

SEQUENCE LISTING

<110> FLAGSHIP PIONEERING, INC.

<120> COMPOSITIONS AND RELATED METHODS FOR MODULATING ENDOSYMBIONTS

<130> 51215-008W03

<150> US 62/583,990

<151> 2017-11-09

<150> US 62/463,451

<151> 2017-02-24

<160> 153

<170> PatentIn version 3.5

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<211> 1526

<212> DNA

<213> Carsonella ruddii

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 <212> DNA
 <213> Portiera aleyrodidarum BT-B

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<211> 1540

<212> DNA

<213> Buchnera aphidicola str. APS (Acyrthosiphon pisum)

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ggggatctac ccaaaagagg gggataacta ctagaaatgg tagctaatac cgcataatgt	180
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gaaatcccta ggctcaacct aggaactgca ttgtaaactg gaaaactaga gtttcgtaga	660
gggaggtaga attctagggt tagcggtgaa atgcgtagat atctggagga ataccctgg	720
cgaaaagcggc ctctaaacg aaaactgaca ctgaggcgcg aaagcgtggg gagcaaacag	780
gattagatac cctggtagtc catgccgtaa acgatgtcga cttggagggt gtttccaaga	840
gaagtgactt ccgaagctaa cgcattaagt cgaccgcctg gggagtacgg ccgcaaggct	900
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<210> 4

<211> 1552

<212> DNA

<213> Buchnera aphidicola str. Sg (Schizaphis graminum)

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<210> 5

<211> 1566

<212> DNA

<213> Buchnera aphidicola str. Bp (Baizongia pistaciae)

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cgcataatgt ttttaaataa accaaagtag gggactaaaa tttttagcct tatgctttta	240
gatgaaccca gacgagatta gcttgatggg aaggtaatgg cttaccaagg cgacgatctc	300
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ttcatgactg ggggtgaagtc gtaacaaggt aaccgtaggg gaacctgcgg ttggatcacc	1560
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 <211> 828
 <212> DNA
 <213> Buchnera aphidicola BCc

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aaattaatga aatattattt gaaaagaaaa attttatgtt tagattaa	828

<210> 7
<211> 921
<212> DNA
<213> Buchnera aphidicola (Cinara tujaefilina)

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<210> 8
<211> 822
<212> DNA
<213> Buchnera aphidicola str. G002 (Myzus persicae)

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acattagtag aaatcggacc aggattagct gcattaactg agcccatatc tcagttatta 180

aaagagttaa tagttattga aatagactgt aatctattat attttttaaa aaaacaacca	240
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ccttattttg tttatgatat taatatttta agccttatta caaataaggc tttccaaaat	660
agaagaaaaa tattacgtca tagtttaaaa aattttatttt ctgaaacaac tttattaaat	720
ttagatatta atcccagatt aagagctgaa aatatttctg tttttcagta ttgtcaatta	780
gctaattatt tgtataaaaa aaattatact aaaaaaaatt aa	822

<210> 9

<211> 822

<212> DNA

<213> Buchnera aphidicola str. Ak (Acyrtosiphon kondoi)

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cctataccga aagtgcattc tgtttttatc aatttaactc ctcataccaa ttctccatat	600

tttgtttatg atacaaatat cctcagttct atcacaagaa atgcttttca aaatagaagg	660
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attaatccaa atttacgagc tgaaaatatt tctatctttc agtattgtca attagctgat	780
tatttatata aaaaattaaa taatcttgta aaaatcaatt aa	822

<210> 10
 <211> 822
 <212> DNA
 <213> Buchnera aphidicola str. Ua (Uroleucon ambrosiae)

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gaaattaatc caaatttaag agctgaaaaat gtttctatta ttcaatattg tcaattggct	780
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<210> 11
 <211> 816
 <212> DNA
 <213> Buchnera aphidicola (Aphis glycines)

<400> 11

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tttaaaagaa ttaatattat taaagatatg	420
cgtttaattg caactccagg tagtaaatta	480
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<210> 12
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ccagactctt acgggaggca gcagtgggga	360
gctatgtcgc gtgtatgaag aagaccttag	420
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 <212> DNA
 <213> Hodgkinia

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 <213> Wolbachia sp. wPip

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 <212> DNA
 <213> *Sulcia muelleri*

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<223> n is a, g, c, or t

<220>
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<222> (40)..(40)
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 <212> DNA
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<210> 28

<211> 1490

<212> DNA

<213> Burkholderia sp. SFA1

<400> 28

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<210> 29
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 <213> Burkholderia sp. KM-A

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<210> 30
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 <212> DNA
 <213> Burkholderia sp. KM-G

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 <213> Xiphinematobacter sp.

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<210> 32
 <211> 975
 <212> DNA
 <213> Wolbachia sp. wOo

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<210> 33
 <211> 1505
 <212> DNA
 <213> Snodgrassella alvi

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<211> 1528
<212> DNA
<213> Bartonella apis

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 <212> DNA
 <213> Parasaccharibacter apium

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<210> 37
 <211> 1583
 <212> DNA
 <213> Lactobacillus kunkeei

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<211> 1395

<212> DNA

<213> Lactobacillus Firm-4

<400> 38

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<210> 39
 <211> 1549
 <212> DNA
 <213> Enterococcus

<400> 39	
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<210> 40
 <211> 1541
 <212> DNA
 <213> Delftia

<400> 40

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1541

<210> 41
<211> 1502
<212> DNA
<213> Pelomonas

<220>
<221> misc_feature
<222> (192)..(193)
<223> n is a, g, c, or t

<220>
<221> misc_feature
<222> (832)..(833)
<223> n is a, g, c, or t

<400> 41
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<210> 42
<211> 34
<212> PRT
<213> Lactococcus lactis

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<400> 42
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Ile Thr Ser Ile Ser Leu Cys Thr Pro Gly Cys Lys Thr Gly Ala Leu
1           5           10          15

```

```

Met Gly Cys Asn Met Lys Thr Ala Thr Cys His Cys Ser Ile His Val
          20          25          30

```

```
Ser Lys
```

```

<210> 43
<211> 22
<212> PRT
<213> Staphylococcus epidermis

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```
<400> 43
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```
Ile Ala Ser Lys Phe Ile Cys Thr Pro Gly Cys Ala Lys Thr Gly Ser
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1 5 10 15

Phe Asn Ser Tyr Cys Cys
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<210> 44
<211> 44
<212> PRT
<213> *Pediococcus acidilactici*

