Figure 1. The cDNA (SEQ ID NO: 1) and amino acid sequence (SEQ ID NO: 2) of human CD37. The start methionine is underlined. The open reading frame extends from nucleic acid 122-967 including the stop codon.

```
   1  TTCCTTTCTCTCTCAGCTCTCCGTCTCTCTTTCTCTCTCAGCCTCTTTCTTTCTCCCTGT
  61  CTCCCCCACTGTCAGCACCTCTTCTGTGTGGTGAGTGGACCGCTTACCCCACTAGGTGAA
        M  S  A  Q  E  S  C  L  S  L  I  K  Y  F  L  F  V  F  N  L
 121  GATGTCAGCCCAGGAGAGCTGCCTCAGCCTCATCAAGTACTTCCTCTTCGTTTTCAACCT
      · F  F  F  V  L  G  S  L  I  F  C  F  G  I  W  I  L  I  D  K
 181  CTTCTTCTTCGTCCTCGGCAGCCTGATCTTCTGCTTCGGCATCTGGATCCTCATTGACAA
      · T  S  F  V  S  F  V  G  L  A  F  V  P  L  Q  I  W  S  K  V
 241  GACCAGCTTCGTGTCCTTTGTGGGCTTGGCCTTCGTGCCTCTGCAGATCTGGTCCAAAGT
      · L  A  I  S  G  I  F  T  M  G  I  A  L  L  G  C  V  G  A  L
 301  CCTGGCCATCTCAGGAATCTTCACCATGGGCATCGCCCTCCTGGGTTGTGTGGGGGCCCT
      · K  E  L  R  C  L  L  G  L  Y  F  G  M  L  L  L  L  F  A  T
 361  CAAGGAGCTCCGCTGCCTCCTGGGCCTGTATTTTGGGATGCTGCTGCTCCTGTTTGCCAC
      · Q  I  T  L  G  I  L  I  S  T  Q  R  A  Q  L  E  R  S  L  R
 421  ACAGATCACCCTGGGAATCCTCATCTCCACTCAGCGGGCCCAGCTGGAGCGAAGCTTGCG
      · D  V  V  E  K  T  I  Q  K  Y  G  T  N  P  E  E  T  A  A  E
 481  GGACGTCGTAGAGAAAACCATCCAAAAGTACGGCACCAACCCCGAGGAGACCGCGGCCGA
      · E  S  W  D  Y  V  Q  F  Q  L  R  C  C  G  W  H  Y  P  Q  D
 541  GGAGAGCTGGGACTATGTGCAGTTCCAGCTGCGCTGCTGCGGCTGGCACTACCCGCAGGA
      · W  F  Q  V  L  I  L  R  G  N  G  S  E  A  H  R  V  P  C  S
 601  CTGGTTCCAAGTCCTCATCCTGAGAGGTAACGGGTCGGAGGCGCACCGCGTGCCCTGCTC
      · C  Y  N  L  S  A  T  N  D  S  T  I  L  D  K  V  I  L  P  Q
 661  CTGCTACAACTTGTCGGCGACCAACGACTCCACAATCCTAGATAAGGTGATCTTGCCCCA
      · L  S  R  L  G  H  L  A  R  S  R  H  S  A  D  I  C  A  V  P
 721  GCTCAGCAGGCTTGGACACCTGGCGCGGTCCAGACACAGTGCAGACATCTGCGCTGTCCC
      · A  E  S  H  I  Y  R  E  G  C  A  Q  G  L  Q  K  W  L  H  N
 781  TGCAGAGAGCCACATCTACCGCGAGGGCTGCGCGCAGGGCCTCCAGAAGTGGCTGCACAA
      · N  L  I  S  I  V  G  I  C  L  G  V  G  L  L  E  L  G  F  M
 841  CAACCTTATTTCCATAGTGGGCATTTGCCTGGGCGTCGGCCTACTCGAGCTCGGGTTCAT
      · T  L  S  I  F  L  C  R  N  L  D  H  V  Y  N  R  L  A  R  Y
 901  GACGCTCTCGATATTCCTGTGCAGAAACCTGGACCACGTCTACAACCGGCTCGCTCGATA
```

Figure 1 (continued)

```
        · R  *
 961  CCGTTAGGCCCCGCCCTCCCCAAAGTCCCGCCCCGCCCCCGTCACGTGCGCTGGGCACTT
1021  CCCTGCTGCCTGTAAATATTTGTTTAATCCCCAGTTCGCCTGGAGCCCTCCGCCTTCACA
1081  TTCCCCTGGGGACCCACGTGGCTGCGTGCCCCTGCTGCTGTCACCTCTCCCACGGGACCT
1141  GGGGCTTTCGTCCACAGCTTCCTGTCCCCATCTGTCGGCCTACCACCACCCACAAGATTA
1201  TTTTTCACCCAAACCTCAAATAAATCCCCTGCGTTTTTGGTAAAAAAAAAAAAAAAAAAA
1261  AAA
```

