SEQUENCE LISTING

<110> Merck, Sharp & Dohme Corp.
Gu, Danling
Beebe, Amy M.

<120> MODULATION OF TUMOR IMMUNITY

<130> 23565-WO-PCT

<150> US 61/867,976
<151> 2013-08-20

<160> 88

<170> PatentIn version 3.5

<210> 1
<211> 10
<212> PRT
<213> Mus musculus

<400> 1

Gly Phe Thr Phe Ser Ser Tyr Ala Met Ser
1 5 10

<210> 2
<211> 10
<212> PRT
<213> Rattus norvegicus

<400> 2

Gly Phe Thr Phe Ser Asp Tyr Tyr Met Ala
1 5 10

<210> 3
<211> 11
<212> PRT
<213> Mus musculus

<400> 3

Gly Tyr Ser Ile Thr Ser Asp Tyr Ala Trp Asn
1 5 10

<210> 4
<211> 10
<212> PRT
<213> Mus musculus

<400> 4

Gly Tyr Thr Phe Ser Arg Tyr Trp Ile Glu
1 5 10

<210> 5
<211> 10
<212> PRT
<213> Mus musculus

<400> 5

Gly Tyr Thr Phe Thr Ser Tyr Thr Met His
1 5 10

<210> 6
<211> 12
<212> PRT
<213> Mus musculus

<400> 6

Gly Phe Ser Leu Ser Thr Ser Gly Met Gly Val Gly
1 5 10

<210> 7
<211> 10
<212> PRT
<213> Mus musculus

<400> 7

Gly Phe Thr Val Arg Asn Tyr Ala Met Ser
1 5 10

<210> 8
<211> 10
<212> PRT
<213> Mus musculus

<400> 8

Gly Asp Ser Ile Thr Ser Gly Tyr Trp Asn
1 5 10

<210> 9
<211> 10
<212> PRT
<213> Mus musculus

<400> 9

Gly Asp Ser Ile Thr Ser Gly Tyr Trp Asn
1 5 10

<210> 10
<211> 12
<212> PRT
<213> Rattus norvegicus

<400> 10

Gly Phe Ser Leu Ser Thr Tyr Gly Val Gly Val Gly
1 5 10

<210> 11
<211> 12
<212> PRT
<213> Rattus norvegicus

<400> 11

Gly Phe Ser Leu Ser Thr Tyr Gly Val Gly Val Gly
1 5 10

<210> 12
<211> 16
<212> PRT
<213> Mus musculus

<400> 12

Ser Ile Ser Ser Gly Gly Thr Thr Tyr Tyr Pro Asp Ser Val Lys Gly
1 5 10 15

<210> 13
<211> 17
<212> PRT
<213> Rattus norvegicus

<400> 13

Tyr Ile His Ala Asn Gly Gly Ser Thr Tyr Tyr Arg Asp Ser Val Arg
1 5 10 15

Gly

<210> 14
<211> 16
<212> PRT
<213> Mus musculus

<400> 14

Tyr Ile Ser Tyr Ser Gly Ser Thr Arg Tyr Asn Pro Ser Leu Lys Ser
1 5 10 15

<210> 15
<211> 17
<212> PRT
<213> Mus musculus

<400> 15

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

Asp

<210> 16
<211> 17
<212> PRT
<213> Mus musculus

<400> 16

Tyr Ile Asn Pro Arg Ser Val Tyr Thr Asn Tyr Asn Gln Lys Phe Lys
1 5 10 15

Asp

<210> 17
<211> 16
<212> PRT
<213> Mus musculus

<400> 17

His Ile Trp Trp Asp Asp Asp Lys Tyr Tyr Ser Pro Ser Leu Lys Ser
1 5 10 15

<210> 18
<211> 16
<212> PRT
<213> Mus musculus

<400> 18

Ser Ile Ser Thr Gly Asp Arg Ser Tyr Leu Pro Asp Ser Met Lys Gly
1 5 10 15

<210> 19
<211> 16
<212> PRT
<213> Mus musculus

<400> 19

Tyr Ile Ser Tyr Ser Gly Ser Thr Tyr Tyr Asn Pro Ser Leu Arg Gly
1 5 10 15

<210> 20
<211> 16
<212> PRT
<213> Mus musculus

<400> 20

Phe Ile Ser Tyr Ser Gly Asn Thr Tyr Tyr Asn Pro Ser Leu Arg Ser
1 5 10 15

<210> 21
<211> 16
<212> PRT
<213> Rattus norvegicus

<400> 21

Asn Ile Trp Trp Asp Asp Asp Asn Tyr Tyr Asn Pro Ser Leu Ile His
1 5 10 15

<210> 22
<211> 16
<212> PRT
<213> Rattus norvegicus

<400> 22

Asn Ile Trp Trp Asp Asp Asp Lys Tyr Tyr Asn Pro Ser Leu Lys Asn
1 5 10 15

<210> 23

<211> 10
<212> PRT
<213> Mus musculus

<400> 23

Val Gly Gly Tyr Tyr Asp Ser Met Asp Tyr
1 5 10

<210> 24
<211> 14
<212> PRT