<400> 44

Lys Tyr Tyr Gly Asn Gly Val Thr Cys Gly Lys His Ser Cys Ser Val
1 5 10 15

Asp Trp Gly Lys Ala Thr Thr Cys Ile Ile Asn Asn Gly Ala Met Ala
20 25 30

Trp Ala Thr Gly Gly His Gln Gly Asn His Lys Cys
35 40

<210> 45
<211> 44
<212> PRT
<213> *Enterococcus faecium*

<400> 45

Ala Thr Arg Ser Tyr Gly Asn Gly Val Tyr Cys Asn Asn Ser Lys Cys
1 5 10 15

Trp Val Asn Trp Gly Glu Ala Lys Glu Asn Ile Ala Gly Ile Val Ile
20 25 30

Ser Gly Trp Ala Ser Gly Leu Ala Gly Met Gly His
35 40

<210> 46
<211> 39
<212> PRT
<213> *Streptococcus lactis*

<400> 46

Gly Thr Trp Asp Asp Ile Gly Gln Gly Ile Gly Arg Val Ala Tyr Trp
1 5 10 15

Val Gly Lys Ala Met Gly Asn Met Ser Asp Val Asn Gln Ala Ser Arg
20 25 30

Ile Asn Arg Lys Lys Lys His
35

<210> 47

<211> 48

<212> PRT

<213> Lactobacillus johnsonii

<400> 47

Asn Arg Trp Gly Asp Thr Val Leu Ser Ala Ala Ser Gly Ala Gly Thr
1 5 10 15

Gly Ile Lys Ala Cys Lys Ser Phe Gly Pro Trp Gly Met Ala Ile Cys
20 25 30

Gly Val Gly Gly Ala Ala Ile Gly Gly Tyr Phe Gly Tyr Thr His Asn
35 40 45

<210> 48

<211> 70

<212> PRT

<213> Enterococcus faecalis

<400> 48

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

Asn Val Val Glu Ala Gly Gly Trp Val Thr Thr Ile Val Ser Ile Leu
20 25 30

Thr Ala Val Gly Ser Gly Gly Leu Ser Leu Leu Ala Ala Ala Gly Arg
35 40 45

Glu Ser Ile Lys Ala Tyr Leu Lys Lys Glu Ile Lys Lys Lys Gly Lys
50 55 60

Arg Ala Val Ile Ala Trp
65 70

<210> 49
<211> 51
<212> PRT
<213> Staphylococcus aureus

<400> 49

Met Ser Trp Leu Asn Phe Leu Lys Tyr Ile Ala Lys Tyr Gly Lys Lys
1 5 10 15

Ala Val Ser Ala Ala Trp Lys Tyr Lys Gly Lys Val Leu Glu Trp Leu
20 25 30

Asn Val Gly Pro Thr Leu Glu Trp Val Trp Gln Lys Leu Lys Lys Ile
35 40 45

Ala Gly Leu
50

<210> 50
<211> 43
<212> PRT
<213> Lactococcus garvieae

<400> 50

Ile Gly Gly Ala Leu Gly Asn Ala Leu Asn Gly Leu Gly Thr Trp Ala
1 5 10 15

Asn Met Met Asn Gly Gly Gly Phe Val Asn Gln Trp Gln Val Tyr Ala
20 25 30

Asn Lys Gly Lys Ile Asn Gln Tyr Arg Pro Tyr
35 40

<210> 51
<211> 103
<212> PRT
<213> Escherichia coli

<400> 51

Met Arg Thr Leu Thr Leu Asn Glu Leu Asp Ser Val Ser Gly Gly Ala
1 5 10 15

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

Val Ala Gly Gly Ile Gly Ala Ala Ala Gly Gly Val Ala Gly Gly Ala
35 40 45

Ile Tyr Asp Tyr Ala Ser Thr His Lys Pro Asn Pro Ala Met Ser Pro
50 55 60

Ser Gly Leu Gly Gly Thr Ile Lys Gln Lys Pro Glu Gly Ile Pro Ser
65 70 75 80

Glu Ala Trp Asn Tyr Ala Ala Gly Arg Leu Cys Asn Trp Ser Pro Asn
85 90 95

Asn Leu Ser Asp Val Cys Leu
100

<210> 52
<211> 48
<212> PRT
<213> Homo sapiens

<400> 52

Ser Ser Leu Leu Glu Lys Gly Leu Asp Gly Ala Lys Lys Ala Val Gly
1 5 10 15

Gly Leu Gly Lys Leu Gly Lys Asp Ala Val Glu Asp Leu Glu Ser Val
20 25 30

Gly Lys Gly Ala Val His Asp Val Lys Asp Val Leu Asp Ser Val Leu
35 40 45

<210> 53
<211> 37
<212> PRT
<213> Hyalophora cecropia

<400> 53

Lys Trp Lys Leu Phe Lys Lys Ile Glu Lys Val Gly Gln Asn Ile Arg
1 5 10 15

Asp Gly Ile Ile Lys Ala Gly Pro Ala Val Ala Val Val Gly Gln Ala
20 25 30

Thr Gln Ile Ala Lys
35

<210> 54
<211> 62
<212> PRT
<213> Drosophila teissieri

<400> 54

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

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

Ala Leu His Thr Gly Ala Gln Ala Gly Phe Lys Leu Ile Arg Pro Val
35 40 45

Glu Arg Gly Ala Thr Pro Lys Lys Ser Glu Lys Pro Glu Lys
50 55 60

<210> 55
<211> 66

<212> PRT
<213> Bombyx mori

<400> 55

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

Val Ser Cys Ser Thr Ala Ala Pro Ala Lys Ile Pro Ile Lys Ala Ile
20 25 30

Lys Thr Val Gly Lys Ala Val Gly Lys Gly Leu Arg Ala Ile Asn Ile
35 40 45

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

Lys His
65

<210> 56
<211> 71
<212> PRT
<213> Ceratitis capitata

<400> 56

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

Ala Leu Gln Cys Val Val Ala Glu Pro Ala Ala Glu Asp Ser Val Val
20 25 30

Val Lys Arg Ser Ile Gly Ser Ala Leu Lys Lys Ala Leu Pro Val Ala
35 40 45

Lys Lys Ile Gly Lys Ile Ala Leu Pro Ile Ala Lys Ala Ala Leu Pro
50 55 60

Val Ala Ala Gly Leu Val Gly
65 70

<210> 57
<211> 53
<212> PRT
<213> Apis mellifera

<400> 57

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

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

Pro Phe Pro Thr Phe Pro Gly Gln Gly Pro Phe Asn Pro Lys Ile Lys
35 40 45

Trp Pro Gln Gly Tyr
50

<210> 58
<211> 283
<212> PRT
<213> Apis mellifera

<400> 58

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

Phe Gly Asn Thr Asn Leu Asp Pro Pro Thr Arg Pro Thr Arg Leu Arg
