Fig. 1

RECTIFIED SHEET (RULE 91) ISA/EP

KIT D4/D5 Antigen (SEQ ID NO: 14): M1-E33 + V308-H515 (SEQ ID NO: 73) + 5 x His

```
   1 MRGARGAWDF LCVLLLLLRV QTGSSQPSVS PGEVDKGFIN IFPMINTTVF VNDGENVDLI
  61 VEYEAFPKPE HQQWIYMNRT FTDKWEDYPK SENESNIRYV SELHLTRLKG TEGGTYTFLV
 121 SNSDVNAAIA FNVYVMTKPE ILTYDRLVNG MLQCVAAGFP EPTIDWYFCP GTEQRCSASV
 181 LPVDVQTLNS SGPPFGKLVV QSSIDSSAFK HNGTVECKAY NDVGKTSAYF NFAFKEQIHP
 241 HHHHHH
```

Fig. 2

H1 VH domain

```
FR1                                                                                     CDR1
        10        20        30        40        50        60        70        80        90       100
CAGGTCCAGCTGgtGCAGTCTGGGGCTGAGCTGaaGAaGCCTGGGGCCTCAGTGAAGCTGTCCTGCAAGGCTTCTGGCTACACTTTCACTGACTACTATA
 Q  V  Q  L  V  Q  S  G  A  E  L  K  K  P  G  A  S  V  K  L  S  C  K  A  S  G  Y  T  F  T  D  Y  Y
                            10                            20                            30
 1                          10                            20                            30

    FR2                                        CDR2                                              FR3
       110       120       130       140       150       160       170       180       190       200
TAAACTGGGTGAAGCAGgccCCTGGAaAGGGACTTGAGTGGATTGCAAGGATTTACCCTGGAAGTGGTAATACTTACTACAATGAGAAGTTCAAGGGCAg
 I  N  W  V  K  Q  A  P  G  K  G  L  E  W  I  A  R  I  Y  P  G  S  G  N  T  Y  Y  N  E  K  F  K  G  R
                  40                            50    52  A                       60
                  40                            50                            60

                                                                                          CDR3
       210       220       230       240       250       260       270       280       290       300
GGCCACACTGACTGCAGAAAAATCCaCCAGCACTGCCTACATGCAGCTCAGCAGCCTGAgATCTGAGGACTCTGCTGTCTATTTCTGTGCAAGGGGGGTG
 A  T  L  T  A  E  K  S  T  S  T  A  Y  M  Q  L  S  S  L  R  S  E  D  S  A  V  Y  F  C  A  R  G  V
          70                            80    82  A  B  C                       90
       70                            80                            90                            100

               FR4
       310       320       330       340
TACTACTTTGACTACTGGGGCCAAGGCACCACTgTCACAGTCTCCTCA
 Y  Y  F  D  Y  W  G  Q  G  T  T  V  T  V  S  S
    99/101                        110                   (Kabat Numbering)
                            110                         (Numerical Numbering)
```

Fig. 3A

H2 VH domain

```
FR1                                                                                    CDR1
    10        20        30        40        50        60        70        80        90       100
CAGGTCCAGCTGgtGCAGTCTGGGGCTGAGgTGaaGAaGCCTGGGGCCTCAGTGAAGCTGTCCTGCAAGGCTTCTGGCTACACTTTCACTGACTACTATA
 Q  V  Q  L  V  Q  S  G  A  E  V  K  K  P  G  A  S  V  K  L  S  C  K  A  S  G  Y  T  F  T  D  Y  Y
                               10                                      20                            30
                               10                                      20                            30

     FR2                                        CDR2                                                    FR3
    110       120       130       140       150       160       170       180       190       200
TAAACTGGGTGAAGCAGgccCCTGGAaAGGGACTTGAGTGGATTGCAAGGATTTACCCTGGAAGTGGTAATACTTACTACAATGAGAAGTTCAAGGGCAg
 I  N  W  V  K  Q  A  P  G  K  G  L  E  W  I  A  R  I  Y  P  G  S  G  N  T  Y  Y  N  E  K  F  K  G  R
                  40                         50   52  A                         60
                  40                         50                               60

                                                                                                CDR3
    210       220       230       240       250       260       270       280       290       300
GGCCACACTGACTGCAGAAAAATCCaCCAGCACTGCCTACATGCAGCTCAGCAGCCTGAgATCTGAGGACaCTGCTGTCTATTTCTGTGCAAGGGGGGTG
 A  T  L  T  A  E  K  S  T  S  T  A  Y  M  Q  L  S  S  L  R  S  E  D  T  A  V  Y  F  C  A  R  G  V
       70                             80    82  A  B  C                          90
    70                             80                             90                             100

          FR4
    310       320       330       340
TACTACTTTGACTACTGGGGCCAAGGCACCACTgTCACAGTCTCCTCA
 Y  Y  F  D  Y  W  G  Q  G  T  T  V  T  V  S  S
    99/101                       110                     (Kabat Numbering)
                110                                      (Numberical Numbering)
```

