

044508-5048-W0-SequenceListing
SEQUENCE LISTING

<110> THE HENRY M. JACKSON FOUNDATION FOR THE ADVANCEMENT OF
MILITARY MEDICINE, INC.
BRODER, Christopher

<120> ANTIBODIES AGAINST F GLYCOPROTEIN OF HENDRA AND NIPAH VIRUSES

<130> 044508-5048-W0

<140> PCT/US2015/012641
<141> 2015-01-23

<150> US 61/931,006
<151> 2014-01-24

<160> 80

<170> PatentIn version 3.5

<210> 1
<211> 117
<212> PRT
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Glu Val Gln 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 Thr 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 Met Ile Ser Ser Gly Gly Ser Tyr Ser Tyr 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 Ser Ser Leu Arg Ser Glu Asp Thr Ala Met Tyr Tyr Cys
85 90 95

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

Leu Val Thr Val Ser
115

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Glu Val Gln 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
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<400> 3

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

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<400> 4

Trp Val Arg Gln Thr Pro Glu Lys Arg Leu Glu Trp Val Ala
 1 5 10

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<400> 5

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

Gly

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<400> 6

Arg Phe Thr Ile Ser Arg Asp Asn Ala Lys Asn Thr Leu Tyr Leu Gln
 1 5 10 15

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

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<400> 7

Gln Gly Asp Tyr Ala Trp Phe Ala Tyr
 1 5

<210> 8
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<400> 8

Trp Gly Gln Gly Thr Leu Val Thr Val Ser
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<400> 9

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

Glu Ser Val Thr Ile Thr Cys Leu Ala Ser Gln Thr Ile Gly Thr Trp
 20 25 30

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

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

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

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

Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys Arg
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Asp Ile Gln Met Thr Gln Ser Pro Ala Ser Gln Ser Ala Ser Leu Gly
 1 5 10 15

Glu Ser Val Thr Ile Thr Cys
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<210> 11
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<400> 11

Leu Ala Ser Gln Thr Ile Gly Thr Trp
 1 5

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<400> 12

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Leu Ala Trp Tyr Gln Gln Lys Pro Gly Lys Ser Pro Gln Leu Leu Ile
 1 5 10 15

Tyr

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<400> 13

Ala Ala Thr Ser Leu Ala Asp
 1 5

<210> 14
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 <213> Artificial Sequence

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<400> 14

Gly Val Pro Ser Arg Phe Ser Gly Ser Gly Ser Gly Thr Lys Phe Ser
 1 5 10 15

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

<210> 15
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<400> 15

Gln Gln Phe Tyr Ser Thr Pro Phe Thr
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<210> 16
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<400> 16

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Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys Arg
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<210> 17
<211> 117
<212> PRT
<213> Artificial Sequence

<220>
<223> Peptide

<400> 17

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

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

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

Ala Met Ile Ser Ser Gly Gly Ser Tyr Ser Tyr Tyr Pro 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 Gln Gly Asp Tyr Ala Trp Phe Ala Tyr Trp Gly Gln Gly Thr
100 105 110

Leu Val Thr Val Ser
115

<210> 18
<211> 25
<212> PRT
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<220>
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<400> 18

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

Ser Leu Arg Leu Ser Cys Ala Ala Ser
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<400> 19

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

<210> 20
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<400> 20

Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val Ala
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<210> 21
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<220>
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<400> 21

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

Gly

<210> 22
 <211> 32
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<220>
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<400> 22

Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr Leu Gln
 1 5 10 15

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

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25

30

<210> 23
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<400> 23

Gln Gly Asp Tyr Ala Trp Phe Ala Tyr
 1 5

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

<220>
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<400> 24

Trp Gly Gln Gly Thr Leu Val Thr Val Ser
 1 5 10

<210> 25
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 <212> PRT
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<220>
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<400> 25

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 Leu Ala Ser Gln Thr Ile Gly Thr Trp
 20 25 30

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

Tyr Ala Ala Thr Ser Leu Ala Asp 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 Phe Tyr Ser Thr Pro Phe
 85 90 95

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

<210> 26
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<212> PRT
<213> Artificial Sequence

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<400> 26

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
20

<210> 27
<211> 9
<212> PRT
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<220>
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<400> 27

