Anti-Fucosyl GM1 3C4 VH

V-segment: VH 3-48
D-segment: D1-1
J-segment: JH6b

```
         E   V   Q   L   V   E   S   G   G   G   L   V   Q   P   G   E   S   L
  1     GAG GTG CAG CTG GTG GAG TCT GGG GGA GGC TTG GTA CAG CCT GGG GAG TCC CTG

                                                      CDR1
                                                 ~~~~~~~~~~~~~~~~~~~~
         R   L   S   C   V   A   S   G   F   T   F   S   R   Y   K   M   N   W
 55     AGA CTC TCC TGT GTA GCC TCT GGA TTC ACC TTC AGT AGG TAT AAG ATG AAC TGG

                                                          CDR2
                                                     ~~~~~~~~~~~~~~~~~~
         V   R   Q   A   P   G   K   G   L   E   W   I   S   Y   I   S   R   S
109     GTC CGC CAG GCT CCA GGG AAG GGA CTG GAA TGG ATT TCA TAC ATT AGT CGT AGT

                    CDR2
        ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
         G   R   D   I   Y   Y   A   D   S   V   K   G   R   F   T   I   S   R
163     GGT CGT GAC ATA TAC TAC GCA GAC TCT GTG AAG GGC CGA TTC ACC ATC TCC AGA

         D   N   A   K   N   S   L   Y   L   Q   M   S   S   L   R   D   E   D
217     GAC AAT GCC AAG AAC TCA CTG TAT CTG CAA ATG AGC AGC CTG AGA GAC GAG GAC

                                                 CDR3
                                     ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
         T   A   V   Y   Y   C   A   G   T   V   T   T   Y   Y   Y   Y   F   G
271     ACG GCT GTG TAT TAC TGT GCG GGA ACT GTC ACG ACA TAT TAT TAT TAC TTC GGT
                                        |  D1-1          |
                                                         |--> JH6b
        CDR3
        ~~~~~~~~~~~
         M   D   V   W   G   L   G   T   T   V   T   V   S   S
325     ATG GAC GTC TGG GGC CTA GGG ACC ACG GTC ACC GTC TCC TCA
```

Fig. 1A

FIG. 1B

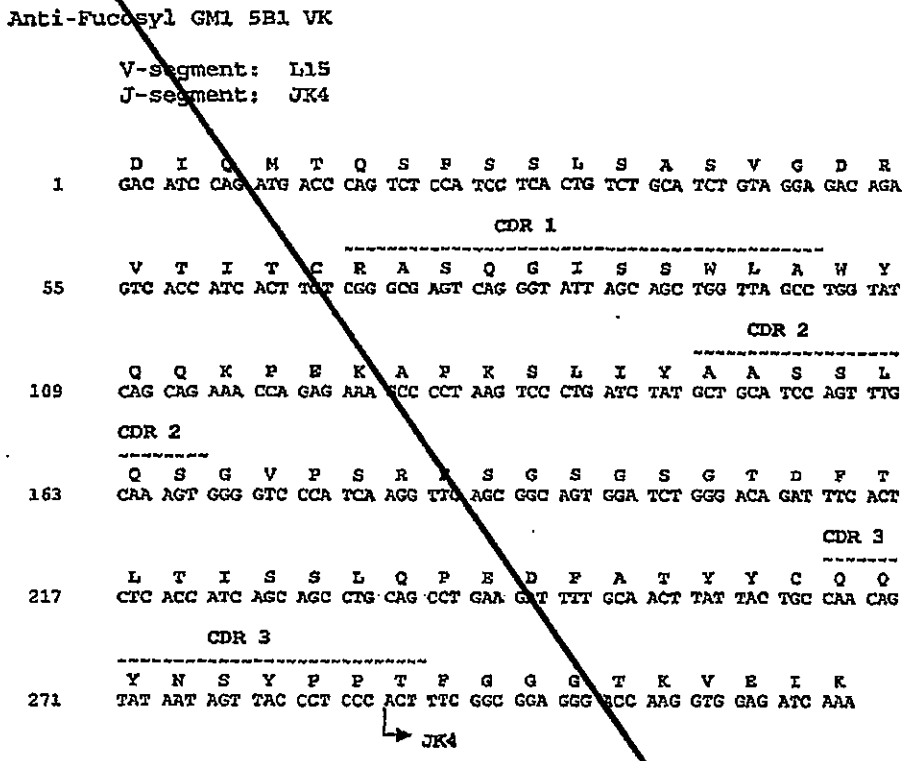

Anti-Fucosyl GM1 5B1 VK
V-segment: L15
J-segment: JK4
D I Q M T Q S P S S L S A S V G D R
1 GAC ATC CAG ATG ACC CAG TCT CCA TCC TCA CTG TCT GCA TCT GTA GGA GAC AGA
CDR 1
V T I T C R A S Q G I S S W L A W Y
55 GTC ACC ATC ACT TGT CGG GCG AGT CAG GGT ATT AGC AGC TGG TTA GCC TGG TAT
CDR 2
Q Q K P E K A P K S L I Y A A S S L
109 CAG CAG AAA CCA GAG AAA GCC CCT AAG TCC CTG ATC TAT GCT GCA TCC AGT TTG
CDR 2
Q S G V P S R F S G S G S G T D F T
163 CAA AGT GGG GTC CCA TCA AGG TTC AGC GGC AGT GGA TCT GGG ACA GAT TTC ACT
CDR 3
L T I S S L Q P E D F A T Y Y C Q Q
217 CTC ACC ATC AGC AGC CTG CAG CCT GAA GAT TTT GCA ACT TAT TAC TGC CAA CAG
CDR 3
Y N S Y P P T F G G G T K V E I K
271 TAT AAT AGT TAC CCT CCC ACT TTC GGC GGA GGG ACC AAG GTG GAG ATC AAA
JK4

FIG. 2A

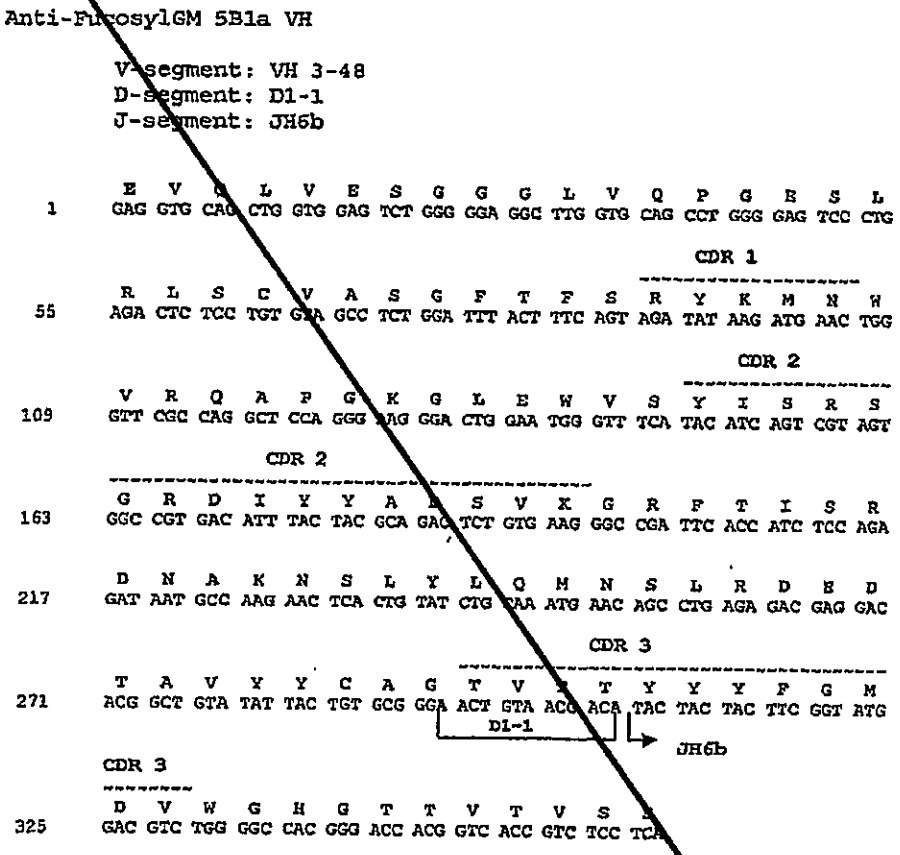

Anti-FucosylGM 5B1a VH
V-segment: VH 3-48
D-segment: D1-1
J-segment: JH6b
CDR 1
CDR 2
CDR 2
CDR 3
D1-1
JH6b
CDR 3

FIG. 2B

Anti-Fucosyl GM1 5B1a VK

V-segment: L15
J-segment: JK4

```
          D   I   Q   M   T   Q   S   P   S   S   L   S   A   S   V   G   D   R
   2      GAC ATC CAG ATG ACC CAG TCT CCA TCC TCA CTG TCT GCA TCT GTA GGA GAC AGA

                                  CDR 1
                          ----------------------------------------
          V   T   I   T   C   R   A   S   Q   G   I   S   S   W   L   A   W   Y
  56      GTC ACC ATC ACT TGT CGG GCG AGT CAG GGT ATT AGC AGC TGG TTA GCC TGG TAT

                                                                  CDR 2
                                                                  ----------
          Q   Q   K   P   E   K   A   P   K   S   L   I   Y   A   A   S   S   L
 110      CAG CAG AAA CCA GAG AAA GCC CCT AAG TCC CTG ATC TAT GCT GCA TCC AGT TTG

          CDR 2
          --------
          Q   S   G   V   P   S   R   F   S   G   S   G   S   G   T   D   F   T
 164      CAA AGT GGG GTC CCA TCA AGG TTC AGC GGC AGT GGA TCT GGG ACA GAT TTC ACT

                                                                          CDR 3
                                                                          -------
          L   T   I   S   S   L   Q   P   E   D   F   A   T   Y   Y   C   Q   Q
 218      CTC ACC ATC AGC AGC CTG CAG CCT GAA GAT TTT GCA ACT TAT TAC TGC CAA CAG

                  CDR 3
          ----------------------------
          Y   N   S   Y   P   P   T   F   G   G   G   T   K   V   E   I   K
 272      TAT AAT AGT TAC CCT CCC ACT TTC GGC GGA GGG ACC AAG GTG GAG ATC AAA
                                  ↳ JK4
```

FIG. 3A

Anti-Fucosyl GM1 7D4 VH

V-segment: VH 3-48
D-segment: D1-1
J-segment: JH6b

```
                                                                   CDR1
     E   V   Q   L   V   E   S   G   G   G   L   V   Q   P   G   E   S   L
1    GAG GTG CAG CTG GTG GAG TCT GGG GGA GGC TTG GTA CAG CCT GGG GAG TCC CTG

                                                         CDR1
                                                 ~~~~~~~~~~~~~~~~~~~~~~~~~
     R   L   S   C   V   V   S   G   F   T   F   S   R   Y   K   M   N   W
55   AGA CTC TCC TGT GTA GTC TCT GGA TTC ACC TTC AGT AGG TAT AAG ATG AAC TGG

                                                             CDR2
                                                     ~~~~~~~~~~~~~~~~~~~~~
     V   R   Q   A   P   G   K   G   L   E   W   I   S   Y   I   S   R   S
109  GTC CGC CAG GCT CCA GGG AAG GGA CTG GAA TGG ATT TCA TAC ATT AGT CGT AGT

                         CDR2
     ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
     G   R   D   I   Y   Y   A   D   S   V   K   G   R   F   T   I   S   R
163  GGT CGT GAC ATA TAC TAC GCA GAC TCT GTG AAG GGC CGA TTC ACC ATC TCC AGA

     D   N   A   K   N   S   L   Y   L   Q   M   S   S   L   R   D   E   D
217  GAC AAT GCC AAG AAC TCA CTG TAT CTG CAA ATG AGC AGC CTG AGA GAC GAG GAC

                                                     CDR3
                                         ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
     T   A   V   Y   Y   C   A   G   T   V   T   T   Y   Y   Y   Y   F   G
271  ACG GCT GTG TAT TAC TGT GCG GGA ACT GTA ACG ACA TAT TAT TAT TAC TTC GGT
                                     |       D1-1    |                   |
                                     |_______________|                   |__>
     CDR3
     JH6b
     ~~~~~~~~~~
     M   D   V   W   G   L   G   T   T   V   T   V   S   S
325  ATG GAC GTC TGG GGC CTA GGG ACC ACG GTC ACC GTC TCC TCA
```

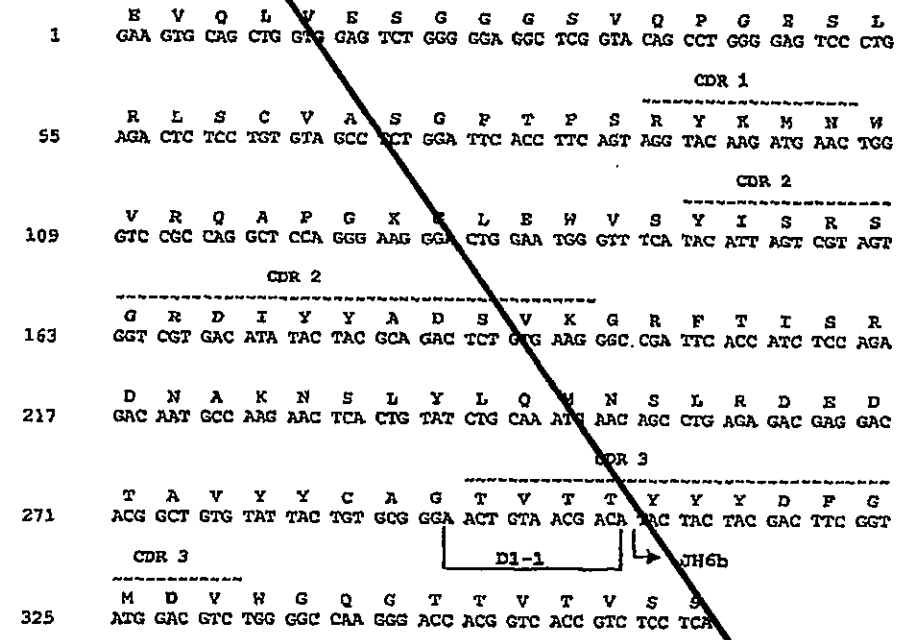
FIG. 3B

Anti-Fucosyl GM1 7D4 VK

V-segment: VK L15
J-segment: JK4

```
  1   GAC ATC CAG ATG ACC CAG TCT CCA TCC TCA CTG TCT GCA TCT GTA GGA GAC AGA
                                  CDR1
                          ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
 55   GTC ACC ATC ACT TGT CGG GCG AGT CAG GGT ATT AGC AGC TGG TTA GCC TGG TAT
                                                          CDR2
                                                  ~~~~~~~~~~~~~~~~~~~
109   CAG CAG AAA CCA GAG AAA GCC CCT AAG TCC CTG ATC TAT GCT GCA TCC AGT TTG
       CDR2
      ~~~~~~~~
163   CAA AGT GGG GTC CCA TCA AGG TTC AGC GGC AGT GGA TCT GGG ACA GAT TTC ACT
                                                                  CDR3
                                                                 ~~~~~~~~
217   CTC ACC ATC AGC TGC CTG CAG CCT GAA GAT TTT GCG ACT TAT TAC TGC CAA CAG
              CDR3
      ~~~~~~~~~~~~~~~~~~~~~~~~~~~~
271   TAT AAT AGT TAC CCT CCC ACT TTC GGC GGA GGG ACC AAG GTG GAG ATC AAA
                          └──► JK4
```