<213> Rattus norvegicus

<400> 24

Gly Ser Phe Met Tyr Ala Ala Asp Tyr Tyr Ile Met Asp Ala
1 5 10

<210> 25
<211> 9
<212> PRT
<213> Mus musculus

<400> 25

Gln Leu Gly Leu Arg Phe Phe Asp Tyr
1 5

<210> 26
<211> 9
<212> PRT
<213> Mus musculus

<400> 26

Lys Val Tyr Tyr Tyr Ala Met Asp Phe
1 5

<210> 27
<211> 10
<212> PRT
<213> Mus musculus

<400> 27

Leu Gly Gly Tyr Tyr Asp Thr Met Asp Tyr
1 5 10

<210> 28
<211> 23
<212> PRT
<213> Mus musculus

<400> 28

Ser Tyr Tyr Tyr Gly Ser Ser Gly Ala Met Asp Tyr Trp Gly Gln Gly
1 5 10 15

Thr Ser Val Thr Val Ser Ser
20

<210> 29
<211> 20
<212> PRT
<213> Mus musculus

<400> 29

Tyr Phe Asp Phe Asp Ser Phe Ala Phe Trp Gly Gln Gly Thr Leu Val
1 5 10 15

Thr Val Ser Ala
20

<210> 30
<211> 23
<212> PRT
<213> Mus musculus

<400> 30

Arg His Leu Gly Ser Gly Tyr Gly Trp Phe Ala Tyr Trp Gly Gln Gly
1 5 10 15

Thr Leu Val Thr Val Ser Ala
20

<210> 31
<211> 23
<212> PRT
<213> Mus musculus

<400> 31

Arg His Leu Ile Ser Gly Tyr Gly Trp Phe Ala Tyr Trp Gly Gln Gly
1 5 10 15

Thr Leu Val Thr Val Ser Ala
20

<210> 32
<211> 22
<212> PRT
<213> Rattus norvegicus

<400> 32

Ile Lys Glu Pro Arg Asp Trp Phe Phe Glu Phe Trp Gly Pro Gly Thr
1 5 10 15

Met Val Ser Val Ser Ser
20

<210> 33
<211> 22
<212> PRT
<213> Rattus norvegicus

<400> 33

Ile Lys Glu Pro Arg Asp Trp Phe Phe Glu Phe Trp Gly Pro Gly Thr
1 5 10 15

Met Val Ser Val Ser Ser
20

<210> 34
<211> 15
<212> PRT
<213> Mus musculus

<400> 34

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

<210> 35
<211> 16
<212> PRT
<213> Rattus norvegicus

<400> 35

Arg Ser Ser Gln Ser Leu Leu His Ser Asp Gly Asn Thr Phe Leu Ser
1 5 10 15

<210> 36
<211> 10
<212> PRT
<213> Mus musculus

<400> 36

Ser Ala Asn Ser Thr Val Asn Tyr Met Tyr
1 5 10

<210> 37
<211> 12
<212> PRT
<213> Mus musculus

<400> 37

Thr Ala Ser Ser Ser Val Ser Ser Ser Tyr Phe His
1 5 10

<210> 38
<211> 15
<212> PRT
<213> Mus musculus

<400> 38

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

<210> 39
<211> 16
<212> PRT
<213> Mus musculus

<400> 39

Arg Ser Ser Gln Ser Leu Val His Ser Asp Gly Asn Thr Tyr Leu His
1 5 10 15

<210> 40
<211> 11
<212> PRT
<213> Mus musculus

<400> 40

Arg Ala Ser Gln Asp Ile Asn Asn Phe Leu Asn
1 5 10

<210> 41
<211> 11
<212> PRT
<213> Mus musculus

<400> 41

Lys Ala Ser Gln Asp Val Asn Thr Ala Val Ala
1 5 10

<210> 42
<211> 11
<212> PRT
<213> Mus musculus

<400> 42

Lys Ala Ser Gln Asp Val Ile Ser Ala Val Ala
1 5 10

<210> 43
<211> 11
<212> PRT
<213> Rattus norvegicus

<400> 43

Arg Ala Ser Gln Gly Val Asn Asn Phe Leu Thr
1 5 10

<210> 44
<211> 11
<212> PRT
<213> Rattus norvegicus

<400> 44

Arg Ala Ser Gln Gly Val Asn Asn Tyr Leu Thr
1 5 10

<210> 45
<211> 7
<212> PRT
<213> Mus musculus

<400> 45

Ala Ala Ser Asn Gln Gly Ser
1 5

<210> 46
<211> 7
<212> PRT
<213> Rattus norvegicus

<400> 46

Leu Ala Ser Asn Arg Phe Ser
1 5

<210> 47
<211> 7
<212> PRT
<213> Mus musculus

<400> 47

Leu Thr Ser Asn Leu Ala Ser
1 5

<210> 48
<211> 7
<212> PRT
<213> Mus musculus

<400> 48

Ser Thr Ser Asn Leu Ala Ser
1 5

