SEQUENCE LISTING

<110> F. Hoffmann-La Roche AG

<120> ANTI-alpha-SYNUCLEIN ANTIBODIES AND METHODS OF USE

<130> Case P31869

<150> EP13193892.0
<151> 2013-11-21

<160> 58

<170> PatentIn version 3.5

<210> 1
<211> 11
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<220>
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<400> 1

Gly Lys Asn Glu Glu Gly Ala Pro Gln Glu Gly
1 5 10

<210> 2
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<220>
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<400> 2

Tyr Ala Met Ile
1

<210> 3
<211> 9
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<220>
<223> CDRH2

<400> 3

Pro Ser Gly Asn Thr Tyr Tyr Ala Asn
1 5

<210> 4
<211> 10
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<213> Artificial Sequence

<220>

<223> CDRH3

<400> 4

Arg Asp Gly Thr Asp Lys Thr Phe Asn Ile
1   5   10

<210> 5
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> CDRL1

<400> 5

Asn Val Tyr Gly Asp Asn
1   5

<210> 6
<211> 6
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<213> Artificial Sequence

<220>
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<400> 6

Glu Ala Ser Lys Leu Ala
1   5

<210> 7
<211> 10
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<400> 7

Gly Glu Phe Leu Cys Thr Thr Ser Asp Cys
1   5   10

<210> 8
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<220>
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<400> 8

Ser Tyr Ala Met Ile
1   5

<210> 9
<211> 16
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<220>
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<400> 9

Val Ile Tyr Pro Ser Gly Asn Thr Tyr Tyr Ala Asn Trp Ala Lys Gly
1 5 10 15

<210> 10
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> CDRL1

<400> 10

Gln Ala Ser Gln Asn Val Tyr Gly Asp Asn Tyr Leu Ala
1 5 10

<210> 11
<211> 7
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<213> Artificial Sequence

<220>
<223> CDRL2

<400> 11

Glu Ala Ser Lys Leu Ala Ser
1 5

<210> 12
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
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<400> 12

Gln Gly Glu Phe Leu Cys Thr Thr Ser Asp Cys Phe Thr
1 5 10

<210> 13
<211> 115
<212> PRT
<213> Artificial Sequence

<220>

<223> heavy chain variable domain

<400> 13

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

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

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

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

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

Ser Pro Thr Thr Glu Asp Thr Ala Thr Tyr Phe Cys Ala Arg Arg Asp
                85                  90                  95

Gly Thr Asp Lys Thr Phe Asn Ile Trp Gly Pro Gly Thr Leu Val Thr
            100                 105                 110

Val Ser Leu
        115
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<210> 14
<211> 112
<212> PRT
<213> Artificial Sequence

<220>
<223> light chain variable domain

<400> 14

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

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

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

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

Gly Ser Gly Ser Gly Thr Gln Phe Thr Leu Thr Ile Ser Asp Val Gln
```

eolf-seql
65 70 75 80

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

Thr Ser Asp Cys Phe Thr Phe Gly Gly Gly Thr Gly Val Val Val Arg
100 105 110

<210> 15
<211> 3
<212> PRT
<213> Artificial Sequence

<220>
<223> CDRH1

<400> 15

Arg Tyr Ala
1

<210> 16
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> CDRH2

<400> 16

Asn Ser Ser Gly Ala
1 5

<210> 17
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> CDRH3

<400> 17

Trp Thr Tyr Asp Asp Tyr Gly Asp Phe Gln Gly Phe Asn Ile
1 5 10

<210> 18
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> CDRL1

<400> 18

Ser Val Tyr Asn Asn Asn Asp Leu Ala
1 5

<210> 19
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> CDRL2

<400> 19

Arg Ala Ser Lys Leu Ala
1 5

<210> 20
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> CDRL3

<400> 20

Gly Gly Tyr Asp Asp Asp Ala Asp Met Gly Ala
1 5 10

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

<220>
<223> CDRH1

<400> 21

Arg Tyr Ala Met Ser
1 5

<210> 22
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> CDRH2

<400> 22

Val Ile Asn Ser Ser Gly Ala Thr Tyr Tyr Ala Ser Trp Ala Lys Gly
1 5 10 15

<210> 23
<211> 13
<212> PRT

<213> Artificial Sequence

<220>
<223> CDRL1

<400> 23

Gln Ser Ser Gln Ser Val Tyr Asn Asn Asn Asp Leu Ala
1 5 10

<210> 24
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> CDRL2

<400> 24

Arg Ala Ser Lys Leu Ala Ser
1 5

<210> 25
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> CDRL3

<400> 25

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

<210> 26
<211> 119
<212> PRT
<213> Artificial Sequence

<220>
<223> heavy chain variable domain

<400> 26

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

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

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

Val Ile Asn Ser Ser Gly Ala Thr Tyr Tyr Ala Ser Trp Ala Lys Gly
50 55 60