Leu Ala Ser Gln Thr Ile Gly Thr Trp
1 5

<210> 28
<211> 17
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<220>
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<400> 28

Leu Ala Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
1 5 10 15

Tyr

<210> 29
<211> 7
<212> PRT
<213> Artificial Sequence

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<400> 29

Ala Ala Thr Ser Leu Ala Asp
1 5

<210> 30

<211> 32

<212> PRT

<213> Artificial Sequence

<220>

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<400> 30

Gly Val Pro Ser Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr
1 5 10 15

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

<210> 31

<211> 9

<212> PRT

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<400> 31

Gln Gln Phe Tyr Ser Thr Pro Phe Thr
1 5

<210> 32

<211> 11

<212> PRT

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<220>

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<400> 32

Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys Arg
1 5 10

<210> 33

<211> 117

<212> PRT

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<400> 33

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

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

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

Ala Met Ile Ser Ser Gly Gly Ser Tyr Ser 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 Gln Gly Asp Tyr Ala Trp Phe Asp Ile Trp Gly Gln Gly Thr
100 105 110

Leu Val Thr Val Ser
115

<210> 34
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<213> Artificial Sequence

<220>
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<400> 34

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

Ser Leu Arg Leu Ser Cys Ala Ala Ser
20 25

<210> 35
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<220>
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<400> 35

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

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<210> 36
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 <212> PRT
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<400> 36

Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val Ala
 1 5 10

<210> 37
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 <212> PRT
 <213> Artificial Sequence

<220>
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<400> 37

Met Ile Ser Ser Gly Gly Ser Tyr Ser Tyr Tyr Ala Asp Ser Val Lys
 1 5 10 15

Gly

<210> 38
 <211> 32
 <212> PRT
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<220>
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<400> 38

Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr Leu Gln
 1 5 10 15

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

<210> 39
 <211> 9
 <212> PRT
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<220>
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<400> 39

Gln Gly Asp Tyr Ala Trp Phe Asp Ile
 1 5

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<210> 40
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 <212> PRT
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<220>
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<400> 40

Trp Gly Gln Gly Thr Leu Val Thr Val Ser
 1 5 10

<210> 41
 <211> 108
 <212> PRT
 <213> Artificial Sequence

<220>
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<400> 41

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 Leu Ala Ser Gln Thr Ile Gly Thr Trp
 20 25 30

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

Tyr Ala Ala Thr Ser Leu Ala Asp 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 Phe Tyr Ser Thr Pro Phe
 85 90 95

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

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<400> 42

044508-5048-W0-SequenceListing

Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
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Asp Arg Val Thr Ile Thr Cys
 20

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<400> 43

Leu Ala Ser Gln Thr Ile Gly Thr Trp
 1 5

<210> 44
 <211> 17
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<400> 44

Leu Ala Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
 1 5 10 15

Tyr

<210> 45
 <211> 7
 <212> PRT
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<220>
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<400> 45

Ala Ala Thr Ser Leu Ala Asp
 1 5

<210> 46
 <211> 32
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<400> 46

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

<210> 47

<211> 9

<212> PRT

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<400> 47

Gln Gln Phe Tyr Ser Thr Pro Phe Thr
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<210> 48

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<212> PRT

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<400> 48

Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys Arg
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<211> 240

<212> PRT

<213> Artificial Sequence

<220>

<223> Peptide

<400> 49

Glu Val Gln 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 Thr 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 Met Ile Ser Ser Gly Gly Ser Tyr Ser Tyr Tyr Pro Asp Ser Val
50 55 60

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

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

Leu Val Thr Val Ser Gly Gly Gly Gly Ser Gly Gly Gly Ser Gly
115 120 125

Gly Gly Gly Ser Asp Ile Gln Met Thr Gln Ser Pro Ala Ser Gln Ser
130 135 140

Ala Ser Leu Gly Glu Ser Val Thr Ile Thr Cys Leu Ala Ser Gln Thr
145 150 155 160

Ile Gly Thr Trp Leu Ala Trp Tyr Gln Gln Lys Pro Gly Lys Ser Pro
165 170 175

Gln Leu Leu Ile Tyr Ala Ala Thr Ser Leu Ala Asp Gly Val Pro Ser
180 185 190

Arg Phe Ser Gly Ser Gly Ser Gly Thr Lys Phe Ser Phe Lys Ile Ser
195 200 205

Ser Leu Gln Ala Glu Asp Phe Val Ser Tyr Tyr Cys Gln Gln Phe Tyr
210 215 220

Ser Thr Pro Phe Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys Arg
225 230 235 240

