Asn Ser Tyr
20 25 30

Lys Asp Pro
35

<210> 56
<211> 155
<212> PRT
<213> Artificial Sequence

<220>
<223> a mutated (T4C/N17S) CsgF sequence with a signal sequence, and a
TEV protease cleavage site (ENLYFQS) inserted between residues 35
and 36 of sequence of the mature protein

<400> 56

Met Arg Val Lys His Ala Val Val Leu Leu Met Leu Ile Ser Pro Leu
1 5 10 15

Ser Trp Ala Gly Thr Met Cys Phe Gln Phe Arg Asn Pro Asn Phe Gly
20 25 30

Gly Asn Pro Ser Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln
35 40 45

Asn Ser Tyr Lys Asp Pro Glu Asn Leu Tyr Phe Gln Ser Ser Tyr Asn
50 55 60

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

Ala Ile Gln Ser Gln Ile Leu Gly Gly Leu Leu Ser Asn Ile Asn Thr
85 90 95

Gly Lys Pro Gly Arg Met Val Thr Asn Asp Tyr Ile Val Asp Ile Ala
 100 105 110

Asn Arg Asp Gly Gln Leu Gln Leu Asn Val Thr Asp Arg Lys Thr Gly
 115 120 125

Gln Thr Ser Thr Ile Gln Val Ser Gly Leu Gln Asn Asn Ser Thr Asp
 130 135 140

Phe Ser Ala Trp Ser His Pro Gln Phe Glu Lys
 145 150 155

<210> 57
 <211> 155
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> a mutated (N17S-Del) CsgF sequence with a signal sequence, and a
 TEV protease cleavage site (ENLYFQS) inserted between residues 35
 and 36 of sequence of the mature protein

<400> 57

Met Arg Val Lys His Ala Val Val Leu Leu Met Leu Ile Ser Pro Leu
 1 5 10 15

Ser Trp Ala Gly Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly
 20 25 30

Gly Asn Pro Ser Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln
 35 40 45

Asn Ser Tyr Lys Asp Pro Glu Asn Leu Tyr Phe Gln Ser Ser Tyr Asn
 50 55 60

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

Ala Ile Gln Ser Gln Ile Leu Gly Gly Leu Leu Ser Asn Ile Asn Thr
 85 90 95

Gly Lys Pro Gly Arg Met Val Thr Asn Asp Tyr Ile Val Asp Ile Ala
 100 105 110

Asn Arg Asp Gly Gln Leu Gln Leu Asn Val Thr Asp Arg Lys Thr Gly
 115 120 125

Gln Thr Ser Thr Ile Gln Val Ser Gly Leu Gln Asn Asn Ser Thr Asp
 130 135 140

Phe Ser Ala Trp Ser His Pro Gln Phe Glu Lys
145 150 155

<210> 58
<211> 155
<212> PRT
<213> Artificial Sequence

<220>
<223> a mutated (G1C/N17S) CsgF sequence with a signal sequence, and a
TEV protease cleavage site (ENLYFQS) inserted between residues 35
and 36 of sequence of the mature protein

<400> 58

Met Arg Val Lys His Ala Val Val Leu Leu Met Leu Ile Ser Pro Leu
1 5 10 15

Ser Trp Ala Cys Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly
20 25 30

Gly Asn Pro Ser Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln
35 40 45

Asn Ser Tyr Lys Asp Pro Glu Asn Leu Tyr Phe Gln Ser Ser Tyr Asn
50 55 60

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

Ala Ile Gln Ser Gln Ile Leu Gly Gly Leu Leu Ser Asn Ile Asn Thr
85 90 95

Gly Lys Pro Gly Arg Met Val Thr Asn Asp Tyr Ile Val Asp Ile Ala
100 105 110

Asn Arg Asp Gly Gln Leu Gln Leu Asn Val Thr Asp Arg Lys Thr Gly
115 120 125

Gln Thr Ser Thr Ile Gln Val Ser Gly Leu Gln Asn Asn Ser Thr Asp
130 135 140

Phe Ser Ala Trp Ser His Pro Gln Phe Glu Lys
145 150 155

<210> 59
<211> 155
<212> PRT
<213> Artificial Sequence

<220>
<223> a mutated (G1C) CsgF sequence with a signal sequence, and a TEV

protease cleavage site (ENLYFQS) inserted between residues 35 and 36 of sequence of the mature protein

<400> 59

Met Arg Val Lys His Ala Val Val Leu Leu Met Leu Ile Ser Pro Leu
1 5 10 15

Ser Trp Ala Cys Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly
20 25 30

Gly Asn Pro Asn Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln
35 40 45

Asn Ser Tyr Lys Asp Pro Glu Asn Leu Tyr Phe Gln Ser Ser Tyr Asn
50 55 60

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

Ala Ile Gln Ser Gln Ile Leu Gly Gly Leu Leu Ser Asn Ile Asn Thr
85 90 95

Gly Lys Pro Gly Arg Met Val Thr Asn Asp Tyr Ile Val Asp Ile Ala
100 105 110

Asn Arg Asp Gly Gln Leu Gln Leu Asn Val Thr Asp Arg Lys Thr Gly
115 120 125

Gln Thr Ser Thr Ile Gln Val Ser Gly Leu Gln Asn Asn Ser Thr Asp
130 135 140

Phe Ser Ala Trp Ser His Pro Gln Phe Glu Lys
145 150 155

<210> 60

<211> 155

<212> PRT

<213> Artificial Sequence

<220>

<223> a CsgF sequence with a signal sequence, a TEV protease cleavage site (ENLYFQS) inserted between residues 45 and 46 of sequence of the mature protein, and a His10 tag at the C-terminus

<400> 60

Met Arg Val Lys His Ala Val Val Leu Leu Met Leu Ile Ser Pro Leu
1 5 10 15

Ser Trp Ala Gly Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly
20 25 30

Gly Asn Pro Asn Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln
 35 40 45

Asn Ser Tyr Lys Asp Pro Ser Tyr Asn Asp Asp Phe Gly Ile Glu Thr
 50 55 60

Glu Asn Leu Tyr Phe Gln Ser Pro Ser Ala Leu Asp Asn Phe Thr Gln
 65 70 75 80

Ala Ile Gln Ser Gln Ile Leu Gly Gly Leu Leu Ser Asn Ile Asn Thr
 85 90 95

Gly Lys Pro Gly Arg Met Val Thr Asn Asp Tyr Ile Val Asp Ile Ala
 100 105 110

Asn Arg Asp Gly Gln Leu Gln Leu Asn Val Thr Asp Arg Lys Thr Gly
 115 120 125

Gln Thr Ser Thr Ile Gln Val Ser Gly Leu Gln Asn Asn Ser Thr Asp
 130 135 140

Phe His His His His His His His His His His
 145 150 155

<210> 61
 <211> 155
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> a CsgF sequence with a signal sequence, a TEV protease cleavage site (ENLYFQS) inserted between residues 35 and 36 of sequence of the mature protein, and a His10 tag at the C-terminus

<400> 61

Met Arg Val Lys His Ala Val Val Leu Leu Met Leu Ile Ser Pro Leu
 1 5 10 15

Ser Trp Ala Gly Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly
 20 25 30

Gly Asn Pro Asn Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln
 35 40 45

Asn Ser Tyr Lys Asp Pro Glu Asn Leu Tyr Phe Gln Ser Ser Tyr Asn
 50 55 60

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

Ala Ile Gln Ser Gln Ile Leu Gly Gly Leu Leu Ser Asn Ile Asn Thr
85 90 95

Gly Lys Pro Gly Arg Met Val Thr Asn Asp Tyr Ile Val Asp Ile Ala
100 105 110

Asn Arg Asp Gly Gln Leu Gln Leu Asn Val Thr Asp Arg Lys Thr Gly
115 120 125

Gln Thr Ser Thr Ile Gln Val Ser Gly Leu Gln Asn Asn Ser Thr Asp
130 135 140

Phe His His His His His His His His His His
145 150 155

<210> 62
<211> 155
<212> PRT
<213> Artificial Sequence

<220>
<223> a CsgF sequence with a signal sequence, a TEV protease cleavage site (ENLYFQS) inserted between residues 30 and 31 of sequence of the mature protein, and a His10 tag at the C-terminus.

