SEQUENCE LISTING

<110> THE BRIGHAM AND WOMEN'S HOSPITAL, INC.

<120> TREATMENT OF CANCER WITH ANTI-LAP MONOCLONAL ANTIBODIES

<130> 043214-083601-PCT

<140> PCT/US2016/013408
<141> 2016-01-14

<150> 62/103,401
<151> 2015-01-14

<160> 31

<170> PatentIn version 3.5

<210> 1
<211> 249
<212> PRT
<213> Homo sapiens

<400> 1

```
Leu Ser Thr Cys Lys Thr Ile Asp Met Glu Leu Val Lys Arg Lys Arg
1               5                  10                  15

Ile Glu Ala Ile Arg Gly Gln Ile Leu Ser Lys Leu Arg Leu Ala Ser
            20                  25                  30

Pro Pro Ser Gln Gly Glu Val Pro Pro Gly Pro Leu Pro Glu Ala Val
        35                  40                  45

Leu Ala Leu Tyr Asn Ser Thr Arg Asp Arg Val Ala Gly Glu Ser Ala
    50                  55                  60

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

Arg Val Leu Met Val Glu Thr His Asn Glu Ile Tyr Asp Lys Phe Lys
                85                  90                  95

Gln Ser Thr His Ser Ile Tyr Met Phe Phe Asn Thr Ser Glu Leu Arg
            100                 105                 110

Glu Ala Val Pro Glu Pro Val Leu Leu Ser Arg Ala Glu Leu Arg Leu
        115                 120                 125

Leu Arg Leu Lys Leu Lys Val Glu Gln His Val Glu Leu Tyr Gln Lys
    130                 135                 140

Tyr Ser Asn Asn Ser Trp Arg Tyr Leu Ser Asn Arg Leu Leu Ala Pro
145                 150                 155                 160

Ser Asp Ser Pro Glu Trp Leu Ser Phe Asp Val Thr Gly Val Val Arg
                165                 170                 175
```

```
Gln Trp Leu Ser Arg Gly Gly Glu Ile Glu Gly Phe Arg Leu Ser Ala
            180                 185                 190

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

Gly Phe Thr Thr Gly Arg Arg Gly Asp Leu Ala Thr Ile His Gly Met
    210                 215                 220

Asn Arg Pro Phe Leu Leu Leu Met Ala Thr Pro Leu Glu Arg Ala Gln
225                 230                 235                 240

His Leu Gln Ser Ser Arg His Arg Arg
                245
```

<210> 2
<211> 282
<212> PRT
<213> Homo sapiens

<400> 2

```
Leu Ser Thr Cys Ser Thr Leu Asp Met Asp Gln Phe Met Arg Lys Arg
1               5                   10                  15

Ile Glu Ala Ile Arg Gly Gln Ile Leu Ser Lys Leu Lys Leu Thr Ser
            20                  25                  30

Pro Pro Glu Asp Tyr Pro Glu Pro Glu Glu Val Pro Pro Glu Val Ile
        35                  40                  45

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

Arg Ala Ala Ala Cys Glu Arg Glu Arg Ser Asp Glu Glu Tyr Tyr Ala
65                  70                  75                  80

Lys Glu Val Tyr Lys Ile Asp Met Pro Pro Phe Phe Pro Ser Glu Asn
                85                  90                  95

Ala Ile Pro Pro Thr Phe Tyr Arg Pro Tyr Phe Arg Ile Val Arg Phe
            100                 105                 110

Asp Val Ser Ala Met Glu Lys Asn Ala Ser Asn Leu Val Lys Ala Glu
        115                 120                 125

Phe Arg Val Phe Arg Leu Gln Asn Pro Lys Ala Arg Val Pro Glu Gln
    130                 135                 140

Arg Ile Glu Leu Tyr Gln Ile Leu Lys Ser Lys Asp Leu Thr Ser Pro
145                 150                 155                 160

Thr Gln Arg Tyr Ile Asp Ser Lys Val Val Lys Thr Arg Ala Glu Gly
                165                 170                 175
```

```
Glu Trp Leu Ser Phe Asp Val Thr Asp Ala Val His Glu Trp Leu His
            180                 185                 190

His Lys Asp Arg Asn Leu Gly Phe Lys Ile Ser Leu His Cys Pro Cys
        195                 200                 205

Cys Thr Phe Val Pro Ser Asn Asn Tyr Ile Ile Pro Asn Lys Ser Glu
    210                 215                 220

Glu Leu Glu Ala Arg Phe Ala Gly Ile Asp Gly Thr Ser Thr Tyr Thr
225                 230                 235                 240

Ser Gly Asp Gln Lys Thr Ile Lys Ser Thr Arg Lys Lys Asn Ser Gly
                245                 250                 255

Lys Thr Pro His Leu Leu Leu Met Leu Leu Pro Ser Tyr Arg Leu Glu
            260                 265                 270

Ser Gln Gln Thr Asn Arg Arg Lys Lys Arg
        275                 280
```