<210> 50
<211> 240
<212> PRT
<213> Artificial Sequence

<220>
<223> Peptide

<400> 50

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

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

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

Ala Met Ile Ser Ser Gly Gly Ser Tyr Ser Tyr Tyr Pro 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 Gln Gly Asp Tyr Ala Trp Phe Ala Tyr Trp Gly Gln Gly Thr
100 105 110

Leu Val Thr Val Ser Gly Gly Gly Gly Ser Gly Gly Gly Ser Gly
115 120 125

Gly Gly Gly Ser Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser
130 135 140

Ala Ser Val Gly Asp Arg Val Thr Ile Thr Cys Leu Ala Ser Gln Thr
145 150 155 160

Ile Gly Thr Trp Leu Ala Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro
165 170 175

Lys Leu Leu Ile Tyr Ala Ala Thr Ser Leu Ala Asp Gly Val Pro Ser
180 185 190

Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser
195 200 205

Ser Leu Gln Pro Glu Asp Phe Ala Thr Tyr Tyr Cys Gln Gln Phe Tyr
210 215 220

Ser Thr Pro Phe Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys Arg
225 230 235 240

<210> 51
<211> 240
<212> PRT
<213> Artificial Sequence

<220>
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<400> 51

Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Lys Pro Gly Gly
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1	5	10	15
Ser	Leu	Arg	Leu
	20	Ser	Cys
		Ala	Ala
		25	Ser
		Gly	Phe
		Thr	Phe
		30	Ser
		Ser	Tyr
Ser	Met	Ser	Trp
	35	Val	Arg
		Gln	Ala
		40	Pro
		Gly	Lys
		Gly	Leu
		45	Glu
		Trp	Val
Ala	Met	Ile	Ser
	50	Ser	Gly
		Gly	Ser
		55	Tyr
		Ser	Tyr
		60	Tyr
		Ala	Asp
		Ser	Val
Lys	Gly	Arg	Phe
65		Thr	Ile
		70	Ser
		Arg	Asp
		Asn	Ser
		75	Lys
		Asn	Thr
		Leu	Tyr
80			
Leu	Gln	Met	Asn
		85	Ser
		Leu	Arg
		Ala	Glu
		90	Asp
		Thr	Ala
		Val	Tyr
		95	Tyr
		Cys	
Ala	Arg	Gln	Gly
		100	Asp
		Tyr	Ala
		Trp	Phe
		105	Asp
		Ile	Trp
		Gly	Gln
		110	Gly
		Thr	
Leu	Val	Thr	Val
	115	Ser	Gly
		Gly	Gly
		120	Gly
		Gly	Ser
		Gly	Gly
		125	Gly
		Gly	Ser
		Gly	
Gly	Gly	Gly	Ser
	130	Asp	Ile
		Gln	Met
		135	Thr
		Gln	Ser
		140	Pro
		Ser	Ser
		Leu	Ser
Ala	Ser	Val	Gly
145		Asp	Arg
		150	Val
		Thr	Ile
		Thr	Cys
		155	Leu
		Ala	Ser
		Gln	Thr
		160	
Ile	Gly	Thr	Trp
		165	Leu
		Ala	Trp
		Tyr	Gln
		170	Gln
		Lys	Pro
		Gly	Lys
		175	Ala
		Pro	
Lys	Leu	Leu	Ile
		180	Tyr
		Ala	Ala
		Thr	Ser
		185	Leu
		Ala	Asp
		Gly	Val
		190	Pro
		Ser	
Arg	Phe	Ser	Gly
	195	Ser	Gly
		Ser	Gly
		200	Thr
		Asp	Phe
		Thr	Leu
		205	Thr
		Ile	Ser
Ser	Leu	Gln	Pro
	210	Glu	Asp
		Phe	Ala
		215	Thr
		Tyr	Tyr
		220	Cys
		Gln	Gln
		Phe	Tyr
Ser	Thr	Pro	Phe
		225	Gly
		Gly	Gly
		230	Thr
		Lys	Leu
		235	Glu
		Ile	Lys
		Arg	
		240	

