

SEQUENCE LISTING

<110> Hawaii Biotech, Inc.

<120> ENHANCED MALARIA MSP-1 SUBUNIT VACCINE

<130> MAL.WO.14.US

<140> 13/510,923

<141> 2012-05-18

<160> 22

<170> PatentIn version 3.5

<210> 1

<211> 72

<212> PRT

<213> Plasmodium falciparum

<400> 1

Ala His Val Lys Ile Thr Lys Leu Ser Asp Leu Lys Ala Ile Asp Asp
1 5 10 15

Lys Ile Asp Leu Phe Lys Asn His Asn Asp Phe Asp Ala Ile Lys Lys
20 25 30

Leu Ile Asn Asp Asp Thr Lys Lys Asp Met Leu Gly Lys Leu Leu Ser
35 40 45

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

Glu Gly Lys Phe Gln Asp Met Leu
65 70

<210> 2

<211> 92

<212> PRT

<213> Plasmodium falciparum

<400> 2

Leu Lys Pro Leu Ala Gly Val Tyr Arg Ser Leu Lys Lys Gln Gly Gly
1 5 10 15

Gly Gly Thr Gly Ala His Val Lys Ile Thr Lys Leu Ser Asp Leu Lys
20 25 30

Ala Ile Asp Asp Lys Ile Asp Leu Phe Lys Asn His Asn Asp Phe Asp
35 40 45

Ala Ile Lys Lys Leu Ile Asn Asp Asp Thr Lys Lys Asp Met Leu Gly
50 55 60

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

Ser Lys Leu Ile Glu Gly Lys Phe Gln Asp Met Leu
85 90

<210> 3
<211> 31
<212> PRT
<213> Plasmodium falciparum

<400> 3

Met Leu Gly Lys Leu Leu Ser Thr Gly Leu Val Gln Asn Phe Pro Asn
1 5 10 15

Thr Ile Ile Ser Lys Leu Ile Glu Gly Lys Phe Gln Asp Met Leu
20 25 30

<210> 4
<211> 112
<212> PRT
<213> Plasmodium falciparum

<400> 4

Lys Phe Leu Pro Phe Leu Thr Asn Ile Glu Thr Leu Tyr Asn Asn Leu
1 5 10 15

Val Asn Lys Ile Asp Asp Tyr Leu Ile Asn Leu Lys Ala Lys Ile Asn
20 25 30

Asp Cys Asn Val Glu Lys Asp Glu Ala His Val Lys Ile Thr Lys Leu
35 40 45

Ser Asp Leu Lys Ala Ile Asp Asp Lys Ile Asp Leu Phe Lys Asn His
50 55 60

Asn Asp Phe Asp Ala Ile Lys Lys Leu Ile Asn Asp Asp Thr Lys Lys
65 70 75 80

Asp Met Leu Gly Lys Leu Leu Ser Thr Gly Leu Val Gln Asn Phe Pro
85 90 95

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

<210> 5
<211> 145
<212> PRT
<213> Plasmodium falciparum

<400> 5

Ile Lys Lys Val Ile Lys Glu Glu Lys Glu Lys Phe Pro Ser Ser Pro
1 5 10 15

Pro Thr Thr Pro Pro Ser Pro Ala Lys Thr Asp Glu Gln Lys Lys Glu
20 25 30

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

Leu Val Asn Lys Ile Asp Asp Tyr Leu Ile Asn Leu Lys Ala Lys Ile
50 55 60

Asn Asp Cys Asn Val Glu Lys Asp Glu Ala His Val Lys Ile Thr Lys
65 70 75 80

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

His Asn Asp Phe Asp Ala Ile Lys Lys Leu Ile Asn Asp Asp Thr Lys
100 105 110

Lys Asp Met Leu Gly Lys Leu Leu Ser Thr Gly Leu Val Gln Asn Phe
115 120 125

Pro Asn Thr Ile Ile Ser Lys Leu Ile Glu Gly Lys Phe Gln Asp Met
130 135 140

Leu
145

<210> 6

<211> 168

<212> PRT

<213> Plasmodium falciparum

<400> 6

Lys Phe Ala Gln Glu Gly Ile Ser Tyr Tyr Glu Lys Val Leu Ala Lys
1 5 10 15

Tyr Lys Asp Asp Leu Glu Ser Ile Lys Lys Val Ile Lys Glu Glu Lys
20 25 30

Glu Lys Phe Pro Ser Ser Pro Pro Thr Thr Pro Pro Ser Pro Ala Lys
35 40 45

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

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

