SEQUENCE LISTING

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<120> THERAPEUTIC ANTIBODIES AND THEIR USES

<130> PC72209-02

<150> US 62/146,504
<151> 2015-04-13

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<151> 2015-04-13

<150> US 62/301,582
<151> 2016-02-29

<160> 502

<170> PatentIn version 3.5

<210> 1
<211> 109
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Glu Ile Val Leu Thr Gln Ser Pro Gly Thr Leu
Ser Leu Ser Pro Gly
1 5 10
15

Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln
Ser Val Ser Ser Ser
20 25
30

Tyr Leu Ala Trp Tyr Gln Gln Lys Pro Gly Gln
Ala Pro Arg Leu Leu
35 40
45

Ile Tyr Gly Ala Ser Ser Arg Ala Thr Gly Ile
Pro Asp Arg Phe Ser
50 55 60

Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr
Ile Ser Arg Leu Glu
65 70 75
80

Pro Glu Asp Phe Ala Val Tyr Tyr Cys Gln His
Tyr Gly Ser Pro Pro
85 90

95

Ser Phe Thr Phe Gly Gln Gly Thr Lys Val Glu
Ile Lys
100 105

<210> 2
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<213> Artificial Sequence

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<400> 2

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu
Val Gln Pro Gly Gly
1 5 10
15

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

Ala Met Thr Trp Val Arg Gln Ala Pro Gly Lys
Gly Leu Glu Trp Val
35 40
45

Ser Ala Ile Ser Gly Ser Gly Gly Asn Thr Phe

Tyr Ala Asp Ser Val
    50   55   60

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

Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr
Ala Val Tyr Tyr Cys
                85   90
95

Ala Arg Val Ser Pro Ile Ala Ser Gly Met Asp
Tyr Trp Gly Gln Gly
            100   105
110

Thr Leu Val Thr Val Ser Ser
        115

<210> 3
<211> 119
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Construct

<400> 3

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu

Val Gln Pro Gly Gly
1 5 10
15

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

Ala Met Thr Trp Val Arg Gln Ala Pro Gly Lys
Gly Leu Glu Trp Val
35 40
45

Ser Ala Ile Ser Gly Ser Gly Gly Asn Thr Phe
Tyr Ala Asp Ser Val
50 55 60

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

Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr
Ala Val Tyr Tyr Cys
85 90
95

Ala Arg Val Ser Pro Ile Ala Ala Gln Met Asp
Tyr Trp Gly Gln Gly
100 105

110

Thr Leu Val Thr Val Ser Ser
115

<210> 4
<211> 109
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Construct

<400> 4

Glu Ile Val Leu Thr Gln Ser Pro Gly Thr Leu
Ser Leu Ser Pro Gly
1 5 10
15

Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln
Ser Leu Gly Ser Phe
20 25
30

Tyr Leu Ala Trp Tyr Gln Gln Lys Pro Gly Gln
Ala Pro Arg Leu Leu
35 40
45

Ile Tyr Gly Ala Ser Ser Arg Ala Thr Gly Ile
Pro Asp Arg Phe Ser

50 55 60

Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr
Ile Ser Arg Leu Glu
65 70 75
80

Pro Glu Asp Phe Ala Val Tyr Tyr Cys Lys His
Tyr Gly Trp Pro Pro
85 90
95

Ser Phe Thr Phe Gly Gln Gly Thr Lys Val Glu
Ile Lys
100 105

<210> 5
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<220>
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<400> 5

Glu Ile Val Leu Thr Gln Ser Pro Gly Thr Leu
Ser Leu Ser Pro Gly
1 5 10
15

Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln

Ser Leu Gly Ser Phe
20 25
30

Tyr Leu Ala Trp Tyr Gln Gln Lys Pro Gly Gln
Ala Pro Arg Leu Leu
35 40
45

Ile Tyr Gly Ala Ser Ser Arg Ala Thr Gly Ile
Pro Asp Arg Phe Ser
50 55 60

Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr
Ile Ser Arg Leu Glu
65 70 75
80