<210> 52
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<220>

<223> Peptide

<400> 52

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser
1 5 10 15

<210> 53

<211> 81

<212> PRT

<213> Artificial Sequence

<220>

<223> Peptide

<400> 53

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

Ser Leu Arg Leu Ser Cys Ala Ala Ser Trp Val Arg Gln Ala Pro Gly
20 25 30

Lys Gly Leu Glu Trp Val Ala Arg Phe Thr Ile Ser Arg Asp Asn Ser
35 40 45

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

Ala Val Tyr Tyr Cys Ala Arg Trp Gly Gln Gly Thr Leu Val Thr Val
65 70 75 80

Ser

<210> 54

<211> 81

<212> PRT

<213> Artificial Sequence

<220>

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<400> 54

Glu Val Gln 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 Trp Val Arg Gln Thr Pro Glu
20 25 30

Lys Arg Leu Glu Trp Val Ala Arg Phe Thr Ile Ser Arg Asp Asn Ala

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35

40

45

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

Ala Met Tyr Tyr Cys Ala Arg Trp Gly Gln Gly Thr Leu Val Thr Val
65 70 75 80

Ser

<210> 55

<211> 81

<212> PRT

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<220>

<223> Peptide

<400> 55

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

Ser Leu Arg Leu Ser Cys Ala Ala Ser Trp Val Arg Gln Ala Pro Gly
20 25 30

Lys Gly Leu Glu Trp Val Ser Arg Phe Thr Ile Ser Arg Asp Asn Ser
35 40 45

Lys Asn Thr Ala Tyr Leu Gln Met Asn Ser Leu Lys Ser Asp Asp Pro
50 55 60

Ala Val Tyr Tyr Cys Thr Arg Trp Gly Gln Gly Thr Leu Val Thr Val
65 70 75 80

Ser

<210> 56

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<212> PRT

<213> Artificial Sequence

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<223> Peptide

<400> 56

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

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Ser Leu Arg Leu Ser Cys Ala Ala Ser Trp Val Arg Gln Ala Pro Gly
20 25 30

Lys Gly Leu Glu Trp Val Gly Arg Phe Thr Ile Ser Arg Asp Asp Ser
35 40 45

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

Ala Val Tyr Tyr Cys Thr Arg Trp Gly Gln Gly Thr Leu Val Thr Val
65 70 75 80

Ser

<210> 57
<211> 81
<212> PRT
<213> Artificial Sequence

<220>
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<400> 57

Glu 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 Trp Val Arg Gln Ala Pro Gly
20 25 30

Lys Gly Leu Glu Trp Val Ala Arg Phe Ser Ile Ser Arg Asp Asn Ala
35 40 45

Arg Asn Ser Leu Tyr Leu Gln Met Asn Ser Leu Arg Asp Asp Asp Thr
50 55 60

Ser Val Tyr Tyr Cys Val Arg Trp Gly Gln Gly Thr Leu Val Thr Val
65 70 75 80

Ser

<210> 58
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Glu Val Gln Leu Val Glu Ser Gly Gly Gly Pro Gly Gln Ala Trp Gly
1 5 10 15

Val Leu Arg Leu Ser Cys Ala Ala Ser Trp Val Arg Gln Ala Pro Gly
20 25 30

Lys Gly Leu Glu Trp Val Ser Arg Phe Thr Ile Ser Arg Asp Asn Ala
35 40 45

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

Ala Val Tyr Tyr Cys Ala Arg Trp Gly Arg Gly Thr Leu Val Thr Val
65 70 75 80

Ser

<210> 59
<211> 81
<212> PRT
<213> Artificial Sequence

<220>
<223> Peptide

<400> 59

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

Ser Leu Lys Ile Ser Cys Lys Gly Ser Trp Val Arg Gln Met Pro Gly
20 25 30

Lys Gly Leu Glu Trp Met Gly Gln Val Thr Ile Ser Ala Asp Lys Ser
35 40 45

Ile Thr Thr Ala Tyr Leu Gln Trp Ser Ser Leu Lys Ala Ser Asp Thr
50 55 60

Ala Met Tyr Tyr Cys Ala Arg Trp Gly Gln Gly Thr Pro Val Thr Val
65 70 75 80

Ser

<210> 60
<211> 81
<212> PRT
<213> Artificial Sequence

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<220>

<223> Peptide

<400> 60

Glu 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 Trp Val Arg Gln Ala Pro Gly
20 25 30

