<110> MOGAM INSTITUTE FOR BIOMEDICAL RESEARCH

<120> Novel Antibody Binding to Mesothelin(MSLN), and Composition Comprising the Same

<130> PP-B1782

<150> KR 10-2015-0135755
<151> 2015-09-24

<160> 127

<170> KopatentIn 2.0

<210> 1
<211> 119
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<213> Artificial Sequence

<220>
<223> clone MI323_Variable heavy chain

<400> 1

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

Ser Val Lys Ile Ser Cys Lys Ala Ser Gly Tyr Ser Phe Thr Ser Tyr
             20                  25                  30

Phe Ile Gln Trp Val Lys Gln Arg Pro Gly Gln Gly Leu Glu Trp Ile
         35                  40                  45

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

Lys Gly Lys Ala Thr Leu Ala Ala Asp Thr Ser Ser Ser Thr Ala Tyr
 65                  70                  75                  80

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

Ala Arg Ser Gly Gly Tyr Gln Tyr Tyr Phe Asp Tyr Trp Gly Gln Gly
            100                 105                 110

Thr Ser Val Thr Val Ser Ser
        115
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<210> 2
<211> 108
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MI323_Variable light chain

<400> 2
Asp Ile Val Met Thr Gln Ser His Lys Phe Met Ser Thr Ser Val Gly
 1   5   10   15

Asp Arg Val Ser Ile Thr Cys Lys Ala Ser Gln Asp Val Ser Thr Ala
            20   25   30

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

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

Ser Gly Ser Gly Thr Asp Phe Thr Phe Thr Ile Ser Ser Val Gln Ala
65   70   75   80

Glu Asp Leu Ala Leu Tyr Tyr Cys Gln Gln His Tyr Ser Thr Pro Trp
                85   90   95

Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys Arg
            100   105

<210> 3
<211> 118
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MI329_Variable heavy chain

<400> 3
Glu Val Met Leu Val Glu Ser Gly Gly Asp Leu Val Lys Pro Gly Gly
 1   5   10   15

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

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

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

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

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

```
Ala Arg Trp Gly Glu Asn Trp Tyr Phe Asp Val Trp Gly Ala Gly Thr
            100                 105                 110

Thr Val Thr Val Ser Ser
        115
```

<210> 4
<211> 113
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MI329_Variable light chain

<400> 4

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Asp Val Val Met Thr Gln Thr Pro Leu Ser Leu Pro Val Ser Leu Gly
  1               5                  10                  15

Asp Gln Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser Leu Val His Ser
             20                  25                  30

Asn Gly Asn Thr Tyr Leu His Trp Tyr Leu Gln Lys Pro Gly Gln Ser
         35                  40                  45

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

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

Ser Arg Val Glu Ala Glu Asp Leu Gly Ile Tyr Phe Cys Ser Gln Ser
                 85                  90                  95

Thr His Phe Pro Arg Thr Phe Gly Gly Ala Thr Lys Leu Glu Leu Lys
            100                 105                 110

Arg
```

<210> 5
<211> 122
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MI403_Variable heavy chain

<400> 5

```
Glu Val Gln Val Val Glu Ser Gly Gly Gly Leu Val Lys Pro Gly Gly
```

```
  1               5                  10                  15

Ser Leu Lys Leu Ser Cys Ala Ala Ser Gly Phe Ala Phe Ser Ser Tyr
             20                  25                  30

Asp Met Ser Trp Val Arg Gln Thr Pro Glu Lys Arg Leu Glu Trp Val
         35                  40                  45

Ala Tyr Ile Ser Ser Gly Gly Gly Ser Thr Tyr Tyr Pro Asp Thr Val
     50                  55                  60

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

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

Ala Arg Gln Gly Thr Ala Val Lys Asn Tyr Trp Tyr Phe Asp Val Trp
            100                 105                 110

Gly Ala Gly Thr Ser Val Thr Val Ser Ser
        115                 120


<210>    6
<211>    112
<212>    PRT
<213>    Artificial Sequence

<220>
<223>    clone MI403_Variable light chain


<400>    6
Asp Ile Val Met Thr Gln Ser Pro Ala Ser Leu Ala Val Ser Leu Gly
  1               5                  10                  15

Gln Arg Ala Thr Ile Ser Cys Arg Ala Ser Gln Ser Val Ser Thr Ser
             20                  25                  30

Ser Ser Ser Tyr Val His Trp Tyr Gln Gln Arg Pro Gly Gln Pro Pro
         35                  40                  45

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

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

Pro Val Glu Glu Glu Asp Thr Gly Thr Tyr Tyr Cys Gln His Ser Trp
                 85                  90                  95

Glu Ile Pro Phe Thr Phe Gly Ser Gly Thr Lys Leu Glu Ile Lys Arg
            100                 105                 110
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<210> 7
<211> 122
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MI407_Variable heavy chain

<400> 7
Glu Val Lys Leu Val Glu Ser Gly Gly Gly Leu Val Lys Pro Gly Gly
  1   5   10   15

Ser Leu Lys Leu Ser Cys Ala Ala Ser Gly Phe Pro Phe Ser Asn Tyr
             20   25   30

Asp Met Ser Trp Val Arg Gln Thr Pro Glu Lys Arg Leu Glu Trp Val
         35   40   45

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

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

Leu Gln Met Ser Ser Leu Lys Ser Glu Asp Thr Ala Leu Tyr Phe Cys
                 85   90   95