FIG. 4A


Anti-Fucosyl GM1 7E4 VH
V-segment: VH3-48
D-segment: D1-1
J-segment: JH6b
CDR 1
CDR 2
CDR 2
CDR 3
CDR 3
D1-1
JH6b

Anti-Fucosyl GM1 7D4 VK

V-segment: L15
J-segment: JK4

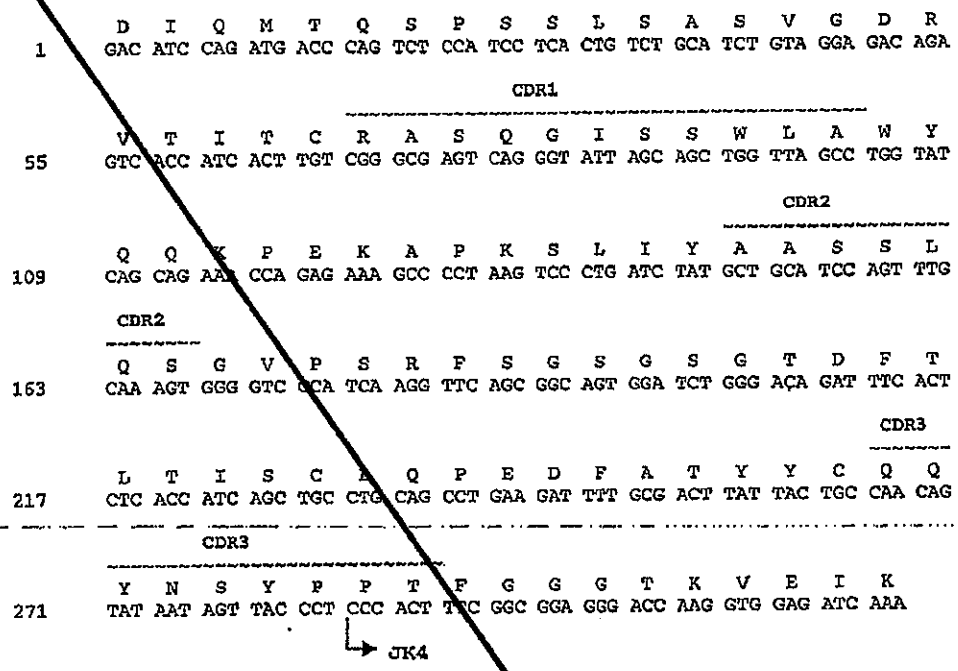


Fig. 4B

FIG. 5A

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Anti-Fucosyl GM1 13B8 VH

V-segment: VH3-48
D-segment: D1-1
J-segment: JH6b

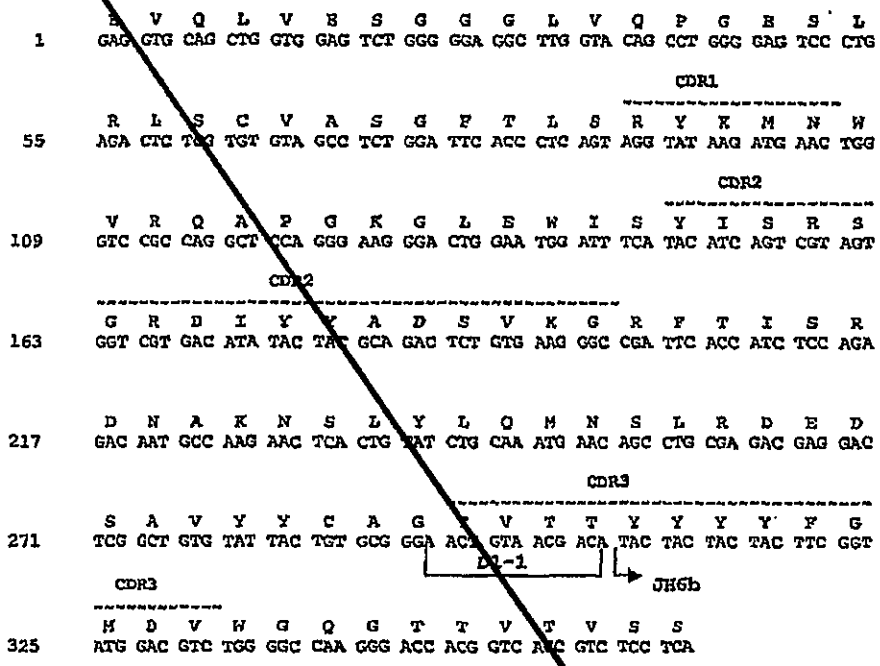
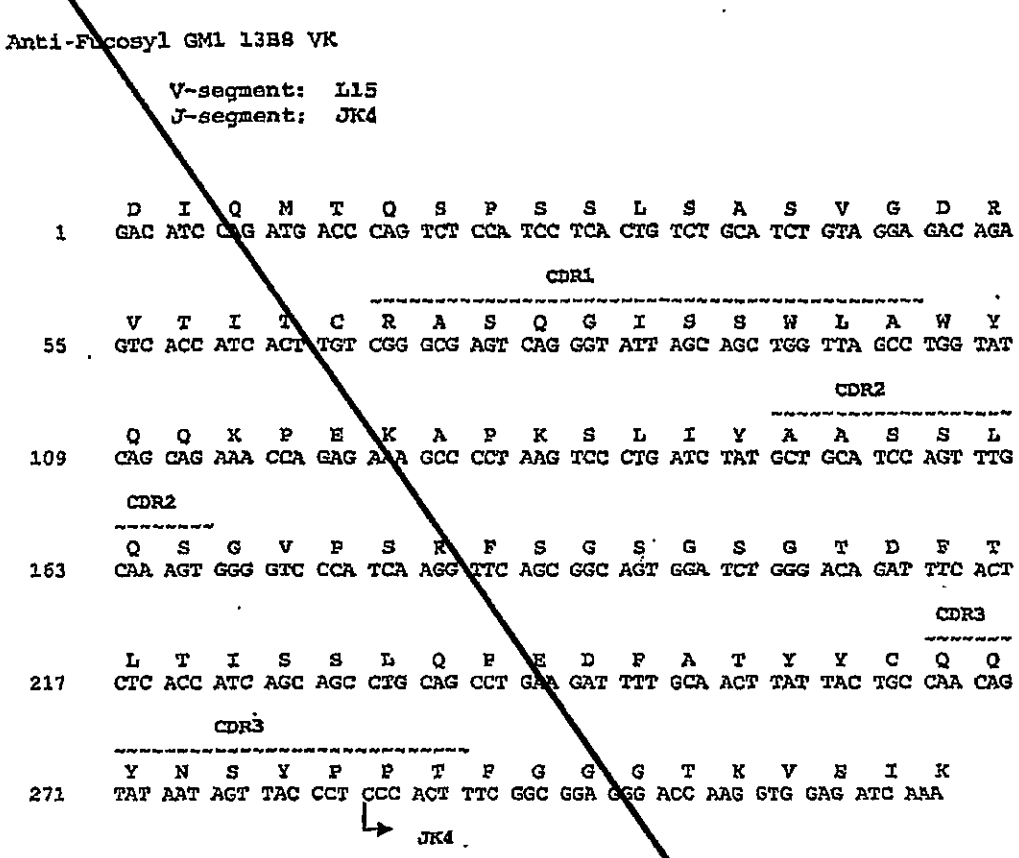


FIG. 5B


Anti-Fucosyl GM1 13B8 VK
V-segment: L15
J-segment: JK4
D I Q M T Q S P S S L S A S V G D R
1 GAC ATC CAG ATG ACC CAG TCT CCA TCC TCA CTG TCT GCA TCT GTA GGA GAC AGA
CDR1
V T I T C R A S Q G I S S W L A W Y
55 GTC ACC ATC ACT TGT CGG GCG AGT CAG GGT ATT AGC AGC TGG TTA GCC TGG TAT
CDR2
Q Q K P E K A P K S L I Y A A S S L
109 CAG CAG AAA CCA GAG AAA GCC CCT AAG TCC CTG ATC TAT GCT GCA TCC AGT TTG
CDR2
Q S G V P S R F S G S G S G T D F T
163 CAA AGT GGG GTC CCA TCA AGG TTC AGC GGC AGT GGA TCT GGG ACA GAT TTC ACT
CDR3
L T I S S L Q P E D F A T Y Y C Q Q
217 CTC ACC ATC AGC AGC CTG CAG CCT GAA GAT TTT GCA ACT TAT TAC TGC CAA CAG
CDR3
Y N S Y P P T F G G G T K V E I K
271 TAT AAT AGT TAC CCT CCC ACT TTC GGC GGA GGG ACC AAG GTG GAG ATC AAA
JK4

```
Anti-Fucosyl GM1 13B8 VH

        V-segment: VH3-48
        D-segment: D1-1
        J-segment: JH6b

         E   V   Q   L   V   E   S   G   G   G   L   V   Q   P   G   E   S   L
  1     GAG GTG CAG CTG GTG GAG TCT GGG GGA GGC TTG GTA CAG CCT GGG GAG TCC CTG

                                                             CDR1
                                                         ~~~~~~~~~~~~~~~~~~~~~
         R   L   S   C   V   A   S   G   F   T   L   S   R   Y   K   M   N   W
 55     AGA CTC TCG TGT GTA GCC TCT GGA TTC ACC CTC AGT AGG TAT AAG ATG AAC TGG

                                                                 CDR2
                                                             ~~~~~~~~~~~~~~~~~
         V   R   Q   A   P   G   K   G   L   E   W   I   S   Y   I   S   R   S
109     GTC CGC CAG GCT CCA GGG AAG GGA CTG GAA TGG ATT TCA TAC ATC AGT CGT AGT

                     CDR2
        ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
         G   R   D   I   Y   Y   A   D   S   V   K   G   R   F   T   I   S   R
163     GGT CGT GAC ATA TAC TAC GCA GAC TCT GTG AAG GGC CGA TTC ACC ATC TCC AGA

         D   N   A   K   N   S   L   Y   L   Q   M   N   S   L   R   D   E   D
217     GAC AAT GCC AAG AAC TCA CTG TAT CTG CAA ATG AAC AGC CTG CGA GAC GAG GAC

                                                     CDR3
                                         ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
         S   A   V   Y   Y   C   A   G   T   V   T   T   Y   Y   Y   Y   F   G
271     TCG GCT GTG TAT TAC TGT GCG GGA ACT GTA ACG ACA TAC TAC TAC TAC TTC GGT
                                           |    D1-1    |  |
        CDR3                                               -> JH6b
        ~~~~~~~~~~~~
         M   D   V   W   G   Q   G   T   T   V   T   V   S   S
325     ATG GAC GTC TGG GGC CAA GGG ACC ACG GTC ACC GTC TCC TCA
```

Fig. 6A

Anti-Fucosyl GM1 13B8 VK

V-segment: L15
J-segment: JK4

```
        D   I   Q   M   T   Q   S   P   S   S   L   S   A   S   V   G   D   R
  1   GAC ATC CAG ATG ACC CAG TCT CCA TCC TCA CTG TCT GCA TCT GTA GGA GAC AGA

                                CDR1
                            ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
        V   T   I   T   C   R   A   S   Q   G   I   S   S   W   L   A   W   Y
 55   GTC ACC ATC ACT TGT CGG GCG AGT CAG GGT ATT AGC AGC TGG TTA GCC TGG TAT

                                                                CDR2
                                                            ~~~~~~~~~~~~~~~~~~~~
        Q   Q   K   P   E   K   A   P   K   S   L   I   Y   A   A   S   S   L
109   CAG CAG AAA CCA GAG AAA GCC CCT AAG TCC CTG ATC TAT GCT GCA TCC AGT TTG

        CDR2
      ~~~~~~~~
        Q   S   G   V   P   S   R   F   S   G   S   G   S   G   T   D   F   T
163   CAA AGT GGG GTC CCA TCA AGG TTC AGC GGC AGT GGA TCT GGG ACA GAT TTC ACT

                                                                        CDR3
                                                                    ~~~~~~~~
        L   T   I   S   S   L   Q   P   E   D   F   A   T   Y   Y   C   Q   Q
217   CTC ACC ATC AGC AGC CTG CAG CCT GAA GAT TTT GCA ACT TAT TAC TGC CAA CAG

              CDR3
      ~~~~~~~~~~~~~~~~~~~~~~~~~~~~
        Y   N   S   Y   P   P   T   F   G   G   G   T   K   V   E   I   K
271   TAT AAT AGT TAC CCT CCC ACT TTC GGC GGA GGG ACG AAG GTG GAG ATC AAA
                      |
                      ↳ JK4
```

Fig. 6B

Anti-Fucosyl GM1 13B8, 18D5, 5B1, 7D4, 7E4 VH regions

3-48 germline	E	V	Q	L	V	E	S	G	G	G	L	V	Q	P	G	G	S	L	R	L	S	C	A	A	S	G	F	T	F	S
13B8 VH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	E	-	-	-	-	-	-	V	-	-	-	-	-	L	-
18D5 VH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	E	-	-	-	-	-	-	V	-	-	-	-	-	-	-
5B1 VH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	E	-	-	-	-	-	-	V	-	-	-	-	-	-	-
5B1a VH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	E	-	-	-	-	-	-	V	-	-	-	-	-	-	-
7D4 VH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	E	-	-	-	-	-	-	V	V	-	-	-	-	-	-
7E4 VH	-	-	-	-	-	-	-	-	-	-	S	-	-	-	-	E	-	-	-	-	-	-	V	-	-	-	-	-	-	-
				CDR1																					CDR2						
3-48 germline	S	Y	S	M	N	W	V	R	Q	A	P	G	K	G	L	E	W	V	S	Y	I	S	S	S	S	T	I	Y	Y	
13B8 VH	R	-	K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	I	-	-	-	-	R	-	G	R	D	-	-	-
18D5 VH	R	-	K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	I	-	-	-	-	R	-	G	R	D	-	-	-
5B1 VH	R	-	K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R	-	G	R	D	-	-	-
5B1a VH	R	-	K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R	-	G	R	D	-	-	-
7D4 VH	R	-	K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	I	-	-	-	-	R	-	G	R	D	-	-	-
7E4 VH	R	-	K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R	-	G	R	D	-	-	-
				CDR2																										
3-48 germline	A	D	S	V	K	G	R	F	T	I	S	R	D	N	A	K	N	S	L	Y	L	Q	M	N	S	L	R	D	E	D
13B8 VH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18D5 VH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	S	-	-	-	-	-	-
5B1 VH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5B1a VH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7D4 VH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	S	-	-	-	-	-	-
7E4 VH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
								CDR3																						
3-48 germline	T	A	V	Y	Y	C	A	R																						
13B8 VH	S	-	-	-	-	-	-	G	T	V	T	T	Y	Y	Y	Y	F	G	M	D	V	W	G	Q	G	T	T	V	T	V
18D5 VH	-	-	-	-	-	-	-	G	T	V	T	T	Y	Y	Y	Y	F	G	M	D	V	W	G	L	G	T	T	V	T	V
5B1 VH	-	-	-	-	-	-	-	G	T	V	T	T	Y	Y	Y	Y	F	G	M	D	V	W	G	H	G	T	T	V	T	V
5B1a VH	-	-	-	-	-	-	-	G	T	V	T	T	*	Y	Y	Y	F	G	M	D	V	W	G	H	G	T	T	V	T	V
7D4 VH	-	-	-	-	-	-	-	G	T	V	T	T	Y	Y	Y	Y	F	G	M	D	V	W	G	L	G	T	T	V	T	V
7E4 VH	-	-	-	-	-	-	-	G	T	V	T	T	Y	Y	Y	D	F	G	M	D	V	W	G	Q	G	T	T	V	T	V