Lys Gly Leu Glu Trp Val Ala Arg Phe Thr Ile Ser Arg Asp Asn Ser
35 40 45

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

Ala Val Tyr Tyr Cys Ala Arg Trp Gly Gln Gly Thr Leu Val Thr Val
65 70 75 80

Ser

<210> 61

<211> 81

<212> PRT

<213> Artificial Sequence

<220>

<223> Peptide

<400> 61

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

Ser Val Lys Val Ser Cys Lys Ala Ser Trp Val Arg Gln Ala Pro Gly
20 25 30

Gln Gly Leu Glu Trp Met Gly Arg Val Thr Met Thr Thr Glu Thr Ser
35 40 45

Thr Ser Thr Ala Tyr Met Glu Leu Arg Ser Leu Arg Ser Asp Asp Thr
50 55 60

Ala Val Tyr Tyr Cys Ala Arg Trp Gly Gln Gly Thr Leu Val Thr Val
65 70 75 80

Ser

044508-5048-W0-SequenceListing

<210> 62
 <211> 81
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Peptide

<400> 62

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

Ser Leu Arg Leu Ser Cys Ala Ala Ser Trp Val Arg Gln Ala Pro Gly
 20 25 30

Lys Gly Leu Glu Trp Val Ser Arg Phe Thr Ile Ser Arg Asp Asn Ser
 35 40 45

Lys Asn Thr Leu Phe Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr
 50 55 60

Ala Val Tyr Tyr Cys Ala Arg Trp Gly Gln Gly Thr Leu Val Thr Val
 65 70 75 80

Ser

<210> 63
 <211> 81
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Peptide

<400> 63

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

Ser Leu Arg Leu Ser Cys Ala Ala Ser Trp Val Arg Gln Ala Pro Gly
 20 25 30

Lys Gly Leu Glu Trp Val Ala Arg Phe Ser Ile Ser Arg Asp Asn Ala
 35 40 45

Arg Asn Ser Leu Tyr Leu Gln Met Asn Ser Leu Arg Asp Asp Asp Thr
 50 55 60

Ser Val Tyr Tyr Cys Val Arg Trp Gly Gln Gly Thr Leu Val Thr Val
 65 70 75 80

044508-5048-W0-SequenceListing

Ser

<210> 64
 <211> 81
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Peptide

<400> 64

Glu 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 Trp Val Arg Gln Ala Pro Gly
 20 25 30

Lys Gly Leu Glu Trp Val Ala Arg Phe Thr Ile Ser Arg Asp Asn Ser
 35 40 45

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

Ala Val Tyr Tyr Cys Ala Arg Trp Gly Gln Gly Thr Leu Val Thr Val
 65 70 75 80

Ser

<210> 65
 <211> 81
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Peptide

<400> 65

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

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

Lys Gly Leu Glu Trp Val Ser Arg Phe Thr Ile Ser Arg Asp Asn Ser
 35 40 45

Glu Asn Met Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr

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50

55

60

Ala Val Tyr Tyr Cys Ala Arg Trp Gly Gln Gly Thr Leu Val Thr Val
65 70 75 80

Ser

<210> 66
<211> 81
<212> PRT
<213> Artificial Sequence

<220>
<223> Peptide

<400> 66

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

Ser Leu Arg Leu Ser Cys Ala Ala Ser Trp Val Arg Gln Ala Pro Gly
20 25 30

Lys Gly Leu Glu Trp Val Ser Arg Phe Thr Ile Ser Arg Asp Asn Ala
35 40 45

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

Ala Val Tyr Tyr Cys Ala Arg Trp Gly Gln Gly Thr Leu Val Thr Val
65 70 75 80

Ser

<210> 67
<211> 83
<212> PRT
<213> Artificial Sequence

<220>
<223> Peptide

<400> 67

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 Leu Ala Trp Tyr Gln Gln Lys Pro Gly
20 25 30