Val Arg Gln Gly Thr Ser Val Glu Ser Tyr Trp Tyr Phe Asp Val Trp
            100   105   110

Gly Ala Gly Thr Thr Val Thr Val Ser Ser
        115   120

<210> 8
<211> 112
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MI407_Variable light chain

<400> 8
Asp Ile Val Leu Thr Gln Ser Pro Ala Ser Leu Ala Val Ser Leu Gly
  1   5   10   15

Gln Arg Ala Thr Ile Ser Cys Arg Ala Ser Gln Ser Val Ser Thr Ser
             20   25   30

```
Ser Ser Ser Tyr Ile His Trp Tyr Gln Gln Lys Pro Gly Gln Pro Pro
         35                  40                  45

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

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

Pro Val Glu Glu Asp Asp Thr Ala Thr Tyr Tyr Cys Gln His Ser Trp
                 85                  90                  95

Glu Ile Pro Phe Thr Phe Gly Ser Gly Thr Glu Leu Glu Ile Lys Arg
            100                 105                 110
```

<210> 9
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MI323_Variable heavy chain CDR1

<400> 9
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Ser Tyr Phe Ile Gln
  1               5
```

<210> 10
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MI323_Variable heavy chain CDR2

<400> 10
```
Trp Ile Phe Pro Gly Ser Gly Asn Thr Lys Tyr Asn Glu Met Phe Lys
  1               5                  10                  15