Fig. 3B

H3 VH domain

FR1 CDR1

```
    10        30        40        50        60        70        80        90       100
CAGGTCCAGCTGgtgCAGTCTGGGGCTGAGgTGAaGAaGCCTGGGGCCTCAGTGAAGCTGTCCTGCAAGGCTTCTGGCTACACTTTCACTGACTACTATA
 Q  V  Q  L  V  Q  S  G  A  E  V  K  K  P  G  A  S  V  K  L  S  C  K  A  S  G  Y  T  F  T  D  Y  Y
                  10                                                                  30
                  10                                                                  30
```

FR2 CDR2 FR3

```
   110       120       130       140       150       160       170       180       190       200
TAAACTGGGTGAGgCAGgcCCCTGGAaAGGGACTTGAGTGGATTGCAAGGATTTACCCTGGAAGTGGTAATACTTACTACAATGAGAAGTTCAAGGGCAG
 I  N  W  V  R  Q  A  P  G  K  G  L  E  W  I  A  R  I  Y  P  G  S  G  N  T  Y  Y  N  E  K  F  K  G  R
                  40                                    50    52  A                    60
                  40                                    50                         60
```

CDR3

```
   210       220       230       240       250       260       270       280       290       300
GGCCACACTGACTGTGACAGCaAAATCCaCCAGCACTGCCTACATGCAGCTCAGCGCCTGAGaTCTGAGGACaCTGCTGTCTATTTCTGTGCAAGGGGGTG
 A  T  L  T  A  D  K  S  T  S  T  A  Y  M  Q  L  S  S  L  R  S  E  D  T  A  V  Y  F  C  A  R  G  V
          70                      80                      90                      100
          70                      80                      90
```

FR4

```
   310       320       330       340
TACTACTTTGACTACTGGGGCCAAGGCACCACTgTCACAGTCTCCTCA
 Y  Y  F  D  Y  W  G  Q  G  T  T  V  T  V  S  S
       98/101                    110                    (Kabat Numbering)
                  110                                   (Numerical Numbering)
```

Fig. 3C

H4 VH domain

FR1 **CDR1**

```
      10        30        40        50        60        70        80        90       100
CAGGTCCAGCTGgtgCAGTCTGGGGCTGAGgTGAAGAAGCCTGGGGCCTCAGTGAAGgTGTCCTGCAAGGCTTCTGGCTACACTTTCACTGACTACTATA
 Q  V  Q  L  V  Q  S  G  A  E  V  K  K  P  G  A  S  V  K  V  S  C  K  A  S  G  Y  T  F  T  D  Y  Y
                10                20                30                40
                10                20                30
```

FR2 **CDR2** **FR3**

```
     110       120       130       140       150       160       170       180       190       200
TAAACTGGGTGAGgCAGgcCCCTGGAaAGGGACTTGAGTGGATTGCTAAGGATTTACCCTGGAAGTGGTAATACTTACTACAATGAGAAGTTCAAGGGCAg
 I  N  W  V  R  Q  A  P  G  K  G  L  E  W  I  A  K  I  Y  P  G  S  G  N  T  Y  Y  N  E  K  F  K  G  R
                40                50        52  A                60
                40                50        52  A                60
```