044508-5048-W0-SequenceListing

Lys Ala Pro Lys Leu Leu Ile Tyr Gly Val Pro Ser Arg Phe Ser Gly
35 40 45

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
50 55 60

Glu Asp Phe Ala Thr Tyr Tyr Cys Thr Phe Gly Gly Gly Thr Lys Leu
65 70 75 80

Glu Ile Lys

<210> 68
<211> 83
<212> PRT
<213> Artificial Sequence

<220>
<223> Peptide

<400> 68

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

Glu Ser Val Thr Ile Thr Cys Leu Ala Trp Tyr Gln Gln Lys Pro Gly
20 25 30

Lys Ser Pro Gln Leu Leu Ile Tyr Gly Val Pro Ser Arg Phe Ser Gly
35 40 45

Ser Gly Ser Gly Thr Lys Phe Ser Phe Lys Ile Ser Ser Leu Gln Ala
50 55 60

Glu Asp Phe Val Ser Tyr Tyr Cys Thr Phe Gly Gly Gly Thr Lys Leu
65 70 75 80

Glu Ile Lys

<210> 69
<211> 83
<212> PRT
<213> Artificial Sequence

<220>
<223> Peptide

<400> 69

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

044508-5048-W0-SequenceListing

Asp Arg Val Thr Ile Thr Cys Leu Asn Trp Tyr Gln Gln Lys Pro Gly
20 25 30

Lys Ala Pro Lys Leu Leu Ile Tyr Gly Val Pro Ser Arg Phe Ser Gly
35 40 45

Ser Gly Ser Gly Thr Glu Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
50 55 60

Asp Asp Phe Ala Thr Tyr Tyr Cys Thr Phe Gly Gln Gly Thr Lys Leu
65 70 75 80

Glu Ile Lys

<210> 70
<211> 83
<212> PRT
<213> Artificial Sequence

<220>
<223> Peptide

<400> 70

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

Asp Arg Val Thr Ile Thr Cys Leu Ala Trp Tyr Gln Gln Lys Pro Gly
20 25 30

Lys Ala Pro Lys Leu Leu Ile Tyr Gly Val Pro Ser Arg Phe Ser Gly
35 40 45

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
50 55 60

Asp Asp Phe Ala Thr Tyr Tyr Cys Thr Phe Gly Gln Gly Thr Lys Leu
65 70 75 80

Glu Ile Lys

<210> 71
<211> 83
<212> PRT
<213> Artificial Sequence

<220>
<223> Peptide

044508-5048-W0-SequenceListing

<400> 71

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

Asp Arg Val Thr Ile Thr Cys Leu Ala Trp Tyr Gln Gln Arg Pro Gly
20 25 30

Lys Ala Pro Lys Leu Leu Ile Tyr Gly Val Pro Ser Arg Phe Ser Gly
35 40 45

Ser Gly Ser Gly Ser Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
50 55 60

Glu Asp Phe Ala Thr Tyr Tyr Cys Thr Phe Gly Gly Gly Thr Lys Leu
65 70 75 80

Glu Ile Lys

<210> 72

<211> 83

<212> PRT

<213> Artificial Sequence

<220>

<223> Peptide

<400> 72

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

Asp Arg Val Thr Ile Thr Cys Leu Asn Trp Tyr Gln Gln Lys Pro Gly
20 25 30

Lys Ala Pro Lys Leu Leu Ile Tyr Gly Val Pro Ser Arg Phe Ser Gly
35 40 45

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
50 55 60

Glu Asp Phe Ala Thr Tyr Tyr Cys Gly Phe Gly Gly Gly Thr Lys Leu
65 70 75 80

Glu Ile Lys

<210> 73

<211> 83

<212> PRT

<213> Artificial Sequence

<220>

<223> Peptide

<400> 73

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 Leu Ala Trp Tyr Gln Gln Lys Pro Gly
 20 25 30