Gly
```

<210> 11
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MI323_Variable heavy chain CDR3

<400> 11
Ser Gly Gly Tyr Gln Tyr Tyr Phe Asp Tyr
  1   5   10

<210> 12
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MI323_Variable light chain CDR1

<400> 12
Lys Ala Ser Gln Asp Val Ser Thr Ala Val Ala
  1   5   10

<210> 13
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MI323_Variable light chain CDR2

<400> 13
Ser Ala Ser Tyr Arg Tyr Pro
  1   5

<210> 14
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MI323_Variable light chain CDR3

<400> 14
Gln Gln His Tyr Ser Thr Pro Trp Thr
  1   5

<210> 15
<211> 5

<212> PRT
<213> Artificial Sequence

<220>
<223> clone MI329_Variable heavy chain CDR1

<400> 15
Ser Tyr Ala Met Ser
  1   5

<210> 16
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MI329_Variable heavy chain CDR2

<400> 16
Thr Ile Asn Ser Asp Gly Ser Tyr Thr Phe Tyr Pro Asp Ser Val Lys
  1   5   10   15

Gly

<210> 17
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MI329_Variable heavy chain CDR3

<400> 17
Trp Gly Glu Asn Trp Tyr Phe Asp Val
  1   5

<210> 18
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MI329_Variable light chain CDR1

<400> 18
Arg Ser Ser Gln Ser Leu Val His Ser Asn Gly Asn Thr Tyr Leu His

1 5 10 15

<210> 19
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MI329_Variable light chain CDR2

<400> 19
Lys Val Ser Asn Arg Phe Ser
1 5

<210> 20
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MI329_Variable light chain CDR3

<400> 20
Ser Gln Ser Thr His Phe Pro Arg Thr
1 5

<210> 21
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MI403_Variable heavy chain CDR1

<400> 21
Ser Tyr Asp Met Ser
1 5

<210> 22
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MI403_Variable heavy chain CDR2

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

Gly

<210> 23
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MI403_Variable heavy chain CDR3

<400> 23
Gln Gly Thr Ala Val Lys Asn Tyr Trp Tyr Phe Asp Val
1 5 10

<210> 24
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MI403_Variable light chain CDR1

<400> 24
Arg Ala Ser Gln Ser Val Ser Thr Ser Ser Ser Ser Tyr Val His
1 5 10 15

<210> 25
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MI403_Variable light chain CDR2

<400> 25
Tyr Ala Ser Asn Leu Glu Ser
1 5

<210> 26
<211> 9

<212> PRT
<213> Artificial Sequence

<220>
<223> clone MI403_Variable light chain CDR3

<400> 26
Gln His Ser Trp Glu Ile Pro Phe Thr
  1   5

<210> 27
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MI407_Variable heavy chain CDR1

<400> 27
Asn Tyr Asp Met Ser
  1   5

<210> 28
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MI407_Variable heavy chain CDR2

<400> 28
Tyr Ile Ser Ser Gly Gly Gly Asn Thr Tyr Tyr Pro Asp Thr Val Lys
  1   5   10   15

Gly

<210> 29
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MI407_Variable heavy chain CDR3

<400> 29
Gln Gly Thr Ser Val Glu Ser Tyr Trp Tyr Phe Asp Val

1 5 10

<210> 30
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MI407_Variable light chain CDR1

<400> 30
Ser Val Ser Thr Ser Ser Ser Ser Tyr Ile His
1 5 10

<210> 31
<211> 87
<212> DNA
<213> Artificial Sequence

<220>
<223> MI323VH-F

<400> 31
gcggccgcca tgtacttggg actgaactat gtattcatag tttttctctt aaatggtgtc 60

cagagtgagg tccagctgca gcagtct 87

<210> 32
<211> 87
<212> DNA
<213> Artificial Sequence

<220>
<223> MI329VH-F

<400> 32
gcggccgcca tgtacttggg actgaactat gtattcatag tttttctctt aaatggtgtc 60

cagagtgagg tgatgctggt ggagtct 87

<210> 33
<211> 87
<212> DNA
<213> Artificial Sequence

<220>
<223> MI403VH-F

<400> 33
gcggccgcca tgtacttggg actgaactat gtattcatag tttttctctt aaatggtgtc 60

cagagtgagg tgcaggtggt ggagtct 87

<210> 34
<211> 87
<212> DNA
<213> Artificial Sequence

<220>
<223> MI407VH-F

<400> 34
gcggccgcca tgtacttggg actgaactat gtattcatag tttttctctt aaatggtgtc 60

cagagtgagg tgaagttggt ggagtct 87

<210> 35
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> VHApaI-R

<400> 35
accgatgggc ccttggtgga 20

<210> 36
<211> 96
<212> DNA
<213> Artificial Sequence

<220>
<223> MI323VL-F

<400> 36
gcggccgcca tggatagcca ggctcaggtg ctgatgctgc tgctgctgtg ggtgtcaggg 60

acttgcgggg acattgtgat gacccagtct cacaaa 96

<210> 37
<211> 45
<212> DNA

<213> Artificial Sequence

<220>
<223> MI323VLCL-R

<400> 37
acactaggag cggccacggt tcgtttgatt tccagtttgg tccct 45

<210> 38
<211> 96
<212> DNA
<213> Artificial Sequence

<220>
<223> MI329VL-F

<400> 38
gcggccgcca tggatagcca ggctcaggtg ctgatgctgc tgctgctgtg ggtgtcaggg 60

acttgcgggg acgttgtgat gacccagact ccactc 96

<210> 39
<211> 42
<212> DNA
<213> Artificial Sequence

<220>
<223> MI329VLCL-R

<400> 39
acactaggag cggccacggt tcgtttcagc tccagcttgg tc 42

<210> 40
<211> 96
<212> DNA
<213> Artificial Sequence

<220>
<223> MI403VL-F

<400> 40
gcggccgcca tggatagcca ggctcaggtg ctgatgctgc tgctgctgtg ggtgtcaggg 60

acttgcgggg atattgtgat gacccagtct cctgct 96

<210> 41

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

<220>
<223> MI403VLCL-R

<400> 41
acactaggag cggccacggt tcgttttatt tccaactttg tccccga 47

<210> 42
<211> 96
<212> DNA
<213> Artificial Sequence

<220>
<223> M407VL-F

<400> 42
gcggccgcca tggatagcca ggctcaggtg ctgatgctgc tgctgctgtg ggtgtcaggg 60

acttgcgggg atattgtgtt gacacagtct cctgct 96

<210> 43
<211> 46
<212> DNA
<213> Artificial Sequence

<220>
<223> M407VLCL-R

<400> 43
acactaggag cggccacggt tcgttttatt tccaactctg tccccg 46

<210> 44
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Ck-F

<400> 44
accgtggccg ctcctagtgt 20

<210> 45

<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> CkSHB-R

<400> 45
nnnnggatcc aagcttacta gcactcccc 29

<210> 46
<211> 116
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MS501_Variable heavy chain

<400> 46
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 Ser Asn Tyr
20 25 30

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

Ser Gly Ile Tyr Pro Asp Ser Gly Ser Thr Tyr 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 Asn Ile Tyr Thr Phe Asp Tyr Trp Gly Gln Gly Thr Leu Val
100 105 110

Thr Val Ser Ser
115

<210> 47
<211> 111
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MS501_Variable light chain

<400> 47
Gln Ser Val Leu Thr Gln Pro Pro Ser Ala Ser Gly Thr Pro Gly Gln
  1   5   10   15

Arg Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Ile Gly Ser Asn
             20   25   30

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

Ile Tyr Tyr Asn Asn Gln Arg Pro Ser Gly Val Pro Asp Arg Phe Ser
     50   55   60

Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Leu Arg
 65   70   75   80

Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Gly Ser Trp Asp Ser Ser Leu
                 85   90   95

Ser Gly Tyr Val Phe Gly Gly Gly Thr Lys Leu Thr Val Leu Gly
            100   105   110

<210> 48
<211> 116
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MS502_Variable heavy chain

<400> 48
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 Ser Asn Tyr
             20   25   30

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

Ser Gly Ile Pro Pro Asp Ser Gly Ser Lys Tyr Tyr Ala Asp Ser Val
     50   55   60

Arg Gly Arg Phe Thr Val 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 Lys Asn Met Leu Ser Phe Asp Tyr Trp Gly Gln Gly Thr Leu Val
            100                 105                 110

Thr Val Ser Ser
        115


<210>    49
<211>    111
<212>    PRT
<213>    Artificial Sequence

<220>
<223>    clone MS502_Variable light chain


<400>    49
Gln Ser Val Leu Thr Gln Pro Pro Ser Ala Ser Gly Thr Pro Gly Gln
  1               5                  10                  15

Arg Val Thr Ile Ser Cys Thr Gly Ser Ser Ser Asn Ile Gly Ser Asn
             20                  25                  30

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

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

Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Leu Arg
 65                  70                  75                  80

Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Gly Ser Trp Asp Ser Ser Leu
                 85                  90                  95

Asn Gly Tyr Val Phe Gly Gly Gly Thr Lys Val Thr Val Leu Gly
            100                 105                 110




<210>    50
<211>    111
<212>    PRT
<213>    Artificial Sequence

<220>
<223>    clone MS502-1_Variable light chain


<400>    50
Gln Ser Val Leu Thr Gln Pro Pro Ser Ala Ser Gly Thr Pro Gly Gln
  1               5                  10                  15
```

```
Arg Val Thr Ile Ser Cys Ile Cys Ser Ser Ser Asn Ile Gly Ser Asn
             20                  25                  30

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

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

Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Leu Arg
 65                  70                  75                  80

Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Gly Ser Trp Asp Ser Ser Leu
                 85                  90                  95

Asn Gly Tyr Val Phe Gly Gly Gly Thr Lys Leu Thr Val Leu Gly
            100                 105                 110
```