<210> 49
<211> 7
<212> PRT
<213> Mus musculus

<400> 49

Ala Ala Ser Asn Gln Gly Ser
1 5

<210> 50
<211> 7
<212> PRT
<213> Mus musculus

<400> 50

Lys Val Ser Lys Arg Phe Ser
1 5

<210> 51
<211> 7
<212> PRT
<213> Mus musculus

<400> 51

Tyr Thr Ser Lys Leu His Ser
1 5

<210> 52
<211> 7
<212> PRT
<213> Mus musculus

<400> 52

Trp Ala Ser Thr Arg His Thr
1 5

<210> 53
<211> 7
<212> PRT
<213> Mus musculus

<400> 53

Trp Ala Ser Thr Arg His Thr
1 5

<210> 54
<211> 7
<212> PRT
<213> Rattus norvegicus

<400> 54

Tyr Thr Ser Asn Leu Gln Ser
1 5

<210> 55
<211> 7
<212> PRT
<213> Rattus norvegicus

<400> 55

Tyr Thr Ser Asn Leu Gln Ser
1 5

<210> 56
<211> 9
<212> PRT
<213> Mus musculus

<400> 56

Gln Gln Thr Lys Glu Val Thr Trp Thr
1 5

<210> 57
<211> 9
<212> PRT
<213> Rattus norvegicus

<400> 57

Phe Gln His Thr His Leu Pro Leu Thr
1 5

<210> 58
<211> 9
<212> PRT
<213> Mus musculus

<400> 58

Gln Gln Trp Asn Ser Asn Pro Pro Thr
1 5

<210> 59
<211> 9
<212> PRT
<213> Mus musculus

<400> 59

His Gln Tyr His Arg Ser Pro Arg Thr
1 5

<210> 60
<211> 9
<212> PRT
<213> Mus musculus

<400> 60

Gln Gln Ser Lys Glu Val Pro Phe Thr
1 5

<210> 61
<211> 9
<212> PRT
<213> Mus musculus

<400> 61

Ser Gln Ser Thr His Val Pro Pro Thr
1 5

<210> 62
<211> 9
<212> PRT
<213> Mus musculus

<400> 62

Gln Gln Gly His Thr Leu Pro Pro Thr
1 5

<210> 63
<211> 10
<212> PRT
<213> Mus musculus

<400> 63

Gln Gln His Ser Tyr Thr Pro Pro Trp Thr
1 5 10

<210> 64
<211> 10

<212> PRT
<213> Mus musculus

<400> 64

Gln Gln His Ser Tyr Thr Pro Pro Trp Thr
1 5 10

<210> 65
<211> 9
<212> PRT
<213> Rattus norvegicus

<400> 65

Gln Gln Tyr His Gly Phe Pro Asn Thr
1 5

<210> 66
<211> 9
<212> PRT
<213> Rattus norvegicus

<400> 66

Gln Gln Tyr His Gly Phe Pro Asn Thr
1 5

<210> 67
<211> 122
<212> PRT
<213> Artificial Sequence

<220>
<223> humanized antibody sequence

<220>
<221> VARIANT
<222> (24)..(24)
<223> Can be A or F

<220>
<221> VARIANT
<222> (69)..(69)
<223> Can be F or L

<220>
<221> VARIANT
<222> (73)..(73)
<223> Can be R or K

<220>
<221> VARIANT
<222> (75)..(75)
<223> Can be N or T

<220>
<221> VARIANT
<222> (80)..(80)
<223> Can be L or V

<220>
<221> VARIANT
<222> (98)..(98)

<223> Can be A or V

<400> 67

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

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

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

Trp Val Ala His Ile Trp Trp Asp Asp Asp Lys Tyr Tyr Ser Pro Ser
50 55 60

Leu Lys Ser Arg Xaa Thr Ile Ser Xaa Asp Xaa Ser Lys Asn Thr Xaa
65 70 75 80

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

Cys Xaa Arg Ser Tyr Tyr Tyr Gly Ser Ser Gly Ala Met Asp Tyr Trp
100 105 110

Gly Gln Gly Thr Leu Val Thr Val Ser Ser
115 120

<210> 68
<211> 113
<212> PRT
<213> Artificial Sequence

<220>
<223> Humanized antibody sequence

<400> 68

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

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

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