Pro Glu Asp Phe Ala Val Tyr Tyr Cys Gln His
Tyr Asn Tyr Pro Pro
85 90
95

Ser Phe Thr Phe Gly Gln Gly Thr Lys Val Glu
Ile Lys
100 105

<210> 6
<211> 109
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Construct

<400> 6

Glu Ile Val Leu Thr Gln Ser Pro Gly Thr Leu
Ser Leu Ser Pro Gly
1 5 10
15

Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln
Ser Val Gly Asp Phe
20 25
30

Tyr Leu Ala Trp Tyr Gln Gln Lys Pro Gly Gln
Ala Pro Arg Leu Leu
35 40
45

Ile Tyr Gly Ala Ser Ser Arg Ala Thr Gly Ile
Pro Asp Arg Phe Ser
50 55 60

Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr
Ile Ser Arg Leu Glu
65 70 75
80

Pro Glu Asp Phe Ala Val Tyr Tyr Cys Gln His
Tyr Asn Tyr Pro Pro
85 90

95

Ser Phe Thr Phe Gly Gln Gly Thr Lys Val Glu
Ile Lys
100 105

<210> 7
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<212> PRT
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<220>
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<400> 7

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu
Val Gln Pro Gly Gly
1 5 10
15

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

Ala Met Thr Trp Val Arg Gln Ala Pro Gly Lys
Gly Leu Glu Trp Val
35 40
45

Ser Ala Ile Ser Gly Ser Gly Gly Asn Thr Phe

Tyr Ala Asp Ser Val
    50   55   60

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

Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr
Ala Val Tyr Tyr Cys
                85   90
95

Ala Arg Ala Arg Val Ser Pro Ile Ala Ala Leu
Met Asp Tyr Trp Gly
            100   105
110

Gln Gly Thr Leu Val Thr Val Ser Ser
        115   120

<210> 8
<211> 119
<212> PRT
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<220>
<223> Synthetic Construct

<400> 8

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu

Val Gln Pro Gly Gly
1 5 10
15

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

Ala Met Thr Trp Val Arg Gln Ala Pro Gly Lys
Gly Leu Glu Trp Val
35 40
45

Ser Ala Ile Ser Gly Ser Gly Gly Asn Thr Phe
Tyr Ala Asp Ser Val
50 55 60

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

Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr
Ala Val Tyr Tyr Cys
85 90
95

Ala Arg Val Ser Pro Ile Ala Ala Pro Met Asp
Tyr Trp Gly Gln Gly
100 105

110

Thr Leu Val Thr Val Ser Ser
115

<210> 9
<211> 109
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Construct

<400> 9

Glu Ile Val Leu Thr Gln Ser Pro Gly Thr Leu
Ser Leu Ser Pro Gly
1 5 10
15

Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln
Ser Leu Gly Ser Phe
20 25
30

Tyr Leu Ala Trp Tyr Gln Gln Lys Pro Gly Gln
Ala Pro Arg Leu Leu
35 40
45

Ile Tyr Gly Ala Ser Ser Arg Ala Thr Gly Ile
Pro Asp Arg Phe Ser

50 55 60

Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr
Ile Ser Arg Leu Glu
65 70 75
80

Pro Glu Asp Phe Ala Val Tyr Tyr Cys Gln His
Tyr Pro Tyr Pro Pro
85 90
95

Ser Phe Thr Phe Gly Gln Gly Thr Lys Val Glu
Ile Lys
100 105

<210> 10
<211> 109
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Construct

<400> 10

Glu Ile Val Leu Thr Gln Ser Pro Gly Thr Leu
Ser Leu Ser Pro Gly
1 5 10
15

Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln

Ser Leu Gly Ser Phe
20 25
30

Tyr Leu Ala Trp Tyr Gln Gln Lys Pro Gly Gln
Ala Pro Arg Leu Leu
35 40
45

Ile Tyr Gly Ala Ser Ser Arg Ala Thr Gly Ile
Pro Asp Arg Phe Ser
50 55 60

Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr
Ile Ser Arg Leu Glu
65 70 75
80

Pro Glu Asp Phe Ala Val Tyr Tyr Cys Gln His
Tyr Asn Tyr Pro Pro
85 90
95

Ser Phe Thr Phe Gly Gln Gly Thr Lys Val Glu
Ile Lys
100 105

<210> 11
<211> 109
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Construct