13B8 VH	S	S
18D5 VH	S	S
5B1 VH	S	S
5B1a VH	S	S
7D4 VH	S	S
7E4 VH	S	S

Fig. 7

Anti-FucosylGM 13B8, 18D5, 5B1, 5B1a, 7D4, 7E4 VK regions

																							CDR1						
L15 germline	D	I	Q	M	T	Q	S	P	S	S	L	S	A	S	V	G	D	R	V	T	I	T	C	R	A	S	Q	G	I	S
13B8 VK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18D5 VK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5B1 VK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5B1a VK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7D4 VK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7E4 VK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

			CDR1																		CDR2									
L15 germline	S	W	L	A	W	Y	Q	Q	K	P	E	K	A	P	K	S	L	I	Y	A	A	S	S	L	Q	S	G	V	P	S
13B8 VK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18D5 VK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5B1 VK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5B1a VK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7D4 VK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7E4 VK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

																											CDR3	
L15 germline	R	F	S	G	S	G	S	G	T	D	F	T	L	T	I	S	S	L	Q	P	E	D	F	A	T	Y	Y	C	Q	Q
13B8 VK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18D5 VK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	C	-	-	-	-	-	-	-	-	-	-	-	-	-
5B1 VK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5B1a VK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7D4 VK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	C	-	-	-	-	-	-	-	-	-	-	-	-	-
7E4 VK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

				CDR3														
L15 germline	Y	N	S	Y	P													
13B8 VK	-	-	-	-	-	P	T	F	G	G	G	T	K	V	E	I	K	(JK4)
18D5 VK	-	-	-	-	-	P	T	F	G	G	G	T	K	V	E	I	K	(JK4)
5B1 VK	-	-	-	-	-	P	T	F	G	G	G	T	K	V	E	I	K	(JK4)
5B1a VK	-	-	-	-	-	P	T	F	G	G	G	T	K	V	E	I	K	(JK4)
7D4 VK	-	-	-	-	-	P	T	F	G	G	G	T	K	V	E	I	K	(JK4)
7E4 VK	-	-	-	-	-	P	T	F	G	G	G	T	K	V	E	I	K	(JK4)

Fig. 8

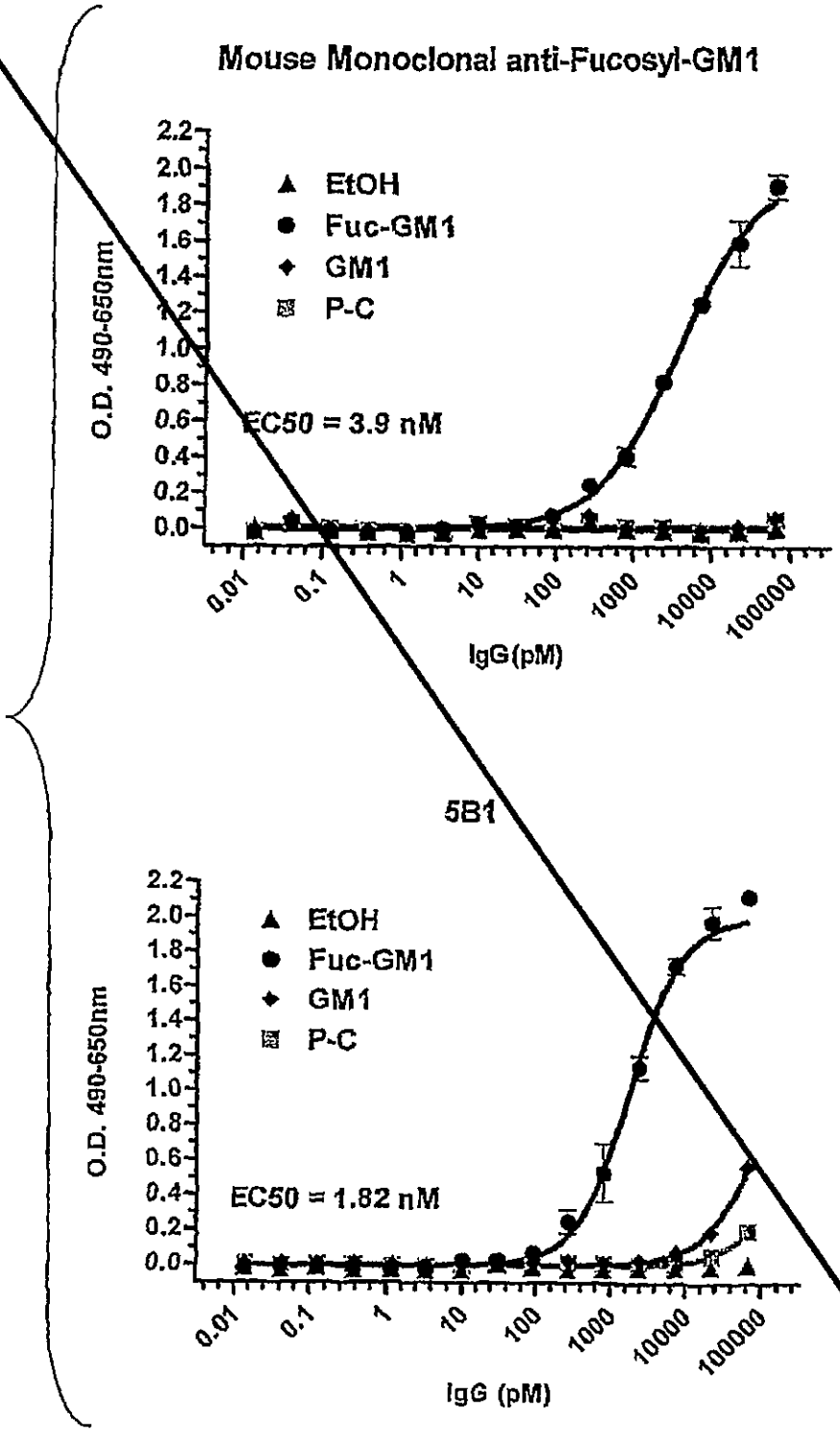

Mouse Monoclonal anti-Fucosyl-GM1
O.D. 490-650nm
EtOH
Fuc-GM1
GM1
P-C
EC50 = 3.9 nM
IgG(pM)
5B1
O.D. 490-650nm
EtOH
Fuc-GM1
GM1
P-C
EC50 = 1.82 nM
IgG (pM)

Fig. 9A

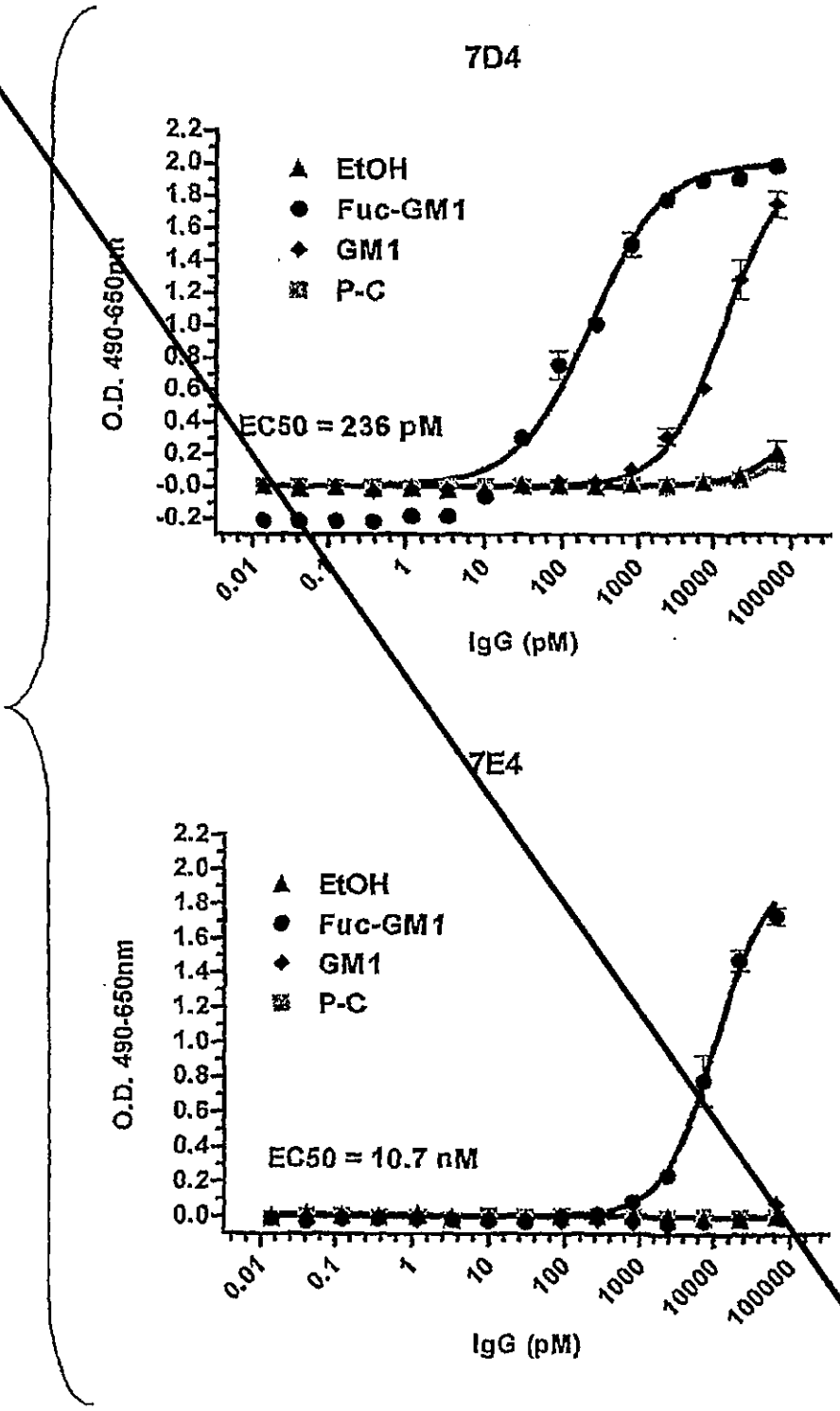

7D4
O.D. 490-650nm
EtOH
Fuc-GM1
GM1
P-C
EC50 = 236 pM
IgG (pM)
7E4
O.D. 490-650nm
EtOH
Fuc-GM1
GM1
P-C
EC50 = 10.7 nM
IgG (pM)

Fig. 9B

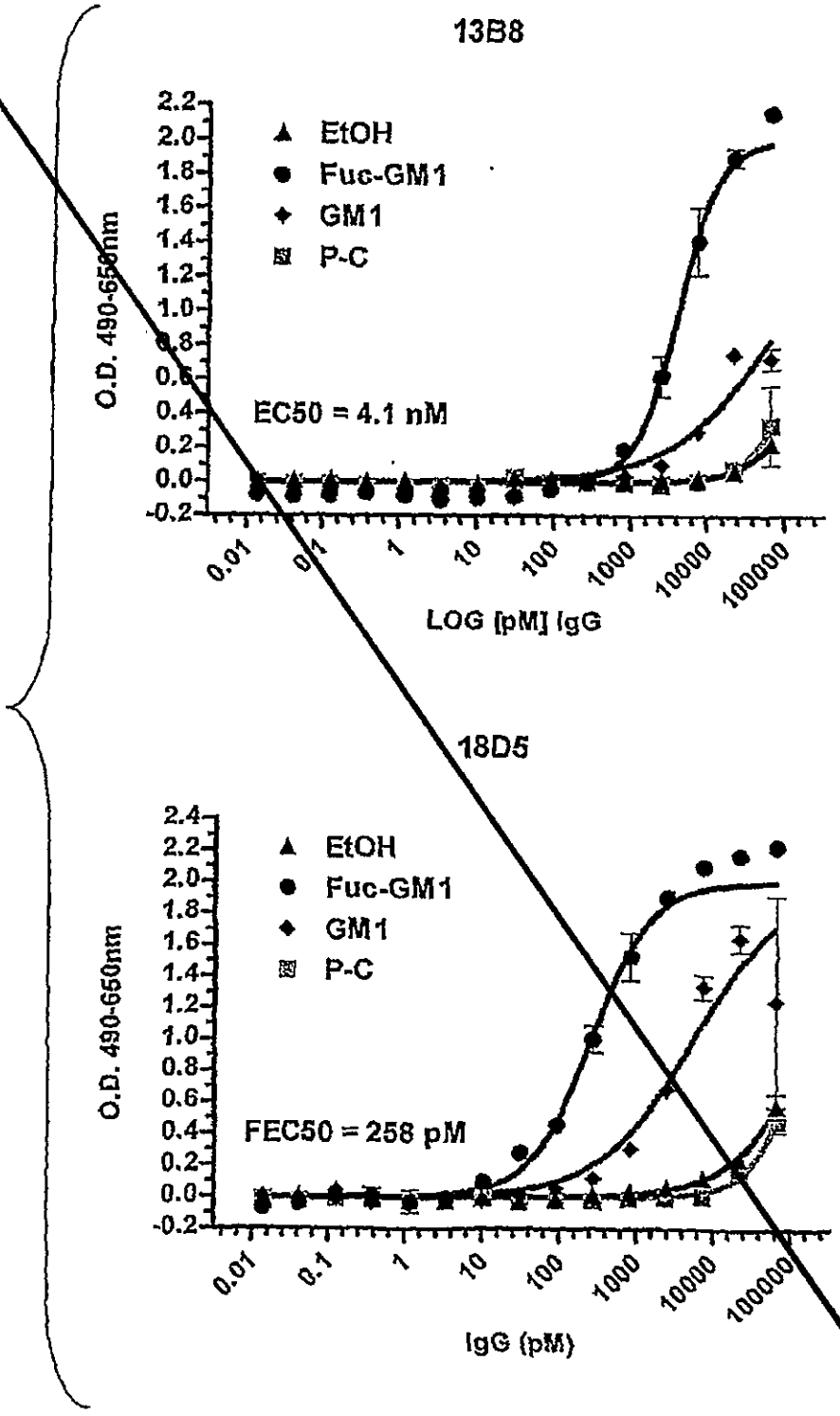

13B8
EtOH
Fuc-GM1
GM1
P-C
EC50 = 4.1 nM
O.D. 490-650nm
LOG [pM] IgG
18D5
EtOH
Fuc-GM1
GM1
P-C
FEC50 = 258 pM
O.D. 490-650nm
IgG (pM)