Pro Gln Leu Leu Ile Tyr Lys Val Ser Lys 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 Val Gly Val Tyr Tyr Cys Ser Gln Ser
85 90 95

```
Thr His Val Pro Pro Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys
            100                 105                 110


Arg



<210>  69
<211>  123
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Humanized antibody sequence


<220>
<221>  VARIANT
<222>  (97)..(97)
<223>  Can be A or T

<220>
<221>  VARIANT
<222>  (98)..(98)
<223>  Can be R or T

<400>  69

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


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


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


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


Arg 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


Xaa Xaa Gly Ser Phe Met Tyr Ala Ala Asp Tyr Tyr Ile Met Asp Ala
            100                 105                 110


Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser
        115                 120


<210>  70
<211>  113
<212>  PRT
<213>  Artificial Sequence
```

<220>
<223> Humanized antibody sequence

<400> 70

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

Glu Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser Leu Leu His Ser
20 25 30

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

Pro Gln Leu Leu Ile Tyr Leu Ala 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 Val Gly Val Tyr Tyr Cys Phe Gln His
85 90 95

Thr His Leu Pro Leu Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys
100 105 110

Arg

<210> 71
<211> 118
<212> PRT
<213> Artificial Sequence

<220>
<223> Humanized antibody sequence

<220>
<221> VARIANT
<222> (48)..(48)
<223> Can be M or I

<220>
<221> VARIANT
<222> (68)..(68)
<223> Can be V or A

<220>
<221> VARIANT
<222> (70)..(70)
<223> Can be M or F

<220>
<221> VARIANT
<222> (72)..(72)
<223> Can be T or A

<400> 71

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

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

Trp Ile Glu Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Xaa
35 40 45

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

Lys Asp Arg Xaa Thr Xaa Thr Xaa Asp Thr Ser Thr Ser Thr Ala Tyr
65 70 75 80

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

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

Leu Val Thr Val Ser Ser
115

<210> 72
<211> 109
<212> PRT
<213> Artificial Sequence

<220>
<223> Humanized antibody sequence

<220>
<221> VARIANT
<222> (48)..(48)
<223> Can be L or W

<220>
<221> VARIANT
<222> (72)..(72)
<223> Can be F or Y

<400> 72

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 Thr Ala Ser Ser Ser Val Ser Ser Ser
20 25 30

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

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

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


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


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


<210>  73
<211>  121
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Humanized antibody sequence