Figure 2A **The cDNA (SEQ ID NO : 3) and amino acid sequence (SEQ ID NO: 4) of HvCD37-6b15.1.1 heavy chain. Double-underlined is the heavy chain variable region, and underlined is the heavy chain human IgG2 constant region.**

```
      Q  V  Q  L  Q  Q  W  G  A  G  L  L  K  P  S  E  T  L  S  L
1     CAGGTGCAGCTACAGCAGTGGGGCGCAGGACTGTTGAAGCCTTCGGAGACCCTGTCCCTC
      T  C  A  V  Y  G  G  S  F  S  P  Y  Y  W  S  W  I  R  Q  P
61    ACCTGCGCTGTCTATGGTGGGTCCTTCAGTCCTTACTACTGGAGCTGGATCCGCCAGCCC
      P  G  K  G  L  E  W  I  G  E  I  N  H  S  G  S  T  N  Y  N
121   CCAGGGAAGGGGTTGGAGTGGATTGGGGAAATCAATCATAGTGGAAGCACCAACTACAAC
      P  S  L  K  S  R  V  T  I  S  V  D  T  S  K  N  Q  F  S  L
181   CCGTCCCTCAAGAGTCGAGTCACCATTTCAGTAGACACGTCCAAGAACCAGTTCTCCCTG
      K  L  S  S  V  T  A  A  D  T  A  V  Y  Y  C  A  R  R  A  G
241   AAGCTGAGCTCTGTGACCGCCGCGGACACGGCTGTCTATTACTGTGCGAGGAGAGCTGGG
      D  F  D  Y  W  G  Q  G  T  L  V  T  V  S  S  A  S  T  K  G
301   GACTTTGACTACTGGGGCCAGGGAACCCTGGTCACCGTCTCCTCAGCATCCACCAAGGGC
      P  S  V  F  P  L  A  P  C  S  R  S  T  S  E  S  T  A  A  L
361   CCATCGGTCTTCCCCCTGGCGCCCTGCTCCAGGAGCACCTCCGAGAGCACAGCGGCCCTG
      G  C  L  V  K  D  Y  F  P  E  P  V  T  V  S  W  N  S  G  A
421   GGCTGCCTGGTCAAGGACTACTTCCCCGAACCGGTGACGGTGTCGTGGAACTCAGGCGCT
      L  T  S  G  V  H  T  F  P  A  V  L  Q  S  S  G  L  Y  S  L
481   CTGACCAGCGGCGTGCACACCTTCCCAGCTGTCCTACAGTCCTCAGGACTCTACTCCCTC
      S  S  V  V  T  V  P  S  S  N  F  G  T  Q  T  Y  T  C  N  V
541   AGCAGCGTGGTGACCGTGCCCTCCAGCAACTTCGGCACCCAGACCTACACCTGCAACGTA
      D  H  K  P  S  N  T  K  V  D  K  T  V  E  R  K  C  C  V  E
601   GATCACAAGCCCAGCAACACCAAGGTGGACAAGACAGTTGAGCGCAAATGTTGTGTCGAG
      C  P  P  C  P  A  P  P  V  A  G  P  S  V  F  L  F  P  P  K
661   TGCCCACCGTGCCCAGCACCACCTGTGGCAGGACCGTCAGTCTTCCTCTTCCCCCCAAAA
      P  K  D  T  L  M  I  S  R  T  P  E  V  T  C  V  V  V  D  V
721   CCCAAGGACACCCTCATGATCTCCCGGACCCCTGAGGTCACGTGCGTGGTGGTGGACGTG
      S  H  E  D  P  E  V  Q  F  N  W  Y  V  D  G  V  E  V  H  N
781   AGCCACGAAGACCCCGAGGTCCAGTTCAACTGGTACGTGGACGGCGTGGAGGTGCATAAT
      A  K  T  K  P  R  E  E  Q  F  N  S  T  F  R  V  V  S  V  L
841   GCCAAGACAAAGCCACGGGAGGAGCAGTTCAACAGCACGTTCCGTGTGGTCAGCGTCCTC
      T  V  V  H  Q  D  W  L  N  G  K  E  Y  K  C  K  V  S  N  K
901   ACCGTTGTGCACCAGGACTGGCTGAACGGCAAGGAGTACAAGTGCAAGGTCTCCAACAAA
      G  L  P  A  P  I  E  K  T  I  S  K  T  K  G  Q  P  R  E  P
961   GGCCTCCCAGCCCCCATCGAGAAAACCATCTCCAAAACCAAAGGGCAGCCCCGAGAACCA
      Q  V  Y  T  L  P  P  S  R  E  E  M  T  K  N  Q  V  S  L  T
1021  CAGGTGTACACCCTGCCCCCATCCCGGGAGGAGATGACCAAGAACCAGGTCAGCCTGACC
      C  L  V  K  G  F  Y  P  S  D  I  A  V  E  W  E  S  N  G  Q
1081  TGCCTGGTCAAAGGCTTCTACCCCAGCGACATCGCCGTGGAGTGGGAGAGCAATGGGCAG
      P  E  N  N  Y  K  T  T  P  P  M  L  D  S  D  G  S  F  F  L
1141  CCGGAGAACAACTACAAGACCACACCTCCCATGCTGGACTCCGACGGCTCCTTCTTCCTC
      Y  S  K  L  T  V  D  K  S  R  W  Q  Q  G  N  V  F  S  C  S
1201  TACAGCAAGCTCACCGTGGACAAGAGCAGGTGGCAGCAGGGGAACGTCTTCTCATGCTCC
      V  M  H  E  A  L  H  N  H  Y  T  Q  K  S  L  S  L  S  P  G
1261  GTGATGCATGAGGCTCTGCACAACCACTACACGCAGAAGAGCCTCTCCCTGTCTCCGGGT
      K  *
1321  AAATAA
```