Ile Asn Leu Lys Ala Lys Ile Asn Asp Cys Asn Val Glu Lys Asp Glu
85 90 95

Ala His Val Lys Ile Thr Lys Leu Ser Asp Leu Lys Ala Ile Asp Asp
100 105 110

Lys Ile Asp Leu Phe Lys Asn His Asn Asp Phe Asp Ala Ile Lys Lys
115 120 125

Leu Ile Asn Asp Asp Thr Lys Lys Asp Met Leu Gly Lys Leu Leu Ser
130 135 140

Thr Gly Leu Val Gln Asn Phe Pro Asn Thr Ile Ile Ser Lys Leu Ile
145 150 155 160

Glu Gly Lys Phe Gln Asp Met Leu
165

<210> 7
<211> 186
<212> PRT
<213> Plasmodium falciparum

<400> 7

Asn Thr Leu Leu Lys Ser Tyr Lys Tyr Ile Lys Glu Ser Val Glu Asn
1 5 10 15

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

Ala Lys Tyr Lys Asp Asp Leu Glu Ser Ile Lys Lys Val Ile Lys Glu
35 40 45

Glu Lys Glu Lys Phe Pro Ser Ser Pro Pro Thr Thr Pro Pro Ser Pro
50 55 60

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

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

Tyr Leu Ile Asn Leu Lys Ala Lys Ile Asn Asp Cys Asn Val Glu Lys
100 105 110

Asp Glu Ala His Val Lys Ile Thr Lys Leu Ser Asp Leu Lys Ala Ile
115 120 125

Asp Asp Lys Ile Asp Leu Phe Lys Asn His Asn Asp Phe Asp Ala Ile
130 135 140

Lys Lys Leu Ile Asn Asp Asp Thr Lys Lys Asp Met Leu Gly Lys Leu
145 150 155 160

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

Leu Ile Glu Gly Lys Phe Gln Asp Met Leu
180 185

<210> 8
<211> 258
<212> PRT
<213> Plasmodium falciparum

<400> 8

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

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

Lys Lys Gln Ile Glu Lys Asn Ile Phe Thr Phe Asn Leu Asn Leu Asn
35 40 45

Asp Ile Leu Asn Ser Arg Leu Lys Lys Arg Lys Tyr Phe Leu Asp Val
50 55 60

Leu Glu Ser Asp Leu Met Gln Phe Lys His Ile Ser Ser Asn Glu Tyr
65 70 75 80

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

Leu Leu Lys Ser Tyr Lys Tyr Ile Lys Glu Ser Val Glu Asn Asp Ile
100 105 110

Lys Phe Ala Gln Glu Gly Ile Ser Tyr Tyr Glu Lys Val Leu Ala Lys
115 120 125

Tyr Lys Asp Asp Leu Glu Ser Ile Lys Lys Val Ile Lys Glu Glu Lys
130 135 140

Glu Lys Phe Pro Ser Ser Pro Pro Thr Thr Pro Pro Ser Pro Ala Lys
Page 5

145 150 155 160

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

Ile Glu Thr Leu Tyr Asn Asn Leu Val Asn Lys Ile Asp Asp Tyr Leu
180 185 190

Ile Asn Leu Lys Ala Lys Ile Asn Asp Cys Asn Val Glu Lys Asp Glu
195 200 205

Ala His Val Lys Ile Thr Lys Leu Ser Asp Leu Lys Ala Ile Asp Asp
210 215 220

Lys Ile Asp Leu Phe Lys Asn His Asn Asp Phe Asp Ala Ile Lys Lys
225 230 235 240

Leu Ile Asn Asp Asp Thr Lys Lys Asp Met Leu Gly Gly Gly Gly Gly
245 250 255

Thr Gly

<210> 9
<211> 81
<212> PRT
<213> Plasmodium falciparum

<400> 9

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

Tyr Asp Val Ile Gly Gly Gly Gly Ser Gly Val Glu Lys Asp Glu Ala
20 25 30

His Val Lys Ile Thr Lys Leu Ser Asp Leu Lys Ala Ile Asp Asp Lys
35 40 45

Ile Asp Leu Phe Lys Asn His Asn Asp Phe Asp Ala Ile Lys Lys Leu
50 55 60

Ile Asn Asp Asp Thr Lys Lys Asp Met Leu Gly Gly Gly Gly Gly Thr
65 70 75 80

Gly

<210> 10
<211> 101

<212> PRT