<220>
<221>  VARIANT
<222>  (24)..(24)
<223>  Can be V or F

<220>
<221>  VARIANT
<222>  (50)..(50)
<223>  Can be I or L

<220>
<221>  VARIANT
<222>  (51)..(51)
<223>  Can be G or A

<220>
<221>  VARIANT
<222>  (69)..(69)
<223>  Can be V or L

<220>
<221>  VARIANT
<222>  (71)..(71)
<223>  Can be I or V

<220>
<221>  VARIANT
<222>  (73)..(73)
<223>  Can be V or K

<220>
<221>  VARIANT
<222>  (80)..(80)
<223>  Can be F or A

<220>
<221>  VARIANT
<222>  (99)..(99)
<223>  Can be R or Q

<400>  73

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

Thr Leu Ser Leu Thr Cys Thr Xaa Ser Gly Phe Ser Leu Ser Thr Tyr
20 25 30

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

Trp Xaa Xaa Asn Ile Trp Trp Asp Asp Asp Asn Tyr Tyr Asn Pro Ser
50 55 60

Leu Ile His Arg Xaa Thr Xaa Ser Xaa Asp Thr Ser Lys Asn Gln Xaa
65 70 75 80

Ser Leu Lys Leu Ser Ser Val Thr Ala Ala Asp Thr Ala Val Tyr Tyr
85 90 95

Cys Ala Xaa Ile Lys Glu Pro Arg Asp Trp Phe Phe Glu Phe Trp Gly
100 105 110

Gln Gly Thr Leu Val Thr Val Ser Ser
115 120

<210> 74
<211> 108
<212> PRT
<213> Artificial Sequence

<220>
<223> Humanized antibody sequence

<220>
<221> VARIANT
<222> (46)..(46)
<223> Can be L or P

<220>
<221> VARIANT
<222> (49)..(49)
<223> Can be Y or F

<220>
<221> VARIANT
<222> (71)..(71)
<223> Can be F or Y

<400> 74

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

Asp Arg Val Thr Ile Thr Cys Arg Ala Ser Gln Gly Val Asn Asn Phe
20 25 30

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

Xaa Tyr Thr Ser Asn Leu Gln Ser Gly Val Pro Ser Arg Phe Ser Gly
50 55 60

Ser Gly Ser Gly Thr Asp Xaa Thr Leu Thr Ile Ser Ser Leu Gln Pro
65 70 75 80

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

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

<210> 75
<211> 121
<212> PRT
<213> Artificial Sequence

<220>
<223> Humanized antibody sequence

<220>
<221> VARIANT
<222> (24)..(24)
<223> Can be V or F

<220>
<221> VARIANT
<222> (50)..(50)
<223> Can be I or L

<220>
<221> VARIANT
<222> (51)..(51)
<223> Can be G or A

<220>
<221> VARIANT
<222> (69)..(69)
<223> Can be V or L

<220>
<221> VARIANT
<222> (73)..(73)
<223> Can be V or K

<220>
<221> VARIANT
<222> (80)..(80)
<223> Can be F or A

<220>
<221> VARIANT
<222> (99)..(99)
<223> Can be R or Q

<400> 75

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

Thr Leu Ser Leu Thr Cys Thr Xaa Ser Gly Phe Ser Leu Ser Thr Tyr
20 25 30

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

Trp Xaa Xaa Asn Ile Trp Trp Asp Asp Asp Lys Tyr Tyr Asn Pro Ser
50 55 60

Leu Lys Asn Arg Xaa Thr Ile Ser Xaa Asp Thr Ser Lys Asn Gln Xaa
65 70 75 80

Ser Leu Lys Leu Ser Ser Val Thr Ala Ala Asp Thr Ala Val Tyr Tyr
85 90 95

Cys Ala Xaa Ile Lys Glu Pro Arg Asp Trp Phe Phe Glu Phe Trp Gly
100 105 110

Gln Gly Thr Leu Val Thr Val Ser Ser
115 120

<210> 76
<211> 108
<212> PRT
<213> Artificial Sequence

<220>
<223> Humanized antibody sequence

<220>
<221> VARIANT
<222> (46)..(46)
<223> Can be L or P

<220>
<221> VARIANT
<222> (49)..(49)
<223> Can be Y or F

<220>
<221> VARIANT
<222> (71)..(71)
<223> Can be F or Y

<400> 76

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

Asp Arg Val Thr Ile Thr Cys Arg Ala Ser Gln Gly Val Asn Asn Tyr
20 25 30

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

Xaa Tyr Thr Ser Asn Leu Gln Ser Gly Val Pro Ser Arg Phe Ser Gly
50 55 60

Ser Gly Ser Gly Thr Asp Xaa Thr Leu Thr Ile Ser Ser Leu Gln Pro
65 70 75 80

```
Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln Tyr His Gly Phe Pro Asn
                85                  90                  95


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


<210>  77
<211>  117
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Humanized antibody sequence


<220>
<221>  VARIANT
<222>  (96)..(96)
<223>  Can be A or Q

<400>  77

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


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


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


Ala Ser Ile Ser Thr Gly Asp Arg Ser Tyr Leu Pro Asp Ser Met Lys