Lys Ala Pro Lys Leu Leu Ile Tyr Gly Val Pro Ser Arg Phe Ser Gly
 35 40 45

Ser Gly Ser Gly Thr Glu Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
 50 55 60

Glu Asp Phe Ala Thr Tyr Tyr Cys Thr Phe Gly Gly Gly Thr Lys Leu
 65 70 75 80

Glu Ile Lys

<210> 74

<211> 83

<212> PRT

<213> Artificial Sequence

<220>

<223> Peptide

<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 Leu Ala Trp Tyr Gln Gln Lys Pro Gly
 20 25 30

Lys Ala Pro Lys Leu Leu Ile Tyr Gly Val Pro Ser Arg Phe Ser Gly
 35 40 45

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

Glu Asp Phe Ala Thr Tyr Tyr Cys Thr Phe Gly Gln Gly Thr Lys Leu
 65 70 75 80

Glu Ile Lys

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<210> 75
 <211> 83
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Peptide

<400> 75

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 Leu Ala Trp Tyr Gln Gln Lys Pro Gly
 20 25 30

Lys Ala Pro Lys Leu Leu Ile Tyr Gly Val Pro Ser Arg Phe Ser Gly
 35 40 45

Ser Gly Ser Gly Thr Glu Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
 50 55 60

Glu Asp Phe Ala Thr Tyr Tyr Cys Thr Phe Gly Gly Gly Thr Lys Leu
 65 70 75 80

Glu Ile Lys

<210> 76
 <211> 83
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Peptide

<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 Leu Asn Trp Tyr Gln Gln Lys Pro Gly
 20 25 30

Lys Ala Pro Lys Leu Leu Ile Tyr Gly Val Pro Ser Arg Phe Ser Gly
 35 40 45

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
 50 55 60

Glu Asp Phe Ala Ala Tyr Phe Cys Thr Phe Gly Gly Gly Thr Lys Leu

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<210> 77
<211> 83
<212> PRT
<213> Artificial Sequence
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<220>
<223> Peptide

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 Leu Asn Trp Tyr Gln Gln Lys Pro Gly
20 25 30

Lys Ala Pro Lys Leu Leu Ile Tyr Gly Val Pro Ser Arg Phe Ser Gly
35 40 45

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
50 55 60

Asp₆₅ Asp Phe Ala Thr Tyr₇₀ Tyr Cys Thr Phe Gly₇₅ Gln Gly Thr Lys Leu₈₀

<210>	78
<211>	83
<212>	PRT
<213>	Artificial Sequence

<220>
<223> Peptide

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

Asp Arg Val Thr Ile Thr Cys Leu Ala Trp Tyr Gln Gln Lys Pro Gly
20 25 30

Lys Ala Pro Lys Leu Leu Ile Tyr Gly Val Pro Ser Arg Phe Ser Gly
35 40 45

044508-5048-W0-SequenceListing

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
50 55 60

Glu Asp Phe Ala Thr Tyr Tyr Cys Thr Phe Gly Arg Gly Thr Lys Leu
65 70 75 80

Glu Ile Lys

<210> 79
<211> 83
<212> PRT
<213> Artificial Sequence

<220>
<223> Peptide

<400> 79

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 Leu Ala Trp Tyr Gln Gln Lys Pro Gly
20 25 30

Lys Ala Pro Lys Leu Leu Ile Tyr Gly Val Pro Ser Arg Phe Ser Gly
35 40 45

Ser Gly Ser Gly Thr Glu Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
50 55 60

Glu Asp Phe Ala Thr Tyr Phe Cys Thr Phe Gly Gln Gly Thr Lys Leu
65 70 75 80

Glu Ile Lys

<210> 80
<211> 83
<212> PRT
<213> Artificial Sequence

<220>
<223> Peptide

<400> 80

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 Leu Asn Trp Tyr Gln Gln Lys Pro Gly
20 25 30

044508-5048-W0-SequenceListing

Lys Ala Pro Lys Leu Leu Ile Tyr Gly Val Pro Ser Arg Phe Ser Gly
 35 40 45

Ser Gly Ser Gly Thr Glu Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
 50 55 60

Glu Asp Phe Ala Thr Tyr Phe Cys Thr Phe Gly Gln Gly Thr Lys Leu
 65 70 75 80

Glu Ile Lys