<400> 11

Glu Ile Val Leu Thr Gln Ser Pro Gly Thr Leu
Ser Leu Ser Pro Gly
1 5 10
15

Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln
Ser Val Gly Asp Phe
20 25
30

Tyr Leu Ala Trp Tyr Gln Gln Lys Pro Gly Gln
Ala Pro Arg Leu Leu
35 40
45

Ile Tyr Gly Ala Ser Ser Arg Ala Thr Gly Ile
Pro Asp Arg Phe Ser
50 55 60

Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr
Ile Ser Arg Leu Glu
65 70 75
80

Pro Glu Asp Phe Ala Val Tyr Tyr Cys Lys His
Tyr Gly Trp Pro Pro
85 90

95

Ser Phe Thr Phe Gly Gln Gly Thr Lys Val Glu
Ile Lys
100 105

<210> 12
<211> 109
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Construct

<400> 12

Glu Ile Val Leu Thr Gln Ser Pro Gly Thr Leu
Ser Leu Ser Pro Gly
1 5 10
15

Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln
Ser Val Gly Asp Phe
20 25
30

Tyr Leu Ala Trp Tyr Gln Gln Lys Pro Gly Gln
Ala Pro Arg Leu Leu
35 40
45

Ile Tyr Gly Ala Ser Ser Arg Ala Thr Gly Ile

Pro Asp Arg Phe Ser
    50   55   60

Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr
Ile Ser Arg Leu Glu
65   70   75
80

Pro Glu Asp Phe Ala Val Tyr Tyr Cys Gln His
Tyr Pro Tyr Pro Pro
                85   90
95

Ser Phe Thr Phe Gly Gln Gly Thr Lys Val Glu
Ile Lys
            100   105

<210> 13
<211> 109
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Construct

<400> 13

Glu Ile Val Leu Thr Gln Ser Pro Gly Thr Leu
Ser Leu Ser Pro Gly
1   5   10
15

Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln
Ser Val Gly Asp Phe
20 25
30

Tyr Leu Ala Trp Tyr Gln Gln Lys Pro Gly Gln
Ala Pro Arg Leu Leu
35 40
45

Ile Tyr Gly Ala Ser Ser Arg Ala Thr Gly Ile
Pro Asp Arg Phe Ser
50 55 60

Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr
Ile Ser Arg Leu Glu
65 70 75
80

Pro Glu Asp Phe Ala Val Tyr Tyr Cys Gln His
Tyr Asn Tyr Pro Pro
85 90
95

Ser Phe Thr Phe Gly Gln Gly Thr Lys Val Glu
Ile Lys
100 105

<210> 14
<211> 109
<212> PRT

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<220>
<223> Synthetic Construct

<400> 14

Glu Ile Val Leu Thr Gln Ser Pro Gly Thr Leu
Ser Leu Ser Pro Gly
1 5 10
15

Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln
Ser Val Gly Asp Phe
20 25
30

Tyr Leu Ala Trp Tyr Gln Gln Lys Pro Gly Gln
Ala Pro Arg Leu Leu
35 40
45

Ile Tyr Gly Ala Ser Ser Arg Ala Thr Gly Ile
Pro Asp Arg Phe Ser
50 55 60

Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr
Ile Ser Arg Leu Glu
65 70 75
80

Pro Glu Asp Phe Ala Val Tyr Tyr Cys Gln His

Tyr Asn Tyr Pro Pro
85 90
95

Ser Phe Thr Phe Gly Gln Gly Thr Lys Val Glu
Ile Lys
100 105

<210> 15
<211> 109
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Construct

<400> 15

Glu Ile Val Leu Thr Gln Ser Pro Gly Thr Leu
Ser Leu Ser Pro Gly
1 5 10
15

Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln
Ser Val Ser Ser Ser
20 25
30

Tyr Leu Ala Trp Tyr Gln Gln Lys Pro Gly Gln
Ala Pro Arg Leu Leu
35 40
45

Ile Tyr Gly Ala Ser Ser Arg Ala Thr Gly Ile
Pro Asp Arg Phe Ser
    50   55   60

Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr
Ile Ser Arg Leu Glu
65   70   75
80

Pro Glu Asp Phe Ala Val Tyr Tyr Cys Lys His
Tyr Gly Trp Pro Pro
                85   90
95