20 25 30

Arg Glu Ala Lys Pro Glu Ala Glu Pro Gly Asn Asn Arg Pro Val Tyr
35 40 45

Ile Pro Gln Pro Arg Pro Pro His Pro Arg Leu Arg Arg Glu Ala Glu
50 55 60

Pro Glu Ala Glu Pro Gly Asn Asn Arg Pro Val Tyr Ile Pro Gln Pro
65 70 75 80

Arg Pro Pro His Pro Arg Leu Arg Arg Glu Ala Glu Leu Glu Ala Glu
85 90 95

Pro Gly Asn Asn Arg Pro Val Tyr Ile Ser Gln Pro Arg Pro Pro His
100 105 110

Pro Arg Leu Arg Arg Glu Ala Glu Pro Glu Ala Glu Pro Gly Asn Asn
115 120 125

Arg Pro Val Tyr Ile Pro Gln Pro Arg Pro Pro His Pro Arg Leu Arg
130 135 140

Arg Glu Ala Glu Leu Glu Ala Glu Pro Gly Asn Asn Arg Pro Val Tyr
145 150 155 160

Ile Ser Gln Pro Arg Pro Pro His Pro Arg Leu Arg Arg Glu Ala Glu
165 170 175

Pro Glu Ala Glu Pro Gly Asn Asn Arg Pro Val Tyr Ile Pro Gln Pro
180 185 190

Arg Pro Pro His Pro Arg Leu Arg Arg Glu Ala Glu Pro Glu Ala Glu
195 200 205

Pro Gly Asn Asn Arg Pro Val Tyr Ile Pro Gln Pro Arg Pro Pro His
210 215 220

Pro Arg Leu Arg Arg Glu Ala Glu Pro Glu Ala Glu Pro Gly Asn Asn
225 230 235 240

Arg Pro Val Tyr Ile Pro Gln Pro Arg Pro Pro His Pro Arg Leu Arg
245 250 255

Arg Glu Ala Lys Pro Glu Ala Lys Pro Gly Asn Asn Arg Pro Val Tyr
260 265 270

Ile Pro Gln Pro Arg Pro Pro His Pro Arg Ile
275 280

<210> 59
<211> 228
<212> PRT
<213> Sus scrofa

<400> 59

Met Glu Thr Gln Arg Ala Ser Leu Cys Leu Gly Arg Trp Ser Leu Trp
1 5 10 15

Leu Leu Leu Leu Ala Leu Val Val Pro Ser Ala Ser Ala Gln Ala Leu
20 25 30

Ser Tyr Arg Glu Ala Val Leu Arg Ala Val Asp Arg Leu Asn Glu Gln
35 40 45

Ser Ser Glu Ala Asn Leu Tyr Arg Leu Leu Glu Leu Asp Gln Pro Pro
50 55 60

Lys Ala Asp Glu Asp Pro Gly Thr Pro Lys Pro Val Ser Phe Thr Val
65 70 75 80

Lys Glu Thr Val Cys Pro Arg Pro Thr Arg Arg Pro Pro Glu Leu Cys
85 90 95

Asp Phe Lys Glu Asn Gly Arg Val Lys Gln Cys Val Gly Thr Val Thr
100 105 110

Leu Asp Gln Ile Lys Asp Pro Leu Asp Ile Thr Cys Asn Glu Gly Val
115 120 125

Arg Arg Phe Pro Trp Trp Trp Pro Phe Leu Arg Arg Pro Arg Leu Arg
130 135 140

Arg Gln Ala Phe Pro Pro Pro Asn Val Pro Gly Pro Arg Phe Pro Pro
145 150 155 160

Pro Asn Val Pro Gly Pro Arg Phe Pro Pro Pro Asn Phe Pro Gly Pro
165 170 175

Arg Phe Pro Pro Pro Asn Phe Pro Gly Pro Arg Phe Pro Pro Pro Asn
180 185 190

Phe Pro Gly Pro Pro Phe Pro Pro Pro Ile Phe Pro Gly Pro Trp Phe
195 200 205

Pro Pro Pro Pro Pro Phe Arg Pro Pro Pro Phe Gly Pro Pro Arg Phe
210 215 220

Pro Gly Arg Arg
225

<210> 60
<211> 144
<212> PRT
<213> Bos taurus

<400> 60

Met Gln Thr Gln Arg Ala Ser Leu Ser Leu Gly Arg Trp Ser Leu Trp
1 5 10 15

Leu Leu Leu Leu Gly Leu Val Val Pro Ser Ala Ser Ala Gln Ala Leu
20 25 30

Ser Tyr Arg Glu Ala Val Leu Arg Ala Val Asp Gln Leu Asn Glu Leu
35 40 45

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

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

Lys Glu Thr Val Cys Pro Arg Thr Ile Gln Gln Pro Ala Glu Gln Cys
85 90 95

Asp Phe Lys Glu Lys Gly Arg Val Lys Gln Cys Val Gly Thr Val Thr
100 105 110

Leu Asp Pro Ser Asn Asp Gln Phe Asp Leu Asn Cys Asn Glu Leu Gln
115 120 125

Ser Val Ile Leu Pro Trp Lys Trp Pro Trp Trp Pro Trp Arg Arg Gly
130 135 140

<210> 61

<211> 149

<212> PRT

<213> Sus scrofa

<400> 61

Met Glu Thr Gln Arg Ala Ser Leu Cys Leu Gly Arg Trp Ser Leu Trp
1 5 10 15

Leu Leu Leu Leu Ala Leu Val Val Pro Ser Ala Ser Ala Gln Ala Leu
20 25 30

Ser Tyr Arg Glu Ala Val Leu Arg Ala Val Asp Arg Leu Asn Glu Gln
35 40 45

Ser Ser Glu Ala Asn Leu Tyr Arg Leu Leu Glu Leu Asp Gln Pro Pro
50 55 60

Lys Ala Asp Glu Asp Pro Gly Thr Pro Lys Pro Val Ser Phe Thr Val
65 70 75 80

Lys Glu Thr Val Cys Pro Arg Pro Thr Arg Gln Pro Pro Glu Leu Cys
85 90 95

Asp Phe Lys Glu Asn Gly Arg Val Lys Gln Cys Val Gly Thr Val Thr
100 105 110

Leu Asp Gln Ile Lys Asp Pro Leu Asp Ile Thr Cys Asn Glu Val Gln

115

120

125

Gly Val Arg Gly Gly Arg Leu Cys Tyr Cys Arg Arg Arg Phe Cys Val
 130 135 140

Cys Val Gly Arg Gly
 145

<210> 62
 <211> 17
 <212> PRT
 <213> Tachypleus gigas

<400> 62

Lys Trp Cys Phe Arg Val Cys Tyr Arg Gly Ile Cys Tyr Arg Arg Cys
 1 5 10 15

Arg

<210> 63
 <211> 102
 <212> PRT
 <213> Anopheles gambiae

<400> 63

Met Lys Cys Ala Thr Ile Val Cys Thr Ile Ala Val Val Leu Ala Ala
 1 5 10 15

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

Leu Ser Gly Gly Ala Asn Leu Asn Thr Leu Leu Asp Glu Leu Pro Glu
 35 40 45

Glu Thr His His Ala Ala Leu Glu Asn Tyr Arg Ala Lys Arg Ala Thr
 50 55 60

Cys Asp Leu Ala Ser Gly Phe Gly Val Gly Ser Ser Leu Cys Ala Ala

65		70		75		80									
His	Cys	Ile	Ala	Arg	Arg	Tyr	Arg	Gly	Gly	Tyr	Cys	Asn	Ser	Lys	Ala
				85					90					95	