Fig. 9C

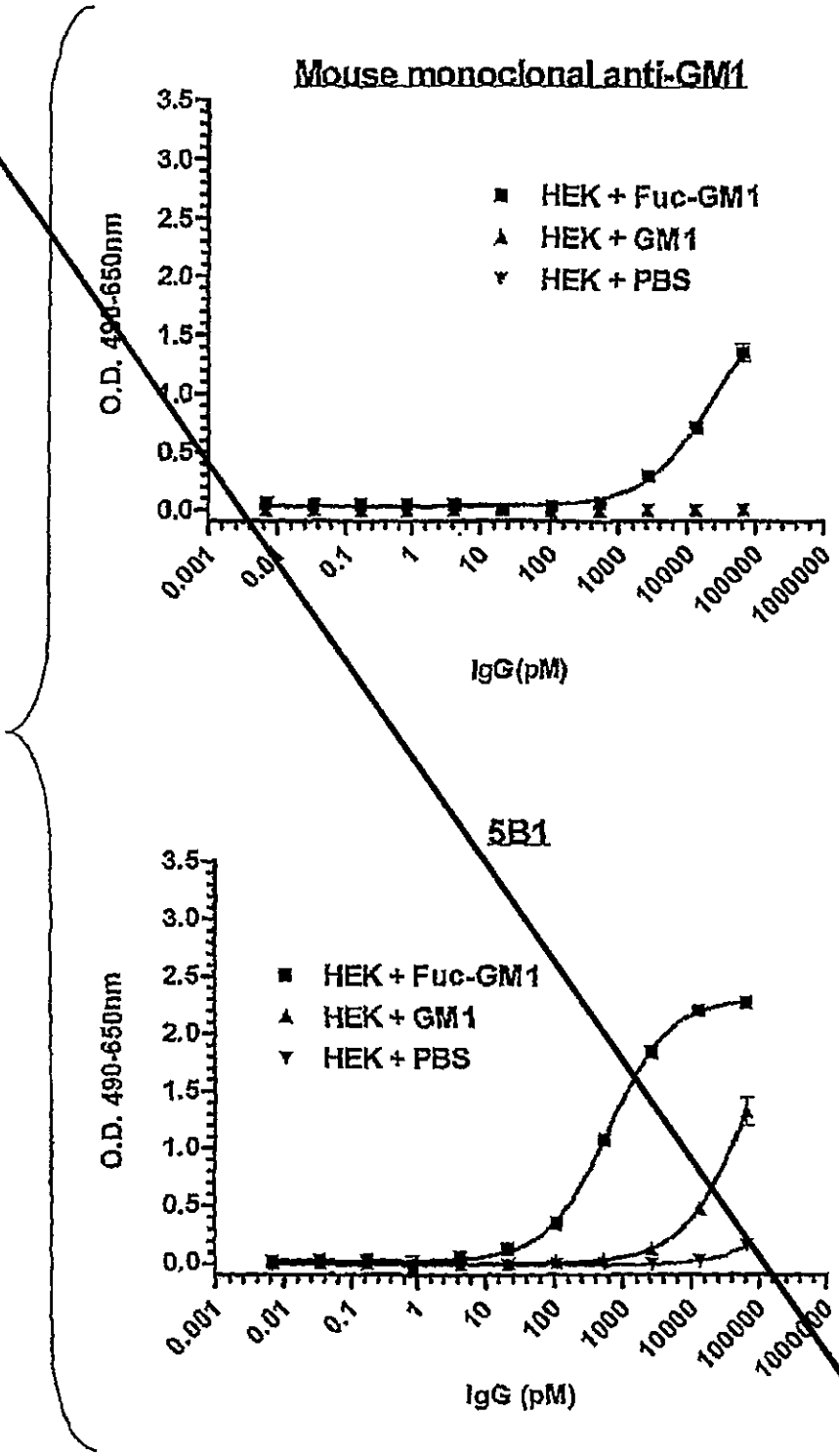

Mouse monoclonal anti-GM1
O.D. 490-650nm
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
HEK + Fuc-GM1
HEK + GM1
HEK + PBS
0.001
0.01
0.1
1
10
100
1000
10000
100000
1000000
IgG(pM)
5B1
O.D. 490-650nm
HEK + Fuc-GM1
HEK + GM1
HEK + PBS
IgG (pM)

Fig. 10A

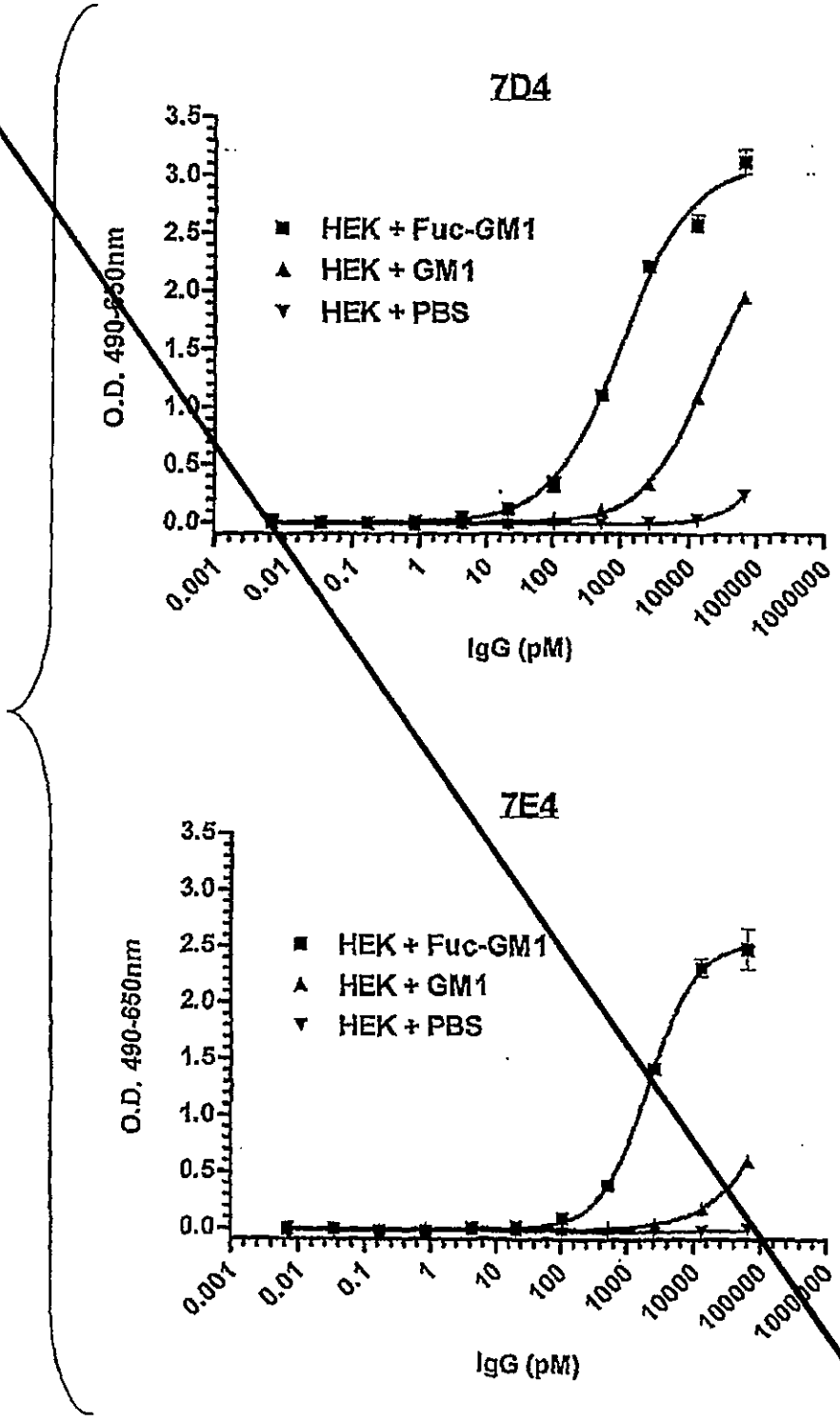

7D4
O.D. 490-650nm
HEK + Fuc-GM1
HEK + GM1
HEK + PBS
IgG (pM)
7E4
O.D. 490-650nm
HEK + Fuc-GM1
HEK + GM1
HEK + PBS
IgG (pM)

Fig. 10B

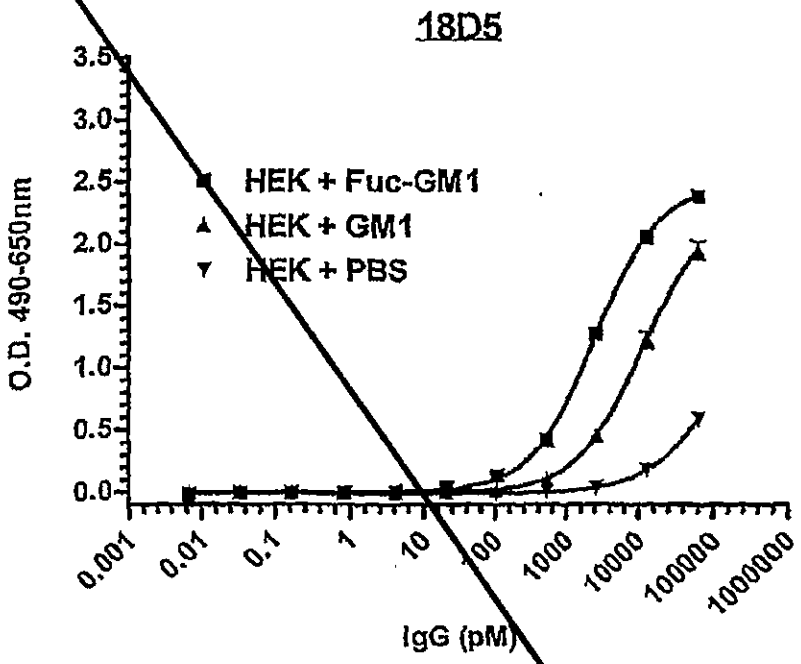

18D5
O.D. 490-650nm
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
HEK + Fuc-GM1
HEK + GM1
HEK + PBS
0.001
0.01
0.1
1
10
100
1000
10000
100000
1000000
IgG (pM)

Fig. 10C

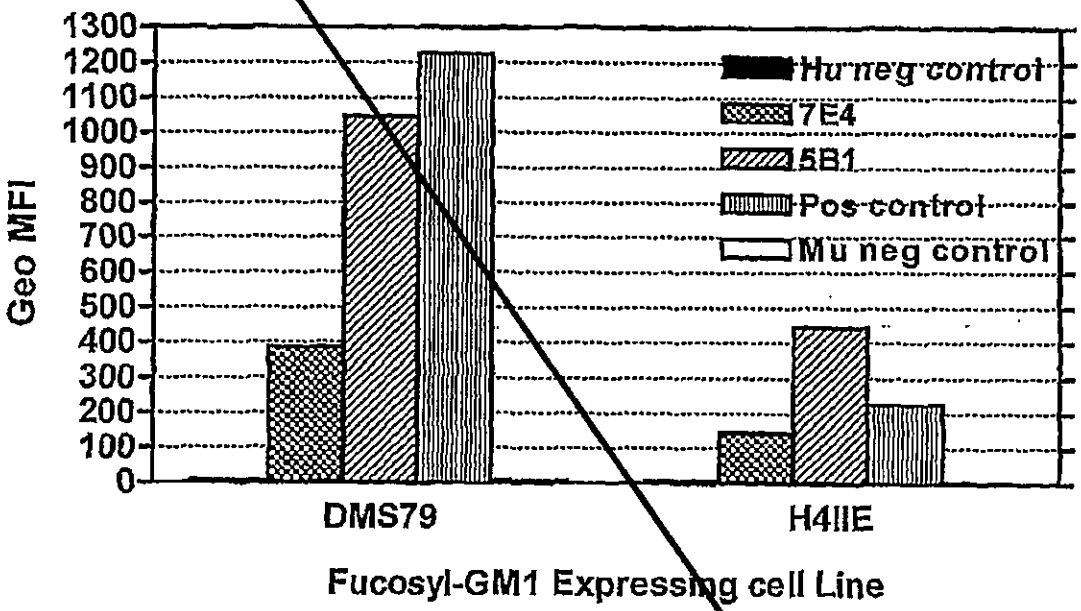

1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
Geo MFI
Hu neg control
7E4
5B1
Pos control
Mu neg control
DMS79
H4IIE
Fucosyl-GM1 Expressing cell Line

Fig. 11A

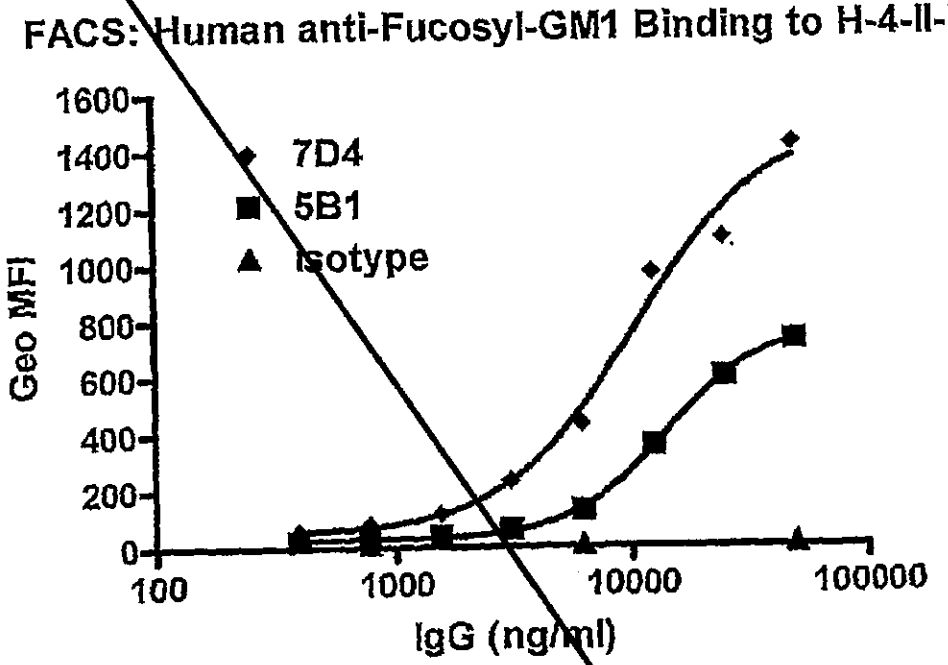

FACS: Human anti-Fucosyl-GM1 Binding to H-4-II-E
Geo MFI
1600
1400
1200
1000
800
600
400
200
0
7D4
5B1
Isotype
100
1000
10000
100000
IgG (ng/ml)