    50                  55                  60


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


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


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


Val Thr Val Ser Ser
        115


<210>  78
<211>  108
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Humanized antibody sequence

<400>  78
```

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


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


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


Tyr Tyr Thr Ser Lys Leu His Ser Gly Val Pro Ser Arg Phe Ser Gly
    50                  55                  60


Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
65                  70                  75                  80


Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln Gly His Thr Leu Pro Pro
                85                  90                  95


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


<210>  79
<211>  120
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Humanized antibody sequence


<220>
<221>  VARIANT
<222>  (47)..(47)
<223>  Can be W or Y

<220>
<221>  VARIANT
<222>  (48)..(48)
<223>  Can be I or M

<220>
<221>  VARIANT
<222>  (71)..(71)
<223>  Can be V or R

<220>
<221>  VARIANT
<222>  (96)..(96)
<223>  Can be A or S

<400>  79

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


Thr Leu Ser Leu Thr Cys Thr Val Ser Gly Asp Ser Ile Thr Ser Gly
            20                  25                  30


Tyr Trp Asn Trp Ile Arg Gln Pro Pro Gly Lys Gly Leu Glu Xaa Xaa
```

35 40 45

Gly Tyr Ile Ser Tyr Ser Gly Ser Thr Tyr Tyr Asn Pro Ser Leu Arg
50 55 60

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

Lys Leu Ser Ser Val Thr Ala Ala Asp Thr Ala Val Tyr Tyr Cys Xaa
85 90 95

Arg Arg His Leu Gly Ser Gly Tyr Gly Trp Phe Ala Tyr Trp Gly Gln
100 105 110

Gly Thr Leu Val Thr Val Ser Ser
115 120

<210> 80
<211> 109
<212> PRT
<213> Artificial Sequence

<220>
<223> Humanized antibody sequence

<220>
<221> VARIANT
<222> (71)..(71)
<223> Can be F or Y

<400> 80

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

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

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

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

Ser Gly Ser Gly Thr Asp Xaa Thr Leu Thr Ile Ser Ser Leu Gln Ala
65 70 75 80

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

Trp Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys Arg
100 105

<210> 81

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

<220>
<223> Humanized antibody sequence

<400> 81

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

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

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

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

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

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

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

Leu Val Thr Val Ser Ser
115

<210> 82
<211> 112
<212> PRT
<213> Artificial Sequence

<220>
<223> Humanized antibody sequence

<220>
<221> VARIANT
<222> (31)..(31)
<223> Can be N or Q

<220>
<221> VARIANT
<222> (57)..(57)
<223> Can be N or Q

<400> 82

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 Glu Ser Val Asp Xaa Tyr
20 25 30

```
Gly Val Ser Phe Met Asn Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro
        35                  40                  45


Arg Leu Leu Ile Tyr Ala Ala Ser Xaa Gln Gly Ser Gly Ile Pro Asp
    50                  55                  60


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


Arg Leu Glu Pro Glu Asp Phe Ala Val Tyr Tyr Cys Gln Gln Thr Lys
                85                  90                  95


Glu Val Thr Trp Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys Arg
            100                 105                 110


<210>  83
<211>  120
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Humanized antibody sequence