Val	Cys	Val	Cys	Arg	Asn
					100

<210> 64
 <211> 70
 <212> PRT
 <213> Drosophila melanogaster
 <400> 64

Met	Met	Gln	Ile	Lys	Tyr	Leu	Phe	Ala	Leu	Phe	Ala	Val	Leu	Met	Leu
1				5					10					15	

Val	Val	Leu	Gly	Ala	Asn	Glu	Ala	Asp	Ala	Asp	Cys	Leu	Ser	Gly	Arg
			20					25					30		

Tyr	Lys	Gly	Pro	Cys	Ala	Val	Trp	Asp	Asn	Glu	Thr	Cys	Arg	Arg	Val
		35					40					45			

Cys	Lys	Glu	Glu	Gly	Arg	Ser	Ser	Gly	His	Cys	Ser	Pro	Ser	Leu	Lys
	50					55					60				

Cys	Trp	Cys	Glu	Gly	Cys
65					70

<210> 65
 <211> 78
 <212> PRT
 <213> Buchnera aphidicola
 <400> 65

Met	Lys	Leu	Leu	His	Gly	Phe	Leu	Ile	Ile	Met	Leu	Thr	Met	His	Leu
1				5					10					15	

Ser	Ile	Gln	Tyr	Ala	Tyr	Gly	Gly	Pro	Phe	Leu	Thr	Lys	Tyr	Leu	Cys
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

20

25

30

Asp Arg Val Cys His Lys Leu Cys Gly Asp Glu Phe Val Cys Ser Cys
 35 40 45

Ile Gln Tyr Lys Ser Leu Lys Gly Leu Trp Phe Pro His Cys Pro Thr
 50 55 60

Gly Lys Ala Ser Val Val Leu His Asn Phe Leu Thr Ser Pro
 65 70 75

<210> 66

<211> 77

<212> PRT

<213> Buchnera aphidicola

<400> 66

Met Lys Leu Leu Tyr Gly Phe Leu Ile Ile Met Leu Thr Ile His Leu
 1 5 10 15

Ser Val Gln Tyr Phe Glu Ser Pro Phe Glu Thr Lys Tyr Asn Cys Asp
 20 25 30

Thr His Cys Asn Lys Leu Cys Gly Lys Ile Asp His Cys Ser Cys Ile
 35 40 45

Gln Tyr His Ser Met Glu Gly Leu Trp Phe Pro His Cys Arg Thr Gly
 50 55 60

Ser Ala Ala Gln Met Leu His Asp Phe Leu Ser Asn Pro
 65 70 75

<210> 67

<211> 86

<212> PRT

<213> Buchnera aphidicola

<400> 67

Met Ser Val Arg Lys Asn Val Leu Pro Thr Met Phe Val Val Leu Leu

1	5	10	15
Ile Met Ser Pro Val Thr Pro Thr Ser Val Phe Ile Ser Ala Val Cys	20	25	30
Tyr Ser Gly Cys Gly Ser Leu Ala Leu Val Cys Phe Val Ser Asn Gly	35	40	45
Ile Thr Asn Gly Leu Asp Tyr Phe Lys Ser Ser Ala Pro Leu Ser Thr	50	55	60
Ser Glu Thr Ser Cys Gly Glu Ala Phe Asp Thr Cys Thr Asp His Cys	65	70	75
Leu Ala Asn Phe Lys Phe	85		

<210> 68
 <211> 69
 <212> PRT
 <213> Buchnera aphidicola

<400> 68

Met Arg Leu Leu Tyr Gly Phe Leu Ile Ile Met Leu Thr Ile Tyr Leu	1	5	10	15
Ser Val Gln Asp Phe Asp Pro Thr Glu Phe Lys Gly Pro Phe Pro Thr	20	25	30	
Ile Glu Ile Cys Ser Lys Tyr Cys Ala Val Val Cys Asn Tyr Thr Ser	35	40	45	
Arg Pro Cys Tyr Cys Val Glu Ala Ala Lys Glu Arg Asp Gln Trp Phe	50	55	60	
Pro Tyr Cys Tyr Asp	65			