<210> 51
<211> 116
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MS503_Variable heavy chain

<400> 51

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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 Ser Asn Tyr
             20                  25                  30

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

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

Thr Val Ser Ser
```

115

<210> 52
<211> 111
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MS503_Variable light chain

<400> 52
Gln Ser Val Leu Thr Gln Pro Pro Ser Ala Ser Gly Thr Pro Gly Gln
1 5 10 15

Arg Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Ile Gly Ser Asn
20 25 30

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

Ile Tyr Tyr Asn Ser His Arg Pro Ser Gly Val Pro Asp Arg Phe Ser
50 55 60

Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Leu Arg
65 70 75 80

Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Gly Thr Trp Asp Ser Ser Leu
85 90 95

Ser Gly Tyr Val Phe Gly Gly Gly Thr Lys Leu Thr Val Leu Gly
100 105 110

<210> 53
<211> 116
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MS504_Variable heavy chain

<400> 53
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 Ser Asn Tyr
20 25 30

Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val

```
         35                  40                  45

Ser Ser Ile Tyr Pro Asn Gly Ser Ser Lys Tyr 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 Met Ala Val Tyr Tyr Cys
                 85                  90                  95

Ala Lys Asn Leu Leu Thr Phe Asp Tyr Trp Gly Gln Gly Thr Leu Val
            100                 105                 110

Thr Val Ser Ser
        115


<210>    54
<211>    111
<212>    PRT
<213>    Artificial Sequence

<220>
<223>    clone MS504_Variable light chain


<400>    54
Gln Ser Val Leu Thr Gln Pro Pro Ser Ala Ser Gly Pro Pro Gly Gln
  1               5                  10                  15

Arg Val Thr Ile Ser Cys Thr Gly Ser Ser Ser Asn Ile Gly Asn Asn
             20                  25                  30

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

Ile Tyr Tyr Asp Ser His Arg Pro Ser Gly Val Pro Asp Arg Phe Ser
     50                  55                  60

Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Gly Gly Leu Arg
 65                  70                  75                  80

Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Gly Ala Trp Asp Asp Ser Leu
                 85                  90                  95

Asn Ala Tyr Val Phe Gly Gly Gly Thr Lys Leu Thr Val Leu Gly
            100                 105                 110



<210>    55
<211>    116
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<212> PRT
<213> Artificial Sequence

<220>
<223> clone MS505_Variable heavy chain

<400> 55
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 Ser Asn Tyr
             20   25   30

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

Ser Ala Ile Tyr Pro Asp Gly Ser Asn Lys Tyr Tyr Ala Asp Ser Val
     50   55   60

Lys Gly Arg Phe Thr Val 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 Asn Ala Tyr Thr Phe Asp Tyr Trp Gly Gln Gly Thr Leu Val
            100   105   110

Thr Val Ser Ser
        115

<210> 56
<211> 111
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MS505_Variable light chain

<400> 56
Gln Ser Val Leu Thr Gln Pro Pro Ser Ala Ser Gly Thr Pro Gly Arg
  1   5   10   15

Arg Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Ile Gly Ser Asn
             20   25   30