Fig. 11B

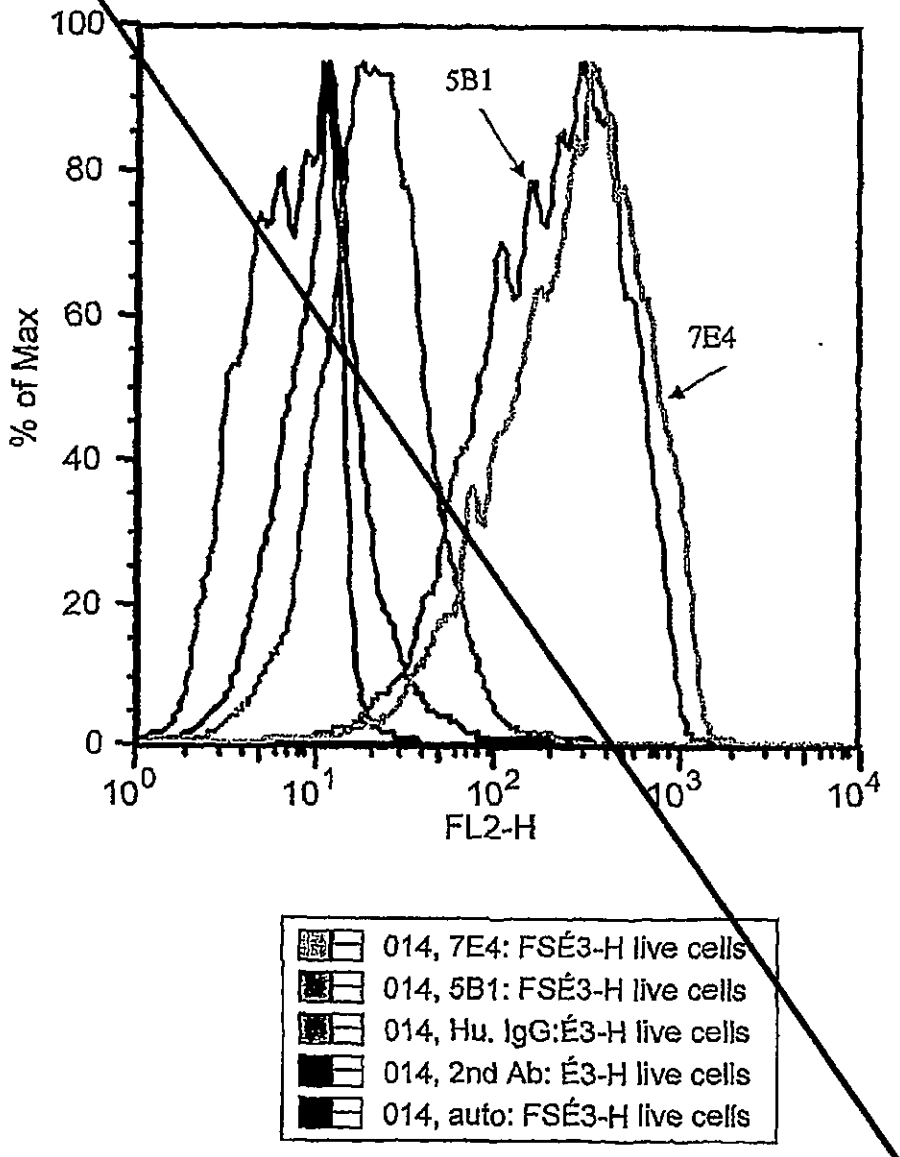
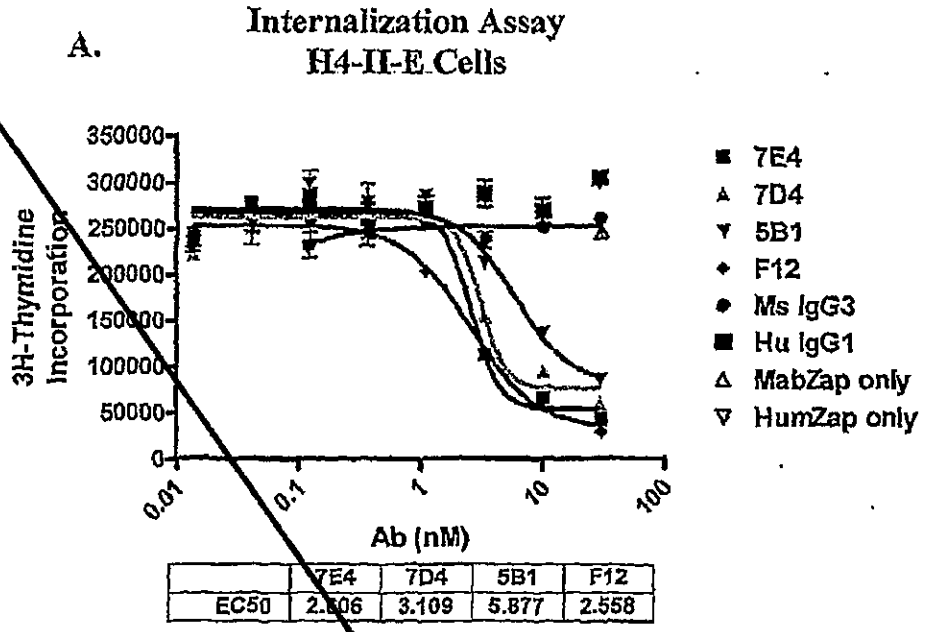

100
80
60
40
20
0
% of Max
5B1
7E4
10^0
10^1
10^2
10^3
10^4
FL2-H
014, 7E4: FSÉ3-H live cells
014, 5B1: FSÉ3-H live cells
014, Hu. IgG:É3-H live cells
014, 2nd Ab: É3-H live cells
014, auto: FSÉ3-H live cells

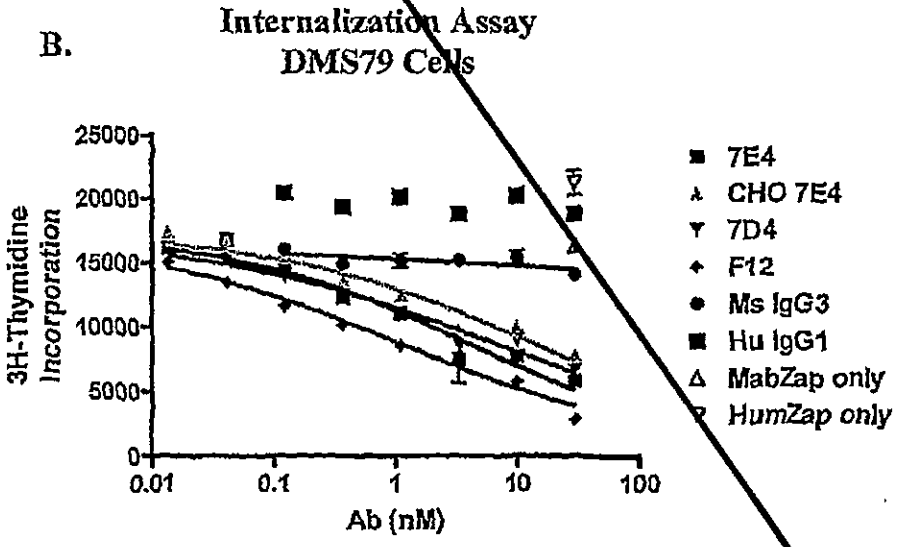
Fig. 11C

A.



	7E4	7D4	5B1	F12
EC50	2.606	3.109	5.877	2.558

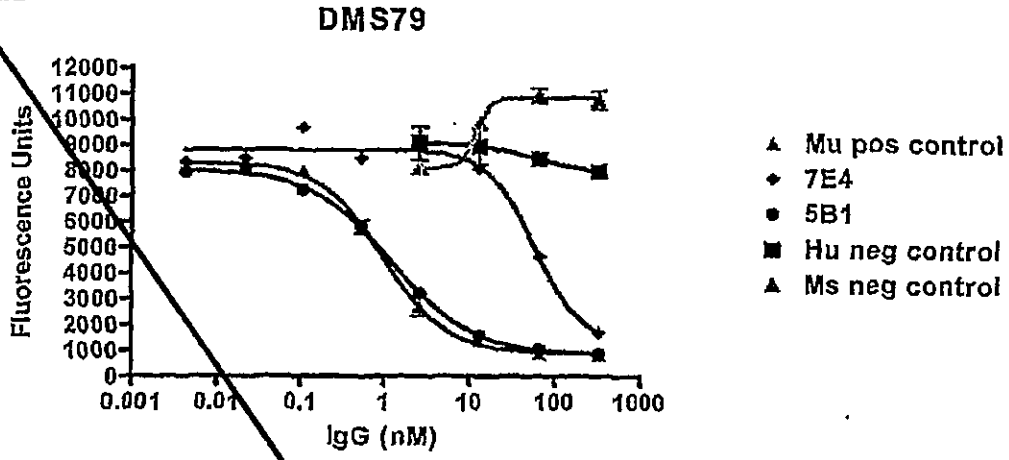
B.



	7E4	CHO 7E4	7D4	F12
EC50	4.049	13.80	6.692	1.105

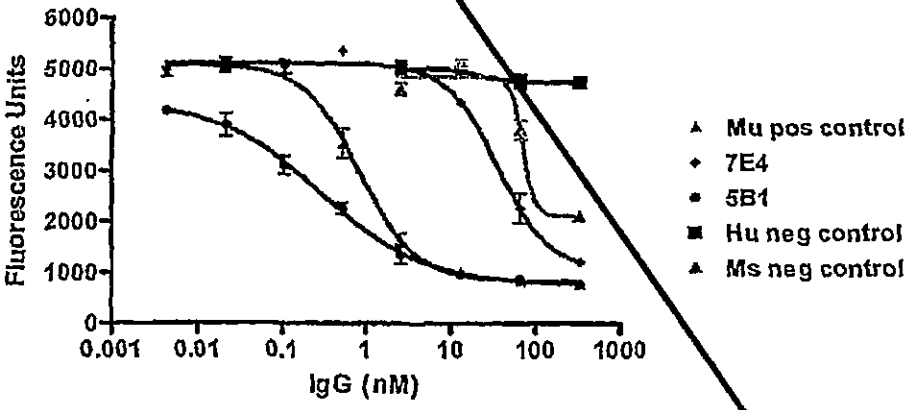
Fig. 12

A.



	F12	7E4	5B1
EC50	0.9833	58.88	1.231

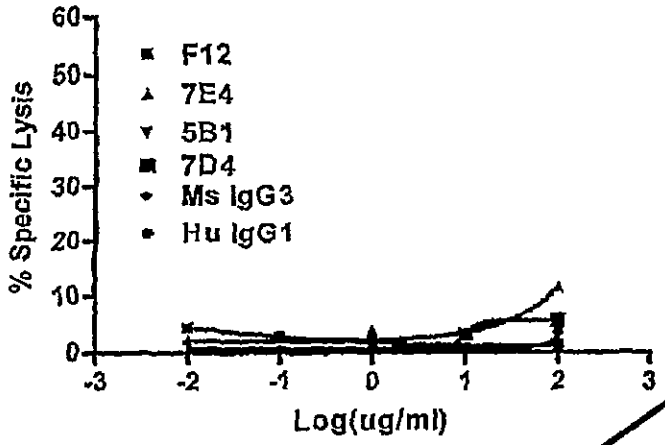
B.



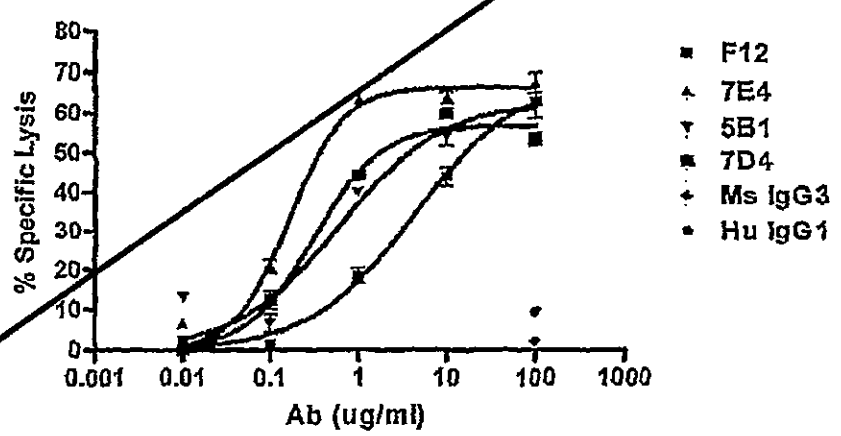
	F12	7E4	5B1
EC50	0.8727	36.73	0.2960

Fig. 13

A.



B.



	F12	7E4	5B1	7D4
TOP	69.01	66.38	62.58	56.84
EC50	4.488	0.1667	0.6174	0.3205

Fig. 14

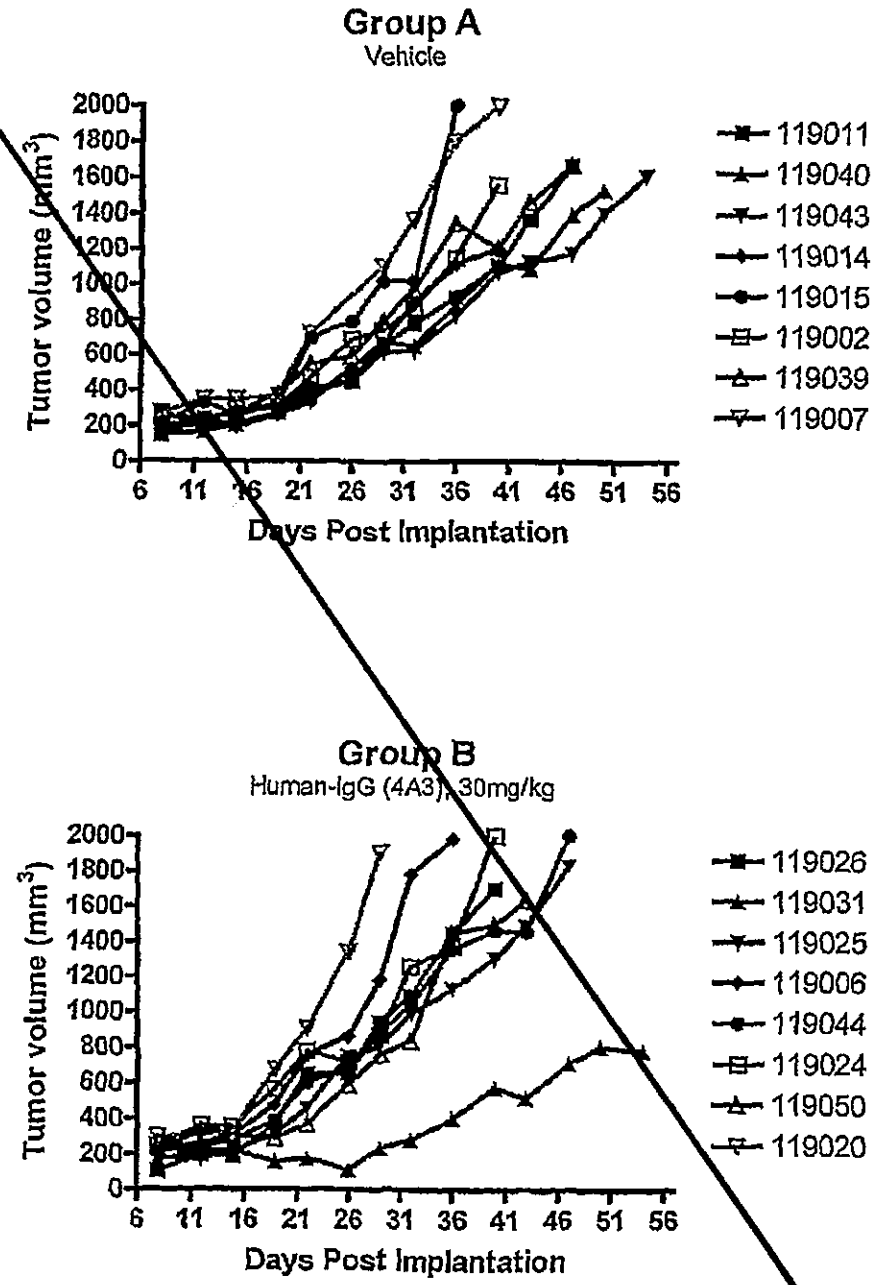

Group A
Vehicle
Tumor volume (mm3)
2000
1800
1600
1400
1200
1000
800
600
400
200
0
6 11 16 21 26 31 36 41 46 51 56
Days Post Implantation
119011
119040
119043
119014
119015
119002
119039
119007
Group B
Human-IgG (4A3), 30mg/kg
Tumor volume (mm3)
2000
1800
1600
1400
1200
1000
800
600
400
200
0
6 11 16 21 26 31 36 41 46 51 56
Days Post Implantation
119026
119031
119025
119006
119044
119024
119050
119020