<213> Plasmodium falciparum

<400> 10

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

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

Lys Lys Gln Ile Glu Lys Asn Ile Gly Gly Gly Gly Ser Gly Val Glu
35 40 45

Lys Asp Glu Ala His Val Lys Ile Thr Lys Leu Ser Asp Leu Lys Ala
50 55 60

Ile Asp Asp Lys Ile Asp Leu Phe Lys Asn His Asn Asp Phe Asp Ala
65 70 75 80

Ile Lys Lys Leu Ile Asn Asp Asp Thr Lys Lys Asp Met Leu Gly Gly
85 90 95

Gly Gly Gly Thr Gly
100

<210> 11
<211> 97
<212> PRT
<213> Plasmodium falciparum

<400> 11

Ala Gln Glu Gly Ile Ser Tyr Tyr Glu Lys Val Leu Ala Lys Tyr Lys
1 5 10 15

Asp Asp Leu Glu Ser Ile Lys Lys Val Ile Lys Glu Glu Lys Glu Lys
20 25 30

Phe Pro Ser Ser Gly Gly Gly Gly Ser Gly Val Glu Lys Asp Glu Ala
35 40 45

His Val Lys Ile Thr Lys Leu Ser Asp Leu Lys Ala Ile Asp Asp Lys
50 55 60

Ile Asp Leu Phe Lys Asn His Asn Asp Phe Asp Ala Ile Lys Lys Leu
65 70 75 80

Ile Asn Asp Asp Thr Lys Lys Asp Met Leu Gly Gly Gly Gly Gly Gly Thr
85 90 95

Gly

<210> 12
<211> 84
<212> PRT
<213> Plasmodium falciparum

<400> 12

Ile Ser Ser Asn Glu Tyr Ile Ile Glu Asp Ser Phe Lys Leu Leu Asn
1 5 10 15

Ser Glu Gln Lys Asn Thr Leu Gly Gly Gly Gly Ser Gly Val Glu Lys
20 25 30

Asp Glu Ala His Val Lys Ile Thr Lys Leu Ser Asp Leu Lys Ala Ile
35 40 45

Asp Asp Lys Ile Asp Leu Phe Lys Asn His Asn Asp Phe Asp Ala Ile
50 55 60

Lys Lys Leu Ile Asn Asp Asp Thr Lys Lys Asp Met Leu Gly Gly Gly
65 70 75 80

Gly Gly Thr Gly

<210> 13
<211> 76
<212> PRT
<213> Plasmodium falciparum

<400> 13

Asn Leu Val Asn Lys Ile Asp Asp Tyr Leu Ile Asn Leu Lys Ala Lys
1 5 10 15

Ile Asn Asp Cys Asn Val Glu Lys Asp Glu Ala His Val Lys Ile Thr
20 25 30

Lys Leu Ser Asp Leu Lys Ala Ile Asp Asp Lys Ile Asp Leu Phe Lys
35 40 45

Asn His Asn Asp Phe Asp Ala Ile Lys Lys Leu Ile Asn Asp Asp Thr
50 55 60

Lys Lys Asp Met Leu Gly Gly Gly Gly Gly Thr Gly
65 70 75

<210> 14
<211> 56

<212> PRT
<213> Plasmodium falciparum

<400> 14

Asp Asn Ile Leu Ser Tyr Leu Lys Pro Leu Ala Gly Val Tyr Arg Ser
1 5 10 15

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

Lys Tyr Lys Asp Asp Leu Glu Ser Ile Lys Lys Val Lys Phe Leu Pro
35 40 45

Phe Leu Thr Asn Ile Glu Thr Leu
50 55

<210> 15
<211> 225
<212> PRT
<213> Plasmodium falciparum

<400> 15

Ala Ile Ser Val Thr Met Gly Phe Glu Asn Glu Tyr Asp Val Ile Glu
1 5 10 15

Lys Asn Ile Phe Thr Phe Asn Leu Asn Leu Asn Asp Ile Lys Lys Arg
20 25 30

Lys Tyr Phe Leu Asp Met Gln Phe Lys His Ile Ser Ser Asn Glu Tyr
35 40 45

Ile Ile Glu Asp Ser Phe Lys Leu Leu Asn Ser Glu Gln Lys Asn Thr
50 55 60

Leu Leu Lys Ser Tyr Lys Tyr Ile Lys Glu Ser Val Glu Asn Asp Ile
65 70 75 80

Lys Phe Ala Gln Glu Gly Ile Ser Tyr Tyr Glu Lys Val Leu Ala Val
85 90 95

Ile Lys Glu Glu Lys Glu Lys Phe Pro Ser Ser Pro Pro Thr Thr Pro
100 105 110

Pro Ser Pro Ala Lys Thr Asp Glu Gln Lys Lys Glu Ser Tyr Asn Asn
115 120 125

Leu Val Asn Lys Ile Asp Asp Tyr Leu Ile Asn Leu Lys Ala Lys Ile
130 135 140

Asn Asp Cys Asn Val Glu Lys Asp Glu Ala His Val Lys Ile Thr Lys