<400> 62

Met Arg Val Lys His Ala Val Val Leu Leu Met Leu Ile Ser Pro Leu
1 5 10 15

Ser Trp Ala Gly Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly
20 25 30

Gly Asn Pro Asn Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln
35 40 45

Asn Glu Asn Leu Tyr Phe Gln Ser Ser Tyr Lys Asp Pro Ser Tyr Asn
50 55 60

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

Ala Ile Gln Ser Gln Ile Leu Gly Gly Leu Leu Ser Asn Ile Asn Thr
85 90 95

Gly Lys Pro Gly Arg Met Val Thr Asn Asp Tyr Ile Val Asp Ile Ala
100 105 110

Asn Arg Asp Gly Gln Leu Gln Leu Asn Val Thr Asp Arg Lys Thr Gly
115 120 125

Gln Thr Ser Thr Ile Gln Val Ser Gly Leu Gln Asn Asn Ser Thr Asp
130 135 140

Phe His His His His His His His His His His
145 150 155

<210> 63
<211> 149
<212> PRT
<213> Artificial Sequence

<220>
<223> a CsgF sequence with a signal sequence, a TEV protease cleavage site (ENLYFQS) inserted between residues 45 and 51 of sequence of the mature protein, and a His10 tag at the C-terminus

<400> 63

Met Arg Val Lys His Ala Val Val Leu Leu Met Leu Ile Ser Pro Leu
1 5 10 15

Ser Trp Ala Gly Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly
20 25 30

Gly Asn Pro Asn Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln
35 40 45

Asn Ser Tyr Lys Asp Pro Ser Tyr Asn Asp Asp Phe Gly Ile Glu Thr
50 55 60

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

Leu Gly Gly Leu Leu Ser Asn Ile Asn Thr Gly Lys Pro Gly Arg Met
85 90 95

Val Thr Asn Asp Tyr Ile Val Asp Ile Ala Asn Arg Asp Gly Gln Leu
100 105 110

Gln Leu Asn Val Thr Asp Arg Lys Thr Gly Gln Thr Ser Thr Ile Gln
115 120 125

Val Ser Gly Leu Gln Asn Asn Ser Thr Asp Phe His His His His His
130 135 140

His His His His His
145

<210> 64
<211> 149
<212> PRT

<213> Artificial Sequence

<220>

<223> a CsgF sequence with a signal sequence, a TEV protease cleavage site (ENLYFQS) inserted between residues 30 and 37 of sequence of the mature protein, and a His10 tag at the C-terminus

<400> 64

Met Arg Val Lys His Ala Val Val Leu Leu Met Leu Ile Ser Pro Leu
1 5 10 15

Ser Trp Ala Gly Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly
20 25 30

Gly Asn Pro Asn Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln
35 40 45

Asn Glu Asn Leu Tyr Phe Gln Ser Tyr Asn Asp Asp Phe Gly Ile Glu
50 55 60

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

Leu Gly Gly Leu Leu Ser Asn Ile Asn Thr Gly Lys Pro Gly Arg Met
85 90 95

Val Thr Asn Asp Tyr Ile Val Asp Ile Ala Asn Arg Asp Gly Gln Leu
100 105 110

Gln Leu Asn Val Thr Asp Arg Lys Thr Gly Gln Thr Ser Thr Ile Gln
115 120 125

Val Ser Gly Leu Gln Asn Asn Ser Thr Asp Phe His His His His His
130 135 140

His His His His His
145

<210> 65

<211> 155

<212> PRT

<213> Artificial Sequence

<220>

<223> a CsgF sequence with a signal sequence, a HCV C3 protease cleavage site (LEVLFQGP) inserted between residues 34 and 36 of sequence of the mature protein, and a His10 tag at the C-terminus

<400> 65

Met Arg Val Lys His Ala Val Val Leu Leu Met Leu Ile Ser Pro Leu
1 5 10 15

Ser Trp Ala Cys Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly
 20 25 30

Gly Asn Pro Asn Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln
 35 40 45

Asn Ser Tyr Lys Asp Leu Glu Val Leu Phe Gln Gly Pro Ser Tyr Asn
 50 55 60

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

Ala Ile Gln Ser Gln Ile Leu Gly Gly Leu Leu Ser Asn Ile Asn Thr
 85 90 95

Gly Lys Pro Gly Arg Met Val Thr Asn Asp Tyr Ile Val Asp Ile Ala
 100 105 110

Asn Arg Asp Gly Gln Leu Gln Leu Asn Val Thr Asp Arg Lys Thr Gly
 115 120 125

Gln Thr Ser Thr Ile Gln Val Ser Gly Leu Gln Asn Asn Ser Thr Asp
 130 135 140

Phe Ser Ala Trp Ser His Pro Gln Phe Glu Lys
 145 150 155

<210> 66
 <211> 156
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> a CsgF sequence with a signal sequence, a HCV C3 protease
 cleavage site (LEVLFQGP) inserted between residues 42 and 43 of
 sequence of the mature protein, and a His10 tag at the C-terminus

<400> 66

Met Arg Val Lys His Ala Val Val Leu Leu Met Leu Ile Ser Pro Leu
 1 5 10 15

Ser Trp Ala Cys Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly
 20 25 30

Gly Asn Pro Asn Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln
 35 40 45

Asn Ser Tyr Lys Asp Pro Ser Tyr Asn Asp Asp Phe Gly Ile Leu Glu
 50 55 60

Val Leu Phe Gln Gly Pro Glu Thr Pro Ser Ala Leu Asp Asn Phe Thr
65 70 75 80

Gln Ala Ile Gln Ser Gln Ile Leu Gly Gly Leu Leu Ser Asn Ile Asn
85 90 95

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

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

Gly Gln Thr Ser Thr Ile Gln Val Ser Gly Leu Gln Asn Asn Ser Thr
130 135 140

Asp Phe Ser Ala Trp Ser His Pro Gln Phe Glu Lys
145 150 155

<210> 67

<211> 148

<212> PRT

<213> Artificial Sequence

<220>

<223> a CsgF sequence with a signal sequence, a HCV C3 protease
cleavage site (LEVLFQGP) inserted between residues 38 and 47 of
sequence of the mature protein, and a His10 tag at the C-terminus