CDR3

```
     210       220       230       240       250       260       270       280       290       300
GCCCACAaTcACTGCAGACAAATCCaCCAGCACTGCCTACATGgAGCTCAGCAGCCTGAgATCTGAGGACaCaGCTGTGTCTATTTTCTGTGCAAGGGGGTG
 A  T  I  T  A  D  K  S  T  S  T  A  Y  M  E  L  S  S  L  R  S  E  D  T  A  V  Y  F  C  A  R  G  G  V
          70                80                90                100               110
          70                80                90                100               110
```

FR4

```
     310       320       330       340
TACTACTTTGACTACTACTGGGGCCAAGGCACCACTgTCACAGTCTCCTCA
 Y  Y  F  D  Y  W  G  Q  G  T  T  V  T  V  S  S
       99/101            110               110
```

(Kabat Numbering)

(Numerical Numbering)

Fig. 3D

H5 VH domain

FR1 CDR1

```
      10        20        30        40        50        60        70        80        90       100
CAGGTCCAGCTGGtGCAGTCTGGGGCTGAGgTGAaGAaGCCTGGGGCCTCAGTGAAGgTGTCCTGCAAGGCTTCTGGCTACACTTTCACTGACTACTATA
 Q  V  Q  L  V  Q  S  G  A  E  V  K  K  P  G  A  S  V  K  V  S  C  K  A  S  G  Y  T  F  T  D  Y  Y
                    10                    20                    30
                    10                    20                    30
```

FR2 CDR2 FR3

```
     110       120       130       140       150       160       170       180       190       200
TAAACTGGGTGAGgCAGgCCACGgjCCCTGGAaAGGGACTTGAGTGGATTGCAAGGATTTACCCTGGAAGTGGTAATACTTACTACAATGAGAAGTTCAAGGGCAG
 I  N  W  V  R  Q  A  P  G  K  G  L  E  W  I  A  R  I  Y  P  G  S  G  N  T  Y  Y  N  E  K  F  K  G  R
                   40                    50        52  A                    60
                   40                    50                    60
```

CDR3

```
     210       220       230       240       250       260       270       280       290       300
GGtCACAaTCACTGCAGACAAATCCaCCAGCACTGCCTACATGgAGCTCAGCAGCCTGAgATCTGAGGACaCTGCTGTCTATTTCTGTGCAAGGGGGGTG
 V  T  I  T  A  D  K  S  T  S  T  A  Y  M  E  L  S  S  L  R  S  E  D  T  A  V  Y  F  C  A  R  G  G  V
          70                    80        82  A  B  C                    90                   100
          70                    80                    90
```

FR4

```
     310       320       330       340
TACTACTTTGACTACTGGGGCCAAGGCACCACTgTCACAGTCTCCTCA
 Y  Y  F  D  Y  W  G  Q  G  T  T  V  T  V  S  S
       99/101                110
                             110
```

(Kabat Numbering)

(Numerical Numbering)

Fig. 3E

L1 VL domain

```
FR1                                                                CDR1
      10        20        30        40        50        60        70        80        90       100
GACATTGTGATGACCCAGTCTCCAtccTTCCTGTCtgCATCAGTAGGAGACAGGGTCACCatCACCTGCAAGGCCAGTCAGAATGTGCGTACTAATGTAG
 D  I  V  M  T  Q  S  P  S  F  L  S  A  S  V  G  D  R  V  T  I  T  C  K  A  S  Q  N  V  R  T  N  V
                  10                                    20                                    30
                  10                                    20                                    30

   FR2                                                CDR2                                FR3
      110       120       130       140       150       160       170       180       190       200
CCTGGTATCAACAGAAACCAGGaAAGgCTCCTAAAGCACTGATTTACTCGGCATCCTACCGGTACAGTGGAGTCCCTGATCGCTTCACAGGCAGTGGATC
 A  W  Y  Q  Q  K  P  G  K  A  P  K  A  L  I  Y  S  A  S  Y  R  Y  S  G  V  P  D  R  F  T  G  S  G  S
               40                                    50                                    60
               40                                    50                                    60

                                                CDR3                                FR4
      210       220       230       240       250       260       270       280       290       300
TGGGACAGATTTCACTCTCACCATCAGCtcTCTGCAGTCTGAAGACTTTGCAGACTATTTCTGTCAGCAATATAACAGCTATCCTCCGACGTTCGGTGGA
 G  T  D  F  T  L  T  I  S  S  L  Q  S  E  D  F  A  D  Y  F  C  Q  Q  Y  N  S  Y  P  P  T  F  G  G
         70                                    80                                    90                                   100
         70                                    80                                    90                                   100

      310       320
GGCACCAAGgTGGAAATCAAA
 G  T  K  V  E  I  K
        106  A
             107
```