<220>
<221>  VARIANT
<222>  (47)..(47)
<223>  Can be W or Y

<220>
<221>  VARIANT
<222>  (48)..(48)
<223>  Can be I or M

<220>
<221>  VARIANT
<222>  (67)..(67)
<223>  Can be V or I

<220>
<221>  VARIANT
<222>  (71)..(71)
<223>  Can be V or R

<220>
<221>  VARIANT
<222>  (78)..(78)
<223>  Can be F or Y

<220>
<221>  VARIANT
<222>  (96)..(96)
<223>  Can be A or S

<400>  83

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


Thr Leu Ser Leu Thr Cys Thr Val Ser Gly Asp Ser Ile Thr Ser Gly
```

20 25 30

Tyr Trp Asn Trp Ile Arg Gln Pro Pro Gly Lys Gly Leu Glu Xaa Xaa
35 40 45

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

Ser Arg Xaa Thr Ile Ser Xaa Asp Thr Ser Lys Asn Gln Xaa Ser Leu
65 70 75 80

Lys Leu Ser Ser Val Thr Ala Ala Asp Thr Ala Val Tyr Tyr Cys Xaa
85 90 95

Arg Arg His Leu Ile Ser Gly Tyr Gly Trp Phe Ala Tyr Trp Gly Gln
100 105 110

Gly Thr Leu Val Thr Val Ser Ser
115 120

<210> 84
<211> 109
<212> PRT
<213> Artificial Sequence

<220>
<223> Humanized antibody sequence

<220>
<221> VARIANT
<222> (1)..(1)
<223> Can be D or V

<400> 84

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

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

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

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

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

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

Trp Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys Arg

100 105

<210> 85
<211> 119
<212> PRT
<213> Artificial Sequence

<220>
<223> Humanized antibody sequence

<220>
<221> VARIANT
<222> (48)..(48)
<223> Can be M or I

<220>
<221> VARIANT
<222> (68)..(68)
<223> Can be V or A

<220>
<221> VARIANT
<222> (70)..(70)
<223> Can be M or L

<220>
<221> VARIANT
<222> (72)..(72)
<223> Can be T or A

<220>
<221> VARIANT
<222> (74)..(74)
<223> Can be T or K

<400> 85

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

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

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

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

Lys Asp Arg Xaa Thr Xaa Thr Xaa Asp Xaa Ser Thr Ser Thr Ala Tyr
65 70 75 80

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

Ala Arg Leu Gly Gly Tyr Tyr Asp Thr Met Asp Tyr Trp Gly Gln Gly
100 105 110

Thr Leu Val Thr Val Ser Ser

115

<210> 86
<211> 112
<212> PRT
<213> Artificial Sequence

<220>
<223> Humanized antibody sequence

<400> 86

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

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

Gly Ile Ser Phe Met Asn Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro
35 40 45

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

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

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

Glu Val Pro Phe Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys Arg
100 105 110

<210> 87
<211> 118
<212> PRT
<213> Artificial Sequence

<220>
<223> Humanized antibody sequence

<220>
<221> VARIANT
<222> (49)..(49)
<223> Can be I or M

<220>
<221> VARIANT
<222> (68)..(68)
<223> Can be V or I

<220>
<221> VARIANT
<222> (72)..(72)
<223> Can be V or R

<400> 87

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

1 5 10 15

Thr Leu Ser Leu Thr Cys Thr Val Ser Gly Tyr Ser Ile Thr Ser Asp
20 25 30

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

Xaa Gly Tyr Ile Ser Tyr Ser Gly Ser Thr Arg Tyr Asn Pro Ser Leu
50 55 60

Lys Ser Arg Xaa Thr Ile Ser Xaa Asp Thr Ser Lys Asn Gln Phe Ser
65 70 75 80

Leu Lys Leu Ser Ser Val Thr Ala Ala Asp Thr Ala Val Tyr Tyr Cys
85 90 95

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

Leu Val Thr Val Ser Ser
115

<210> 88
<211> 107
<212> PRT
<213> Artificial Sequence

<220>
<223> Humanized antibody sequence

<220>
<221> VARIANT
<222> (45)..(45)
<223> Can be L or P

<220>
<221> VARIANT
<222> (46)..(46)
<223> Can be L or C

<400> 88

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 Ser Ala Asn Ser Thr Val Asn Tyr Met
20 25 30

Tyr Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Arg Xaa Xaa Ile Tyr
35 40 45

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

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

Asp Phe Ala Val Tyr Tyr Cys Gln Gln Trp Asn Ser Asn Pro Pro Thr
                85                  90                  95

Phe Gly Gln Gly Thr Lys Val Glu Ile Lys Arg
            100                 105
```