<210> 3
<211> 277
<212> PRT
<213> Homo sapiens

<400> 3

```
Leu Ser Thr Cys Thr Thr Leu Asp Phe Gly His Ile Lys Lys Lys Arg
1               5                   10                  15

Val Glu Ala Ile Arg Gly Gln Ile Leu Ser Lys Leu Arg Leu Thr Ser
            20                  25                  30

Pro Pro Glu Pro Thr Val Met Thr His Val Pro Tyr Gln Val Leu Ala
        35                  40                  45

Leu Tyr Asn Ser Thr Arg Glu Leu Leu Glu Glu Met His Gly Glu Arg
    50                  55                  60

Glu Glu Gly Cys Thr Gln Glu Asn Thr Glu Ser Glu Tyr Tyr Ala Lys
65                  70                  75                  80

Glu Ile His Lys Phe Asp Met Ile Gln Gly Leu Ala Glu His Asn Glu
                85                  90                  95

Leu Ala Val Cys Pro Lys Gly Ile Thr Ser Lys Val Phe Arg Phe Asn
            100                 105                 110

Val Ser Ser Val Glu Lys Asn Arg Thr Asn Leu Phe Arg Ala Glu Phe
        115                 120                 125
```

```
Arg Val Leu Arg Val Pro Asn Pro Ser Ser Lys Arg Asn Glu Gln Arg
    130                 135                 140

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

Arg Tyr Ile Gly Gly Lys Asn Leu Pro Thr Arg Gly Thr Ala Glu Trp
                165                 170                 175

Leu Ser Phe Asp Val Thr Asp Thr Val Arg Glu Trp Leu Leu Arg Arg
            180                 185                 190

Glu Ser Asn Leu Gly Leu Glu Ile Ser Ile His Cys Pro Cys His Thr
        195                 200                 205

Phe Gln Pro Asn Gly Asp Ile Leu Glu Asn Ile His Glu Val Met Glu
    210                 215                 220

Ile Lys Phe Lys Gly Val Asp Asn Glu Asp Asp His Gly Arg Gly Asp
225                 230                 235                 240

Leu Gly Arg Leu Lys Lys Gln Lys Asp His His Asn Pro His Leu Ile
                245                 250                 255

Leu Met Met Ile Pro Pro His Arg Leu Asp Asn Pro Gly Gln Gly Gly
            260                 265                 270

Gln Arg Lys Lys Arg
        275
```

<210> 4
<211> 249
<212> PRT
<213> Mus musculus

<400> 4

```
Leu Ser Thr Cys Lys Thr Ile Asp Met Glu Leu Val Lys Arg Lys Arg
1               5                   10                  15

Ile Glu Ala Ile Arg Gly Gln Ile Leu Ser Lys Leu Arg Leu Ala Ser
            20                  25                  30

Pro Pro Ser Gln Gly Glu Val Pro Pro Gly Pro Leu Pro Glu Ala Val
        35                  40                  45

Leu Ala Leu Tyr Asn Ser Thr Arg Asp Arg Val Ala Gly Glu Ser Ala
    50                  55                  60

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

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

```
Asp Ile Ser His Ser Ile Tyr Met Phe Phe Asn Thr Ser Asp Ile Arg
            100                 105                 110

Glu Ala Val Pro Glu Pro Pro Leu Leu Ser Arg Ala Glu Leu Arg Leu
        115                 120                 125

Gln Arg Leu Lys Ser Ser Val Glu Gln His Val Glu Leu Tyr Gln Lys
    130                 135                 140

Tyr Ser Asn Asn Ser Trp Arg Tyr Leu Gly Asn Arg Leu Leu Thr Pro
145                 150                 155                 160

Thr Asp Thr Pro Glu Trp Leu Ser Phe Asp Val Thr Gly Val Val Arg
                165                 170                 175

Gln Trp Leu Asn Gln Gly Asp Gly Ile Gln Gly Phe Arg Phe Ser Ala
            180                 185                 190

His Cys Ser Cys Asp Ser Lys Asp Asn Lys Leu His Val Glu Ile Asn
        195                 200                 205

Gly Ile Ser Pro Lys Arg Arg Gly Asp Leu Gly Thr Ile His Asp Met
    210                 215                 220

Asn Arg Pro Phe Leu Leu Leu Met Ala Thr Pro Leu Glu Arg Ala Gln
225                 230                 235                 240

His Leu His Ser Ser Arg His Arg Arg
                245
```

<210> 5
<211> 282
<212> PRT
<213> Mus musculus

<400> 5

```
Leu Ser Thr Cys Ser Thr Leu Asp Met Asp Gln Phe Met Arg Lys Arg
1               5                   10                  15

Ile Glu Ala Ile Arg Gly Gln Ile Leu Ser Lys Leu Lys Leu Thr Ser
            20                  25                  30

Pro Pro Glu Asp Tyr Pro Glu Pro Asp Glu Val Pro Pro Glu Val Ile
        35                  40                  45

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

Arg Ala Ala Ala Cys Glu Arg Glu Arg Ser Asp Glu Glu Tyr Tyr Ala
65                  70                  75                  80
```

```
Lys Glu Val Tyr Lys Ile Asp Met Pro Ser His Leu Pro Ser Glu Asn
                85                  90                  95

Ala Ile Pro Pro Thr Phe Tyr Arg Pro Tyr Phe Arg Ile Val Arg Phe
            100                 105                 110

Asp Val Ser Thr Met Glu Lys Asn Ala Ser Asn Leu Val Lys Ala Glu
        115                 120                 125

Phe Arg Val Phe Arg Leu Gln Asn Pro Lys Ala Arg Val Ala Glu Gln
    130                 135                 140

Arg Ile Glu Leu Tyr Gln Ile Leu Lys Ser Lys Asp Leu Thr Ser Pro
145                 150                 155                 160

Thr Gln Arg Tyr Ile Asp Ser Lys Val Val Lys Thr Arg Ala Glu Gly
                165                 170                 175