```
Arg Phe Thr Ile Ser Glu Thr Ser Thr Thr Val Glu Leu Lys Ile Thr
65                  70                  75                  80


Ser Pro Thr Thr Glu Asp Thr Ala Thr Tyr Phe Cys Ala Arg Trp Thr
                85                  90                  95


Tyr Asp Asp Tyr Gly Asp Phe Gln Gly Phe Asn Ile Trp Gly Pro Gly
            100                 105                 110


Thr Leu Val Thr Val Ser Leu
        115


<210>  27
<211>  111
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  light chain variable domain

<400>  27

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


Thr Val Thr Ile Ser Cys Gln Ser Ser Gln Ser Val Tyr Asn Asn Asn
            20                  25                  30


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


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


Gly Ser Gly Ser Gly Thr Gln Phe Thr Leu Thr Ile Ser Gly Val Gln
65                  70                  75                  80


Cys Asp Asp Ala Ala Thr Tyr Tyr Cys Leu Gly Gly Tyr Asp Asp Asp
                85                  90                  95


Ala Asp Met Gly Ala Phe Gly Gly Gly Thr Glu Val Val Val Lys
            100                 105                 110


<210>  28
<211>  5
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  CDRH1
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<400> 28

Arg Asp Thr Met Ile
1 5

<210> 29
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> CDRH2

<400> 29

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

<210> 30
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> CDRH3

<400> 30

Asn Phe Ser Val
1

<210> 31
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> CDRL1

<400> 31

Val Tyr Asn Ser Asp Arg
1 5

<210> 32
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> CDRL2

<400> 32

Val Ser Lys Leu Ala
1 5

<210> 33
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> CDRL3

<400> 33

Leu Gly Gly Tyr Asp Cys Ser Ser Ala Glu Cys
1 5 10

<210> 34
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> CDRH2

<400> 34

Ser Ile Tyr Thr Asp Ser Gly Asn Thr Trp Tyr Ala Ser Trp Val Lys
1 5 10 15

Gly

<210> 35
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> CDRL1

<400> 35

Gln Ala Ser Gln Ser Val Tyr Asn Ser Asp Arg Leu Ala
1 5 10

<210> 36
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> CDRL2

<400> 36

Asp Val Ser Lys Leu Ala Ser
1 5

<210> 37
<211> 13
<212> PRT

<213> Artificial Sequence

<220>
<223> CDRL3

<400> 37

Leu Gly Gly Tyr Asp Cys Ser Ser Ala Glu Cys Asn Val
1 5 10

<210> 38
<211> 111
<212> PRT
<213> Artificial Sequence

<220>
<223> heavy chain variable domain

<400> 38

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

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

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

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

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

Ile Thr Ser Pro Thr Thr Glu Asp Thr Ala Thr Tyr Phe Cys Ala Arg
85 90 95

Asn Phe Ser Val Trp Gly Pro Gly Thr Leu Val Thr Val Ser Leu
100 105 110

<210> 39
<211> 112
<212> PRT
<213> Artificial Sequence

<220>
<223> light chain variable domain

<400> 39

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

eolf-seql

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

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

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

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

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

Ser Ala Glu Cys Asn Val Phe Gly Gly Gly Thr Glu Val Val Val Lys
            100   105   110

<210> 40
<211> 140
<212> PRT
<213> Homo sapiens

<400> 40

Met Asp Val Phe Met Lys Gly Leu Ser Lys Ala Lys Glu Gly Val Val
1   5   10   15

Ala Ala Ala Glu Lys Thr Lys Gln Gly Val Ala Glu Ala Ala Gly Lys
            20   25   30

Thr Lys Glu Gly Val Leu Tyr Val Gly Ser Lys Thr Lys Glu Gly Val
        35   40   45

Val His Gly Val Ala Thr Val Ala Glu Lys Thr Lys Glu Gln Val Thr
    50   55   60

Asn Val Gly Gly Ala Val Val Thr Gly Val Thr Ala Val Ala Gln Lys
65   70   75   80

Thr Val Glu Gly Ala Gly Ser Ile Ala Ala Ala Thr Gly Phe Val Lys
                85   90   95

Lys Asp Gln Leu Gly Lys Asn Glu Glu Gly Ala Pro Gln Glu Gly Ile
            100   105   110