<400> 67

Met Arg Val Lys His Ala Val Val Leu Leu Met Leu Ile Ser Pro Leu
1 5 10 15

Ser Trp Ala Cys Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly
20 25 30

Gly Asn Pro Asn Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln
35 40 45

Asn Ser Tyr Lys Asp Pro Ser Tyr Asn Leu Glu Val Leu Phe Gln Gly
50 55 60

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

Gly Gly Leu Leu Ser Asn Ile Asn Thr Gly Lys Pro Gly Arg Met Val
85 90 95

Thr Asn Asp Tyr Ile Val Asp Ile Ala Asn Arg Asp Gly Gln Leu Gln
100 105 110

Leu Asn Val Thr Asp Arg Lys Thr Gly Gln Thr Ser Thr Ile Gln Val
115 120 125

Ser Gly Leu Gln Asn Asn Ser Thr Asp Phe Ser Ala Trp Ser His Pro
130 135 140

Gln Phe Glu Lys
145

<210> 68
<211> 248
<212> PRT
<213> *Citrobacter koseri*

<400> 68

Met Pro Arg Ala Gln Ser Tyr Lys Asp Leu Thr His Leu Pro Met Pro
1 5 10 15

Thr Gly Lys Ile Phe Val Ser Val Tyr Asn Ile Gln Asp Glu Thr Gly
20 25 30

Gln Phe Lys Pro Tyr Pro Ala Ser Asn Phe Ser Thr Ala Val Pro Gln
35 40 45

Ser Ala Thr Ala Met Leu Val Thr Ala Leu Lys Asp Ser Arg Trp Phe
50 55 60

Ile Pro Leu Glu Arg Gln Gly Leu Gln Asn Leu Leu Asn Glu Arg Lys
65 70 75 80

Ile Ile Arg Ala Ala Gln Glu Asn Gly Thr Val Ala Ile Asn Asn Arg
85 90 95

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

Ile Ile Gly Tyr Glu Ser Asn Val Lys Ser Gly Gly Val Gly Ala Arg
115 120 125

Tyr Phe Gly Ile Gly Ala Asp Thr Gln Tyr Gln Leu Asp Gln Ile Ala
130 135 140

Val Asn Leu Arg Val Val Asn Val Ser Thr Gly Glu Ile Leu Ser Ser
145 150 155 160

Val Asn Thr Ser Lys Thr Ile Leu Ser Tyr Glu Val Gln Ala Gly Val
165 170 175

Phe Arg Phe Ile Asp Tyr Gln Arg Leu Leu Glu Gly Glu Ile Gly Tyr
180 185 190

Thr Ser Asn Glu Pro Val Met Leu Cys Leu Met Ser Ala Ile Glu Thr
195 200 205

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

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

His Met Ser Val Pro Pro Glu Ser
245

<210> 69
<211> 223
<212> PRT
<213> Salmonella enterica

<400> 69

Cys Leu Thr Ala Pro Pro Lys Gln Ala Ala Lys Pro Thr Leu Met Pro
1 5 10 15

Arg Ala Gln Ser Tyr Lys Asp Leu Thr His Leu Pro Ala Pro Thr Gly
20 25 30

Lys Ile Phe Val Ser Val Tyr Asn Ile Gln Asp Glu Thr Gly Gln Phe
35 40 45

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

Thr Ala Met Leu Val Thr Ala Leu Lys Asp Ser Arg Trp Phe Ile Pro
65 70 75 80

Leu Glu Arg Gln Gly Leu Gln Asn Leu Leu Asn Glu Arg Lys Ile Ile
85 90 95

Arg Ala Ala Gln Glu Asn Gly Thr Val Ala Met Asn Asn Arg Ile Pro
100 105 110

Leu Gln Ser Leu Thr Ala Ala Asn Ile Met Val Glu Gly Ser Ile Ile
115 120 125

Gly Tyr Glu Ser Asn Val Lys Ser Gly Gly Val Gly Ala Arg Tyr Phe
130 135 140

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

145		150		155		160
Leu Arg Val Val	Asn Val Ser Thr Gly Glu Ile Leu Ser Ser Val Asn					
	165			170		175
Thr Ser Lys Thr	Ile Leu Ser Tyr Glu Val Gln Ala Gly Val Phe Arg					
	180		185			190
Phe Ile Asp Tyr	Gln Arg Leu Leu Glu Gly Glu Ile Gly Tyr Thr Ser					
	195		200			205
Asn Glu Pro Val Met	Leu Cys Leu Met Ser Ala Ile Glu Thr Gly					
	210		215			220
<210> 70						
<211> 262						
<212> PRT						
<213> Citrobacter amalonaticus						
<400> 70						
Cys Leu Thr Ala Pro Pro Lys Glu Ala Ala Lys Pro Thr Leu Met Pro						
1		5		10		15
Arg Ala Gln Ser Tyr Lys Asp Leu Thr His Leu Pro Ile Pro Thr Gly						
	20		25			30
Lys Ile Phe Val Ser Val Tyr Asn Ile Gln Asp Glu Thr Gly Gln Phe						
	35		40			45
Lys Pro Tyr Pro Ala Ser Asn Phe Ser Thr Ala Val Pro Gln Ser Ala						
	50		55			60
Thr Ala Met Leu Val Thr Ala Leu Lys Asp Ser Arg Trp Phe Val Pro						
65		70		75		80
Leu Glu Arg Gln Gly Leu Gln Asn Leu Leu Asn Glu Arg Lys Ile Ile						
	85		90			95
Arg Ala Ala Gln Glu Asn Gly Thr Val Ala Ile Asn Asn Arg Ile Pro						
	100		105			110
Leu Gln Ser Leu Thr Ala Ala Asn Ile Met Val Glu Gly Ser Ile Ile						
	115		120			125
Gly Tyr Glu Ser Asn Val Lys Ser Gly Gly Val Gly Ala Arg Tyr Phe						
	130		135			140
Gly Ile Gly Ala Asp Thr Gln Tyr Gln Leu Asp Gln Ile Ala Val Asn						
145		150		155		160