<210> 69
<211> 77
<212> PRT
<213> Buchnera aphidicola

<400> 69

Met Arg Leu Leu Tyr Gly Phe Leu Ile Ile Met Leu Thr Ile His Leu
1 5 10 15

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

Lys Glu Ile Cys Ser Lys Tyr Cys Glu Tyr Asn Val Val Cys Gly Ala
35 40 45

Ser Leu Pro Cys Ile Cys Val Gln Asp Ala Arg Gln Leu Asp His Trp
50 55 60

Phe Ala Cys Cys Tyr Asp Gly Gly Pro Glu Met Leu Met
65 70 75

<210> 70
<211> 108
<212> PRT
<213> Buchnera aphidicola

<400> 70

Met Lys Leu Phe Val Val Val Val Leu Val Ala Val Gly Ile Met Phe
1 5 10 15

Val Phe Ala Ser Asp Thr Ala Ala Ala Pro Thr Asp Tyr Glu Asp Thr
20 25 30

Asn Asp Met Ile Ser Leu Ser Ser Leu Val Gly Asp Asn Ser Pro Tyr
35 40 45

Val Arg Val Ser Ser Ala Asp Ser Gly Gly Ser Ser Lys Thr Ser Ser
50 55 60

Lys Asn Pro Ile Leu Gly Leu Leu Lys Ser Val Ile Lys Leu Leu Thr
65 70 75 80

Lys Ile Phe Gly Thr Tyr Ser Asp Ala Ala Pro Ala Met Pro Pro Ile
85 90 95

Pro Pro Ala Leu Arg Lys Asn Arg Gly Met Leu Ala
100 105

<210> 71
<211> 178
<212> PRT
<213> Buchnera aphidicola

<400> 71

Met Val Ala Cys Lys Val Ile Leu Ala Val Ala Val Val Phe Val Ala
1 5 10 15

Ala Val Gln Gly Arg Pro Gly Gly Glu Pro Glu Trp Ala Ala Pro Ile
20 25 30

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

Leu Asp Asn Ala Gly Glu Tyr Ala Thr Ala Ala Lys Asn Asn Leu Asn
50 55 60

Ala Phe Ala Glu Ser Leu Lys Thr Glu Ala Ala Val Phe Ser Lys Ser
65 70 75 80

Phe Glu Gly Lys Ala Ser Ala Ser Asp Val Phe Lys Glu Ser Thr Lys
85 90 95

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

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

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

Glu Thr Glu Lys Glu Ile Lys Glu Phe Phe Lys Lys Gln Ile Glu Asn
145 150 155 160

Leu Ile Gly Gln Gly Lys Ala Leu Gln Ala Lys Ile Ala Glu Ala Lys
165 170 175

Lys Ala

<210> 72

<211> 311

<212> PRT

<213> Buchnera aphidicola

<400> 72

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

Cys Leu Ala Ser Val Ala Asn Ala Leu Pro Val Gln Lys Ser Val Ala
20 25 30

Ala Thr Thr Glu Asn Pro Ile Val Glu Lys His Gly Cys Arg Ala His
35 40 45

Lys Asn Leu Val Arg Gln Asn Val Val Asp Leu Lys Thr Tyr Asp Ser
50 55 60

Met Leu Ile Thr Asn Glu Val Val Gln Lys Gln Ser Asn Glu Val Gln
65 70 75 80

Ser Ser Glu Gln Ser Asn Glu Gly Gln Asn Ser Glu Gln Ser Asn Glu
85 90 95

Gly Gln Asn Ser Glu Gln Ser Asn Glu Val Gln Ser Ser Glu His Ser
100 105 110

Asn Glu Gly Gln Asn Ser Lys Gln Ser Asn Glu Gly Gln Asn Ser Glu
115 120 125

Gln Ser Asn Glu Val Gln Ser Ser Glu His Ser Asn Glu Gly Gln Asn
130 135 140

Ser Glu Gln Ser Asn Glu Val Gln Ser Ser Glu His Ser Asn Glu Gly
145 150 155 160

Gln Asn Ser Lys Gln Ser Asn Glu Gly Gln Asn Ser Lys Gln Ser Asn
165 170 175

Glu Val Gln Ser Ser Glu His Trp Asn Glu Gly Gln Asn Ser Lys Gln
180 185 190

Ser Asn Glu Asp Gln Asn Ser Glu Gln Ser Asn Glu Gly Gln Asn Ser
195 200 205

Lys Gln Ser Asn Glu Gly Gln Asn Ser Lys Gln Ser Asn Glu Asp Gln
210 215 220

Asn Ser Glu Gln Ser Asn Glu Gly Gln Asn Ser Lys Gln Ser Asn Glu
225 230 235 240

Val Gln Ser Ser Glu Gln Ser Asn Glu Gly Gln Asn Ser Lys Gln Ser
245 250 255

Asn Glu Gly Gln Ser Ser Glu Gln Ser Asn Glu Gly Gln Asn Ser Lys
260 265 270

Gln Ser Asn Glu Val Gln Ser Pro Glu Glu His Tyr Asp Leu Pro Asp
275 280 285

Pro Glu Ser Ser Tyr Glu Ser Glu Glu Thr Lys Gly Ser His Glu Ser
290 295 300

Gly Asp Asp Ser Glu His Arg
305 310

<210> 73
<211> 431
<212> PRT
<213> Buchnera aphidicola

<400> 73

Met Lys Thr Ile Ile Leu Gly Leu Cys Leu Phe Gly Ala Leu Phe Trp
1 5 10 15

Ser Thr Gln Ser Met Pro Val Gly Glu Val Ala Pro Ala Val Pro Ala
20 25 30

Val Pro Ser Glu Ala Val Pro Gln Lys Gln Val Glu Ala Lys Pro Glu
35 40 45

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

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

Glu Ser Glu Gln Lys Pro Ser Gly Glu Pro Lys Pro Glu Ser Asp Ala
85 90 95

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

Ala Ala Val Val Glu Ser Lys Pro Glu Asn Asp Ala Val Ala Pro Glu
115 120 125

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

Asn Lys Pro Ala Thr Asp Ala Lys Ala Glu Thr Glu Leu Ile Ala Gln
145 150 155 160

Ala Lys Pro Glu Ser Lys Pro Ala Ser Asp Leu Lys Ala Glu Pro Glu
165 170 175

Ala Ala Lys Pro Asn Ser Glu Val Pro Val Ala Leu Pro Leu Asn Pro
180 185 190

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

Gln Ala Ala Pro Ala Ala Ala Gln Ala Asp Pro Ala Ala Ala Pro Ala
210 215 220

Ala Asp Pro Ala Pro Ala Pro Ala Ala Ala Pro Val Ala Ala Glu Glu
225 230 235 240

Ala Lys Leu Ser Glu Ser Ala Pro Ser Thr Glu Asn Lys Ala Ala Glu
245 250 255

Glu Pro Ser Lys Pro Ala Glu Gln Gln Ser Ala Lys Pro Val Glu Asp
260 265 270

Ala Val Pro Ala Ala Ser Glu Ile Ser Glu Thr Lys Val Ser Pro Ala
275 280 285

Val Pro Ala Val Pro Glu Val Pro Ala Ser Pro Ser Ala Pro Ala Val
290 295 300

Ala Asp Pro Val Ser Ala Pro Glu Ala Glu Lys Asn Ala Glu Pro Ala
305 310 315 320

Lys Ala Ala Asn Ser Ala Glu Pro Ala Val Gln Ser Glu Ala Lys Pro
325 330 335

Ala Glu Asp Ile Gln Lys Ser Gly Ala Val Val Ser Ala Glu Asn Pro
340 345 350

Lys Pro Val Glu Glu Gln Lys Pro Ala Glu Val Ala Lys Pro Ala Glu

355

360

365

Gln Ser Lys Ser Glu Ala Pro Ala Glu Ala Pro Lys Pro Thr Glu Gln
 370 375 380

Ser Ala Ala Glu Glu Pro Lys Lys Pro Glu Ser Ala Asn Asp Glu Lys
 385 390 395 400

Lys Glu Gln His Ser Val Asn Lys Arg Asp Ala Thr Lys Glu Lys Lys
 405 410 415

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

<210> 74

<211> 160

<212> PRT

<213> Buchnera aphidicola

<400> 74

Met Asn Gly Lys Ile Val Leu Cys Phe Ala Val Val Phe Ile Gly Gln
 1 5 10 15

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