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

Ile Tyr Tyr Asn Ser Gln Arg Pro Ser Gly Val Pro Asp Arg Phe Ser
     50   55   60

```
Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Leu Arg
 65                  70                  75                  80

Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Gly Ser Trp Asp Ser Ser Leu
                85                  90                  95

Asn Gly Tyr Val Phe Gly Gly Gly Thr Lys Leu Thr Val Leu Gly
            100                 105                 110
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<210> 57
<211> 116
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MS506_Variable heavy chain

<400> 57

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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 Ser Asn Tyr
             20                  25                  30

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

Ser Ser Ile Tyr Pro Gly Ser Gly Ser Thr Tyr 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 Asn Leu Tyr Thr Phe Asp Tyr Trp Gly Gln Gly Thr Leu Val
            100                 105                 110

Thr Val Ser Ser
        115
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<210> 58
<211> 111
<212> PRT
<213> Artificial Sequence

<220>

<223> clone MS506_Variable light chain

<400> 58
Gln Ser Val Leu Thr Gln Pro Pro Ser Ala Ser Gly Thr Pro Gly Gln
  1   5   10   15

Arg Val Thr Ile Ser Cys Thr Gly Ser Ser Ser Asn Ile Gly Ser Asn
             20   25   30

Ala Val Thr Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu
         35   40   45

Ile Tyr Tyr Asp Ser His Arg Pro Ser Gly Val Pro Asp Arg Phe Ser
     50   55   60

Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Pro Arg
 65   70   75   80

Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Gly Ala Trp Asp Ser Ser Leu
                 85   90   95

Ser Ala Tyr Val Phe Gly Gly Gly Thr Lys Leu Thr Val Leu Gly
            100   105   110

<210> 59
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MS501_Variable heavy chain CDR1

<400> 59
Asn Tyr Ala Met Ser
  1   5

<210> 60
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MS501_Variable heavy chain CDR2

<400> 60
Gly Ile Tyr Pro Asp Ser Gly Ser Thr Tyr Tyr Ala Asp Ser Val Lys
  1   5   10   15

Gly

<210> 61
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MS501 Variable heavy chain CDR3

<400> 61
Asn Ile Tyr Thr Phe Asp Tyr
  1   5

<210> 62
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MS501_Variable light chain CDR1

<400> 62
Ser Gly Ser Ser Ser Asn Ile Gly Ser Asn Ala Val Ser
  1   5   10

<210> 63
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MS501_Variable light chain CDR2

<400> 63
Tyr Asn Asn Gln Arg Pro Ser
  1   5

<210> 64
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MS501_Variable light chain CDR3

<400> 64
Gly Ser Trp Asp Ser Ser Leu Ser Gly Tyr Val
1 5 10

<210> 65
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MS502_Variable heavy chain CDR2

<400> 65
Gly Ile Pro Pro Asp Ser Gly Ser Lys Tyr Tyr Ala Asp Ser Val Arg
1 5 10 15

Gly

<210> 66
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MS502 Variable heavy chain CDR3

<400> 66
Asn Met Leu Ser Phe Asp Tyr
1 5

<210> 67
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MS502_Variable light chain CDR1

<400> 67
Thr Gly Ser Ser Ser Asn Ile Gly Ser Asn Ala Val Ser
1 5 10

<210> 68
<211> 7

<212> PRT
<213> Artificial Sequence

<220>
<223> clone MS502_Variable light chain CDR2

<400> 68
Tyr Asn Ser Lys Arg Pro Ser
  1   5

<210> 69
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MS502_Variable light chain CDR3

<400> 69
Gly Ser Trp Asp Ser Ser Leu Asn Gly Tyr Val
  1   5   10

<210> 70
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MS502-1_Variable light chain CDR1

<400> 70
Ile Cys Ser Ser Ser Asn Ile Gly Ser Asn Ala Val Ser
  1   5   10

<210> 71
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MS503_Variable heavy chain CDR2

<400> 71
Ser Ile Tyr Pro Gly Asp Gly Ser Thr Tyr Tyr Ala Asp Ser Val Lys
  1   5   10   15

Gly

<210> 72
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MS503_Variable heavy chain CDR3

<400> 72
Asn Ala Phe Thr Phe Asp Tyr
  1   5

<210> 73
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MS503_Variable light chain CDR2

<400> 73
Tyr Asn Ser His Arg Pro Ser
  1   5

<210> 74
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MS503_Variable light chain CDR3

<400> 74
Gly Thr Trp Asp Ser Ser Leu Ser Gly Tyr Val
  1   5   10

<210> 75
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MS504_Variable heavy chain CDR2

<400> 75
Ser Ile Tyr Pro Asn Gly Ser Ser Lys Tyr Tyr Ala Asp Ser Val Lys
1 5 10 15

Gly

<210> 76
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MS504_Variable heavy chain CDR3

<400> 76
Asn Leu Leu Thr Phe Asp Tyr
1 5

<210> 77
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MS504_Variable light chain CDR1

<400> 77
Thr Gly Ser Ser Ser Asn Ile Gly Asn Asn Ser Val Ser
1 5 10

<210> 78
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MS504_Variable light chain CDR2