Glu Trp Leu Ser Phe Asp Val Thr Asp Ala Val Gln Glu Trp Leu His
            180                 185                 190

His Lys Asp Arg Asn Leu Gly Phe Lys Ile Ser Leu His Cys Pro Cys
        195                 200                 205

Cys Thr Phe Val Pro Ser Asn Asn Tyr Ile Ile Pro Asn Lys Ser Glu
    210                 215                 220

Glu Leu Glu Ala Arg Phe Ala Gly Ile Asp Gly Thr Ser Thr Tyr Ala
225                 230                 235                 240

Ser Gly Asp Gln Lys Thr Ile Lys Ser Thr Arg Lys Lys Thr Ser Gly
                245                 250                 255

Lys Thr Pro His Leu Leu Leu Met Leu Leu Pro Ser Tyr Arg Leu Glu
            260                 265                 270

Ser Gln Gln Ser Ser Arg Arg Lys Lys Arg
        275                 280


<210> 6
<211> 277
<212> PRT
<213> Mus musculus

<400> 6
Leu Ser Thr Cys Thr Thr Leu Asp Phe Gly His Ile Lys Lys Lys Arg
1               5                   10                  15

Val Glu Ala Ile Arg Gly Gln Ile Leu Ser Lys Leu Arg Leu Thr Ser
            20                  25                  30

Pro Pro Glu Pro Ser Val Met Thr His Val Pro Tyr Gln Val Leu Ala
        35                  40                  45
```

```
Leu Tyr Asn Ser Thr Arg Glu Leu Leu Glu Glu Met His Gly Glu Arg
    50                  55                  60

Glu Glu Gly Cys Thr Gln Glu Thr Ser Glu Ser Glu Tyr Tyr Ala Lys
65                  70                  75                  80

Glu Ile His Lys Phe Asp Met Ile Gln Gly Leu Ala Glu His Asn Glu
                85                  90                  95

Leu Ala Val Cys Pro Lys Gly Ile Thr Ser Lys Val Phe Arg Phe Asn
            100                 105                 110

Val Ser Ser Val Glu Lys Asn Gly Thr Asn Leu Phe Arg Ala Glu Phe
        115                 120                 125

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

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

Arg Tyr Ile Gly Gly Lys Asn Leu Pro Thr Arg Gly Thr Ala Glu Trp
                165                 170                 175

Leu Ser Phe Asp Val Thr Asp Thr Val Arg Glu Trp Leu Leu Arg Arg
            180                 185                 190

Glu Ser Asn Leu Gly Leu Glu Ile Ser Ile His Cys Pro Cys His Thr
        195                 200                 205

Phe Gln Pro Asn Gly Asp Ile Leu Glu Asn Val His Glu Val Met Glu
    210                 215                 220

Ile Lys Phe Lys Gly Val Asp Asn Glu Asp Asp His Gly Arg Gly Asp
225                 230                 235                 240

Leu Gly Arg Leu Lys Lys Gln Lys Asp His His Asn Pro His Leu Ile
                245                 250                 255

Leu Met Met Ile Pro Pro His Arg Leu Asp Ser Pro Gly Gln Gly Ser
            260                 265                 270