Fig. 15A

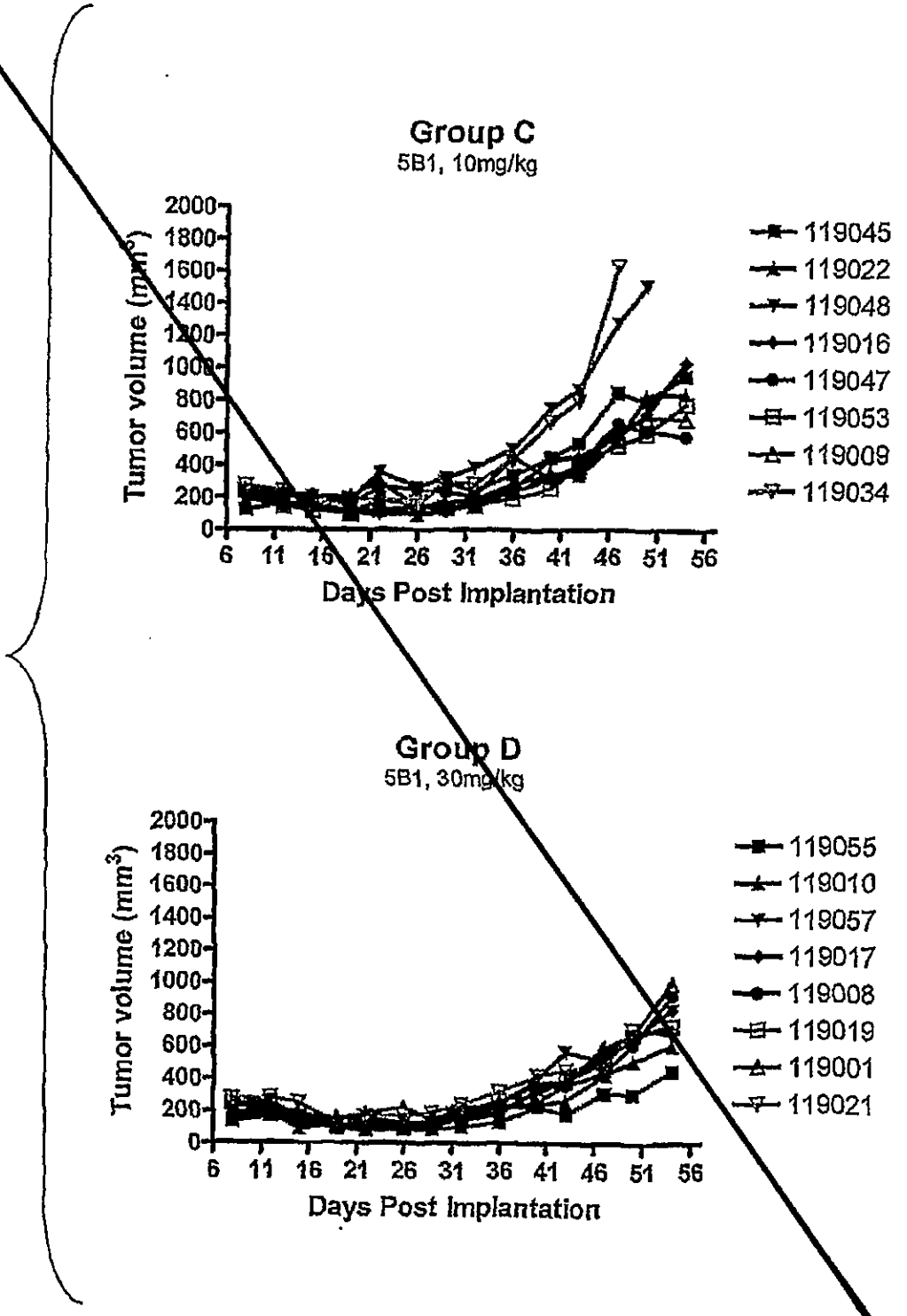

Group C
5B1, 10mg/kg
Tumor volume (mm3)
2000
1800
1600
1400
1200
1000
800
600
400
200
0
6 11 16 21 26 31 36 41 46 51 56
Days Post Implantation
119045
119022
119048
119016
119047
119053
119009
119034
Group D
5B1, 30mg/kg
Tumor volume (mm3)
2000
1800
1600
1400
1200
1000
800
600
400
200
0
6 11 16 21 26 31 36 41 46 51 56
Days Post Implantation
119055
119010
119057
119017
119008
119019
119001
119021

Fig. 15B

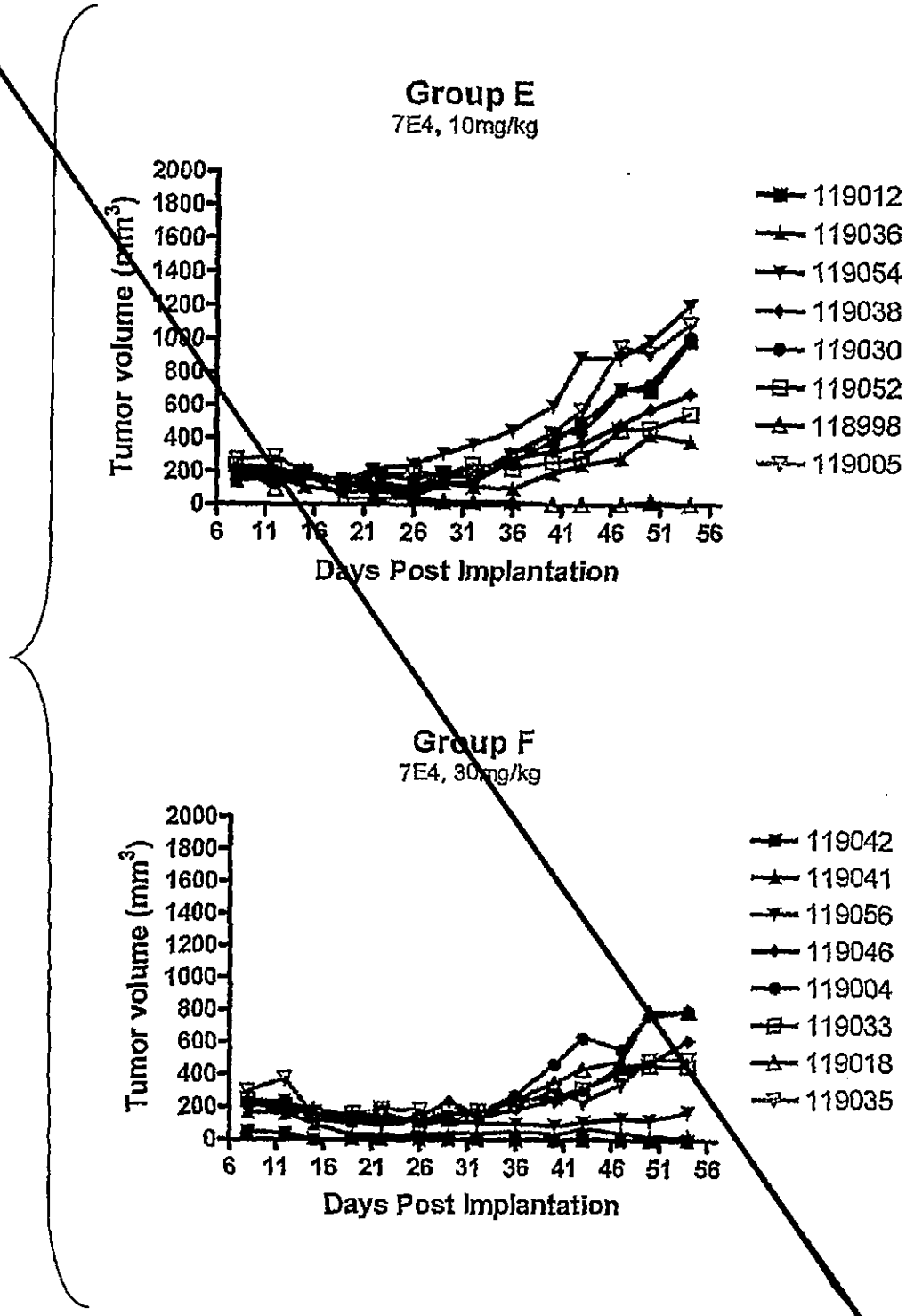

Group E
7E4, 10mg/kg
Tumor volume (mm3)
2000
1800
1600
1400
1200
1000
800
600
400
200
0
6 11 16 21 26 31 36 41 46 51 56
Days Post Implantation
119012
119036
119054
119038
119030
119052
118998
119005
Group F
7E4, 30mg/kg
Tumor volume (mm3)
2000
1800
1600
1400
1200
1000
800
600
400
200
0
6 11 16 21 26 31 36 41 46 51 56
Days Post Implantation
119042
119041
119056
119046
119004
119033
119018
119035

Fig. 15C

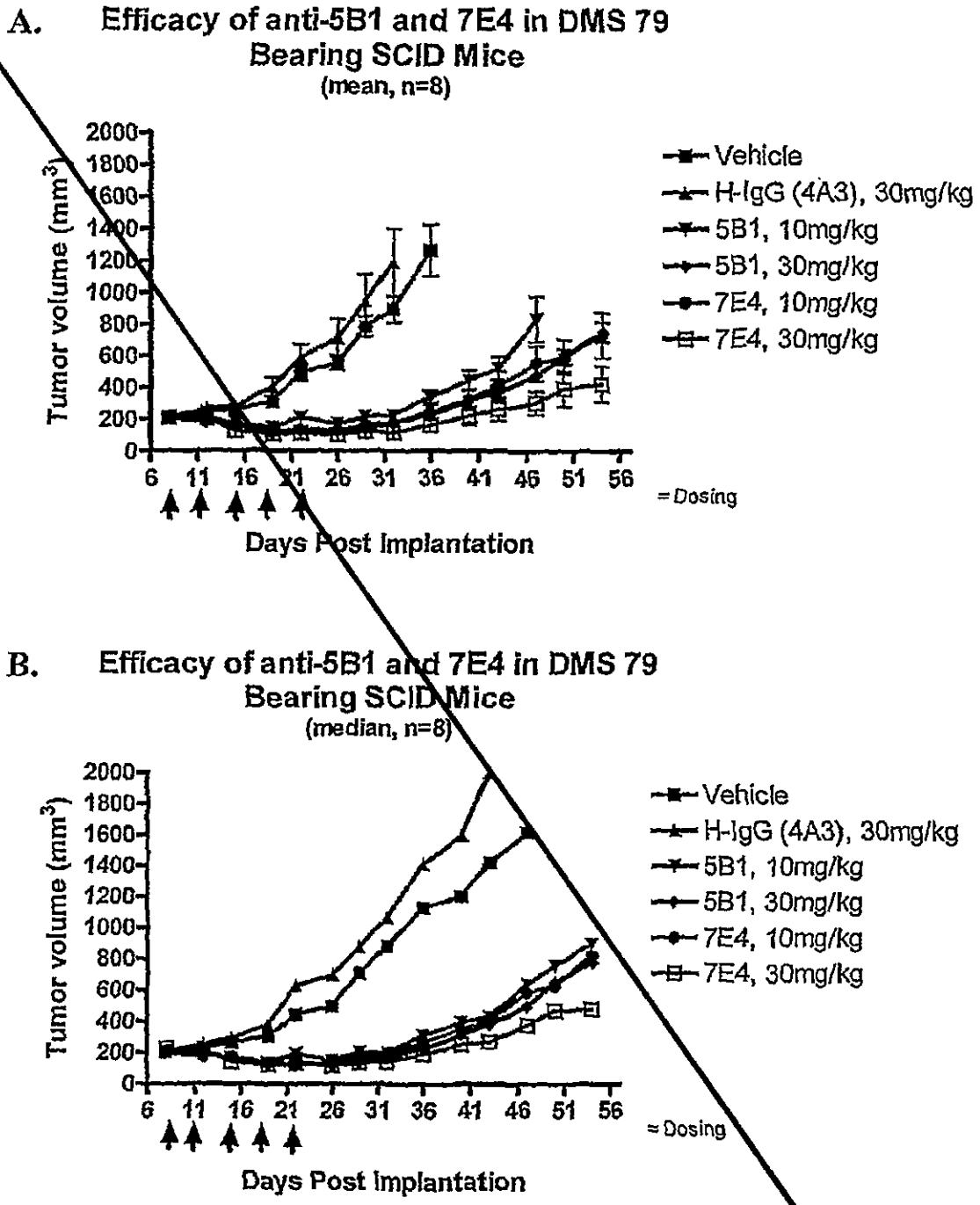

A.
Efficacy of anti-5B1 and 7E4 in DMS 79 Bearing SCID Mice
(mean, n=8)
Tumor volume (mm3)
2000
1800
1600
1400
1200
1000
800
600
400
200
0
6 11 16 21 26 31 36 41 46 51 56
Days Post Implantation
= Dosing
Vehicle
H-IgG (4A3), 30mg/kg
5B1, 10mg/kg
5B1, 30mg/kg
7E4, 10mg/kg
7E4, 30mg/kg
B.
Efficacy of anti-5B1 and 7E4 in DMS 79 Bearing SCID Mice
(median, n=8)
Tumor volume (mm3)
2000
1800
1600
1400
1200
1000
800
600
400
200
0
6 11 16 21 26 31 36 41 46 51 56
Days Post Implantation
= Dosing
Vehicle
H-IgG (4A3), 30mg/kg
5B1, 10mg/kg
5B1, 30mg/kg
7E4, 10mg/kg
7E4, 30mg/kg