<400> 78
Tyr Asp Ser His Arg Pro Ser
1 5

<210> 79
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MS504_Variable light chain CDR3

<400> 79
Gly Ala Trp Asp Asp Ser Leu Asn Ala Tyr Val
1 5 10

<210> 80
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MS505_Variable heavy chain CDR2

<400> 80
Ala Ile Tyr Pro Asp Gly Ser Asn Lys Tyr Tyr Ala Asp Ser Val Lys
1 5 10 15

Gly

<210> 81
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MS505_Variable heavy chain CDR3

<400> 81
Asn Ala Tyr Thr Phe Asp Tyr
1 5

<210> 82
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MS505_Variable light chain CDR2

<400> 82
Tyr Asn Ser Gln Arg Pro Ser
1 5

<210> 83
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MS505_Variable light chain CDR3

<400> 83
Gly Ser Trp Asp Ser Ser Leu Asn Gly Tyr Val
  1   5   10

<210> 84
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MS506_Variable heavy chain CDR2

<400> 84
Ser Ile Tyr Pro Gly Ser Gly Ser Thr Tyr Tyr Ala Asp Ser Val Lys
  1   5   10   15

Gly

<210> 85
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MS506_Variable heavy chain CDR3

<400> 85
Asn Leu Tyr Thr Phe Asp Tyr
  1   5

<210> 86
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MS506_Variable light chain CDR1

<400> 86
Thr Gly Ser Ser Ser Asn Ile Gly Ser Asn Ala Val Thr
1 5 10

<210> 87
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> clone MS506_Variable light chain CDR3

<400> 87
Gly Ala Trp Asp Ser Ser Leu Ser Ala Tyr Val
1 5 10

<210> 88
<211> 94
<212> DNA
<213> Artificial Sequence

<220>
<223> NotI-Leader- VL-F

<400> 88
nnnngcggcc gccatggata gccaggctca ggtgctgatg ctgctgctgc tgtgggtgtc 60

agggacttgc gggcagtctg tgctgactca gcca 94

<210> 89
<211> 39
<212> DNA
<213> Artificial Sequence

<220>
<223> VL-R

<400> 89
ggggttggcc ttgggctggc ctaggaccgt cagcttggt 39

<210> 90
<211> 18
<212> DNA
<213> Artificial Sequence

<220>

<223> VL-CL-F

<400> 90
cagcccaagg ccaacccc 18

<210> 91
<211> 42
<212> DNA
<213> Artificial Sequence

<220>
<223> HindIII-VL-R

<400> 91
nnnnggatcc aagcttacta acattctgta ggggccactg tc 42

<210> 92
<211> 97
<212> DNA
<213> Artificial Sequence

<220>
<223> HD-Heavy-F

<400> 92
ggtgtccagg cggccgccat gtacttggga ctgaactatg tattcatagt ttttctctta 60

aatggtgtcc agagtgaggt gcagctgttg gagtctg 97

<210> 93
<211> 52
<212> DNA
<213> Artificial Sequence

<220>
<223> HD-Heavy-R

<400> 93
gggggaagac cgatgggccc ttggtggagg ctgagctcac ggtgaccagt gt 52

<210> 94
<211> 79
<212> DNA
<213> Artificial Sequence

<220>

<223> MS502 VL FR1 Fo NruI

<400> 94
gctcgcgatt gcagtggcac tggctggttt cgctaccgtg gcccaggcgg cccagtctgt 60

gctgactcag ccaccctca 79

<210> 95
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> MS502 VL FR1 Fo

<400> 95
cagtctgtgc tgactcagcc accctca 27

<210> 96
<211> 60
<212> DNA
<213> Artificial Sequence

<220>
<223> MS502 VL FR1 Re

<400> 96
gagctgctgg taccaggaga cagcattrtg gccaatatta gatgaagagc cagtacaaga 60

60

<210> 97
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> MS502 VL FR2 Fo

<400> 97
gccaatatta gatgaagagc cagtacaaga 30

<210> 98
<211> 93
<212> DNA
<213> Artificial Sequence

<220>
<223> MS502 VL FR2 Re

<400> 98
acctaggacg gtcaccttgg tgcctccgcc gaagacataa ccrtgcaggc trtgatcctg 60

agaaccacag taataatcag cctcatcctc gga 93

<210> 99
<211> 48
<212> DNA
<213> Artificial Sequence

<220>
<223> MS502 CL Fo

<400> 99
ggcaccaagg tgaccgtcct aggtcagccc aaggccaacc ccactgtc 48

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

<220>
<223> MS502 CL Re

<400> 100
gctctagaac attctgtagg ggccactgtc ttctc 35

<210> 101
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> MS502 VH FR1 Fo NcoI

<400> 101
gcccatggcc gaggtgcagc tgttggagtc tggg 34

<210> 102
<211> 57
<212> DNA
<213> Artificial Sequence

<220>
<223> MS502 VH FR1 Re

<400> 102
agcctggcgg acccagctca tntgrtgrtg gctaaaggtg aatccagagg ccgcaca 57

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

<220>
<223> MS502 VH FR2 Fo

<400> 103
atgagctggg tccgccaggc t 21

<210> 104
<211> 72
<212> DNA
<213> Artificial Sequence

<220>
<223> MS502 VH FR2 Re

<400> 104
ggtgaaccga cctcttacag aatcagcgta atatttrtgn tgactrtgag gagggatccc 60

tgagacccac tc 72

<210> 105
<211> 36
<212> DNA
<213> Artificial Sequence

<220>
<223> MS502 VH FR3 Fo

<400> 105
aaatattacg ctgattctgt aagaggtcgg ttcacc 36

<210> 106
<211> 78
<212> DNA
<213> Artificial Sequence

<220>
<223> MS502 VH FR3 Re

<400> 106
tgagctcacc gtgaccagtg taccctggcc ccagtagtcr tgrtgntgca tatttttcgc 60

acagtaatac acggccgt 78

<210> 107
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> MS502 VH Re

<400> 107
tgagctcacc gtgaccagtg taccctg 27

<210> 108
<211> 46
<212> DNA
<213> Artificial Sequence

<220>
<223> MS502 VH Re ApaI

<400> 108
gcgggccctt ggtggaggct gagctcaccg tgaccagtgt accctg 46

<210> 109
<211> 111
<212> PRT
<213> Artificial Sequence

<220>
<223> clone C2G1_Variable light chain

<400> 109
Gln Ser Val Leu Thr Gln Pro Pro Ser Ala Ser Gly Thr Pro Gly Gln
  1   5   10   15

Arg Val Thr Ile Ser Cys Thr Gly Ser Ser Ser Asn Ile Gly Pro Asn
             20   25   30

Ala Val Ser Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu

```
         35                  40                  45

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

Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Leu Arg
 65                  70                  75                  80

Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Gly Ser Trp Asp Ser Ser Leu
                 85                  90                  95

Ser Gly Tyr Val Phe Gly Gly Gly Thr Lys Val Thr Val Leu Gly
            100                 105                 110
```

<210> 110
<211> 111
<212> PRT
<213> Artificial Sequence

<220>
<223> clone C2G4_Variable light chain

<400> 110

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Gln Ser Val Leu Thr Gln Pro Pro Ser Ala Ser Gly Thr Pro Gly Gln
  1               5                  10                  15

Arg Val Thr Ile Ser Cys Thr Gly Ser Ser Ser Asn Ile Gly Ser Asn
             20                  25                  30

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

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

Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Leu Arg
 65                  70                  75                  80

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

Asn Gly Tyr Val Phe Gly Gly Gly Thr Lys Val Thr Val Leu Gly
            100                 105                 110
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<210> 111
<211> 111
<212> PRT

<213> Artificial Sequence

<220>
<223> clone C3C8_Variable light chain

<400> 111
Gln Ser Val Leu Thr Gln Pro Pro Ser Ala Ser Gly Thr Pro Gly Gln
  1   5   10   15

Arg Val Thr Ile Ser Cys Thr Gly Ser Ser Ser Asn Ile Gly Pro Asn
             20   25   30

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

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

Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Leu Arg
 65   70   75   80

Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Gly Ser Trp Asp Ser Asp Leu
                 85   90   95

Arg Gly Tyr Val Phe Gly Gly Gly Thr Lys Val Thr Val Leu Gly
            100   105   110

<210> 112
<211> 116
<212> PRT
<213> Artificial Sequence

<220>
<223> clone 54_Variable heavy chain

<400> 112
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 Ser Asn Tyr
             20   25   30

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

Ser Gly Ile Tyr Pro Asp Ser Ser Ser Thr Tyr 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 Asn Ile Tyr Thr Phe Asp Tyr Trp Gly Gln Gly Thr Leu Val
            100                 105                 110

Thr Val Ser Ser
        115


<210>    113
<211>    116
<212>    PRT
<213>    Artificial Sequence

<220>
<223>    clone 56_Variable heavy chain


<400>    113
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 Ser Asn Tyr
             20                  25                  30

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

Ser Gly Ile Pro Pro Asp Ser Ala Ser Lys Tyr Tyr Ala Asp Ser Val
     50                  55                  60

Arg Gly Arg Phe Thr Val 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 Lys Asn Met Leu Ser Phe Asp Tyr Trp Gly Gln Gly Thr Leu Val
            100                 105                 110

Thr Val Ser Ser
        115


<210>    114
<211>    116
<212>    PRT
<213>    Artificial Sequence

<220>
<223>    clone 2-30_Variable heavy chain
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<400> 114
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 Ser Asn Tyr
             20   25   30

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

Ser Gly Ile Pro Pro Asp Ser Asn Ser Lys Tyr Tyr Ala Asp Ser Val
     50   55   60

Arg Gly Arg Phe Thr Val 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 Lys Asn Met Arg Thr Phe Asp Tyr Trp Gly Gln Gly Thr Leu Val
            100   105   110

Thr Val Ser Ser
        115

<210> 115
<211> 116
<212> PRT
<213> Artificial Sequence

<220>
<223> clone 2-73_Variable heavy chain

<400> 115
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 Ser Asn Tyr
             20   25   30

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

Ser Gly Ile Pro Pro Asn Ser Asp Ser Lys Tyr Tyr Ala Asp Ser Val
     50   55   60

Arg Gly Arg Phe Thr Val 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 Lys Asn Met Leu Ser Phe Asp Tyr Trp Gly Gln Gly Thr Leu Val
            100                 105                 110

Thr Val Ser Ser
        115


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

<220>
<223>    clone 2-78_Variable heavy chain


<400>    116
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 Ser Asn Tyr
             20                  25                  30

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

Ser Gly Ile Pro Pro Asp Ser Gly Ser Lys Tyr Tyr Ala Asp Ser Val
     50                  55                  60

Arg Gly Arg Phe Thr Val 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 Lys Asn Met Phe Ser Phe Asp Tyr Trp Gly Gln Gly Thr Leu Val
            100                 105                 110

Thr Val Ser Ser
        115


<210>    117
<211>    13
<212>    PRT
<213>    Artificial Sequence

<220>
<223>    clone C2G1_Variable light chain CDR1


<400>    117
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Thr Gly Ser Ser Ser Asn Ile Gly Pro Asn Ala Val Ser
1 5 10

<210> 118
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> clone C2G1_Variable light chain CDR3

<400> 118
Gly Ser Trp Asp Ser Ser Leu Ser Gly Tyr Val
1 5 10

<210> 119
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> clone C2G4_Variable light chain CDR3

<400> 119
Gly Ser Trp Asp Pro Ser Leu Asn Gly Tyr Val
1 5 10

<210> 120
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> clone C3C8_Variable light chain CDR3

<400> 120
Gly Ser Trp Asp Ser Asp Leu Arg Gly Tyr Val
1 5 10

<210> 121
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> clone 54_Variable heavy chain CDR2

<400> 121
Gly Ile Pro Pro Asp Ser Ser Ser Lys Tyr Tyr Ala Asp Ser Val Arg
1 5 10 15

Gly

<210> 122
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> clone 56_Variable heavy chain CDR2

<400> 122
Gly Ile Pro Pro Asp Ser Ala Ser Lys Tyr Tyr Ala Asp Ser Val Arg
1 5 10 15

Gly

<210> 123
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> clone 2-30_Variable heavy chain CDR2

<400> 123
Gly Ile Pro Pro Asp Ser Asn Ser Lys Tyr Tyr Ala Asp Ser Val Arg
1 5 10 15

Gly

<210> 124
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> clone 2-30_Variable heavy chain CDR3

<400> 124
Asn Met Arg Thr Phe Asp Tyr

1 5

<210> 125
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> clone 2-73_Variable heavy chain CDR2

<400> 125
Gly Ile Pro Pro Asn Ser Asp Ser Lys Tyr Tyr Ala Asp Ser Val Arg
1 5 10 15

Gly

<210> 126
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> clone 2-78_Variable heavy chain CDR3

<400> 126
Asn Met Phe Ser Phe Asp Tyr
1 5

<210> 127
<211> 622
<212> PRT
<213> Artificial Sequence

<220>
<223> Mesothelin

<400> 127
Met Ala Leu Pro Thr Ala Arg Pro Leu Leu Gly Ser Cys Gly Thr Pro
1 5 10 15

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

Pro Ser Arg Thr Leu Ala Gly Glu Thr Gly Gln Glu Ala Ala Pro Leu
35 40 45

Asp Gly Val Leu Ala Asn Pro Pro Asn Ile Ser Ser Leu Ser Pro Arg