145 150 155 160

Leu Ser Asp Leu Lys Ala Ile Asp Asp Lys Ile Asp Leu Phe Lys Asn
165 170 175

His Asn Asp Phe Asp Ala Ile Lys Lys Leu Ile Asn Asp Asp Thr Lys
180 185 190

Lys Asp Met Leu Gly Lys Leu Leu Ser Thr Gly Leu Val Gln Asn Phe
195 200 205

Pro Asn Thr Ile Ile Ser Lys Leu Ile Glu Gly Lys Phe Gln Asp Met
210 215 220

Leu
225

<210> 16
<211> 49
<212> PRT
<213> Plasmodium falciparum

<400> 16

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

Lys Ala Ile Asp Asp Lys Ile Asp Leu Phe Lys Asn His Asn Asp Phe
20 25 30

Asp Ala Ile Lys Lys Leu Ile Asn Asp Asp Thr Lys Lys Asp Met Leu
35 40 45

Gly

<210> 17
<211> 98
<212> PRT
<213> Plasmodium falciparum

<400> 17

Asn Leu Val Asn Lys Ile Asp Asp Tyr Leu Ile Asn Leu Lys Ala Lys
1 5 10 15

Ile Asn Asp Cys Asn Val Glu Lys Asp Glu Ala His Val Lys Ile Thr
20 25 30

Lys Leu Ser Asp Leu Lys Ala Ile Asp Asp Lys Ile Asp Leu Phe Lys
35 40 45

Asn His Asn Asp Phe Asp Ala Ile Lys Lys Leu Ile Asn Asp Asp Thr
 50 55 60

Lys Lys Asp Met Leu Gly Lys Leu Leu Ser Thr Gly Leu Val Gln Asn
 65 70 75 80

Phe Pro Asn Thr Ile Ile Ser Lys Leu Ile Glu Gly Lys Phe Gln Asp
 85 90 95

Met Leu

<210> 18
 <211> 85
 <212> PRT
 <213> Plasmodium falciparum

<400> 18

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

Tyr Asp Val Ile Gly Gly Gly Gly Ser Gly Ile Ser Ser Asn Glu Tyr
 20 25 30

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

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

Lys Asp Asp Leu Glu Ser Ile Lys Lys Val Ile Lys Glu Glu Lys Glu
 65 70 75 80

Lys Phe Pro Ser Ser
 85

<210> 19
 <211> 373
 <212> PRT
 <213> Plasmodium falciparum

<400> 19

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

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

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

Lys Lys Gln Cys Pro Glu Asn Ser Gly Cys Phe Arg His Leu Asp Glu
290 295 300

Arg Glu Glu Cys Lys Cys Leu Leu Asn Tyr Lys Gln Glu Gly Asp Lys
305 310 315 320

Cys Val Glu Asn Pro Asn Pro Thr Cys Asn Glu Asn Asn Gly Gly Cys
325 330 335

Asp Ala Asp Ala Lys Cys Thr Glu Glu Asp Ser Gly Ser Asn Gly Lys
340 345 350

Lys Ile Thr Cys Glu Cys Thr Lys Pro Asp Ser Tyr Pro Leu Phe Asp
355 360 365

Gly Ile Phe Cys Ser
370

<210> 20
<211> 373
<212> PRT
<213> Plasmodium falciparum

<400> 20

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

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

Lys Lys Gln Ile Glu Lys Asn Ile Phe Thr Phe Asn Leu Asn Leu Asn
35 40 45

Asp Ile Leu Asn Ser Arg Leu Lys Lys Arg Lys Tyr Phe Leu Asp Val
50 55 60

Leu Glu Ser Asp Leu Met Gln Phe Lys His Ile Ser Ser Asn Glu Tyr
65 70 75 80

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

Leu Leu Lys Ser Tyr Lys Tyr Ile Lys Glu Ser Val Glu Asn Asp Ile
100 105 110

Lys Phe Ala Gln Glu Gly Ile Ser Tyr Tyr Glu Lys Val Leu Ala Lys
115 120 125

Tyr Lys Asp Asp Leu Glu Ser Ile Lys Lys Val Ile Lys Glu Glu Lys
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130