Gln Arg Lys Lys Arg
        275
```

<210> 7
<211> 417
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic polynucleotide

<400> 7

atgaagttgt ggctgaactg gattttcctt gtaacacttt taaatgatat ccagtgtgag 60

gtgaagctgg tggagtctgg aggaggcttg gtacagcctg ggggttctct gagtctctcc 120

tgtgcagctt ctggattcac cttcactgat tactacatga gctgggtccg ccagcctcca 180

gggaaggcac ttgagtggtt gggttttatt agaaacaaac ctaatggtta cacaacagag 240

tacagtgcat ctgtgaaggg tcggttcacc atctccagag ataattccca aagcatcctc 300

tatcttcaaa tgaatgtcct gagagctgag gacagtgcca cttattactg tgcaagatat 360

acgggggggg gttactttga ctactggggc caaggcacca ctctcacagt ctcctca 417

<210> 8
<211> 139
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polypeptide

<400> 8

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

Ile Gln Cys Glu Val Lys Leu Val Glu Ser Gly Gly Gly Leu Val Gln
20 25 30

Pro Gly Gly Ser Leu Ser Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe
35 40 45

Thr Asp Tyr Tyr Met Ser Trp Val Arg Gln Pro Pro Gly Lys Ala Leu
50 55 60

Glu Trp Leu Gly Phe Ile Arg Asn Lys Pro Asn Gly Tyr Thr Thr Glu
65 70 75 80

Tyr Ser Ala Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser
85 90 95

Gln Ser Ile Leu Tyr Leu Gln Met Asn Val Leu Arg Ala Glu Asp Ser
100 105 110

Ala Thr Tyr Tyr Cys Ala Arg Tyr Thr Gly Gly Gly Tyr Phe Asp Tyr
115 120 125

Trp Gly Gln Gly Thr Thr Leu Thr Val Ser Ser
130 135

<210> 9
<211> 5
<212> PRT

<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 9
Asp Tyr Tyr Met Ser
1 5

<210> 10
<211> 19
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 10
Phe Ile Arg Asn Lys Pro Asn Gly Tyr Thr Thr Glu Tyr Ser Ala Ser
1 5 10 15

Val Lys Gly

<210> 11
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 11
Tyr Thr Gly Gly Gly Tyr Phe Asp Tyr
1 5

<210> 12
<211> 381
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polynucleotide

<400> 12
atgatgtcct ctgctcagtt ccttggtctc ctgttgctct gttttcaagg taccagatgt 60

gatatccaga tgacacagac tacatcctcc ctgtctgcct ctctgggaga cagactcacc 120

atcagttgca gggcaagtca ggacattagc aattatttaa actggtatca gcagaaacca 180

gatggaactg ttaaactcct gatctactac acatcaagat tacactcagg agtcccatca 240

aggttcagtg gcagtgggtc tggaacagat tattctctca ccattagcaa cctggagcaa 300

gcagatattg ccacttactt ttgccaacag ggtgatacac ttccgtggac gttcggtgga 360

ggcaccaagc tggaaatcaa a 381

<210> 13
<211> 127
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polypeptide

<400> 13
Met Met Ser Ser Ala Gln Phe Leu Gly Leu Leu Leu Leu Cys Phe Gln
1 5 10 15

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

Ala Ser Leu Gly Asp Arg Leu Thr Ile Ser Cys Arg Ala Ser Gln Asp
35 40 45

Ile Ser Asn Tyr Leu Asn Trp Tyr Gln Gln Lys Pro Asp Gly Thr Val
50 55 60

Lys Leu Leu Ile Tyr Tyr Thr Ser Arg Leu His Ser Gly Val Pro Ser
65 70 75 80

Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Tyr Ser Leu Thr Ile Ser
85 90 95

Asn Leu Glu Gln Ala Asp Ile Ala Thr Tyr Phe Cys Gln Gln Gly Asp
100 105 110

Thr Leu Pro Trp Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys
115 120 125

<210> 14
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 14
Arg Ala Ser Gln Asp Ile Ser Asn Tyr Leu Asn
1 5 10

<210> 15
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 15
Tyr Thr Ser Arg Leu His Ser
1 5

<210> 16
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 16
Gln Gln Gly Asp Thr Leu Pro Trp Thr
1 5

<210> 17
<211> 30
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polypeptide

<400> 17
Glu Val Lys Leu Val Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15

Ser Leu Ser Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Thr
20 25 30

<210> 18
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 18
Trp Val Arg Gln Pro Pro Gly Lys Ala Leu Glu Trp Leu Gly
1 5 10

<210> 19
<211> 32
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polypeptide

<400> 19
Arg Phe Thr Ile Ser Arg Asp Asn Ser Gln Ser Ile Leu Tyr Leu Gln
1 5 10 15

Met Asn Val Leu Arg Ala Glu Asp Ser Ala Thr Tyr Tyr Cys Ala Arg
20 25 30

<210> 20
<211> 11

<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 20
Trp Gly Gln Gly Thr Thr Leu Thr Val Ser Ser
1 5 10

<210> 21
<211> 23
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 21
Asp Ile Gln Met Thr Gln Thr Thr Ser Ser Leu Ser Ala Ser Leu Gly
1 5 10 15

Asp Arg Leu Thr Ile Ser Cys
20

<210> 22
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic peptide

<400> 22
Trp Tyr Gln Gln Lys Pro Asp Gly Thr Val Lys Leu Leu Ile Tyr
1 5 10 15

<210> 23
<211> 32
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic polypeptide

<400> 23
Gly Val Pro Ser Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Tyr Ser
1 5 10 15

Leu Thr Ile Ser Asn Leu Glu Gln Ala Asp Ile Ala Thr Tyr Phe Cys
20 25 30

<210> 24
<211> 10
<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
peptide

<400> 24
Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys
1 5 10

<210> 25
<211> 390
<212> PRT
<213> Homo sapiens

<400> 25
Met Pro Pro Ser Gly Leu Arg Leu Leu Pro Leu Leu Leu Pro Leu Leu
1 5 10 15

Trp Leu Leu Val Leu Thr Pro Gly Arg Pro Ala Ala Gly Leu Ser Thr
20 25 30

Cys Lys Thr Ile Asp Met Glu Leu Val Lys Arg Lys Arg Ile Glu Ala
35 40 45

Ile Arg Gly Gln Ile Leu Ser Lys Leu Arg Leu Ala Ser Pro Pro Ser
50 55 60

Gln Gly Glu Val Pro Pro Gly Pro Leu Pro Glu Ala Val Leu Ala Leu
65 70 75 80

Tyr Asn Ser Thr Arg Asp Arg Val Ala Gly Glu Ser Ala Glu Pro Glu
85 90 95

Pro Glu Pro Glu Ala Asp Tyr Tyr Ala Lys Glu Val Thr Arg Val Leu
100 105 110

Met Val Glu Thr His Asn Glu Ile Tyr Asp Lys Phe Lys Gln Ser Thr
115 120 125

His Ser Ile Tyr Met Phe Phe Asn Thr Ser Glu Leu Arg Glu Ala Val
130 135 140

Pro Glu Pro Val Leu Leu Ser Arg Ala Glu Leu Arg Leu Leu Arg Leu
145 150 155 160

Lys Leu Lys Val Glu Gln His Val Glu Leu Tyr Gln Lys Tyr Ser Asn
165 170 175

Asn Ser Trp Arg Tyr Leu Ser Asn Arg Leu Leu Ala Pro Ser Asp Ser
180 185 190

Pro Glu Trp Leu Ser Phe Asp Val Thr Gly Val Val Arg Gln Trp Leu
195 200 205

Ser Arg Gly Gly Glu Ile Glu Gly Phe Arg Leu Ser Ala His Cys Ser
210 215 220