Ser Phe Thr Phe Gly Gln Gly Thr Lys Val Glu
Ile Lys
            100   105

<210> 16
<211> 109
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Construct

<400> 16

Glu Ile Val Leu Thr Gln Ser Pro Gly Thr Leu
Ser Leu Ser Pro Gly
1   5   10
15

Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln
Ser Val Ser Ser Ser
20 25
30

Tyr Leu Ala Trp Tyr Gln Gln Lys Pro Gly Gln
Ala Pro Arg Leu Leu
35 40
45

Ile Tyr Gly Ala Ser Ser Arg Ala Thr Gly Ile
Pro Asp Arg Phe Ser
50 55 60

Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr
Ile Ser Arg Leu Glu
65 70 75
80

Pro Glu Asp Phe Ala Val Tyr Tyr Cys Gln His
Tyr Pro Tyr Pro Pro
85 90
95

Ser Phe Thr Phe Gly Gln Gly Thr Lys Val Glu
Ile Lys
100 105

<210> 17
<211> 109

<212> PRT
<213> Artificial Sequence

<220>
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<400> 17

Glu Ile Val Leu Thr Gln Ser Pro Gly Thr Leu
Ser Leu Ser Pro Gly
1 5 10
15

Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln
Ser Val Ser Ser Ser
20 25
30

Tyr Leu Ala Trp Tyr Gln Gln Lys Pro Gly Gln
Ala Pro Arg Leu Leu
35 40
45

Ile Tyr Gly Ala Ser Ser Arg Ala Thr Gly Ile
Pro Asp Arg Phe Ser
50 55 60

Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr
Ile Ser Arg Leu Glu
65 70 75
80

Pro Glu Asp Phe Ala Val Tyr Tyr Cys Gln His
Tyr Asn Tyr Pro Pro
85 90
95

Ser Phe Thr Phe Gly Gln Gly Thr Lys Val Glu
Ile Lys
100 105

<210> 18
<211> 109
<212> PRT
<213> Artificial Sequence

<220>
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<400> 18

Glu Ile Val Leu Thr Gln Ser Pro Gly Thr Leu
Ser Leu Ser Pro Gly
1 5 10
15

Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln
Ser Val Ser Ser Ser
20 25
30

Tyr Pro Ser Trp Tyr Gln Gln Lys Pro Gly Gln
Ala Pro Arg Leu Leu
35 40
45

Ile Tyr Gly Ala Ser Ser Arg Ala Thr Gly Ile
Pro Asp Arg Phe Ser
    50   55   60

Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr
Ile Ser Arg Leu Glu
65   70   75
80

Pro Glu Asp Phe Ala Val Tyr Tyr Cys Gln His
Tyr Pro Tyr Pro Pro
                85   90
95

Ser Phe Thr Phe Gly Gln Gly Thr Lys Val Glu
Ile Lys
            100   105

<210> 19
<211> 109
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Construct

<400> 19

Glu Ile Val Leu Thr Gln Ser Pro Gly Thr Leu
Ser Leu Ser Pro Gly
1   5   10
15

Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln
Ser Val Ser Ala His
20 25
30

Tyr Leu Ala Trp Tyr Gln Gln Lys Pro Gly Gln
Ala Pro Arg Leu Leu
35 40
45

Ile Tyr Gly Ala Ser Ser Arg Ala Thr Gly Ile
Pro Asp Arg Phe Ser
50 55 60

Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr
Ile Ser Arg Leu Glu
65 70 75
80

Pro Glu Asp Phe Ala Val Tyr Tyr Cys Gln His
Tyr Pro Tyr Pro Pro
85 90
95

Ser Phe Thr Phe Gly Gln Gly Thr Lys Val Glu
Ile Lys
100 105

<210> 20

<211> 109
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Construct

<400> 20

Glu Ile Val Leu Thr Gln Ser Pro Gly Thr Leu
Ser Leu Ser Pro Gly
1 5 10
15

Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln
Ser Val Ser Ser Phe
20 25
30

Phe Leu Ala Trp Tyr Gln Gln Lys Pro Gly Gln
Ala Pro Arg Leu Leu
35 40
45