Leu Arg Val Val Asn Val Ser Thr Gly Glu Ile Leu Ser Ser Val Asn
165 170 175

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

Phe Ile Asp Tyr Gln Arg Leu Leu Glu Gly Glu Ile Gly Tyr Thr Ser
195 200 205

Asn Glu Pro Val Met Leu Cys Leu Met Ser Ala Ile Glu Thr Gly Val
210 215 220

Ile Phe Leu Ile Asn Asp Gly Ile Asp Arg Gly Leu Trp Asp Leu Gln
225 230 235 240

Asn Lys Ala Asp Arg Gln Asn Asp Ile Leu Val Lys Tyr Arg His Met
245 250 255

Ser Val Pro Pro Glu Ser
260

<210> 71
<211> 262
<212> PRT
<213> Citrobacter rodentium

<400> 71

Cys Leu Thr Thr Pro Pro Lys Glu Ala Ala Lys Pro Thr Leu Met Pro
1 5 10 15

Arg Ala Gln Ser Tyr Lys Asp Leu Thr His Leu Pro Val Pro Thr Gly
20 25 30

Lys Ile Phe Val Ser Val Tyr Asn Ile Gln Asp Glu Thr Gly Gln Phe
35 40 45

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

Thr Ala Met Leu Val Thr Ala Leu Lys Asp Ser Arg Trp Phe Ile Pro
65 70 75 80

Leu Glu Arg Gln Gly Leu Gln Asn Leu Leu Asn Glu Arg Lys Ile Ile
85 90 95

Arg Ala Ala Gln Glu Asn Gly Thr Val Ala Ile Asn Asn Arg Ile Pro
100 105 110

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

Gly Tyr Glu Ser Asn Val Lys Ser Gly Gly Ala Gly Ala Arg Tyr Phe
130 135 140

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

Leu Arg Val Val Asn Val Ser Thr Gly Glu Ile Leu Ser Ser Val Asn
165 170 175

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

Phe Ile Asp Tyr Gln Arg Leu Leu Glu Gly Glu Ile Gly Tyr Thr Ser
195 200 205

Asn Glu Pro Val Met Leu Cys Leu Met Ser Ala Ile Glu Thr Gly Val
210 215 220

Ile Phe Leu Ile Asn Asp Gly Ile Asp Arg Gly Leu Trp Asp Leu Gln
225 230 235 240

Asn Lys Ala Asp Arg Gln Asn Asp Ile Leu Val Lys Tyr Arg Gln Met
245 250 255

Ser Val Pro Pro Glu Ser
260

<210> 72
<211> 262
<212> PRT
<213> Enterobacter asburiae

<400> 72

Cys Leu Thr Ala Pro Pro Lys Glu Ala Ala Lys Pro Thr Leu Met Pro
1 5 10 15

Arg Ala Gln Ser Tyr Arg Asp Leu Thr His Leu Pro Ala Pro Thr Gly
20 25 30

Lys Ile Phe Val Ser Val Tyr Asn Ile Gln Asp Glu Thr Gly Gln Phe
35 40 45

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

Thr Ala Met Leu Val Thr Ala Leu Lys Asp Ser His Trp Phe Ile Pro
65 70 75 80

Leu Glu Arg Gln Gly Leu Gln Asn Leu Leu Asn Glu Arg Lys Ile Ile
85 90 95

Arg Ala Ala Gln Glu Asn Gly Thr Val Ala Asn Asn Asn Arg Met Pro
100 105 110

Leu Gln Ser Leu Ala Ala Ala Asn Val Met Ile Glu Gly Ser Ile Ile
115 120 125

Gly Tyr Glu Ser Asn Val Lys Ser Gly Gly Val Gly Ala Arg Tyr Phe
130 135 140

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

Leu Arg Val Val Asn Val Ser Thr Gly Glu Val Leu Ser Ser Val Asn
165 170 175

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

Phe Ile Asp Tyr Gln Arg Leu Leu Glu Gly Glu Ile Gly Tyr Thr Ser
195 200 205

Asn Glu Pro Val Met Met Cys Leu Met Ser Ala Ile Glu Thr Gly Val
210 215 220

Ile Phe Leu Ile Asn Asp Gly Ile Asp Arg Gly Leu Trp Asp Leu Gln
225 230 235 240

Asn Lys Ala Asp Ala Gln Asn Pro Val Leu Val Lys Tyr Arg Asp Met
245 250 255

Ser Val Pro Pro Glu Ser
260

<210> 73
<211> 262
<212> PRT
<213> Yokenella regensburgei

<400> 73

Cys Leu Thr Ala Pro Pro Lys Glu Ala Ala Lys Pro Thr Leu Met Pro
1 5 10 15

Arg Ala Gln Ser Tyr Arg Asp Leu Thr His Leu Pro Leu Pro Ser Gly

20

25

30

Lys Val Phe Val Ser Val Tyr Asn Ile Gln Asp Glu Thr Gly Gln Phe
 35 40 45

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

Thr Ala Met Leu Val Thr Ala Leu Lys Asp Ser Arg Trp Phe Val Pro
 65 70 75 80

Leu Glu Arg Gln Gly Leu Gln Asn Leu Leu Asn Glu Arg Lys Ile Ile
 85 90 95

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

Leu Gln Ser Leu Thr Ala Ala Asn Val Met Ile Glu Gly Ser Ile Ile
 115 120 125

Gly Tyr Glu Ser Asn Val Lys Ser Gly Gly Val Gly Ala Arg Tyr Phe
 130 135 140

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

Leu Arg Val Val Asn Val Ser Thr Gly Glu Val Leu Ser Ser Val Asn
 165 170 175

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

Phe Val Asp Tyr Gln Arg Leu Leu Glu Gly Glu Ile Gly Tyr Thr Ser
 195 200 205

Asn Glu Pro Val Met Leu Cys Leu Met Ser Ala Ile Glu Thr Gly Val
 210 215 220

Ile Tyr Leu Ile Asn Asp Gly Ile Glu Arg Gly Leu Trp Asp Leu Gln
 225 230 235 240

Gln Lys Ala Asp Val Asp Asn Pro Ile Leu Ala Arg Tyr Arg Asn Met
 245 250 255

Ser Ala Pro Pro Glu Ser
 260

<210> 74

<211> 262
<212> PRT
<213> Cronobacter pulveris

<400> 74

Cys Leu Thr Ala Pro Pro Lys Glu Ala Ala Lys Pro Thr Leu Met Pro
1 5 10 15

Arg Ala Gln Ser Tyr Arg Asp Leu Thr Asn Leu Pro Asp Pro Lys Gly
20 25 30

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

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

Thr Ser Met Leu Val Thr Ala Leu Lys Asp Ser Arg Trp Phe Ile Pro
65 70 75 80

Leu Glu Arg Gln Gly Leu Gln Asn Leu Leu Asn Glu Arg Lys Ile Ile
85 90 95

Arg Ala Ala Gln Glu Asn Gly Thr Val Ala Glu Asn Asn Arg Met Pro
100 105 110

Leu Gln Ser Leu Val Ala Ala Asn Val Met Ile Glu Gly Ser Ile Ile
115 120 125

Gly Tyr Glu Ser Asn Val Lys Ser Gly Gly Val Gly Ala Arg Tyr Phe
130 135 140

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

Leu Arg Val Val Asn Val Ser Thr Gly Glu Val Leu Ser Ser Val Asn
165 170 175

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

Phe Ile Asp Tyr Gln Arg Leu Leu Glu Gly Glu Ile Gly Tyr Thr Ala
195 200 205

Asn Glu Pro Val Met Leu Cys Leu Met Ser Ala Ile Glu Thr Gly Val
210 215 220

Ile His Leu Ile Asn Asp Gly Ile Asn Arg Gly Leu Trp Glu Leu Lys
225 230 235 240

Asn	Lys	Gly	Asp	Ala	Lys	Asn	Thr	Ile	Leu	Ala	Lys	Tyr	Arg	Ser	Met
				245					250					255	

Ala	Val	Pro	Pro	Glu	Ser
				260	

<210> 75
 <211> 262
 <212> PRT
 <213> Rahnella aquatilis

<400> 75

Cys	Leu	Thr	Ala	Ala	Pro	Lys	Glu	Ala	Ala	Arg	Pro	Thr	Leu	Leu	Pro
1				5					10					15	

Arg	Ala	Pro	Ser	Tyr	Thr	Asp	Leu	Thr	His	Leu	Pro	Ser	Pro	Gln	Gly
			20					25					30		

Arg	Ile	Phe	Val	Ser	Val	Tyr	Asn	Ile	Gln	Asp	Glu	Thr	Gly	Gln	Phe
		35					40					45			

Lys	Pro	Tyr	Pro	Ala	Cys	Asn	Phe	Ser	Thr	Ala	Val	Pro	Gln	Ser	Ala
	50					55					60				

Thr	Ala	Met	Leu	Val	Ser	Ala	Leu	Lys	Asp	Ser	Lys	Trp	Phe	Ile	Pro
65					70					75					80

Leu	Glu	Arg	Gln	Gly	Leu	Gln	Asn	Leu	Leu	Asn	Glu	Arg	Lys	Ile	Ile
				85					90					95	

Arg	Ala	Ala	Gln	Glu	Asn	Gly	Ser	Val	Ala	Ile	Asn	Asn	Gln	Arg	Pro
			100					105					110		

Leu	Ser	Ser	Leu	Val	Ala	Ala	Asn	Ile	Leu	Ile	Glu	Gly	Ser	Ile	Ile
		115					120					125			

Gly	Tyr	Glu	Ser	Asn	Val	Lys	Ser	Gly	Gly	Val	Gly	Ala	Arg	Tyr	Phe
	130					135					140				

Gly	Ile	Gly	Ala	Ser	Thr	Gln	Tyr	Gln	Leu	Asp	Gln	Ile	Ala	Val	Asn
145					150					155					160