```
Cys Asp Ser Arg Asp Asn Thr Leu Gln Val Asp Ile Asn Gly Phe Thr
225                 230                 235                 240

Thr Gly Arg Arg Gly Asp Leu Ala Thr Ile His Gly Met Asn Arg Pro
                245                 250                 255

Phe Leu Leu Leu Met Ala Thr Pro Leu Glu Arg Ala Gln His Leu Gln
            260                 265                 270

Ser Ser Arg His Arg Arg Ala Leu Asp Thr Asn Tyr Cys Phe Ser Ser
        275                 280                 285

Thr Glu Lys Asn Cys Cys Val Arg Gln Leu Tyr Ile Asp Phe Arg Lys
    290                 295                 300

Asp Leu Gly Trp Lys Trp Ile His Glu Pro Lys Gly Tyr His Ala Asn
305                 310                 315                 320

Phe Cys Leu Gly Pro Cys Pro Tyr Ile Trp Ser Leu Asp Thr Gln Tyr
                325                 330                 335

Ser Lys Val Leu Ala Leu Tyr Asn Gln His Asn Pro Gly Ala Ser Ala
            340                 345                 350

Ala Pro Cys Cys Val Pro Gln Ala Leu Glu Pro Leu Pro Ile Val Tyr
        355                 360                 365

Tyr Val Gly Arg Lys Pro Lys Val Glu Gln Leu Ser Asn Met Ile Val
    370                 375                 380

Arg Ser Cys Lys Cys Ser
385                 390


<210> 26
<211> 390
<212> PRT
<213> Mus musculus

<400> 26
Met Pro Pro Ser Gly Leu Arg Leu Leu Pro Leu Leu Leu Pro Leu Pro
1               5                   10                  15

Trp Leu Leu Val Leu Thr Pro Gly Arg Pro Ala Ala Gly Leu Ser Thr
            20                  25                  30

Cys Lys Thr Ile Asp Met Glu Leu Val Lys Arg Lys Arg Ile Glu Ala
        35                  40                  45

Ile Arg Gly Gln Ile Leu Ser Lys Leu Arg Leu Ala Ser Pro Pro Ser
    50                  55                  60
```

```
Gln Gly Glu Val Pro Pro Gly Pro Leu Pro Glu Ala Val Leu Ala Leu
65                  70                  75                  80

Tyr Asn Ser Thr Arg Asp Arg Val Ala Gly Glu Ser Ala Asp Pro Glu
                85                  90                  95

Pro Glu Pro Glu Ala Asp Tyr Tyr Ala Lys Glu Val Thr Arg Val Leu
            100                 105                 110

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

His Ser Ile Tyr Met Phe Phe Asn Thr Ser Asp Ile Arg Glu Ala Val
    130                 135                 140

Pro Glu Pro Pro Leu Leu Ser Arg Ala Glu Leu Arg Leu Gln Arg Leu
145                 150                 155                 160

Lys Ser Ser Val Glu Gln His Val Glu Leu Tyr Gln Lys Tyr Ser Asn
                165                 170                 175

Asn Ser Trp Arg Tyr Leu Gly Asn Arg Leu Leu Thr Pro Thr Asp Thr
            180                 185                 190

Pro Glu Trp Leu Ser Phe Asp Val Thr Gly Val Val Arg Gln Trp Leu
        195                 200                 205

Asn Gln Gly Asp Gly Ile Gln Gly Phe Arg Phe Ser Ala His Cys Ser
    210                 215                 220

Cys Asp Ser Lys Asp Asn Lys Leu His Val Glu Ile Asn Gly Ile Ser
225                 230                 235                 240

Pro Lys Arg Arg Gly Asp Leu Gly Thr Ile His Asp Met Asn Arg Pro
                245                 250                 255

Phe Leu Leu Leu Met Ala Thr Pro Leu Glu Arg Ala Gln His Leu His
            260                 265                 270

Ser Ser Arg His Arg Arg Ala Leu Asp Thr Asn Tyr Cys Phe Ser Ser
        275                 280                 285

Thr Glu Lys Asn Cys Cys Val Arg Gln Leu Tyr Ile Asp Phe Arg Lys
    290                 295                 300

Asp Leu Gly Trp Lys Trp Ile His Glu Pro Lys Gly Tyr His Ala Asn
305                 310                 315                 320