Lys Val Ala Glu Gln Met Ser Gln Thr Phe Met Ser Val Ala Asn His
 35 40 45

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

Lys Ile Arg Thr Ile Met Asn Lys Gly Phe Thr Asp Met Glu Thr Glu
 65 70 75 80

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

Val Glu Lys Tyr Asp Glu Leu Glu Lys Glu Leu Lys Lys His Leu Ser
100 105 110

Thr Ala Lys Asp Met Phe Glu Asp Lys Val Val Lys Pro Ile Gly Glu
115 120 125

Lys Val Glu Leu Lys Lys Ile Thr Glu Asn Val Ile Lys Thr Thr Lys
130 135 140

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

<210> 75

<211> 415

<212> PRT

<213> Buchnera aphidicola

<400> 75

Met His Leu Phe Leu Ala Leu Gly Leu Phe Ile Val Cys Gly Met Val
1 5 10 15

Asp Ala Thr Phe Tyr Asn Pro Arg Ser Gln Thr Phe Asn Gln Leu Met
20 25 30

Glu Arg Arg Gln Arg Ser Ile Pro Ile Pro Tyr Ser Tyr Gly Tyr His
35 40 45

Tyr Asn Pro Ile Glu Pro Ser Ile Asn Val Leu Asp Ser Leu Ser Glu
50 55 60

Gly Leu Asp Ser Arg Ile Asn Thr Phe Lys Pro Ile Tyr Gln Asn Val
65 70 75 80

Lys Met Ser Thr Gln Asp Val Asn Ser Val Pro Arg Thr Gln Tyr Gln
85 90 95

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

Pro Ser Leu Phe Pro Glu Glu Asp Ser Tyr Asp Tyr Lys Tyr Leu Gly
115 120 125

Ser Pro Leu Asn Lys Tyr Leu Thr Arg Pro Ser Thr Gln Glu Ser Gly
130 135 140

Ile Ala Ile Asn Leu Val Ala Ile Lys Glu Thr Ser Val Phe Asp Tyr
145 150 155 160

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

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

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

Val Lys Leu Leu Pro Glu Thr Pro Glu Gln Glu Ser Ile Ile Thr Thr
210 215 220

Thr Lys Asn Tyr Glu Leu Asn Tyr Lys Thr Thr Gln Glu Thr Pro Thr
225 230 235 240

Glu Ala Glu Leu Tyr Pro Ile Thr Ser Glu Glu Phe Gln Thr Glu Asp
245 250 255

Glu Trp His Pro Met Val Pro Lys Glu Asn Thr Thr Lys Asp Glu Ser
260 265 270

Ser Phe Ile Thr Thr Glu Glu Pro Leu Thr Glu Asp Lys Ser Asn Ser
275 280 285

Ile Thr Ile Glu Lys Thr Gln Thr Glu Asp Glu Ser Asn Ser Ile Glu
290 295 300

Phe Asn Ser Ile Arg Thr Glu Glu Lys Ser Asn Ser Ile Thr Thr Glu

Gln Gln Gln Pro Lys Gln Trp Glu Val Arg Pro Asp Leu Ser Arg Asp
65 70 75 80

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

Asn His Asp Ile Asn Ala Gly Trp Gly Lys Asn Ile Asn Gly Pro Asp
100 105 110

Ser His Lys Asp Thr Trp His Val Gly Gly Ser Val Arg Trp
115 120 125

<210> 77
<211> 220
<212> PRT
<213> Acyrthosiphon pisum

<400> 77

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

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

Leu Gly Asn Asn Ser Cys Arg Ser His Gly Glu Cys Cys Ser Gly Phe
35 40 45

Cys Phe Ile Glu Pro Gly Trp Ala Leu Gly Val Cys Lys Arg Leu Gly
50 55 60

Thr Pro Lys Lys Ser Asp Asp Ser Asn Asn Gly Lys Asn Ile Glu Lys
65 70 75 80

Asn Asn Gly Val His Glu Arg Ile Asp Asp Val Phe Glu Arg Gly Val
85 90 95

Cys Ser Tyr Tyr Lys Gly Pro Ser Ile Thr Ala Asn Gly Asp Val Phe
100 105 110

Asp Glu Asn Glu Met Thr Ala Ala His Arg Thr Leu Pro Phe Asn Thr
115 120 125

Met Val Lys Val Glu Gly Met Gly Thr Ser Val Val Val Lys Ile Asn
130 135 140

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

Ala Ala Glu Ser Leu Asn Ile Asp Glu Asn Thr Gly Pro Val Gln Cys
165 170 175

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

Asp Thr Cys Val Leu His His Glu Cys Cys Ser Gln Asn Cys Phe Arg
195 200 205

Glu Met Phe Ser Asp Lys Gly Phe Cys Leu Pro Lys
210 215 220

<210> 78
<211> 3
<212> DNA
<213> Streptococcus pyogenes

<220>
<221> misc_feature
<222> (1)..(1)
<223> n is a, g, c, or t

<400> 78
ngg

3

<210> 79
<211> 6
<212> DNA
<213> Streptococcus thermophilus

<220>
<221> misc_feature
<222> (1)..(2)
<223> n is a, g, c, or t

<400> 79
nnagaa

6

<210> 80
<211> 5
<212> DNA
<213> Streptococcus thermophilus

<220>
<221> misc_feature
<222> (1)..(1)
<223> n is a, g, c, or t

<220>
<221> misc_feature
<222> (4)..(4)
<223> n is a, g, c, or t

<400> 80
nggng

5

<210> 81
<211> 7
<212> DNA
<213> Neisseria meningitidis

<220>
<221> misc_feature
<222> (1)..(3)
<223> n is a, g, c, or t

<400> 81
nnngatt

7

<210> 82
<211> 16
<212> PRT
<213> Artificial Sequence

<220>

<223> Penetratin

<400> 82

Arg Gln Ile Lys Ile Trp Phe Gln Asn Arg Arg Met Lys Trp Lys Lys
1 5 10 15

<210> 83

<211> 13

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 83

Gly Arg Lys Lys Arg Arg Gln Arg Arg Arg Pro Pro Gln
1 5 10

<210> 84

<211> 18

<212> PRT

<213> Artificial Sequence

<220>

<223> pVEC

<400> 84

Leu Leu Ile Ile Leu Arg Arg Arg Ile Arg Lys Gln Ala His Ala His
1 5 10 15

Ser Lys

<210> 85

<211> 27

<212> PRT

<213> Artificial Sequence

<220>

<223> Transportan

<400> 85

Gly Trp Thr Leu Asn Ser Ala Gly Tyr Leu Leu Gly Lys Ile Asn Leu
1 5 10 15

Lys Ala Leu Ala Ala Leu Ala Lys Lys Ile Leu
20 25

<210> 86
<211> 27
<212> PRT
<213> Artificial Sequence

<220>
<223> MPG

<400> 86

Gly Ala Leu Phe Leu Gly Phe Leu Gly Ala Ala Gly Ser Thr Met Gly
1 5 10 15

Ala Trp Ser Gln Pro Lys Lys Lys Arg Lys Val
20 25

<210> 87
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Pep-1

<400> 87

Lys Glu Thr Trp Trp Glu Thr Trp Trp Thr Glu Trp Ser Gln Pro Lys
1 5 10 15

Lys Lys Arg Lys Val
20

<210> 88
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> MAP

<400> 88

Lys Leu Ala Leu Lys Leu Ala Leu Lys Ala Leu Lys Ala Ala Leu Lys
1 5 10 15

Leu Ala

<210> 89
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> R6W3

<400> 89

Arg Arg Trp Trp Arg Arg Trp Arg Arg
1 5

<210> 90
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Bcr1 forward primer

<400> 90
aaactgctgc atggctttct 20

<210> 91
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Bcr1 reverse primer