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

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

Phe Ile Asp Tyr Gln Arg Leu Leu Glu Gly Glu Leu Gly Tyr Thr Thr
195 200 205

Asn Glu Pro Val Met Leu Cys Leu Met Ser Ala Ile Glu Ser Gly Val
210 215 220

Ile Tyr Leu Val Asn Asp Gly Ile Glu Arg Asn Leu Trp Gln Leu Gln
225 230 235 240

Asn Pro Ser Glu Ile Asn Ser Pro Ile Leu Gln Arg Tyr Lys Asn Asn
245 250 255

Ile Val Pro Ala Glu Ser
260

<210> 76
<211> 259
<212> PRT
<213> Kluyvera ascorbata

<400> 76

Cys Ile Thr Ser Pro Pro Lys Gln Ala Ala Lys Pro Thr Leu Leu Pro
1 5 10 15

Arg Ser Gln Ser Tyr Gln Asp Leu Thr His Leu Pro Glu Pro Gln Gly
20 25 30

Arg Leu Phe Val Ser Val Tyr Asn Ile Ser Asp Glu Thr Gly Gln Phe
35 40 45

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

Thr Ala Met Leu Val Ser Ala Leu Lys Asp Ser Asn Trp Phe Ile Pro
65 70 75 80

Leu Glu Arg Gln Gly Leu Gln Asn Leu Leu Asn Glu Arg Lys Ile Ile
85 90 95

Arg Ala Ala Gln Glu Asn Gly Thr Val Ala Val Asn Asn Arg Thr Gln
100 105 110

Leu Pro Ser Leu Val Ala Ala Asn Ile Leu Ile Glu Gly Ser Ile Ile
115 120 125

Gly Tyr Glu Ser Asn Val Lys Ser Gly Gly Ala Gly Ala Arg Tyr Phe
130 135 140

Gly Ile Gly Ala Ser Thr Gln Tyr Gln Leu Asp Gln Ile Ala Val Asn
145 150 155 160

Leu Arg Val Val Asn Val Ser Thr Gly Glu Val Leu Ser Ser Val Asn
165 170 175

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

Tyr Ile Asp Tyr Gln Arg Leu Leu Glu Gly Glu Val Gly Tyr Thr Val
195 200 205

Asn Glu Pro Val Met Leu Cys Leu Met Ser Ala Ile Glu Thr Gly Val
210 215 220

Ile Tyr Leu Val Asn Asp Gly Ile Ser Arg Asn Leu Trp Gln Leu Lys
225 230 235 240

Asn Ala Ser Asp Ile Asn Ser Pro Val Leu Glu Lys Tyr Lys Ser Ile
245 250 255

Ile Val Pro

<210> 77
<211> 259
<212> PRT
<213> Hafnia alvei

<400> 77

Cys Leu Thr Ala Pro Pro Lys Gln Ala Ala Lys Pro Thr Leu Met Pro
1 5 10 15

Arg Ala Gln Ser Tyr Gln Asp Leu Thr His Leu Pro Glu Pro Ala Gly
20 25 30

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

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

Thr Ala Met Leu Val Ser Ala Leu Lys Asp Ser Gly Trp Phe Ile Pro
65 70 75 80

Leu Glu Arg Gln Gly Leu Gln Asn Leu Leu Asn Glu Arg Lys Ile Ile
85 90 95

Arg Ala Ala Gln Glu Asn Gly Thr Ala Ala Val Asn Asn Gln His Gln

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

Ile Val Pro

<210> 78
 <211> 255
 <212> PRT
 <213> Enterobacteriaceae bacterium
 <400> 78

Cys	Ile	Thr	Thr	Pro	Pro	Gln	Glu	Ala	Ala	Lys	Pro	Thr	Leu	Leu	Pro
1				5					10					15	
Arg	Asp	Ala	Thr	Tyr	Lys	Asp	Leu	Val	Ser	Leu	Pro	Gln	Pro	Arg	Gly
			20					25					30		
Lys	Ile	Tyr	Val	Ala	Val	Tyr	Asn	Ile	Gln	Asp	Glu	Thr	Gly	Gln	Phe
		35					40					45			
Gln	Pro	Tyr	Pro	Ala	Ser	Asn	Phe	Ser	Thr	Ser	Val	Pro	Gln	Ser	Ala
	50					55					60				

Thr Ala Met Leu Val Ser Ser Leu Lys Asp Ser Arg Trp Phe Val Pro
65 70 75 80

Leu Glu Arg Gln Gly Leu Asn Asn Leu Leu Asn Glu Arg Lys Ile Ile
85 90 95

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

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

Gly Tyr Ala Ser Asn Val Lys Thr Gly Gly Phe Gly Ala Arg Tyr Phe
130 135 140

Gly Ile Gly Gly Ser Thr Gln Tyr Gln Leu Asp Gln Val Ala Val Asn
145 150 155 160

Leu Arg Ile Val Asn Val His Thr Gly Glu Val Leu Ser Ser Val Asn
165 170 175

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

Phe Ile Asp Tyr Gln Arg Leu Leu Glu Gly Glu Ala Gly Phe Thr Thr
195 200 205

Asn Glu Pro Val Met Thr Cys Leu Met Ser Ala Ile Glu Glu Gly Val
210 215 220

Ile His Leu Ile Asn Asp Gly Ile Asn Lys Lys Leu Trp Ala Leu Ser
225 230 235 240

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

<210> 79
<211> 258
<212> PRT
<213> Plesiomonas shigelloides

<400> 79

Ile Thr Glu Val Pro Lys Glu Ala Ala Lys Pro Thr Leu Met Pro Arg
1 5 10 15

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

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Ile Ile Val Ser Val Tyr Ser Val Gln Asp Glu Thr Gly Gln Phe Lys
   35                               40                       45

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

Ala Met Leu Thr Ser Ala Leu Lys Asp Ser Gly Trp Phe Val Pro Leu
   65                               70                       75                       80

Glu Arg Glu Gly Leu Gln Asn Leu Leu Asn Glu Arg Lys Ile Ile Arg
      85                               90                       95

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

Pro Ser Leu Leu Ser Ala Asn Val Val Ile Glu Gly Ala Ile Ile Gly
      115                               120                       125

Tyr Asp Ser Asp Ile Lys Thr Gly Gly Ala Gly Ala Arg Tyr Phe Gly
      130                               135                       140

Ile Gly Ala Asp Gly Lys Tyr Arg Val Asp Gln Val Ala Val Asn Leu
      145                               150                       155                       160

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

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

Ile Glu Tyr Gln Arg Leu Leu Glu Leu Glu Ala Gly Tyr Thr Thr Asn
      195                               200                       205

Glu Pro Val Met Met Cys Met Met Ser Ala Leu Glu Ala Gly Val Ala
      210                               215                       220

His Leu Ile Val Glu Gly Ile Arg Gln Asn Leu Trp Ser Leu Gln Asn
      225                               230                       235                       240

Pro Ser Asp Ile Asn Asn Pro Ile Ile Gln Arg Tyr Met Lys Glu Asp
      245                               250                       255

Val Pro

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<210> 80
<211> 248
<212> PRT