Phe Cys Leu Gly Pro Cys Pro Tyr Ile Trp Ser Leu Asp Thr Gln Tyr
                325                 330                 335
```

Ser Lys Val Leu Ala Leu Tyr Asn Gln His Asn Pro Gly Ala Ser Ala
340 345 350

Ser Pro Cys Cys Val Pro Gln Ala Leu Glu Pro Leu Pro Ile Val Tyr
355 360 365

Tyr Val Gly Arg Lys Pro Lys Val Glu Gln Leu Ser Asn Met Ile Val
370 375 380

Arg Ser Cys Lys Cys Ser
385 390

<210> 27
<211> 412
<212> PRT
<213> Homo sapiens

<400> 27
Met Lys Met His Leu Gln Arg Ala Leu Val Val Leu Ala Leu Leu Asn
1 5 10 15

Phe Ala Thr Val Ser Leu Ser Leu Ser Thr Cys Thr Thr Leu Asp Phe
20 25 30

Gly His Ile Lys Lys Lys Arg Val Glu Ala Ile Arg Gly Gln Ile Leu
35 40 45

Ser Lys Leu Arg Leu Thr Ser Pro Pro Glu Pro Thr Val Met Thr His
50 55 60

Val Pro Tyr Gln Val Leu Ala Leu Tyr Asn Ser Thr Arg Glu Leu Leu
65 70 75 80

Glu Glu Met His Gly Glu Arg Glu Glu Gly Cys Thr Gln Glu Asn Thr
85 90 95

Glu Ser Glu Tyr Tyr Ala Lys Glu Ile His Lys Phe Asp Met Ile Gln
100 105 110

Gly Leu Ala Glu His Asn Glu Leu Ala Val Cys Pro Lys Gly Ile Thr
115 120 125

Ser Lys Val Phe Arg Phe Asn Val Ser Ser Val Glu Lys Asn Arg Thr
130 135 140

Asn Leu Phe Arg Ala Glu Phe Arg Val Leu Arg Val Pro Asn Pro Ser
145 150 155 160

Ser Lys Arg Asn Glu Gln Arg Ile Glu Leu Phe Gln Ile Leu Arg Pro
165 170 175

Asp Glu His Ile Ala Lys Gln Arg Tyr Ile Gly Gly Lys Asn Leu Pro
180 185 190

```
Thr Arg Gly Thr Ala Glu Trp Leu Ser Phe Asp Val Thr Asp Thr Val
        195                 200                 205

Arg Glu Trp Leu Leu Arg Arg Glu Ser Asn Leu Gly Leu Glu Ile Ser
    210                 215                 220

Ile His Cys Pro Cys His Thr Phe Gln Pro Asn Gly Asp Ile Leu Glu
225                 230                 235                 240

Asn Ile His Glu Val Met Glu Ile Lys Phe Lys Gly Val Asp Asn Glu
                245                 250                 255

Asp Asp His Gly Arg Gly Asp Leu Gly Arg Leu Lys Lys Gln Lys Asp
            260                 265                 270

His His Asn Pro His Leu Ile Leu Met Met Ile Pro Pro His Arg Leu
        275                 280                 285

Asp Asn Pro Gly Gln Gly Gly Gln Arg Lys Lys Arg Ala Leu Asp Thr
    290                 295                 300

Asn Tyr Cys Phe Arg Asn Leu Glu Glu Asn Cys Cys Val Arg Pro Leu
305                 310                 315                 320

Tyr Ile Asp Phe Arg Gln Asp Leu Gly Trp Lys Trp Val His Glu Pro
                325                 330                 335

Lys Gly Tyr Tyr Ala Asn Phe Cys Ser Gly Pro Cys Pro Tyr Leu Arg
            340                 345                 350

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

Asn Pro Glu Ala Ser Ala Ser Pro Cys Cys Val Pro Gln Asp Leu Glu
    370                 375                 380

Pro Leu Thr Ile Leu Tyr Tyr Val Gly Arg Thr Pro Lys Val Glu Gln
385                 390                 395                 400

Leu Ser Asn Met Val Val Lys Ser Cys Lys Cys Ser
                405                 410
```

<210> 28
<211> 412
<212> PRT
<213> Mus musculus

<400> 28

```
Met Lys Met His Leu Gln Arg Ala Leu Val Val Leu Ala Leu Leu Asn
1               5                   10                  15
```

```
Leu Ala Thr Ile Ser Leu Ser Leu Ser Thr Cys Thr Thr Leu Asp Phe
            20                  25                  30

Gly His Ile Lys Lys Lys Arg Val Glu Ala Ile Arg Gly Gln Ile Leu
        35                  40                  45

Ser Lys Leu Arg Leu Thr Ser Pro Pro Glu Pro Ser Val Met Thr His
    50                  55                  60

Val Pro Tyr Gln Val Leu Ala Leu Tyr Asn Ser Thr Arg Glu Leu Leu
65                  70                  75                  80

Glu Glu Met His Gly Glu Arg Glu Glu Gly Cys Thr Gln Glu Thr Ser
                85                  90                  95

Glu Ser Glu Tyr Tyr Ala Lys Glu Ile His Lys Phe Asp Met Ile Gln
            100                 105                 110

Gly Leu Ala Glu His Asn Glu Leu Ala Val Cys Pro Lys Gly Ile Thr
        115                 120                 125

Ser Lys Val Phe Arg Phe Asn Val Ser Ser Val Glu Lys Asn Gly Thr
    130                 135                 140

Asn Leu Phe Arg Ala Glu Phe Arg Val Leu Arg Val Pro Asn Pro Ser
145                 150                 155                 160

Ser Lys Arg Thr Glu Gln Arg Ile Glu Leu Phe Gln Ile Leu Arg Pro
                165                 170                 175

Asp Glu His Ile Ala Lys Gln Arg Tyr Ile Gly Gly Lys Asn Leu Pro
            180                 185                 190

Thr Arg Gly Thr Ala Glu Trp Leu Ser Phe Asp Val Thr Asp Thr Val
        195                 200                 205

Arg Glu Trp Leu Leu Arg Arg Glu Ser Asn Leu Gly Leu Glu Ile Ser
    210                 215                 220

Ile His Cys Pro Cys His Thr Phe Gln Pro Asn Gly Asp Ile Leu Glu
225                 230                 235                 240

Asn Val His Glu Val Met Glu Ile Lys Phe Lys Gly Val Asp Asn Glu
                245                 250                 255

Asp Asp His Gly Arg Gly Asp Leu Gly Arg Leu Lys Lys Gln Lys Asp
            260                 265                 270