Figure 2B **The cDNA (SEQ ID NO : 5) and amino acid sequence (SEQ ID NO: 6) of HvCD37-6b15.1.1 light chain. Double-underlined is the light chain variable region, and underlined is the human kappa constant region.**

```
     D  I  Q  M  T  Q  S  P  S  T  L  S  A  S  V  G  D  R  V  T
   1 GACATCCAGATGACCCAGTCTCCTTCCACCCTGTCTGCATCTGTTGGAGACAGAGTCACC
     I  T  C  R  A  S  Q  S  I  S  S  W  L  A  W  Y  Q  Q  K  P
  61 ATCACTTGCCGGGCCAGTCAGAGTATTAGTAGCTGGTTGGCCTGGTATCAGCAGAAACCA
     G  K  A  P  K  L  L  I  Y  K  A  S  S  L  E  S  G  V  P  S
 121 GGGAAAGCCCCTAAGCTCCTGATCTATAAGGCGTCTAGTTTAGAAAGTGGGGTCCCATCA
     R  F  S  G  S  G  S  G  T  E  F  T  L  T  I  S  S  L  Q  P
 181 AGGTTTAGCGGCAGTGGATCTGGGACAGAATTCACTCTCACCATCAGCAGCCTGCAGCCT
     D  D  F  A  T  Y  Y  C  Q  Q  Y  N  S  Y  I  F  G  Q  G  T
 241 GATGATTTTGCAACTTATTACTGCCAACAGTATAATAGTTACATTTTTGGCCAGGGGACC
     K  L  E  I  K  R  T  V  A  A  P  S  V  F  I  F  P  P  S  D
 301 AAGCTGGAGATCAAACGGACTGTGGCTGCACCATCTGTCTTCATCTTCCCGCCATCTGAT
     E  Q  L  K  S  G  T  A  S  V  V  C  L  L  N  N  F  Y  P  R
 361 GAGCAGTTGAAATCTGGAACTGCCTCTGTTGTGTGCCTGCTGAATAACTTCTATCCCAGA
     E  A  K  V  Q  W  K  V  D  N  A  L  Q  S  G  N  S  Q  E  S
 421 GAGGCCAAAGTACAGTGGAAGGTGGATAACGCCCTCCAATCGGGTAACTCCCAGGAGAGT
     V  T  E  Q  D  S  K  D  S  T  Y  S  L  S  S  T  L  T  L  S
 481 GTCACAGAGCAGGACAGCAAGGACAGCACCTACAGCCTCAGCAGCACCCTGACGCTGAGC
     K  A  D  Y  E  K  H  K  V  Y  A  C  E  V  T  H  Q  G  L  S
 541 AAAGCAGACTACGAGAAACACAAAGTCTACGCCTGCGAAGTCACCCATCAGGGCCTGAGC
     S  P  V  T  K  S  F  N  R  G  E  C  *
 601 TCGCCCGTCACAAAGAGCTTCAACAGGGGAGAGTGTTAG
```

Figure 3A The amino acid sequence (SEQ ID NO: 7) of HvCD37-6b15.1.1 heavy chain. Double-underlined is the heavy chain variable region, and underlined is the human IgG2 constant region.