Fig. 16

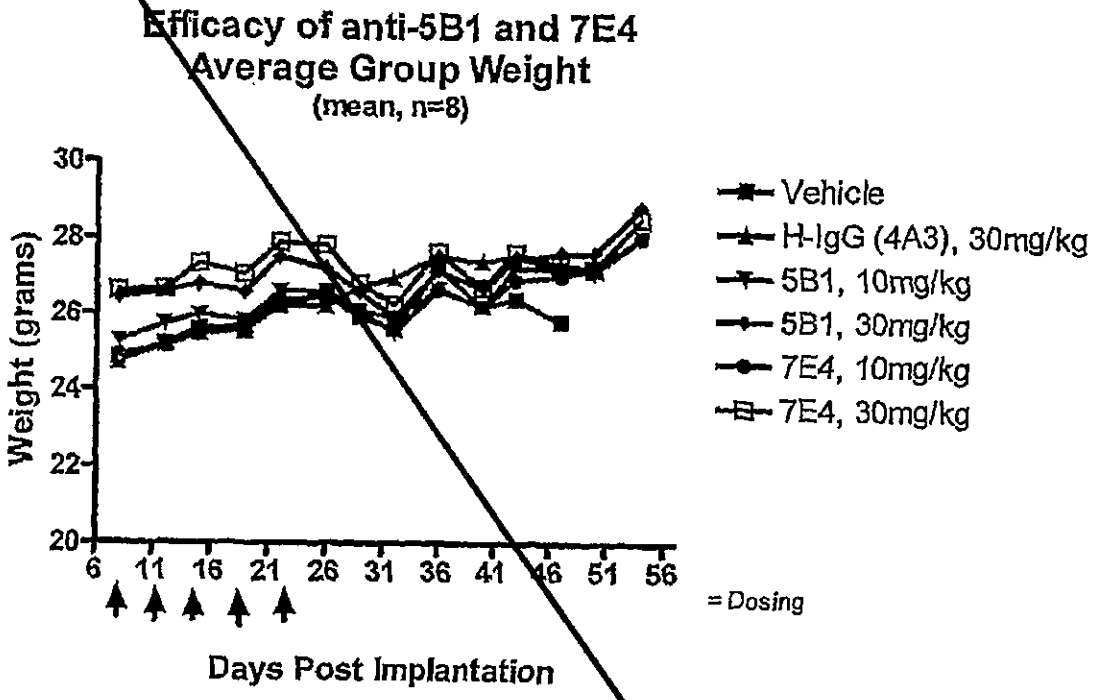

Efficacy of anti-5B1 and 7E4
Average Group Weight
(mean, n=8)
Weight (grams)
30
28
26
24
22
20
6
11
16
21
26
31
36
41
46
51
56
Days Post Implantation
Vehicle
H-IgG (4A3), 30mg/kg
5B1, 10mg/kg
5B1, 30mg/kg
7E4, 10mg/kg
7E4, 30mg/kg
= Dosing

Fig. 17

V-segment: VH 3-48
D-segment: D1-1
J-segment: JH6b

```
        E   V   Q   L   V   E   S   G   G   G   L   V   Q   P   G   E   S   L
1       GAG GTG CAG CTG GTG GAG TCT GGG GGA GGC TTG GTG CAG CCT GGG GAG TCC CTG

                                                        CDR 1
                                                        ~~~~~~~~~~~~~~~~~~~~
        R   L   S   C   V   A   S   G   F   T   F   S   R   Y   K   M   N   W
55      AGA CTC TCC TGT GTA GCC TCT GGA TTT ACT TTC AGT AGA TAT AAG ATG AAC TGG

                                                            CDR 2
                                                            ~~~~~~~~~~~~~~~~~~~
        V   R   Q   A   P   G   K   G   L   E   W   V   S   Y   I   S   R   S
109     GTT CGC CAG GCT CCA GGG AAG GGA CTG GAA TGG GTT TCA TAC ATC AGT CGT AGT

                    CDR 2
        ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
        G   R   D   I   Y   Y   A   D   S   V   K   G   R   F   T   I   S   R
163     GGC CGT GAC ATT TAC TAC GCA GAC TCT GTG AAG GGC CGA TTC ACC ATC TCC AGA

        D   N   A   K   N   S   L   Y   L   Q   M   N   S   L   R   D   E   D
217     GAT AAT GCC AAG AAC TCA CTG TAT CTG CAA ATG AAC AGC CTG AGA GAC GAG GAC

                                            CDR 3
                                            ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
        T   A   V   Y   Y   C   A   G   T   V   T   T   Y   Y   Y   Y   F   G
271     ACG GCT GTA TAT TAC TGT GCG GGA ACT GTA ACG ACA TAC TAC TAC TAC TTC GGT
                                        D1-1                    JH6b
        CDR 3
        ~~~~~~~~~~~~
        M   D   V   W   G   H   G   T   T   V   T   V   S   S
325     ATG GAC GTC TGG GGC CAC GGG ACC ACG GTC ACC GTC TCC TCA
```

Figure 1A

V-segment: L15
J-segment: JK4

```
        D   I   Q   M   T   Q   S   P   S   S   L   S   A   S   V   G   D   R
1       GAC ATC CAG ATG ACC CAG TCT CCA TCC TCA CTG TCT GCA TCT GTA GGA GAC AGA

                                    CDR 1
                                ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
        V   T   I   T   C   R   A   S   Q   G   I   S   S   W   L   A   W   Y
55      GTC ACC ATC ACT TGT CGG GCG AGT CAG GGT ATT AGC AGC TGG TTA GCC TGG TAT

                                                                CDR 2
                                                            ~~~~~~~~~~~~~~~~~~~
        Q   Q   K   P   E   K   A   P   K   S   L   I   Y   A   A   S   S   L
109     CAG CAG AAA CCA GAG AAA GCC CCT AAG TCC CTG ATC TAT GCT GCA TCC AGT TTG

        CDR 2
        ~~~~~~~~
        Q   S   G   V   P   S   R   F   S   G   S   G   S   G   T   D   F   T
163     CAA AGT GGG GTC CCA TCA AGG TTC AGC GGC AGT GGA TCT GGG ACA GAT TTC ACT

                                                                        CDR 3
                                                                        ~~~~~~~
        L   T   I   S   S   L   Q   P   E   D   F   A   T   Y   Y   C   Q   Q
217     CTC ACC ATC AGC AGC CTG CAG CCT GAA GAT TTT GCA ACT TAT TAC TGC CAA CAG

                CDR 3
        ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
        Y   N   S   Y   P   P   T   F   G   G   G   T   K   V   E   I   K
271     TAT AAT AGT TAC CCT CCC ACT TTC GGC GGA GGG ACC AAG GTG GAG ATC AAA
                                  └──► JK4
```

Figure 1B

V-segment: VH 3-48
D-segment: D1-1
J-segment: JH6b

```
        E   V   Q   L   V   E   S   G   G   G   L   V   Q   P   G   E   S   L
  1     GAG GTG CAG CTG GTG GAG TCT GGG GGA GGC TTG GTG CAG CCT GGG GAG TCC CTG

                                                            CDR 1
                                                        ~~~~~~~~~~~~~~~~~~~~
        R   L   S   C   V   A   S   G   F   T   F   S   R   Y   K   M   N   W
 55     AGA CTC TCC TGT GTA GCC TCT GGA TTT ACT TTC AGT AGA TAT AAG ATG AAC TGG

                                                                CDR 2
                                                            ~~~~~~~~~~~~~~~~~~~~
        V   R   Q   A   P   G   K   G   L   E   W   V   S   Y   I   S   R   S
109     GTT CGC CAG GCT CCA GGG AAG GGA CTG GAA TGG GTT TCA TAC ATC AGT CGT AGT

                    CDR 2
        ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
        G   R   D   I   Y   Y   A   D   S   V   K   G   R   F   T   I   S   R
163     GGC CGT GAC ATT TAC TAC GCA GAC TCT GTG AAG GGC CGA TTC ACC ATC TCC AGA

        D   N   A   K   N   S   L   Y   L   Q   M   N   S   L   R   D   E   D
217     GAT AAT GCC AAG AAC TCA CTG TAT CTG CAA ATG AAC AGC CTG AGA GAC GAG GAC

                                                CDR 3
                                        ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
        T   A   V   Y   Y   C   A   G   T   V   T   T   Y   Y   Y   F   G   M
271     ACG GCT GTA TAT TAC TGT GCG GGA ACT GTA ACG ACA TAC TAC TAC TTC GGT ATG
                                      |_____D1-1_____|   |
                                                          |-->  JH6b
        CDR 3
        ~~~~~~~~
        D   V   W   G   H   G   T   T   V   T   V   S   S
325     GAC GTC TGG GGC CAC GGG ACC ACG GTC ACC GTC TCC TCA
```

Figure 2A

V-segment: L15
J-segment: JK4

```
        D   I   Q   M   T   Q   S   P   S   S   L   S   A   S   V   G   D   R
  2     GAC ATC CAG ATG ACC CAG TCT CCA TCC TCA CTG TCT GCA TCT GTA GGA GAC AGA

                                    CDR 1
                                ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
        V   T   I   T   C   R   A   S   Q   G   I   S   S   W   L   A   W   Y
 56     GTC ACC ATC ACT TGT CGG GCG AGT CAG GGT ATT AGC AGC TGG TTA GCC TGG TAT

                                                            CDR 2
                                                        ~~~~~~~~~~~~~~~~~~~~
        Q   Q   K   P   E   K   A   P   K   S   L   I   Y   A   A   S   S   L
110     CAG CAG AAA CCA GAG AAA GCC CCT AAG TCC CTG ATC TAT GCT GCA TCC AGT TTG

        CDR 2
        ~~~~~~~~
        Q   S   G   V   P   S   R   F   S   G   S   G   S   G   T   D   F   T
164     CAA AGT GGG GTC CCA TCA AGG TTC AGC GGC AGT GGA TCT GGG ACA GAT TTC ACT

                                                                CDR 3
                                                                ~~~~~~~
        L   T   I   S   S   L   Q   P   E   D   F   A   T   Y   Y   C   Q   Q
218     CTC ACC ATC AGC AGC CTG CAG CCT GAA GAT TTT GCA ACT TAT TAC TGC CAA CAG

                CDR 3
        ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
        Y   N   S   Y   P   P   T   F   G   G   G   T   K   V   E   I   K
272     TAT AAT AGT TAC CCT CCC ACT TTC GGC GGA GGG ACC AAG GTG GAG ATC AAA
                                  ↳ JK4
```

Figure 2B

V-segment: VH 3-48
D-segment: D1-1
J-segment: JH6b

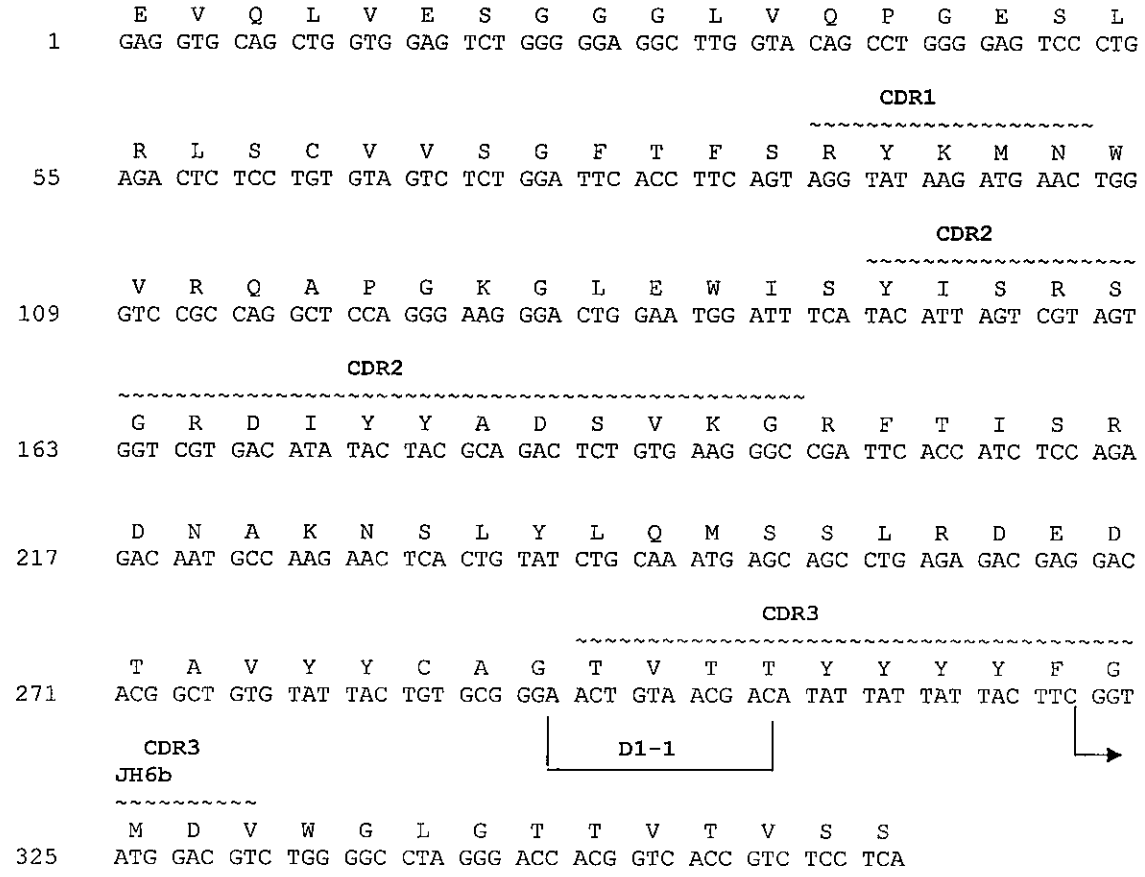


Figure 3A

V-segment: L15
J-segment: JK4

```
        D   I   Q   M   T   Q   S   P   S   S   L   S   A   S   V   G   D   R
1       GAC ATC CAG ATG ACC CAG TCT CCA TCC TCA CTG TCT GCA TCT GTA GGA GAC AGA

                                CDR1
                            ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
        V   T   I   T   C   R   A   S   Q   G   I   S   S   W   L   A   W   Y
55      GTC ACC ATC ACT TGT CGG GCG AGT CAG GGT ATT AGC AGC TGG TTA GCC TGG TAT

                                                            CDR2
                                                        ~~~~~~~~~~~~~~~~~~~~
        Q   Q   K   P   E   K   A   P   K   S   L   I   Y   A   A   S   S   L
109     CAG CAG AAA CCA GAG AAA GCC CCT AAG TCC CTG ATC TAT GCT GCA TCC AGT TTG

        CDR2
        ~~~~~~~~
        Q   S   G   V   P   S   R   F   S   G   S   G   S   G   T   D   F   T
163     CAA AGT GGG GTC CCA TCA AGG TTC AGC GGC AGT GGA TCT GGG ACA GAT TTC ACT

                                                                    CDR3
                                                                ~~~~~~~~
        L   T   I   S   C   L   Q   P   E   D   F   A   T   Y   Y   C   Q   Q
217     CTC ACC ATC AGC TGC CTG CAG CCT GAA GAT TTT GCG ACT TAT TAC TGC CAA CAG

                CDR3
        ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
        Y   N   S   Y   P   P   T   F   G   G   G   T   K   V   E   I   K
271     TAT AAT AGT TAC CCT CCC ACT TTC GGC GGA GGG ACC AAG GTG GAG ATC AAA
                            └──► JK4
```