His His Asn Pro His Leu Ile Leu Met Met Ile Pro Pro His Arg Leu
        275                 280                 285
```

```
Asp Ser Pro Gly Gln Gly Ser Gln Arg Lys Lys Arg Ala Leu Asp Thr
    290                 295                 300

Asn Tyr Cys Phe Arg Asn Leu Glu Glu Asn Cys Cys Val Arg Pro Leu
305                 310                 315                 320

Tyr Ile Asp Phe Arg Gln Asp Leu Gly Trp Lys Trp Val His Glu Pro
                325                 330                 335

Lys Gly Tyr Tyr Ala Asn Phe Cys Ser Gly Pro Cys Pro Tyr Leu Arg
            340                 345                 350

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

Asn Pro Glu Ala Ser Ala Ser Pro Cys Cys Val Pro Gln Asp Leu Glu
    370                 375                 380

Pro Leu Thr Ile Leu Tyr Tyr Val Gly Arg Thr Pro Lys Val Glu Gln
385                 390                 395                 400

Leu Ser Asn Met Val Val Lys Ser Cys Lys Cys Ser
                405                 410


<210> 29
<211> 442
<212> PRT
<213> Homo sapiens

<400> 29
Met His Tyr Cys Val Leu Ser Ala Phe Leu Ile Leu His Leu Val Thr
1               5                   10                  15

Val Ala Leu Ser Leu Ser Thr Cys Ser Thr Leu Asp Met Asp Gln Phe
            20                  25                  30

Met Arg Lys Arg Ile Glu Ala Ile Arg Gly Gln Ile Leu Ser Lys Leu
        35                  40                  45

Lys Leu Thr Ser Pro Pro Glu Asp Tyr Pro Glu Pro Glu Glu Val Pro
    50                  55                  60

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

Lys Ala Ser Arg Arg Ala Ala Ala Cys Glu Arg Glu Arg Ser Asp Glu
                85                  90                  95

Glu Tyr Tyr Ala Lys Glu Val Tyr Lys Ile Asp Met Pro Pro Phe Phe
            100                 105                 110

Pro Ser Glu Thr Val Cys Pro Val Val Thr Thr Pro Ser Gly Ser Val
        115                 120                 125
```

```
Gly Ser Leu Cys Ser Arg Gln Ser Gln Val Leu Cys Gly Tyr Leu Asp
    130                 135                 140

Ala Ile Pro Pro Thr Phe Tyr Arg Pro Tyr Phe Arg Ile Val Arg Phe
145                 150                 155                 160

Asp Val Ser Ala Met Glu Lys Asn Ala Ser Asn Leu Val Lys Ala Glu
                165                 170                 175

Phe Arg Val Phe Arg Leu Gln Asn Pro Lys Ala Arg Val Pro Glu Gln
            180                 185                 190

Arg Ile Glu Leu Tyr Gln Ile Leu Lys Ser Lys Asp Leu Thr Ser Pro
        195                 200                 205

Thr Gln Arg Tyr Ile Asp Ser Lys Val Val Lys Thr Arg Ala Glu Gly
    210                 215                 220

Glu Trp Leu Ser Phe Asp Val Thr Asp Ala Val His Glu Trp Leu His
225                 230                 235                 240

His Lys Asp Arg Asn Leu Gly Phe Lys Ile Ser Leu His Cys Pro Cys
                245                 250                 255

Cys Thr Phe Val Pro Ser Asn Asn Tyr Ile Ile Pro Asn Lys Ser Glu
            260                 265                 270

Glu Leu Glu Ala Arg Phe Ala Gly Ile Asp Gly Thr Ser Thr Tyr Thr
        275                 280                 285

Ser Gly Asp Gln Lys Thr Ile Lys Ser Thr Arg Lys Lys Asn Ser Gly
    290                 295                 300

Lys Thr Pro His Leu Leu Leu Met Leu Leu Pro Ser Tyr Arg Leu Glu
305                 310                 315                 320

Ser Gln Gln Thr Asn Arg Arg Lys Lys Arg Ala Leu Asp Ala Ala Tyr
                325                 330                 335

Cys Phe Arg Asn Val Gln Asp Asn Cys Cys Leu Arg Pro Leu Tyr Ile
            340                 345                 350

Asp Phe Lys Arg Asp Leu Gly Trp Lys Trp Ile His Glu Pro Lys Gly
        355                 360                 365

Tyr Asn Ala Asn Phe Cys Ala Gly Ala Cys Pro Tyr Leu Trp Ser Ser
    370                 375                 380

Asp Thr Gln His Ser Arg Val Leu Ser Leu Tyr Asn Thr Ile Asn Pro
385                 390                 395                 400
```

```
Glu Ala Ser Ala Ser Pro Cys Cys Val Ser Gln Asp Leu Glu Pro Leu
                405                 410                 415

Thr Ile Leu Tyr Tyr Ile Gly Lys Thr Pro Lys Ile Glu Gln Leu Ser
            420                 425                 430

Asn Met Ile Val Lys Ser Cys Lys Cys Ser
        435                 440
```

<210> 30
<211> 414
<212> PRT
<213> Mus musculus

<400> 30

```
Met His Tyr Cys Val Leu Ser Thr Phe Leu Leu Leu His Leu Val Pro
1               5                   10                  15

Val Ala Leu Ser Leu Ser Thr Cys Ser Thr Leu Asp Met Asp Gln Phe
            20                  25                  30