```
     50                  55                  60

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

Arg Val Arg Glu Leu Ala Val Ala Leu Ala Gln Lys Asn Val Lys Leu
                 85                  90                  95

Ser Thr Glu Gln Leu Arg Cys Leu Ala His Arg Leu Ser Glu Pro Pro
            100                 105                 110

Glu Asp Leu Asp Ala Leu Pro Leu Asp Leu Leu Leu Phe Leu Asn Pro
        115                 120                 125

Asp Ala Phe Ser Gly Pro Gln Ala Cys Thr Arg Phe Phe Ser Arg Ile
    130                 135                 140

Thr Lys Ala Asn Val Asp Leu Leu Pro Arg Gly Ala Pro Glu Arg Gln
145                 150                 155                 160

Arg Leu Leu Pro Ala Ala Leu Ala Cys Trp Gly Val Arg Gly Ser Leu
                165                 170                 175

Leu Ser Glu Ala Asp Val Arg Ala Leu Gly Gly Leu Ala Cys Asp Leu
            180                 185                 190

Pro Gly Arg Phe Val Ala Glu Ser Ala Glu Val Leu Leu Pro Arg Leu
        195                 200                 205

Val Ser Cys Pro Gly Pro Leu Asp Gln Asp Gln Gln Glu Ala Ala Arg
    210                 215                 220

Ala Ala Leu Gln Gly Gly Gly Pro Pro Tyr Gly Pro Pro Ser Thr Trp
225                 230                 235                 240

Ser Val Ser Thr Met Asp Ala Leu Arg Gly Leu Leu Pro Val Leu Gly
                245                 250                 255

Gln Pro Ile Ile Arg Ser Ile Pro Gln Gly Ile Val Ala Ala Trp Arg
            260                 265                 270

Gln Arg Ser Ser Arg Asp Pro Ser Trp Arg Gln Pro Glu Arg Thr Ile
        275                 280                 285

Leu Arg Pro Arg Phe Arg Arg Glu Val Glu Lys Thr Ala Cys Pro Ser
    290                 295                 300

Gly Lys Lys Ala Arg Glu Ile Asp Glu Ser Leu Ile Phe Tyr Lys Lys
305                 310                 315                 320

Trp Glu Leu Glu Ala Cys Val Asp Ala Ala Leu Leu Ala Thr Gln Met
                325                 330                 335

Asp Arg Val Asn Ala Ile Pro Phe Thr Tyr Glu Gln Leu Asp Val Leu
```

```
            340                 345                 350

Lys His Lys Leu Asp Glu Leu Tyr Pro Gln Gly Tyr Pro Glu Ser Val
        355                 360                 365

Ile Gln His Leu Gly Tyr Leu Phe Leu Lys Met Ser Pro Glu Asp Ile
    370                 375                 380

Arg Lys Trp Asn Val Thr Ser Leu Glu Thr Leu Lys Ala Leu Leu Glu
385                 390                 395                 400

Val Asn Lys Gly His Glu Met Ser Pro Gln Val Ala Thr Leu Ile Asp
                405                 410                 415

Arg Phe Val Lys Gly Arg Gly Gln Leu Asp Lys Asp Thr Leu Asp Thr
            420                 425                 430

Leu Thr Ala Phe Tyr Pro Gly Tyr Leu Cys Ser Leu Ser Pro Glu Glu
        435                 440                 445

Leu Ser Ser Val Pro Pro Ser Ser Ile Trp Ala Val Arg Pro Gln Asp
    450                 455                 460

Leu Asp Thr Cys Asp Pro Arg Gln Leu Asp Val Leu Tyr Pro Lys Ala
465                 470                 475                 480

Arg Leu Ala Phe Gln Asn Met Asn Gly Ser Glu Tyr Phe Val Lys Ile
                485                 490                 495

Gln Ser Phe Leu Gly Gly Ala Pro Thr Glu Asp Leu Lys Ala Leu Ser
            500                 505                 510

Gln Gln Asn Val Ser Met Asp Leu Ala Thr Phe Met Lys Leu Arg Thr
        515                 520                 525

Asp Ala Val Leu Pro Leu Thr Val Ala Glu Val Gln Lys Leu Leu Gly
    530                 535                 540

Pro His Val Glu Gly Leu Lys Ala Glu Glu Arg His Arg Pro Val Arg
545                 550                 555                 560

Asp Trp Ile Leu Arg Gln Arg Gln Asp Asp Leu Asp Thr Leu Gly Leu
                565                 570                 575

Gly Leu Gln Gly Gly Ile Pro Asn Gly Tyr Leu Val Leu Asp Leu Ser
            580                 585                 590

Met Gln Glu Ala Leu Ser Gly Thr Pro Cys Leu Leu Gly Pro Gly Pro
        595                 600                 605

Val Leu Thr Val Leu Ala Leu Leu Leu Ala Ser Thr Leu Ala
    610                 615                 620
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