(Kabat Numbering)

(Numerical Numbering)

Fig. 3F

L2 VL domain

```
FR1                                                                CDR1
      10        20        30        40        50        60        70        80        90       100
GACATTGTGATGACCCAGTCTCCAtccTCCCTGTCCgCATCAGTAGGAGACAGGGTCAccATCACCTGCAAGGCCAGTCAGAATGTGCGTACTAATGTAG
 D  I  V  M  T  Q  S  P  S  S  L  S  A  S  V  G  D  R  V  T  I  T  C  K  A  S  Q  N  V  R  T  N  V
                  10                                        20                                  30
                  10                                        20                                  30

     FR2                                                   CDR2                                FR3
      110       120       130       140       150       160       170       180       190       200
CCTGGTATCAACAGAAACCAGGaaAAGCTCCTAAAGCACTGATTTACTCGGCATCCTACCGGTACAGTGGAGTCCCTGATCGCTTCAGAGGCAGTGGATC
 A  W  Y  Q  Q  K  P  G  K  A  P  K  A  L  I  Y  S  A  S  Y  R  Y  S  G  V  P  D  R  F  T  G  S  G  S
                  40                                        50                                  60
                  40                                        50                                  60

                                                        CDR3                                FR4
      210       220       230       240       250       260       270       280       290       300
TGGGACAGATTTCACTCTCACCATCAGCtcTCtGCAGcCTGAAGACTTTGCAGACTATTTCTGTCAGCAATATAACAGCTATCCTCGGACGTTCGGTGGA
 G  T  D  F  T  L  T  I  S  S  L  Q  P  E  D  F  A  D  Y  F  C  Q  Q  Y  N  S  Y  P  R  T  F  G  G
        70                                        80                                  90                  100
        70                                        80                                  90                  100

      310       320
GGCACCAAGgTGGAAATCAAA
 G  T  K  V  E  I  K
       106  A
            107
```

(Kabat Numbering)

(Numerical Numbering)

Fig. 3G

L3 VL domain

Fig. 3H

L4 VL domain

```
FR1                                                                CDR1
      10        20        30        40        50        60        70        80        90       100
GACATTGTGATGACCCAGTCTCCAtccTCcCTGTCCgCATCAGTAAGAGACAGGGTCACcaTCACCTGCAAGGCCAGTCAGAATGTGCGTACTAATGTAG
 D  I  V  M  T  Q  S  P  S  S  L  S  A  S  V  G  D  R  V  T  I  T  C  K  A  S  Q  N  V  R  T  N  V
                  10                                        20                                  30
                  10                                        20                                  30

      FR2                                                CDR2                                FR3
      110       120       130       140       150       160       170       180       190       200
CCTGGTATCAACAGAAACCAGGGaAAgCTCCTAAAtCcCTGATTTACTCGGCATCCTACCGGTACAGTGGAGTCCCTGATCGCTTCAGcGGCAGTGGATC
 A  W  Y  Q  Q  K  P  G  K  A  P  K  S  L  I  Y  S  A  S  Y  R  Y  S  G  V  P  D  R  F  S  G  S  G  S
                  40                                        50                                  60
                  40                                        50                                  60

                                                     CDR3                                FR4
      210       220       230       240       250       260       270       280       290       300
TGGGACAGATTTCACTCTCACCATCAGCtcTGCAGcCTGAAGACTTcGCAacCTATTaCTGTCAGCAATATAACAGCTATCCTCCGACGTTCGGTGGA
 G  T  D  F  T  L  T  I  S  S  L  Q  P  E  D  F  A  T  Y  Y  C  Q  Q  Y  N  S  Y  P  P  T  F  G  G
                  70                                        80                                  90                                  100
                  70                                        80                                  90                                  100

      310       320
GGCACCAAGgTGGAAATCAAA
 G  T  K  V  E  I  K
                 106  A
                 107

(Kabat Numbering)
(Numerical Numbering)
```