Met Arg Lys Arg Ile Glu Ala Ile Arg Gly Gln Ile Leu Ser Lys Leu
        35                  40                  45

Lys Leu Thr Ser Pro Pro Glu Asp Tyr Pro Glu Pro Asp Glu Val Pro
    50                  55                  60

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

Lys Ala Ser Arg Arg Ala Ala Ala Cys Glu Arg Glu Arg Ser Asp Glu
                85                  90                  95

Glu Tyr Tyr Ala Lys Glu Val Tyr Lys Ile Asp Met Pro Ser His Leu
            100                 105                 110

Pro Ser Glu Asn Ala Ile Pro Pro Thr Phe Tyr Arg Pro Tyr Phe Arg
        115                 120                 125

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

Val Lys Ala Glu Phe Arg Val Phe Arg Leu Gln Asn Pro Lys Ala Arg
145                 150                 155                 160

Val Ala Glu Gln Arg Ile Glu Leu Tyr Gln Ile Leu Lys Ser Lys Asp
                165                 170                 175

Leu Thr Ser Pro Thr Gln Arg Tyr Ile Asp Ser Lys Val Val Lys Thr
            180                 185                 190
```

```
Arg Ala Glu Gly Glu Trp Leu Ser Phe Asp Val Thr Asp Ala Val Gln
        195                 200                 205

Glu Trp Leu His His Lys Asp Arg Asn Leu Gly Phe Lys Ile Ser Leu
    210                 215                 220

His Cys Pro Cys Cys Thr Phe Val Pro Ser Asn Asn Tyr Ile Ile Pro
225                 230                 235                 240

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

Ser Thr Tyr Ala Ser Gly Asp Gln Lys Thr Ile Lys Ser Thr Arg Lys
            260                 265                 270

Lys Thr Ser Gly Lys Thr Pro His Leu Leu Leu Met Leu Leu Pro Ser
        275                 280                 285

Tyr Arg Leu Glu Ser Gln Gln Ser Ser Arg Arg Lys Lys Arg Ala Leu
    290                 295                 300

Asp Ala Ala Tyr Cys Phe Arg Asn Val Gln Asp Asn Cys Cys Leu Arg
305                 310                 315                 320

Pro Leu Tyr Ile Asp Phe Lys Arg Asp Leu Gly Trp Lys Trp Ile His
                325                 330                 335

Glu Pro Lys Gly Tyr Asn Ala Asn Phe Cys Ala Gly Ala Cys Pro Tyr
            340                 345                 350

Leu Trp Ser Ser Asp Thr Gln His Thr Lys Val Leu Ser Leu Tyr Asn
        355                 360                 365

Thr Ile Asn Pro Glu Ala Ser Ala Ser Pro Cys Cys Val Ser Gln Asp
    370                 375                 380

Leu Glu Pro Leu Thr Ile Leu Tyr Tyr Ile Gly Asn Thr Pro Lys Ile
385                 390                 395                 400

Glu Gln Leu Ser Asn Met Ile Val Lys Ser Cys Lys Cys Ser
                405                 410
```

<210> 31
<211> 310
<212> PRT
<213> Homo sapiens

<400> 31

```
Leu Ser Thr Cys Ser Thr Leu Asp Met Asp Gln Phe Met Arg Lys Arg
1               5                   10                  15

Ile Glu Ala Ile Arg Gly Gln Ile Leu Ser Lys Leu Lys Leu Thr Ser
            20                  25                  30
```

```
Pro Pro Glu Asp Tyr Pro Glu Pro Glu Glu Val Pro Pro Glu Val Ile
        35                  40                  45

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

Arg Ala Ala Ala Cys Glu Arg Glu Arg Ser Asp Glu Glu Tyr Tyr Ala
65                  70                  75                  80

Lys Glu Val Tyr Lys Ile Asp Met Pro Pro Phe Phe Pro Ser Glu Thr
                85                  90                  95

Val Cys Pro Val Val Thr Thr Pro Ser Gly Ser Val Gly Ser Leu Cys
            100                 105                 110

Ser Arg Gln Ser Gln Val Leu Cys Gly Tyr Leu Asp Ala Ile Pro Pro
        115                 120                 125

Thr Phe Tyr Arg Pro Tyr Phe Arg Ile Val Arg Phe Asp Val Ser Ala
    130                 135                 140

Met Glu Lys Asn Ala Ser Asn Leu Val Lys Ala Glu Phe Arg Val Phe
145                 150                 155                 160

Arg Leu Gln Asn Pro Lys Ala Arg Val Pro Glu Gln Arg Ile Glu Leu
                165                 170                 175

Tyr Gln Ile Leu Lys Ser Lys Asp Leu Thr Ser Pro Thr Gln Arg Tyr
            180                 185                 190

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

Phe Asp Val Thr Asp Ala Val His Glu Trp Leu His His Lys Asp Arg
    210                 215                 220

Asn Leu Gly Phe Lys Ile Ser Leu His Cys Pro Cys Cys Thr Phe Val
225                 230                 235                 240

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

Arg Phe Ala Gly Ile Asp Gly Thr Ser Thr Tyr Thr Ser Gly Asp Gln
            260                 265                 270

Lys Thr Ile Lys Ser Thr Arg Lys Lys Asn Ser Gly Lys Thr Pro His
        275                 280                 285

Leu Leu Leu Met Leu Leu Pro Ser Tyr Arg Leu Glu Ser Gln Gln Thr
    290                 295                 300
```

```
Asn Arg Arg Lys Lys Arg
305                 310
```