<400> 91
acaggccttt caggctttta 20

<210> 92
<211> 24
<212> DNA

<213> Artificial Sequence

<220>

<223> T7 promoter sequence

<400> 92

ttaatacgac tcactatagg gaga 24

<210> 93

<211> 478

<212> RNA

<213> Acyrthosiphon pisum

<400> 93

augaaacugc ugcauggcuu ucugauuuuu augcugacca ugcaucugag cauucaguau 60

gcguauggcg gcccguuuu gaccaaauau cugugcgau cgcugugcca uaaacugugc 120

ggcgaugaau uugugugcag cugcauucag uauaaaagcc ugaaaggccu gugguuuccg 180

cauugcccga ccggcaaagc gagcguggug cugcauaacu uucugaccag cccguuuuuu 240

uuuucgggcu ggucagaaaag uuaugcagca ccacgcucgc uuugccgguc gggcaaugcg 300

gaaaccacag gccuuucagg cuuuuauacu gaaugcagcu gcacacaaa ucaucgccgc 360

acaguuuuug gcacacgcga ucgcacagau auuuggucag aaacgggccg ccuacgcgau 420

acugaaugcu cagaugcaug gucagcauaa uaaucagaaa gccaugcagc aguuucau 478

<210> 94

<211> 378

<212> DNA

<213> Artificial Sequence

<220>

<223> Coleopteracin A (colA) gene

<400> 94

atgacccgca ccatgctgtt tctggcgtgc gtggcggcgc tgtatgtgtg cattagcgcg 60

accgcgggca aaccggaaga atttgcgaaa ctgagcgatg aagcgccgag caacgatcag 120

gcgatgtatg aaagcattca gcgctatcgc cgctttgtgg atggcaaccg ctataacggc 180

ggccagcagc agcagcagca gccgaaacag tgggaagtgc gcccggatct gagccgcgat 240

cagcgcggca acaccaaagc gcaggtggaa attaacaaaa aaggcgataa ccatgatatt 300

aacgcgggct ggggcaaaaa cattaacggc ccggatagcc ataaagatac ctggcatgtg 360

ggcggcagcg tgcgctgg 378

<210> 95

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> ColA forward primer

<400> 95

caacgatcag gcgatgtatg 20

<210> 96

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> ColA reverse primer

<400> 96

ttaatttcca cctgcgcttt 20

<210> 97

<211> 17

<212> DNA

<213> Artificial Sequence

<220>

<223> Buchnera forward primer

<400> 97

gtcggctcat cacatcc 17

<210> 98

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Buchnera reverse primer

<400> 98
ttccgtctgt attatctcct 20

<210> 99
<211> 40
<212> DNA
<213> Artificial Sequence

<220>
<223> Mpcactus fwd

<400> 99
taatacgact cactataggg tacacccatt gtgtgcacct 40

<210> 100
<211> 40
<212> DNA
<213> Artificial Sequence

<220>
<223> Mpcactus rev

<400> 100
taatacgact cactataggg ccactgtcca aggcaatttt 40

<210> 101
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Buch_groES_18F

<400> 101
catgatcgtg tgcttgtaa g 21

<210> 102
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Buch_groES_98R

<400> 102
ctgttcctcg agtcgatttc c 21

<210> 103
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> ApEF1a 107F

<400> 103
ctgattgtgc cgtgcttatt g 21

<210> 104
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> ApEF1a 246R

<400> 104
tatggtggtt cagtagagtc c 21

<210> 105
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> BCR4 (from BCR4-CPP)

<400> 105
cgtacaataa tctcatgg 18

<210> 106
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Tat

<400> 106

Tyr Gly Arg Lys Lys Arg Arg Gln Arg Arg Arg
1 5 10

<210> 107
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> ApBCR-4F

<400> 107
ctctgtcaac caccatgaga tta 23

<210> 108
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> ApBCR-4R

<400> 108
tgcagactac agcacaatac tt 22

<210> 109
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Actin forward

<400> 109
gatcagcagc cacacacaag 20

<210> 110
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Actin reverse

<400> 110
tttgaaccgg tttacgacga 20

<210> 111
 <211> 40
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> ApGLNT1 forward

 <400> 111
 taatacgact cactataggg caattacaaa aggacggcag 40

<210> 112
 <211> 40
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> ApGLNT1 reverse

 <400> 112
 taatacgact cactataggg ccgctctagg aacaccgtat 40

<210> 113
 <211> 19
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> ACYPI001018-fwd

 <400> 113
 cctgaaatcg acggggtcc 19

<210> 114
 <211> 21
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> ACYPI001018-rev

 <400> 114
 agatcggcaa catctgttcg t 21

<210> 115
 <211> 6

<212> DNA
<213> Artificial Sequence

<220>
<223> Small hairpin

<400> 115
acacgt

6

<210> 116
<211> 42
<212> DNA
<213> Artificial Sequence

<220>
<223> ApGlnT1 sense fwd

<400> 116
ctacaaatct atctctccta ggcaattaca aaaggacggc ag

42

<210> 117
<211> 49
<212> DNA
<213> Artificial Sequence

<220>
<223> ApGlnT1 sense rev

<400> 117
ttacaaactg ggaagaacct ggagacgtgc cgctctagga acaccgtat

49

<210> 118
<211> 50
<212> DNA
<213> Artificial Sequence

<220>
<223> ApGlnT1 antisense fwd

<400> 118
ttacaaactg ggaagaacct ggaacacgtc ccgctctagg aacaccgtat

50

<210> 119
<211> 50
<212> DNA
<213> Artificial Sequence

<220>
 <223> ApGlnT1 antisense rev

 <400> 119
 agaaactaga gcttgatcgat cgtaattaa caattacaaa aggacggcag 50

 <210> 120
 <211> 42
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> ApUbx sense fwd

 <400> 120
 ctacaaatct atctctccta ggttttaccg tcacaggcat ca 42

 <210> 121
 <211> 50
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> ApUbx sense rev

 <400> 121
 acgagtgtg aagtccttag ccagacgtgt tcgtgctcgt taccaaagt 50

 <210> 122
 <211> 50
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> ApUbx antisense fwd