Leu Glu Asp Met Pro Val Asp Pro Asp Asn Glu Ala Tyr Glu Met Pro
        115   120   125

eolf-seql
Ser Glu Glu Gly Tyr Gln Asp Tyr Glu Pro Glu Ala
130 135 140

<210> 41
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> linker peptide

<400> 41

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

Gly Ser

<210> 42
<211> 37
<212> DNA
<213> Artificial Sequence

<220>
<223> rbHCfinal.up

<400> 42
aagcttgcca ccatggagac tgggctgcgc tggcttc 37

<210> 43
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> rbHCfinal.do

<400> 43
ccattggtga gggtgcccga g 21

<210> 44
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> rbLCfinal.up

<400> 44
aagcttgcca ccatggacay gagggccccc actc 34

<210> 45
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> rbLCfinal.do

<400> 45
cagagtrctg ctgaggttgt aggtac 26

<210> 46
<211> 324
<212> PRT
<213> Mus musculus

<400> 46

Ala Lys Thr Thr Pro Pro Ser Val Tyr Pro Leu Ala Pro Gly Ser Ala
1 5 10 15

Ala Gln Thr Asn Ser Met Val Thr Leu Gly Cys Leu Val Lys Gly Tyr
20 25 30

Phe Pro Glu Pro Val Thr Val Thr Trp Asn Ser Gly Ser Leu Ser Ser
35 40 45

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

Ser Ser Ser Val Thr Val Pro Ser Ser Thr Trp Pro Ser Glu Thr Val
65 70 75 80

Thr Cys Asn Val Ala His Pro Ala Ser Ser Thr Lys Val Asp Lys Lys
85 90 95

Ile Val Pro Arg Asp Cys Gly Cys Lys Pro Cys Ile Cys Thr Val Pro
100 105 110

Glu Val Ser Ser Val Phe Ile Phe Pro Pro Lys Pro Lys Asp Val Leu
115 120 125

Thr Ile Thr Leu Thr Pro Lys Val Thr Cys Val Val Val Asp Ile Ser
130 135 140

Lys Asp Asp Pro Glu Val Gln Phe Ser Trp Phe Val Asp Asp Val Glu
145 150 155 160

Val His Thr Ala Gln Thr Gln Pro Arg Glu Glu Gln Phe Asn Ser Thr
165 170 175

Phe Arg Ser Val Ser Glu Leu Pro Ile Met His Gln Asp Trp Leu Asn
180 185 190

Gly Lys Glu Phe Lys Cys Arg Val Asn Ser Ala Ala Phe Pro Ala Pro

195 200 205

Ile Glu Lys Thr Ile Ser Lys Thr Lys Gly Arg Pro Lys Ala Pro Gln
210 215 220

Val Tyr Thr Ile Pro Pro Pro Lys Glu Gln Met Ala Lys Asp Lys Val
225 230 235 240

Ser Leu Thr Cys Met Ile Thr Asp Phe Phe Pro Glu Asp Ile Thr Val
245 250 255

Glu Trp Gln Trp Asn Gly Gln Pro Ala Glu Asn Tyr Lys Asn Thr Gln
260 265 270

Pro Ile Met Asp Thr Asp Gly Ser Tyr Phe Val Tyr Ser Lys Leu Asn
275 280 285

Val Gln Lys Ser Asn Trp Glu Ala Gly Asn Thr Phe Thr Cys Ser Val
290 295 300

Leu His Glu Gly Leu His Asn His His Thr Glu Lys Ser Leu Ser His
305 310 315 320

Ser Pro Gly Lys

<210> 47
<211> 107
<212> PRT
<213> Mus musculus

<400> 47

Arg Ala Asp Ala Ala Pro Thr Val Ser Ile Phe Pro Pro Ser Ser Glu
1 5 10 15

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

Tyr Pro Lys Asp Ile Asn Val Lys Trp Lys Ile Asp Gly Ser Glu Arg
35 40 45

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

Thr Tyr Ser Met Ser Ser Thr Leu Thr Leu Thr Lys Asp Glu Tyr Glu
65 70 75 80

Arg His Asn Ser Tyr Thr Cys Glu Ala Thr His Lys Thr Ser Thr Ser

85 90 95

Pro Ile Val Lys Ser Phe Asn Arg Asn Glu Cys
100 105

<210> 48
<211> 106
<212> PRT
<213> Mus musculus

<400> 48

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

Glu Glu Leu Glu Thr Asn Lys Ala Thr Leu Val Cys Thr Ile Thr Asp
20 25 30

Phe Tyr Pro Gly Val Val Thr Val Asp Trp Lys Val Asp Gly Thr Pro
35 40 45

Val Thr Gln Gly Met Glu Thr Thr Gln Pro Ser Lys Gln Ser Asn Asn
50 55 60

Lys Tyr Met Ala Ser Ser Tyr Leu Thr Leu Thr Ala Arg Ala Trp Glu
65 70 75 80

Arg His Ser Ser Tyr Ser Cys Gln Val Thr His Glu Gly His Thr Val
85 90 95

Glu Lys Ser Leu Ser Arg Ala Asp Cys Ser
100 105

<210> 49
<211> 330
<212> PRT
<213> Homo sapiens

<400> 49

Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys
1 5 10 15

Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr
20 25 30

Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser
35 40 45

Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser
50 55 60

```
Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr
65                  70                  75                  80

Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys
                85                  90                  95

Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys
            100                 105                 110

Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro
        115                 120                 125

Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys
    130                 135                 140

Val Val Val Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp
145                 150                 155                 160

Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu
                165                 170                 175

Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu
            180                 185                 190

His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn
        195                 200                 205

Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly
    210                 215                 220

Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu
225                 230                 235                 240

Leu Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr
                245                 250                 255

Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn
            260                 265                 270

Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe
        275                 280                 285

Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn
    290                 295                 300

Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr
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305 310 315 320

Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
325 330

<210> 50
<211> 330
<212> PRT
<213> Artificial Sequence

<220>
<223> human Ig1 hole constant region

<400> 50

Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys
1 5 10 15

Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr
20 25 30

Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser
35 40 45

Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser
50 55 60

Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr
65 70 75 80

Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys
85 90 95

Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys
100 105 110

Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro
115 120 125

Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys
130 135 140

Val Val Val Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp
145 150 155 160

Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu
165 170 175

Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu
180 185 190

```
His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn
        195                 200                 205

Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly
    210                 215                 220

Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu
225                 230                 235                 240

Leu Thr Lys Asn Gln Val Ser Leu Trp Cys Leu Val Lys Gly Phe Tyr
                245                 250                 255

Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn
            260                 265                 270

Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe
        275                 280                 285

Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn
    290                 295                 300

Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr
305                 310                 315                 320

Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
                325                 330
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<210> 51
<211> 330
<212> PRT
<213> Artificial Sequence

<220>
<223> human Ig1 knob constant region

<400> 51

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Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys
1               5                   10                  15

Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr
            20                  25                  30

Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser
        35                  40                  45

Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser
    50                  55                  60
```

```
Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr
65                  70                  75                  80

Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys
                85                  90                  95

Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys
            100                 105                 110

Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro
        115                 120                 125

Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys
    130                 135                 140

Val Val Val Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp
145                 150                 155                 160

Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu
                165                 170                 175

Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu
            180                 185                 190

His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn
        195                 200                 205

Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly
    210                 215                 220

Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu
225                 230                 235                 240

Leu Thr Lys Asn Gln Val Ser Leu Ser Cys Ala Val Lys Gly Phe Tyr
                245                 250                 255

Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn
            260                 265                 270

Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe
        275                 280                 285

Leu Val Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn
    290                 295                 300

Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr
305                 310                 315                 320
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Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
325 330

<210> 52
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> human transferrin receptor fragment

<400> 52

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

<210> 53
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> human transferrin receptor fragment

<400> 53

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

<210> 54
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> human transferrin receptor fragment

<400> 54

Gln Ser Asn Gly Asn Leu Asp Pro Val Glu Ser Pro Glu Gly Tyr
1 5 10 15

<210> 55
<211> 32
<212> PRT
<213> Artificial Sequence

<220>
<223> peptidic linker

<400> 55

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

Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly

20 25 30

<210> 56
<211> 118
<212> PRT
<213> Mus musculus

<400> 56

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

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

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

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

Ala Val Pro Thr Ser His Tyr Val Val Asp Val Trp Gly Gln Gly Val
100 105 110

Ser Val Thr Val Ser Ser
115

<210> 57
<211> 107
<212> PRT
<213> Mus musculus

<400> 57

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

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

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

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

```
Ser Arg Ser Gly Thr Gln Phe Ser Leu Lys Ile Ser Arg Val Gln Val
65                  70                  75                  80


Glu Asp Ile Gly Ile Tyr Tyr Cys Leu Gln Ala Tyr Asn Thr Pro Trp
                85                  90                  95


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


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Glu Ile Val Thr Ile Thr Cys Gln Ala Ser Gln Asp Ile Gly Asn Trp
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Leu Ala Trp Tyr Gln Gln Lys Pro Gly Lys Ser Pro Gln Leu Leu Ile
        35                  40                  45


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


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


Glu Asp Ile Gly Ile Tyr Tyr Cys Leu Gln Ala Tyr Asn Thr Pro Trp
                85                  90                  95


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