Figure 3B

V-segment: VH3-48
D-segment: D1-1
J-segment: JH6b

```
          E   V   Q   L   V   E   S   G   G   G   S   V   Q   P   G   E   S   L
    1     GAA GTG CAG CTG GTG GAG TCT GGG GGA GGC TCG GTA CAG CCT GGG GAG TCC CTG

                                                                CDR 1
                                                              ~~~~~~~~~~~~~~~~~~~~
          R   L   S   C   V   A   S   G   F   T   F   S   R   Y   K   M   N   W
   55     AGA CTC TCC TGT GTA GCC TCT GGA TTC ACC TTC AGT AGG TAC AAG ATG AAC TGG

                                                                    CDR 2
                                                                  ~~~~~~~~~~~~~~~~~~~~
          V   R   Q   A   P   G   K   G   L   E   W   V   S   Y   I   S   R   S
  109     GTC CGC CAG GCT CCA GGG AAG GGA CTG GAA TGG GTT TCA TAC ATT AGT CGT AGT

                        CDR 2
          ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
          G   R   D   I   Y   Y   A   D   S   V   K   G   R   F   T   I   S   R
  163     GGT CGT GAC ATA TAC TAC GCA GAC TCT GTG AAG GGC CGA TTC ACC ATC TCC AGA

          D   N   A   K   N   S   L   Y   L   Q   M   N   S   L   R   D   E   D
  217     GAC AAT GCC AAG AAC TCA CTG TAT CTG CAA ATG AAC AGC CTG AGA GAC GAG GAC

                                                CDR 3
                                              ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
          T   A   V   Y   Y   C   A   G   T   V   T   T   Y   Y   Y   D   F   G
  271     ACG GCT GTG TAT TAC TGT GCG GGA ACT GTA ACG ACA TAC TAC TAC GAC TTC GGT

            CDR 3                       |_____D1-1_____|  |-->  JH6b
          ~~~~~~~~~~~~~
          M   D   V   W   G   Q   G   T   T   V   T   V   S   S
  325     ATG GAC GTC TGG GGC CAA GGG ACC ACG GTC ACC GTC TCC TCA
```

Figure 4A

V-segment: L15
J-segment: JK4

```
        D   I   Q   M   T   Q   S   P   S   S   L   S   A   S   V   G   D   R
3       GAC ATC CAG ATG ACC CAG TCT CCA TCC TCA CTG TCT GCA TCT GTA GGA GAC AGA

                                    CDR 1
                                ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
        V   T   I   T   C   R   A   S   Q   G   I   S   S   W   L   A   W   Y
57      GTC ACC ATC ACT TGT CGG GCG AGT CAG GGT ATT AGC AGC TGG TTA GCC TGG TAT

                                                                CDR 2
                                                            ~~~~~~~~~~~~~~~~~~~
        Q   Q   K   P   E   K   A   P   K   S   L   I   Y   A   A   S   S   L
111     CAG CAG AAA CCA GAG AAA GCC CCT AAG TCC CTG ATC TAT GCT GCA TCC AGT TTG

        CDR 2
        ~~~~~~~~
        Q   S   G   V   P   S   R   F   S   G   S   G   S   G   T   D   F   T
165     CAA AGT GGG GTC CCA TCA AGG TTC AGC GGC AGT GGA TCT GGG ACA GAT TTC ACT

                                                                    CDR 3
                                                                    ~~~~~~~
        L   T   I   S   S   L   Q   P   E   D   F   A   T   Y   Y   C   Q   Q
219     CTC ACC ATC AGC AGC CTG CAG CCT GAA GAT TTT GCA ACT TAT TAC TGC CAA CAG

                CDR 3
        ~~~~~~~~~~~~~~~~~~~~~~~~~~~~
        Y   N   S   Y   P   P   T   F   G   G   G   T   K   V   E   I   K
273     TAT AAT AGT TAC CCT CCC ACT TTC GGC GGA GGG ACC AAG GTG GAG ATC AAA
                                  └──► JK4
```

Figure 4B

Anti-Fucosyl GM1 13B8 VH

V-segment: VH3-48
D-segment: D1-1
J-segment: JH6b

```
         E   V   Q   L   V   E   S   G   G   G   L   V   Q   P   G   E   S   L
  1     GAG GTG CAG CTG GTG GAG TCT GGG GGA GGC TTG GTA CAG CCT GGG GAG TCC CTG

                                                              CDR1
                                                         ~~~~~~~~~~~~~~~~~~~~
         R   L   S   C   V   A   S   G   F   T   L   S   R   Y   K   M   N   W
 55     AGA CTC TCG TGT GTA GCC TCT GGA TTC ACC CTC AGT AGG TAT AAG ATG AAC TGG

                                                                  CDR2
                                                             ~~~~~~~~~~~~~~~~~~~
         V   R   Q   A   P   G   K   G   L   E   W   I   S   Y   I   S   R   S
109     GTC CGC CAG GCT CCA GGG AAG GGA CTG GAA TGG ATT TCA TAC ATC AGT CGT AGT

                     CDR2
        ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
         G   R   D   I   Y   Y   A   D   S   V   K   G   R   F   T   I   S   R
163     GGT CGT GAC ATA TAC TAC GCA GAC TCT GTG AAG GGC CGA TTC ACC ATC TCC AGA

         D   N   A   K   N   S   L   Y   L   Q   M   N   S   L   R   D   E   D
217     GAC AAT GCC AAG AAC TCA CTG TAT CTG CAA ATG AAC AGC CTG CGA GAC GAG GAC

                                                      CDR3
                                        ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
         S   A   V   Y   Y   C   A   G   T   V   T   T   Y   Y   Y   Y   F   G
271     TCG GCT GTG TAT TAC TGT GCG GGA ACT GTA ACG ACA TAC TAC TAC TAC TTC GGT
                                       |____D1-1____|  |-> JH6b
         CDR3
        ~~~~~~~~~~~~
         M   D   V   W   G   Q   G   T   T   V   T   V   S   S
325     ATG GAC GTC TGG GGC CAA GGG ACC ACG GTC ACC GTC TCC TCA
```

Figure 5A

V-segment: L15
J-segment: JK4

```
      D   I   Q   M   T   Q   S   P   S   S   L   S   A   S   V   G   D   R
1     GAC ATC CAG ATG ACC CAG TCT CCA TCC TCA CTG TCT GCA TCT GTA GGA GAC AGA

                                CDR1
                    ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
      V   T   I   T   C   R   A   S   Q   G   I   S   S   W   L   A   W   Y
55    GTC ACC ATC ACT TGT CGG GCG AGT CAG GGT ATT AGC AGC TGG TTA GCC TGG TAT

                                                            CDR2
                                                ~~~~~~~~~~~~~~~~~~~~
      Q   Q   K   P   E   K   A   P   K   S   L   I   Y   A   A   S   S   L
109   CAG CAG AAA CCA GAG AAA GCC CCT AAG TCC CTG ATC TAT GCT GCA TCC AGT TTG

      CDR2
      ~~~~~~~~
      Q   S   G   V   P   S   R   F   S   G   S   G   S   G   T   D   F   T
163   CAA AGT GGG GTC CCA TCA AGG TTC AGC GGC AGT GGA TCT GGG ACA GAT TTC ACT

                                                                    CDR3
                                                                    ~~~~~~~
      L   T   I   S   S   L   Q   P   E   D   F   A   T   Y   Y   C   Q   Q
217   CTC ACC ATC AGC AGC CTG CAG CCT GAA GAT TTT GCA ACT TAT TAC TGC CAA CAG

              CDR3
      ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
      Y   N   S   Y   P   P   T   F   G   G   G   T   K   V   E   I   K
271   TAT AAT AGT TAC CCT CCC ACT TTC GGC GGA GGG ACC AAG GTG GAG ATC AAA
                          |
                          └──► JK4
```

Figure 5B

Anti-Fucosyl GM1 3C4 VH

```
        V-segment: VH3-48
        D-segment: D1-1
        J-segment: JH6b

         E   V   Q   L   V   E   S   G   G   G   L   V   Q   P   G   E   S   L
  1     GAG GTG CAG CTG GTG GAG TCT GGG GGA GGC TTG GTA CAG CCT GGG GAG TCC CTG

                                                          CDR1
                                                    ~~~~~~~~~~~~~~~~~~~~
         R   L   S   C   V   A   S   G   F   T   F   S   R   Y   K   M   N   W
 55     AGA CTC TCC TGT GTA GCC TCT GGA TTC ACC TTC AGT AGG TAT AAG ATG AAC TGG

                                                              CDR2
                                                        ~~~~~~~~~~~~~~~~~~~
         V   R   Q   A   P   G   K   G   L   E   W   I   S   Y   I   S   R   S
109     GTC CGC CAG GCT CCA GGG AAG GGA CTG GAA TGG ATT TCA TAC ATT AGT CGT AGT

                  CDR2
        ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
         G   R   D   I   Y   Y   A   D   S   V   K   G   R   F   T   I   S   R
163     GGT CGT GAC ATA TAC TAC GCA GAC TCT GTG AAG GGC CGA TTC ACC ATC TCC AGA


         D   N   A   K   N   S   L   Y   L   Q   M   S   S   L   R   D   E   D
217     GAC AAT GCC AAG AAC TCA CTG TAT CTG CAA ATG AGC AGC CTG AGA GAC GAG GAC

                                                     CDR3
                                        ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
         T   A   V   Y   Y   C   A   G   T   V   T   T   Y   Y   Y   Y   F   G
271     ACG GCT GTG TAT TAC TGT GCG GGA ACT GTC ACG ACA TAT TAT TAT TAC TTC GGT
                                    |_D1-1___________|
          CDR3                                         |-> JH6b
        ~~~~~~~~~~~~
         M   D   V   W   G   L   G   T   T   V   T   V   S   S
325     ATG GAC GTC TGG GGC CTA GGG ACC ACG GTC ACC GTC TCC TCA
```

Figure 6A

V-segment: L15
J-segment: JK4

```
        D   I   Q   M   T   Q   S   P   S   S   L   S   A   S   V   G   D   R
1       GAC ATC CAG ATG ACC CAG TCT CCA TCC TCA CTG TCT GCA TCT GTA GGA GAC AGA

                                CDR1
                            ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
        V   T   I   T   C   R   A   S   Q   G   I   S   S   W   L   A   W   Y
55      GTC ACC ATC ACT TGT CGG GCG AGT CAG GGT ATT AGC AGC TGG TTA GCC TGG TAT

                                                            CDR2
                                                        ~~~~~~~~~~~~~~~~~~~~
        Q   Q   K   P   E   K   A   P   K   S   L   I   Y   A   A   S   S   L
109     CAG CAG AAA CCA GAG AAA GCC CCT AAG TCC CTG ATC TAT GCT GCA TCC AGT TTG

        CDR2
        ~~~~~~~~
        Q   S   G   V   P   S   R   F   S   G   S   G   S   G   T   D   F   T
163     CAA AGT GGG GTC CCA TCA AGG TTC AGC GGC AGT GGA TCT GGG ACA GAT TTC ACT

                                                                    CDR3
                                                                ~~~~~~~~
        L   T   I   S   C   L   Q   P   E   D   F   A   T   Y   Y   C   Q   Q
217     CTC ACC ATC AGC TGC CTG CAG CCT GAA GAT TTT GCG ACT TAT TAC TGC CAA CAG

                CDR3
        ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
        Y   N   S   Y   P   P   T   F   G   G   G   T   K   V   E   I   K
271     TAT AAT AGT TAC CCT CCC ACT TTC GGC GGA GGG ACC AAG GTG GAG ATC AAA
                            └►  JK4
```

Figure 6B

Anti-Fucosyl GM1 13B8, 18D5, 5B1, 7D4, 7E4 VH regions

3-48 germline	E	V	Q	L	V	E	S	G	G	G	L	V	Q	P	G	G	S	L	R	L	S	C	A	A	S	G	F	T	F	S
13B8 VH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	E	-	-	-	-	-	-	V	-	-	-	-	-	L	-
18D5 VH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	E	-	-	-	-	-	-	V	-	-	-	-	-	-	-
5B1 VH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	E	-	-	-	-	-	-	V	-	-	-	-	-	-	-
5B1a VH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	E	-	-	-	-	-	-	V	-	-	-	-	-	-	-
7D4 VH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	E	-	-	-	-	-	-	V	V	-	-	-	-	-	-
7E4 VH	-	-	-	-	-	-	-	-	-	-	S	-	-	-	-	E	-	-	-	-	-	-	V	-	-	-	-	-	-	-

	CDR1																				CDR2									
3-48 germline	S	Y	S	M	N	W	V	R	Q	A	P	G	K	G	L	E	W	V	S	Y	I	S	S	S	S	S	T	I	Y	Y
13B8 VH	R	-	K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	I	-	-	-	-	R	-	G	R	D	-	-	-
18D5 VH	R	-	K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	I	-	-	-	-	R	-	G	R	D	-	-	-
5B1 VH	R	-	K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R	-	G	R	D	-	-	-
5B1a VH	R	-	K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R	-	G	R	D	-	-	-
7D4 VH	R	-	K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	I	-	-	-	-	R	-	G	R	D	-	-	-
7E4 VH	R	-	K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R	-	G	R	D	-	-	-

	CDR2																													
3-48 germline	A	D	S	V	K	G	R	F	T	I	S	R	D	N	A	K	N	S	L	Y	L	Q	M	N	S	L	R	D	E	D
13B8 VH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18D5 VH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	S	-	-	-	-	-	-
5B1 VH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5B1a VH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7D4 VH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	S	-	-	-	-	-	-
7E4 VH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

								CDR3																						
3-48 germline	T	A	V	Y	Y	C	A	R																						
13B8 VH	S	-	-	-	-	-	-	G	T	V	T	T	Y	Y	Y	Y	F	G	M	D	V	W	G	Q	G	T	T	V	T	V
18D5 VH	-	-	-	-	-	-	-	G	T	V	T	T	Y	Y	Y	Y	F	G	M	D	V	W	G	L	G	T	T	V	T	V
5B1 VH	-	-	-	-	-	-	-	G	T	V	T	T	Y	Y	Y	Y	F	G	M	D	V	W	G	H	G	T	T	V	T	V
5B1a VH	-	-	-	-	-	-	-	G	T	V	T	T	*	Y	Y	Y	F	G	M	D	V	W	G	H	G	T	T	V	T	V
7D4 VH	-	-	-	-	-	-	-	G	T	V	T	T	Y	Y	Y	Y	F	G	M	D	V	W	G	L	G	T	T	V	T	V
7E4 VH	-	-	-	-	-	-	-	G	T	V	T	T	Y	Y	Y	D	F	G	M	D	V	W	G	Q	G	T	T	V	T	V

13B8 VH	S	S
18D5 VH	S	S
5B1 VH	S	S
5B1a VH	S	S
7D4 VH	S	S
7E4 VH	S	S

Fig. 7