135

140

Glu Lys Phe Pro Ser Ser Pro Pro Thr Thr Pro Pro Ser Pro Ala Lys
 145 150 155 160

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

Ile Glu Thr Leu Tyr Asn Asn Leu Val Asn Lys Ile Asp Asp Tyr Leu
 180 185 190

Ile Asn Leu Lys Ala Lys Ile Asn Asp Cys Asn Val Glu Lys Asp Glu
 195 200 205

Ala His Val Lys Ile Thr Lys Leu Ser Asp Leu Lys Ala Ile Asp Asp
 210 215 220

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

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

Thr Gly Leu Val Gln Asn Phe Pro Asn Thr Ile Ile Ser Lys Leu Ile
 260 265 270

Glu Gly Lys Phe Gln Asp Met Leu Asn Ile Ser Gln His Gln Cys Val
 275 280 285

Lys Lys Gln Cys Pro Glu Asn Ser Gly Cys Phe Arg His Leu Asp Glu
 290 295 300

Arg Glu Glu Cys Lys Cys Leu Leu Asn Tyr Lys Gln Glu Gly Asp Lys
 305 310 315 320

Cys Val Glu Asn Pro Asn Pro Thr Cys Asn Glu Asn Asn Gly Gly Cys
 325 330 335

Asp Ala Asp Ala Thr Cys Thr Glu Glu Asp Ser Gly Ser Ser Arg Lys
 340 345 350

Lys Ile Thr Cys Glu Cys Thr Lys Pro Asp Ser Tyr Pro Leu Phe Asp
 355 360 365

Gly Ile Phe Cys Ser
 370

<210> 21

<211> 355
 <212> PRT
 <213> Plasmodium falciparum

<400> 21

Ala Val Thr Pro Ser Val Ile Asp Asn Ile Leu Ser Lys Ile Glu Asn
 1 5 10 15

Glu Tyr Glu Val Leu Tyr Leu Lys Pro Leu Ala Gly Val Tyr Arg Ser
 20 25 30

Leu Lys Lys Gln Leu Glu Lys Asn Val Met Thr Phe Asn Val Asn Val
 35 40 45

Lys Asp Ile Leu Asn Ser Arg Lys Asn Lys Arg Glu Asn Phe Lys Asn
 50 55 60

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

Tyr Val Val Lys Asp Pro Tyr Lys Phe Leu Asn Lys Glu Lys Arg Asp
 85 90 95

Lys Phe Leu Ser Ser Tyr Asn Tyr Ile Lys Asp Ser Ile Asp Thr Asp
 100 105 110

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

Lys Tyr Lys Ser Asp Leu Asp Ser Ile Lys Lys Tyr Ile Asn Asp Lys
 130 135 140

Gln Gly Glu Asn Glu Lys Tyr Leu Pro Phe Leu Asn Asn Ile Glu Thr
 145 150 155 160

Leu Tyr Lys Thr Val Asn Asp Lys Ile Asp Leu Phe Val Ile His Leu
 165 170 175

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

Lys Ile Lys Glu Leu Asn Tyr Leu Lys Thr Ile Gln Asp Lys Leu Ala
 195 200 205

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

Asp Tyr Asn His Asn Asn Leu Leu Thr Lys Phe Leu Ser Thr Gly Met
 225 230 235 240

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

Asn Leu Gln Gly Met Leu Asn Ile Ser Gln His Gln Cys Val Lys Lys
260 265 270

Gln Cys Pro Gln Asn Ser Gly Cys Phe Arg His Leu Asp Glu Arg Glu
275 280 285

Glu Cys Lys Cys Leu Leu Asn Tyr Lys Gln Glu Gly Asp Lys Cys Val
290 295 300

Glu Asn Pro Asn Pro Thr Cys Asn Glu Asn Asn Gly Gly Cys Asp Ala
305 310 315 320

Asp Ala Lys Cys Thr Glu Glu Asp Ser Gly Ser Asn Gly Lys Lys Ile
325 330 335

Thr Cys Glu Cys Thr Lys Pro Asp Ser Tyr Pro Leu Phe Asp Gly Ile
340 345 350

Phe Cys Ser
355

<210> 22
<211> 6
<212> PRT
<213> Synthetic Linker

<400> 22

Gly Gly Thr Gly Gly Gly
1 5