Fig. 31

QVQLVQSGAEX_{H1}KKPGASVKX_{H2}SCKASGYTFTDYYINWVX_{H3}QAPGKGLEWIARIYPGSGNTYYNEKF
KGRX_{H4}TX_{H5}TAX_{H6}KSTSTAYMX_{H7}LSSLRSEDX_{H8}AVYFCARGVYYFDYWGQGTTVTVSS

Fig. 4A

DIVMTQSPSX_{K1}LSASVGDRVTITCKASQNVRTNVAWYQQKPGKAPKX_{K2}LIYSASYRYSGVPDRFX_{K3}G
SGSGTDFTLTISSLQX_{K4}EDFAX_{K5}YX_{K6}CQQYNSYPRTFGGGTKVEIK

Fig. 4B

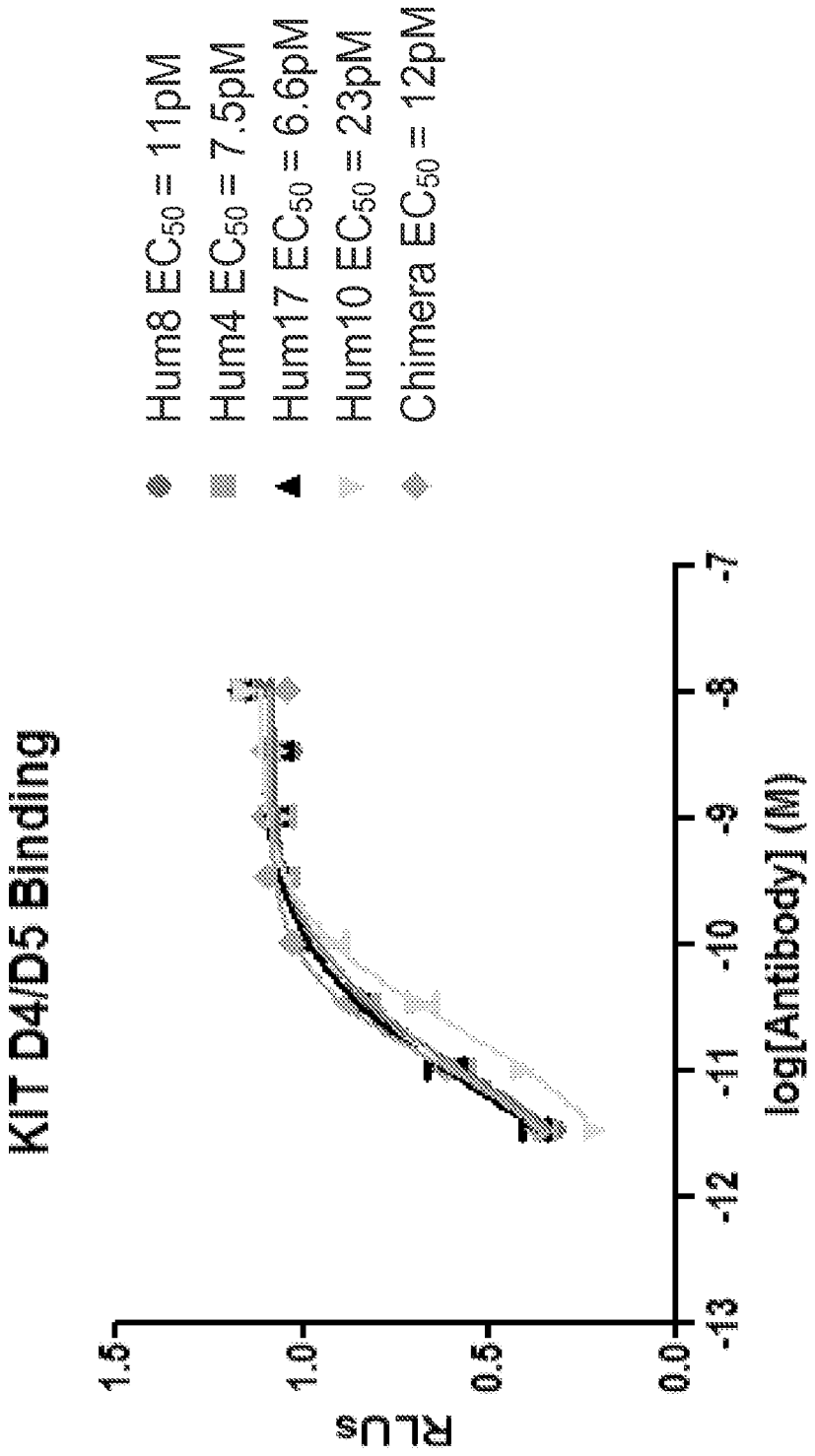

KIT D4/D5 Binding
Hum8 EC50 = 11pM
Hum4 EC50 = 7.5pM
Hum17 EC50 = 6.6pM
Hum10 EC50 = 23pM
Chimera EC50 = 12pM
RLUs
1.5
1.0
0.5
0.0
-13
-12
-11
-10
-9
-8
-7
log[Antibody] (M)