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<213> *Vibrio fischeri*

<400> 80

Pro Glu Thr Ser Glu Ser Pro Thr Leu Met Gln Arg Gly Ala Asn Tyr
1 5 10 15

Ile Asp Leu Ile Ser Leu Pro Lys Pro Gln Gly Lys Ile Phe Val Ser
20 25 30

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

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

Met Ala Leu Leu Asp Ser Glu Trp Phe Tyr Pro Leu Glu Arg Gln Gly
65 70 75 80

Leu Gln Asn Leu Leu Thr Glu Arg Lys Ile Ile Arg Ala Ala Gln Lys
85 90 95

Lys Gln Glu Ser Ile Ser Asn His Gly Ser Thr Leu Pro Ser Leu Leu
100 105 110

Ser Ala Asn Val Met Ile Glu Gly Gly Ile Val Ala Tyr Asp Ser Asn
115 120 125

Ile Lys Thr Gly Gly Ala Gly Ala Arg Tyr Leu Gly Ile Gly Gly Ser
130 135 140

Gly Gln Tyr Arg Ala Asp Gln Val Thr Val Asn Ile Arg Ala Val Asp
145 150 155 160

Val Arg Ser Gly Lys Ile Leu Thr Ser Val Thr Thr Ser Lys Thr Ile
165 170 175

Leu Ser Tyr Glu Val Ser Ala Gly Ala Phe Arg Phe Val Asp Tyr Lys
180 185 190

Glu Leu Leu Glu Val Glu Leu Gly Tyr Thr Asn Asn Glu Pro Val Asn
195 200 205

Ile Ala Leu Met Ser Ala Ile Asp Ser Ala Val Ile His Leu Ile Val
210 215 220

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

Asn Asn Pro Ile Phe Lys Lys Tyr
245

<210> 81
<211> 248
<212> PRT
<213> Aliivibrio logei

<400> 81

Pro Asp Ala Ser Glu Ser Pro Thr Leu Met Gln Arg Gly Ala Thr Tyr
1 5 10 15

Leu Asp Leu Ile Ser Leu Pro Lys Pro Gln Gly Lys Ile Tyr Val Ser
20 25 30

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

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

Met Ala Leu Leu Asp Ser Glu Trp Phe Tyr Pro Leu Glu Arg Gln Gly
65 70 75 80

Leu Gln Asn Leu Leu Thr Glu Arg Lys Ile Ile Arg Ala Ala Gln Lys
85 90 95

Lys Gln Glu Ser Ile Ser Asn His Gly Ser Thr Leu Pro Ser Leu Leu
100 105 110

Ser Ala Asn Val Met Ile Glu Gly Gly Ile Val Ala Tyr Asp Ser Asn
115 120 125

Ile Lys Thr Gly Gly Ala Gly Ala Arg Tyr Leu Gly Ile Gly Gly Ser
130 135 140

Gly Gln Tyr Arg Ala Asp Gln Val Thr Val Asn Ile Arg Ala Val Asp
145 150 155 160

Val Arg Ser Gly Lys Ile Leu Thr Ser Val Thr Thr Ser Lys Thr Ile
165 170 175

Leu Ser Tyr Glu Leu Ser Ala Gly Ala Phe Arg Phe Val Asp Tyr Lys
180 185 190

Glu Leu Leu Glu Val Glu Leu Gly Tyr Thr Asn Asn Glu Pro Val Asn
195 200 205

Ile Ala Leu Met Ser Ala Ile Asp Ser Ala Val Ile His Leu Ile Val

210

215

220

Lys Gly Ile Glu Glu Gly Leu Trp Arg Pro Glu Asn Gln Asn Gly Lys
 225 230 235 240

Glu Asn Pro Ile Phe Arg Lys Tyr
 245

<210> 82

<211> 254

<212> PRT

<213> Photobacterium sp.

<400> 82

Pro Glu Thr Ser Lys Glu Pro Thr Leu Met Ala Arg Gly Thr Ala Tyr
 1 5 10 15

Gln Asp Leu Val Ser Leu Pro Leu Pro Lys Gly Lys Val Tyr Val Ser
 20 25 30

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

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

Thr Ala Leu Leu Asp Ser Arg Trp Phe Met Pro Leu Glu Arg Glu Gly
 65 70 75 80

Leu Gln Asn Leu Leu Thr Glu Arg Lys Ile Ile Arg Ala Ala Gln Lys
 85 90 95

Lys Asp Glu Ile Pro Thr Asn His Gly Val His Leu Pro Ser Leu Ala
 100 105 110

Ser Ala Asn Ile Met Val Glu Gly Gly Ile Val Ala Tyr Asp Thr Asn
 115 120 125

Ile Gln Thr Gly Gly Ala Gly Ala Arg Tyr Leu Gly Val Gly Ala Ser
 130 135 140

Gly Gln Tyr Arg Thr Asp Gln Val Thr Val Asn Ile Arg Ala Val Asp
 145 150 155 160

Val Arg Thr Gly Arg Ile Leu Leu Ser Val Thr Thr Ser Lys Thr Ile
 165 170 175

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

Asp Leu Leu Glu Ala Glu Leu Gly Tyr Thr Thr Asn Glu Pro Val Asn
195 200 205

Leu Ala Val Met Ser Ala Ile Asp Ala Ala Val Val His Val Ile Val
210 215 220

Asp Gly Ile Lys Thr Gly Leu Trp Glu Pro Leu Arg Gly Glu Asp Leu
225 230 235 240

Gln His Pro Ile Ile Gln Glu Tyr Met Asn Arg Ser Lys Pro
245 250

<210> 83

<211> 261

<212> PRT

<213> Aeromonas veronii

<400> 83

Cys Ala Thr His Ile Gly Ser Pro Val Ala Asp Glu Lys Ala Thr Leu
1 5 10 15

Met Pro Arg Ser Val Ser Tyr Lys Glu Leu Ile Ser Leu Pro Lys Pro
20 25 30

Lys Gly Lys Ile Val Ala Ala Val Tyr Asp Phe Arg Asp Gln Thr Gly
35 40 45

Gln Tyr Leu Pro Ala Pro Ala Ser Asn Phe Ser Thr Ala Val Thr Gln
50 55 60

Gly Gly Val Ala Met Leu Ser Thr Ala Leu Trp Asp Ser Gln Trp Phe
65 70 75 80

Val Pro Leu Glu Arg Glu Gly Leu Gln Asn Leu Leu Thr Glu Arg Lys
85 90 95

Ile Val Arg Ala Ala Gln Asn Lys Pro Asn Val Pro Gly Asn Asn Ala
100 105 110

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

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

Tyr Phe Gly Ile Gly Ala Ser Gly Glu Tyr Arg Val Asp Gln Val Thr
145 150 155 160

Val Asn Leu Arg Ala Val Asp Ile Arg Ser Gly Arg Ile Leu Asn Ser
165 170 175

Val Thr Thr Ser Lys Thr Val Met Ser Gln Gln Val Gln Ala Gly Val
180 185 190

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

Ser Thr Asn Glu Pro Val Gln Met Cys Val Met Ser Ala Ile Glu Ser
210 215 220

Gly Val Ile Arg Leu Ile Ala Asn Gly Val Arg Asp Asn Leu Trp Gln
225 230 235 240

Leu Ala Asp Gln Arg Asp Ile Asp Asn Pro Ile Leu Gln Glu Tyr Leu
245 250 255

Gln Asp Asn Ala Pro
260

<210> 84
<211> 239
<212> PRT
<213> Shewanella sp.