 <400> 122
 acgagtgtg aagtccttag ccaacacgtc tcgtgctcgt taccaaagt 50

 <210> 123
 <211> 50
 <212> DNA
 <213> Artificial Sequence

 <220>

<223> ApUbx antisense rev

<400> 123

agaaactaga gcttgatcgat cgtaattaa ttttaccgtc acaggcatca

50

<210> 124

<211> 42

<212> DNA

<213> Artificial Sequence

<220>

<223> ApbAs sense fwd

<400> 124

ctacaaatct atctctccta ggggtgtcac catcgagacg tt

42

<210> 125

<211> 52

<212> DNA

<213> Artificial Sequence

<220>

<223> ApbAs sense rev

<400> 125

aaaaaccaca tacctcgagt ggggacgtgt catgactctg gcagttgaag tt

52

<210> 126

<211> 52

<212> DNA

<213> Artificial Sequence

<220>

<223> ApbAs antisense fwd

<400> 126

aaaaaccaca tacctcgagt gggacacgtc catgactctg gcagttgaag tt

52

<210> 127

<211> 50

<212> DNA

<213> Artificial Sequence

<220>

<223> ApbAs antisense rev

<400> 127
agaaactaga gcttgtcgat cgtaaattaa ggtgtcacca tcgagacgtt 50

<210> 128
<211> 42
<212> DNA
<213> Artificial Sequence

<220>
<223> Apcactus sense fwd

<400> 128
ctacaaatct atctctccta gggtcgtcgt cgtcgtcgta gt 42

<210> 129
<211> 50
<212> DNA
<213> Artificial Sequence

<220>
<223> Apcactus sense rev

<400> 129
accaaaaattg ccttggacag tgggacgtgt gcacgcacgg aaaacattta 50

<210> 130
<211> 50
<212> DNA
<213> Artificial Sequence

<220>
<223> Apcactus antisense fwd

<400> 130
accaaaaattg ccttggacag tggacacgtc gcacgcacgg aaaacattta 50

<210> 131
<211> 50
<212> DNA
<213> Artificial Sequence

<220>
<223> Apcactus antisense rev

<400> 131
agaaactaga gcttgtcgat cgtaaattaa gtcgtcgtcg tcgtcgtagt 50

<210> 132
<211> 48
<212> DNA
<213> Artificial Sequence

<220>
<223> MpGlnT1 sense fwd

<400> 132
ctacaaatct atctctccta ggttggaagg gattggtggt gtaatgcc 48

<210> 133
<211> 61
<212> DNA
<213> Artificial Sequence

<220>
<223> MpGlnT1 sense rev

<400> 133
ttacaaactg ggaagaacct ggagacgtgt tccaggttct tcccagtttg taactagatc 60

g 61

<210> 134
<211> 61
<212> DNA
<213> Artificial Sequence

<220>
<223> MpGlnT1 antisense fwd

<400> 134
ttacaaactg ggaagaacct ggaacacgtc tccaggttct tcccagtttg taactagatc 60

g 61

<210> 135
<211> 56
<212> DNA
<213> Artificial Sequence

<220>
<223> MpGlnT1 antisense rev

<400> 135
agaaactaga gcttgtcgat cgtaaattaa ttggaaggga ttggtgttgt aatgcc 56

<210> 136
<211> 43
<212> DNA
<213> Artificial Sequence

<220>
<223> MpUbx sense fwd

<400> 136
ctacaaatct atctctccta ggtcgtgtgg agcaagtaca gcg 43

<210> 137
<211> 52
<212> DNA
<213> Artificial Sequence

<220>
<223> MpUbx sense rev

<400> 137
acgagtgtg aagtccttag ccagacgtgt tggctaggga cttcagcact cg 52

<210> 138
<211> 52
<212> DNA
<213> Artificial Sequence

<220>
<223> MpUbx antisense fwd

<400> 138
acgagtgtg aagtccttag ccaacacgtc tggctaggga cttcagcact cg 52

<210> 139
<211> 52
<212> DNA
<213> Artificial Sequence

<220>
<223> MpUbx antisense rev

<400> 139
agaaactaga gcttgtcgat cgtaaattaa tcgtgtggag caagtacagc gg 52

<210> 140
<211> 48
<212> DNA
<213> Artificial Sequence

<220>
<223> MpbAs sense fwd

<400> 140
ctacaaatct atctctccta gggaggaact ccaactgcca gagtcatg 48

<210> 141
<211> 59
<212> DNA
<213> Artificial Sequence

<220>
<223> MpbAs sense rev

<400> 141
aaaaaccaca tacctcgagt ggggacgtgt ccactcgag gtatgtggtt tttcctatg 59

<210> 142
<211> 55
<212> DNA
<213> Artificial Sequence

<220>
<223> MpbAs antisense fwd

<400> 142
aaaaaccaca tacctcgagt ggacacgtc ccactcgag gtatgtggtt tttcc 55

<210> 143
<211> 56
<212> DNA
<213> Artificial Sequence

<220>
<223> MpbAs antisense rev

<400> 143
agaaactaga gcttgtcgat cgtaattaa gaggaactcc aactgccaga gtcatg 56

<210> 144
 <211> 48
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Mpcactus sense fwd

 <400> 144
 ctacaaatct atctctccta ggtagaccca ttgtgtgcac ctgagtac 48

<210> 145
 <211> 55
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Mpcactus sense rev

 <400> 145
 accaaaattg ccttggacag tgggacgtgt ccactgtcca aggcaatttt ggttg 55

<210> 146
 <211> 55
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Mpcactus antisense fwd

 <400> 146
 accaaaattg ccttggacag tggacacgtc ccactgtcca aggcaatttt ggttg 55

<210> 147
 <211> 56
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Mpcactus antisense rev

 <400> 147
 agaaaactaga gcttgtcgat cgtaaattaa tacacccatt gtgtgcacct gaggtag 56

<210> 148
 <211> 172

<212> DNA
<213> Artificial Sequence

<220>
<223> C002

<400> 148
ctgaaccgta cgatgagcag gaagaagcgt ctgtcgaatt accgatggag caccgtcagt 60
gcgatgaata caaatcgaag atctgggaca aagcatttag caaccaggag gctatgcagc 120
tgatggaact aacgtttaat acaggtaagg aattaggctc ccacgaagtg tg 172

<210> 149
<211> 266
<212> DNA
<213> Artificial Sequence

<220>
<223> ApGLNT1

<400> 149
caattacaaa aggacggcag cgatacaact ctcatacaga cagaacagca atattagcgt 60
tgtcaattac agctattagt gtccagtaaa attgttttta aacaaaaaaaa cgacaataaa 120
tattttgtac tgattaacta gggtgcaaca gtgaattttg aaaaaaatat aaaaacaaaa 180
tcatggattt tagatattag tcttttatct ttggatcatca gtttttgagt attatattat 240
tatattatac ggtgttccta gagcgg 266

<210> 150
<211> 191
<212> DNA
<213> Artificial Sequence

<220>
<223> Rnase

<400> 150
attgcaccga gcagaagact acctataccc ataataatat tacaaggaag aaacctgagg 60
actgtactta gacgtgttat atcataagac ctaataacgt acatgctcga aaatgcattc 120
aactgcatta attactgcag tatgttttagt catttggttcg tgtcttcttc cgaccatcaa 180
tgccaagaaa a 191

<210> 151
<211> 14
<212> DNA
<213> Artificial Sequence

<220>
<223> ApGLNT1 (from ApGLNT1-CPP)

<400> 151
tgatgcgaca tagc 14

<210> 152
<211> 15
<212> DNA
<213> Artificial Sequence

<220>
<223> ApC002 (from ApC002-CPP)

<400> 152
taacttccca tgttg 15

<210> 153
<211> 16
<212> DNA
<213> Artificial Sequence

<220>
<223> BCR-4 (from BCR-4-CPP)

<400> 153
tacaataatc tcatgg 16