Fig. 5

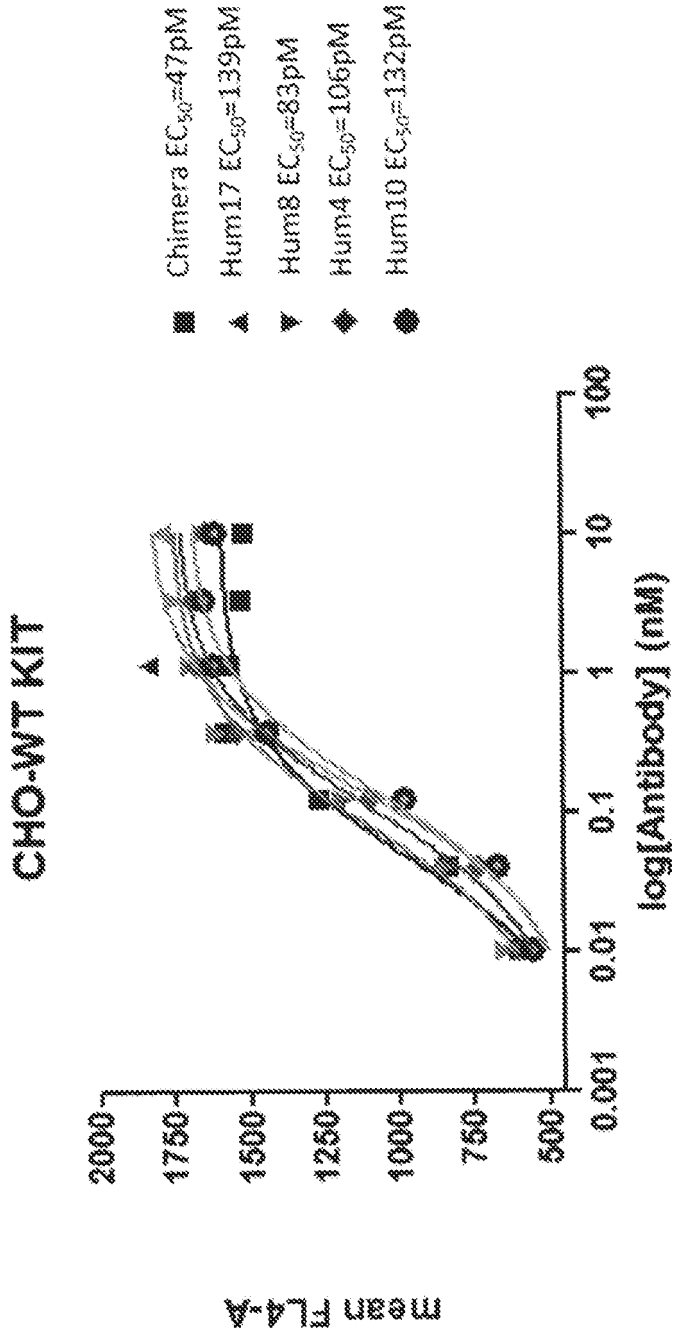

CHO-WT KIT
Chimera EC_{50}=47pM
Hum17 EC_{50}=139pM
Hum8 EC_{50}=83pM
Hum4 EC_{50}=106pM
Hum10 EC_{50}=132pM
mean FL4-A
2000
1750
1500
1250
1000
750
500
0.001
0.01
0.1
1
10
100
log[Antibody] (nM)