<400> 84

Ala Ser Ser Ser Leu Met Pro Lys Gly Glu Ser Tyr Tyr Asp Leu Ile
1 5 10 15

Asn Leu Pro Ala Pro Gln Gly Val Met Leu Ala Ala Val Tyr Asp Phe
20 25 30

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

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

Asp Ser Ser Trp Phe Ile Pro Val Glu Arg Glu Gly Leu Gln Asn Leu
65 70 75 80

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

Lys Leu Pro Gln Leu Asn Ser Ala Gln Ile Leu Met Glu Gly Gly Ile
100 105 110

Val Ala Tyr Asp Thr Asn Val Arg Thr Gly Gly Ala Gly Ala Arg Tyr
115 120 125

Leu Gly Ile Gly Ala Ala Thr Gln Phe Arg Val Asp Thr Val Thr Val
130 135 140

Asn Leu Arg Ala Val Asp Ile Arg Thr Gly Arg Leu Leu Ser Ser Val
145 150 155 160

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

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

Ser Asn Glu Pro Val Ser Leu Cys Val Ala Ser Ala Ile Glu Ser Ala
195 200 205

Val Val His Met Ile Ala Asp Gly Ile Trp Lys Gly Ala Trp Asn Leu
210 215 220

Ala Asp Gln Ala Ser Gly Leu Arg Ser Pro Val Leu Gln Lys Tyr
225 230 235

<210> 85
<211> 233
<212> PRT
<213> Pseudomonas putida

<400> 85

Gln Asp Ser Glu Thr Pro Thr Leu Thr Pro Arg Ala Ser Thr Tyr Tyr
1 5 10 15

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

Tyr Gly Phe Arg Asp Gln Thr Gly Gln Tyr Lys Pro Thr Pro Ala Ser
35 40 45

Ser Phe Ser Thr Ser Val Thr Gln Gly Ala Ala Ser Met Leu Met Asp
50 55 60

Ala Leu Ser Ala Ser Gly Trp Phe Val Val Leu Glu Arg Glu Gly Leu
65 70 75 80

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

Pro Asp Val Ala Glu Asn Ile Met Gly Glu Leu Pro Pro Leu Gln Ala

100

105

110

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

Arg Ser Gly Gly Glu Gly Ala Arg Tyr Leu Gly Ile Asp Ile Ser Arg
 130 135 140

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

Arg Thr Gly Gln Val Leu Ala Asn Val Met Thr Ser Lys Thr Ile Tyr
 165 170 175

Ser Val Gly Arg Ser Ala Gly Val Phe Lys Phe Ile Glu Phe Lys Lys
 180 185 190

Leu Leu Glu Ala Glu Val Gly Tyr Thr Thr Asn Glu Pro Ala Gln Leu
 195 200 205

Cys Val Leu Ser Ala Ile Glu Ser Ala Val Gly His Leu Leu Ala Gln
 210 215 220

Gly Ile Glu Gln Arg Leu Trp Gln Val
 225 230

<210> 86

<211> 234

<212> PRT

<213> Shewanella violacea

<400> 86

Met Pro Lys Ser Asp Thr Tyr Tyr Asp Leu Ile Gly Leu Pro His Pro
 1 5 10 15

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

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

Ser Gly Thr Ala Phe Leu Ala Gln Ala Leu Asn Asp Ser Ser Trp Phe
 50 55 60

Val Pro Val Glu Arg Glu Gly Leu Gln Asn Leu Leu Thr Glu Arg Lys
 65 70 75 80

Ile Val Arg Ala Gly Leu Lys Gly Glu Ala Asn Gln Leu Pro Gln Leu
 85 90 95

Ser Ser Ala Gln Ile Leu Met Glu Gly Gly Ile Val Ala Tyr Asp Thr
100 105 110

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

Asn Ser Lys Phe Arg Val Asp Thr Val Thr Val Asn Leu Arg Ala Val
130 135 140

Asp Ile Arg Thr Gly Arg Leu Leu Ser Ser Val Thr Thr Thr Lys Ser
145 150 155 160

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

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

Ser Leu Cys Val Ala Gln Ala Ile Glu Ser Ala Val Val His Met Ile
195 200 205

Ala Asp Gly Ile Trp Lys Arg Ala Trp Asn Leu Ala Asp Thr Ala Ser
210 215 220

Gly Leu Asn Asn Pro Val Leu Gln Lys Tyr
225 230

<210> 87
<211> 245
<212> PRT
<213> Marinobacterium jannaschii

<400> 87

Leu Thr Arg Arg Met Ser Thr Tyr Gln Asp Leu Ile Asp Met Pro Ala
1 5 10 15

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

Gly Gln Tyr Lys Pro Ala Pro Ser Ser Ser Phe Ser Thr Ala Val Thr
35 40 45

Gln Gly Ala Ala Ala Met Leu Val Asn Val Leu Asn Asp Ser Gly Trp
50 55 60

Phe Ile Pro Leu Glu Arg Glu Gly Leu Gln Asn Ile Leu Thr Glu Arg
65 70 75 80

Lys Ile Ile Arg Ala Ala Leu Lys Lys Asp Asn Val Pro Val Asn Asn
85 90 95

Ser Ala Gly Leu Pro Ser Leu Leu Ala Ala Asn Ile Met Leu Glu Gly
100 105 110

Gly Ile Val Gly Tyr Asp Ser Asn Ile His Thr Gly Gly Ala Gly Ala
115 120 125

Arg Tyr Phe Gly Ile Gly Ala Ser Glu Lys Tyr Arg Val Asp Glu Val
130 135 140

Thr Val Asn Leu Arg Ala Ile Asp Ile Arg Thr Gly Arg Ile Leu His
145 150 155 160

Ser Val Leu Thr Ser Lys Lys Ile Leu Ser Arg Glu Ile Arg Ser Asp
165 170 175

Val Tyr Arg Phe Ile Glu Phe Lys His Leu Leu Glu Met Glu Ala Gly
180 185 190

Ile Thr Thr Asn Asp Pro Ala Gln Leu Cys Val Leu Ser Ala Ile Glu
195 200 205

Ser Ala Val Ala His Leu Ile Val Asp Gly Val Ile Lys Lys Ser Trp
210 215 220

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

Gln Gln Gln Arg Ile
245

<210> 88
<211> 234
<212> PRT
<213> Chryseobacterium oranimense

<400> 88

Pro Ser Asp Pro Glu Arg Ser Thr Met Gly Glu Leu Thr Pro Ser Thr
1 5 10 15

Ala Glu Leu Arg Asn Leu Pro Leu Pro Asn Glu Lys Ile Val Ile Gly
20 25 30

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

Gly Asn Asn Trp Ser Thr Ala Val Pro Gln Gly Thr Thr Thr Ile Leu
50 55 60

Ile Lys Ala Leu Glu Asp Ser Arg Trp Phe Ile Pro Ile Glu Arg Glu
65 70 75 80

Asn Ile Ala Asn Leu Leu Asn Glu Arg Gln Ile Ile Arg Ser Thr Arg
85 90 95

Gln Glu Tyr Met Lys Asp Ala Asp Lys Asn Ser Gln Ser Leu Pro Pro
100 105 110

Leu Leu Tyr Ala Gly Ile Leu Leu Glu Gly Gly Val Ile Ser Tyr Asp
115 120 125

Ser Asn Thr Met Thr Gly Gly Phe Gly Ala Arg Tyr Phe Gly Ile Gly
130 135 140

Ala Ser Thr Gln Tyr Arg Gln Asp Arg Ile Thr Ile Tyr Leu Arg Ala
145 150 155 160

Val Ser Thr Leu Asn Gly Glu Ile Leu Lys Thr Val Tyr Thr Ser Lys
165 170 175

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

Thr Glu Arg Leu Leu Glu Ala Glu Val Gly Leu Thr Gln Asn Glu Pro
195 200 205

Val Gln Leu Ala Val Thr Glu Ala Ile Glu Lys Ala Val Arg Ser Leu
210 215 220

Ile Ile Glu Gly Thr Arg Asp Lys Ile Trp
225 230

<210> 89

<211> 45

<212> PRT

<213> Artificial Sequence

<220>

<223> CsgF peptide

<400> 89

Cys Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly Gly Asn Pro
1 5 10 15

Asn Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln Asn Ser Tyr
20 25 30

Lys Asp Pro Ser Tyr Asn Asp Asp Phe Gly Ile Glu Thr
35 40 45

<210> 90
<211> 29
<212> PRT
<213> Artificial Sequence

<220>
<223> CsgF peptide

<400> 90

Cys Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly Gly Asn Pro
1 5 10 15

Asn Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln
20 25

<210> 91
<211> 35
<212> PRT
<213> Artificial Sequence

<220>
<223> CsgF peptide

<400> 91

Cys Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly Gly Asn Pro
1 5 10 15

Asn Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln Asn Ser Tyr
20 25 30

Lys Asp Pro
35

<210> 92
<211> 35
<212> PRT
<213> Artificial Sequence

<220>
<223> CsgF peptide

<400> 92

Gly Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly Gly Asn Pro
1 5 10 15

Ser Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln Asn Ser Tyr
20 25 30

Lys Asp Pro
35

<210> 93
<211> 35
<212> PRT
<213> Artificial Sequence

<220>
<223> CsgF peptide

<400> 93

Cys Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly Gly Asn Pro
1 5 10 15

Asn Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln Asn Ser Tyr
20 25 30

Lys Tyr Pro
35

<210> 94
<211> 45
<212> PRT
<213> Artificial Sequence

<220>
<223> CsgF peptide

<400> 94

Gly Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly Gly Asn Pro
1 5 10 15

Ser Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln Asn Ser Tyr
20 25 30

Lys Asp Pro Ser Tyr Asn Asp Asp Phe Gly Ile Glu Thr
35 40 45

<210> 95
<211> 35
<212> PRT
<213> Artificial Sequence

<220>
<223> CsgF peptide

<400> 95

Cys Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly Gly Asn Pro
1 5 10 15

Ser Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln Asn Ser Tyr
20 25 30

Lys Tyr Pro
35

<210> 96
<211> 39
<212> PRT
<213> Artificial Sequence

<220>
<223> CsgF peptide

<400> 96

Cys Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly Gly Asn Pro
1 5 10 15

Asn Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln His His His
20 25 30

His His His His His His His
35

<210> 97
<211> 45
<212> PRT
<213> Artificial Sequence

<220>
<223> CsgF peptide

<400> 97

Cys Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly Gly Asn Pro
1 5 10 15

Asn Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln Asn Ser Tyr
20 25 30

Lys Asp Pro His His His His His His His His His His His
35 40 45

<210> 98
<211> 35
<212> PRT
<213> Artificial Sequence

<220>
<223> CsgF peptide

<400> 98

Gly Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly Gly Asn Pro
1 5 10 15

Ser Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln Asn Ser Tyr
20 25 30

Lys Tyr Pro
35

<210> 99
<211> 35
<212> PRT
<213> Artificial Sequence

<220>
<223> CsgF peptide

<400> 99

Gly Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly Gly Asn Pro
1 5 10 15

Ser Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln Asn Ser Tyr
20 25 30

Lys Asn Pro
35

<210> 100
<211> 35
<212> PRT
<213> Artificial Sequence

<220>
<223> CsgF peptide

<400> 100

Gly Thr Met Cys Phe Gln Phe Arg Asn Pro Asn Phe Gly Gly Asn Pro
1 5 10 15

Ser Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln Asn Ser Tyr
20 25 30

Lys Asp Pro
35

<210> 101
<211> 35
<212> PRT
<213> Artificial Sequence

<220>
<223> CsgF peptide

<400> 101

Gly Thr Met Cys Phe Gln Phe Arg Asn Pro Asn Phe Gly Gly Asn Pro
1 5 10 15

Ser Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln Asn Ser Tyr
20 25 30

Lys Tyr Pro
35

<210> 102
<211> 35
<212> PRT
<213> Artificial Sequence

<220>
<223> CsgF peptide

<400> 102

Gly Thr Met Cys Phe Gln Phe Arg Asn Pro Asn Phe Gly Gly Asn Pro
1 5 10 15

Ser Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln Asn Ser Tyr
20 25 30

Lys Asn Pro
35

<210> 103
<211> 35
<212> PRT
<213> Artificial Sequence

<220>
<223> CsgF peptide

<400> 103

Cys Thr Met Cys Phe Gln Phe Arg Asn Pro Asn Phe Gly Gly Asn Pro
1 5 10 15

Ser Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln Asn Ser Tyr
20 25 30

Lys Asp Pro
35

<210> 104
<211> 35
<212> PRT
<213> Artificial Sequence

<220>
<223> CsgF peptide

<400> 104

Cys Thr Met Cys Phe Gln Phe Arg Asn Pro Asn Phe Gly Gly Asn Pro
1 5 10 15

Ser Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln Asn Ser Tyr
20 25 30

Lys Asn Pro
35

<210> 105
<211> 35
<212> PRT
<213> Artificial Sequence

<220>
<223> CsgF peptide

<400> 105

Cys Thr Met Cys Phe Gln Phe Arg Asn Pro Asn Phe Gly Gly Asn Pro
1 5 10 15

Ser Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln Asn Ser Tyr
20 25 30

Lys Tyr Pro
35

<210> 106
<211> 35
<212> PRT
<213> Artificial Sequence

<220>
<223> CsgF peptide

<400> 106

Gly Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly Gly Asn Pro
1 5 10 15

Val Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln Asn Ser Tyr
20 25 30

Lys Asp Pro
35

<210> 107
<211> 35
<212> PRT
<213> Artificial Sequence

<220>
<223> CsgF peptide

<400> 107

Gly	Thr	Met	Thr	Phe	Gln	Phe	Arg	Asn	Pro	Asn	Phe	Gly	Gly	Asn	Pro
1				5				10						15	

Ala	Asn	Gly	Ala	Phe	Leu	Leu	Asn	Ser	Ala	Gln	Ala	Gln	Asn	Ser	Tyr
			20				25						30		

Lys	Asp	Pro
		35

<210> 108

<211> 35

<212> PRT

<213> Artificial Sequence

<220>

<223> CsgF peptide

<400> 108

Gly	Thr	Met	Thr	Phe	Gln	Phe	Arg	Asn	Pro	Asn	Phe	Gly	Gly	Asn	Pro
1				5				10						15	

Phe	Asn	Gly	Ala	Phe	Leu	Leu	Asn	Ser	Ala	Gln	Ala	Gln	Asn	Ser	Tyr
			20				25						30		

Lys	Asp	Pro
		35

<210> 109

<211> 30

<212> PRT

<213> Artificial Sequence

<220>

<223> CsgF peptide

<400> 109

Gly	Thr	Met	Thr	Phe	Gln	Phe	Arg	Asn	Pro	Asn	Phe	Gly	Gly	Asn	Pro
1				5				10						15	

Ser	Asn	Gly	Ala	Phe	Leu	Leu	Asn	Ser	Ala	Gln	Ala	Gln	Asn
			20				25						30

<210> 110

<211> 30

<212> PRT

<213> Artificial Sequence

<220>

<223> CsgF peptide

<400> 110

Gly Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly Gly Asn Pro
1 5 10 15

Val Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln Asn
20 25 30

<210> 111
<211> 30
<212> PRT
<213> Artificial Sequence

<220>
<223> CsgF peptide

<400> 111

Gly Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly Gly Asn Pro
1 5 10 15

Ala Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln Asn
20 25 30

<210> 112
<211> 30
<212> PRT
<213> Artificial Sequence

<220>
<223> CsgF peptide

<400> 112

Gly Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly Gly Asn Pro
1 5 10 15

Phe Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln Asn
20 25 30

<210> 113
<211> 35
<212> PRT
<213> Artificial Sequence

<220>
<223> CsgF peptide

<400> 113

Gly Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly Gly Asn Pro
1 5 10 15

Val Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln Asn Ser Tyr
20 25 30

Lys Tyr Pro
35

<210> 114
<211> 35
<212> PRT
<213> Artificial Sequence

<220>
<223> CsgF peptide

<400> 114

Gly Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly Gly Asn Pro
1 5 10 15

Ala Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln Asn Ser Tyr
20 25 30

Lys Tyr Pro
35

<210> 115
<211> 35
<212> PRT
<213> Artificial Sequence

<220>
<223> CsgF peptide

<400> 115

Gly Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly Gly Asn Pro
1 5 10 15

Phe Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln Asn Ser Tyr
20 25 30

Lys Tyr Pro
35

<210> 116
<211> 35
<212> PRT
<213> Artificial Sequence

<220>
<223> CsgF peptide

<400> 116

Gly Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly Gly Asn Pro
1 5 10 15

Ser Asn Gly Gln Phe Leu Leu Asn Ser Ala Gln Ala Gln Asn Ser Tyr
20 25 30

Lys Asp Pro
35

<210> 117
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> CsgF peptide

<400> 117

Gly Thr Met Thr Phe Gln Phe Arg His His His His His His
1 5 10

<210> 118
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
<223> CsgF peptide

<400> 118

Gly Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly Gly Asn Pro
1 5 10 15

Asn Asn Gly His His His His His His
20 25

<210> 119
<211> 35
<212> PRT
<213> Artificial Sequence

<220>
<223> CsgF peptide

<400> 119

Gly Thr Met Thr Phe Gln Phe Arg Asn Pro Asn Phe Gly Gly Asn Pro
1 5 10 15

Asn Asn Gly Ala Phe Leu Leu Asn Ser Ala Gln Ala Gln His His His
20 25 30

His His His
35

<210> 120
<211> 51
<212> PRT
<213> Artificial Sequence

<220>

<223> CsgF peptide

<400> 120

Gly	Thr	Met	Thr	Phe	Gln	Phe	Arg	Asn	Pro	Asn	Phe	Gly	Gly	Asn	Pro
1				5				10						15	

Asn	Asn	Gly	Ala	Phe	Leu	Leu	Asn	Ser	Ala	Gln	Ala	Gln	Asn	Ser	Tyr
			20					25					30		

Lys	Asp	Pro	Ser	Tyr	Asn	Asp	Asp	Phe	Gly	Ile	Glu	Thr	His	His	His
		35					40					45			

His	His	His
		50