Fig. 6

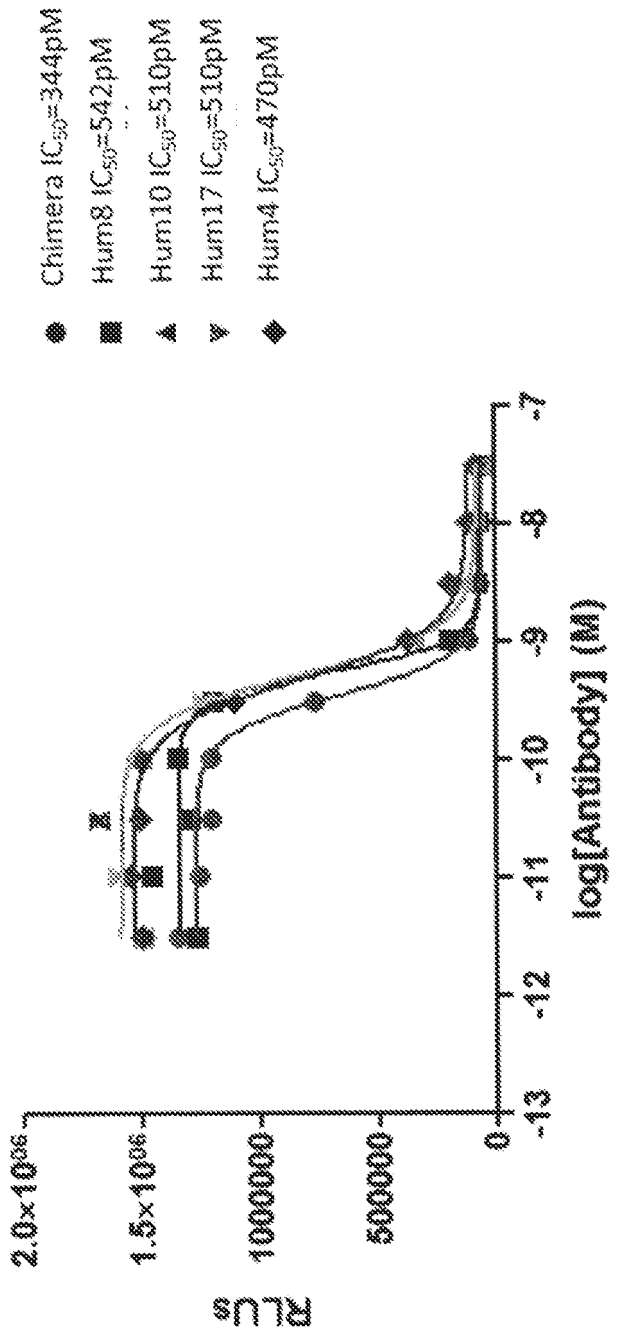

CHO-WT KIT Phosphorylation
Chimera IC50=344pM
Hum8 IC50=542pM
Hum10 IC50=510pM
Hum17 IC50=510pM
Hum4 IC50=470pM
RLUs
2.0x10^6
1.5x10^6
1000000
500000
0
-13
-12
-11
-10
-9
-8
-7
log[Antibody] (M)

Fig. 7