1 QVQLQQWGAGLLKPSETLSLTCAVYGGSFSPYYWSWIRQPPGKGLEWIGE

51 INHSGSTNYNPSLKSRVTISVDTSKNQFSLKLSSVTAADTAVYYCARRAG

101 DFDYWGQGTLVTVSSASTKGPSVFPLAPCSRSTSESTAALGCLVKDYFPE

151 PVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSNFGTQTYTCNV

201 DHKPSNTKVDKTVERKCCVECPPCPAPPVAGPSVFLFPPKPKDTLMISRT

251 PEVTCVVVDVSHEDPEVQFNWYVDGVEVHNAKTKPREEQFNSTFRVVSVL

301 TVVHQDWLNGKEYKCKVSNKGLPAPIEKTISKTKGQPREPQVYTLPPSRE

351 EMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPMLDSDGSFFL

401 YSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK

Figure 3B **The amino acid sequence (SEQ ID NO: 8) of HvCD37-6b15.1.1 light chain. Double-underlined is the light chain variable region, and underlined is the human kappa constant region.**

1 DIQMTQSPSTLSASVGDRVTITCRASQSISSWLAWYQQKPGKAPKLLIYK

51 ASSLESGVPSRFSGSGSGTEFTLTISSLQPDDFATYYCQQYNSYIFGQGT

101 KLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDN

151 ALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLS

201 SPVTKSFNRGEC

Figure 4A: Alignment of HvCD37-6b15.1.1 heavy chain to human Ig germline.

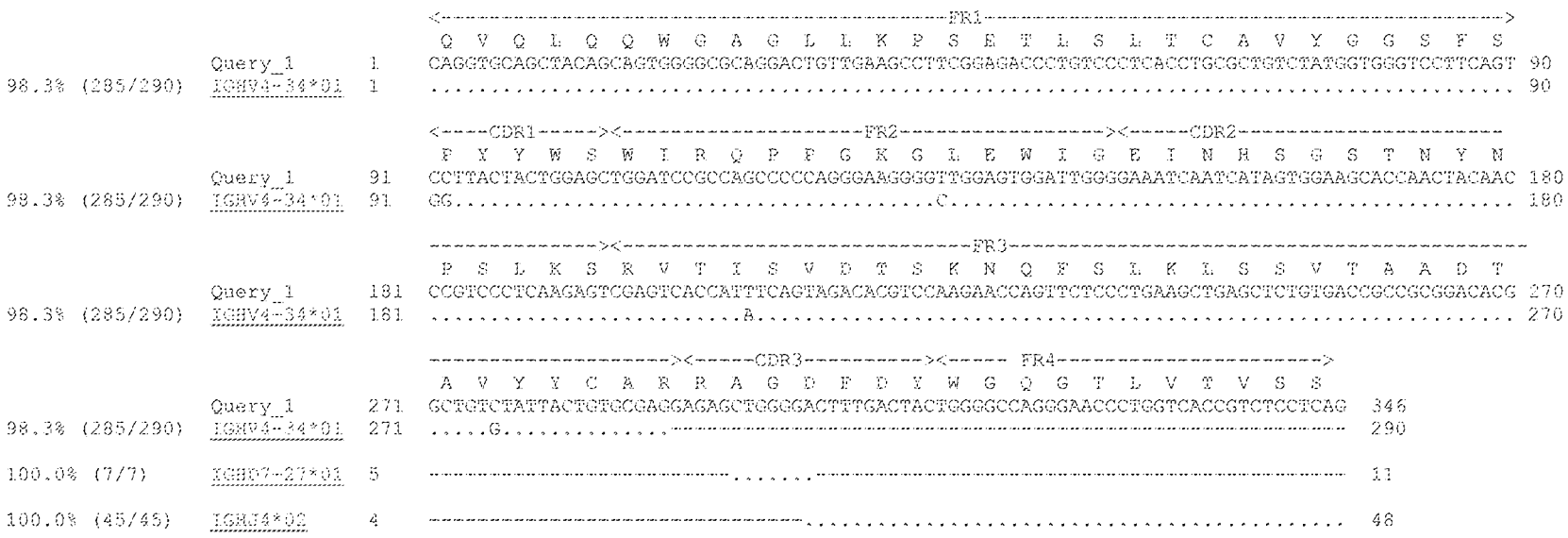


Figure 4B: Alignment of HvCD37-6b15.1.1 light chain to human Ig germline.

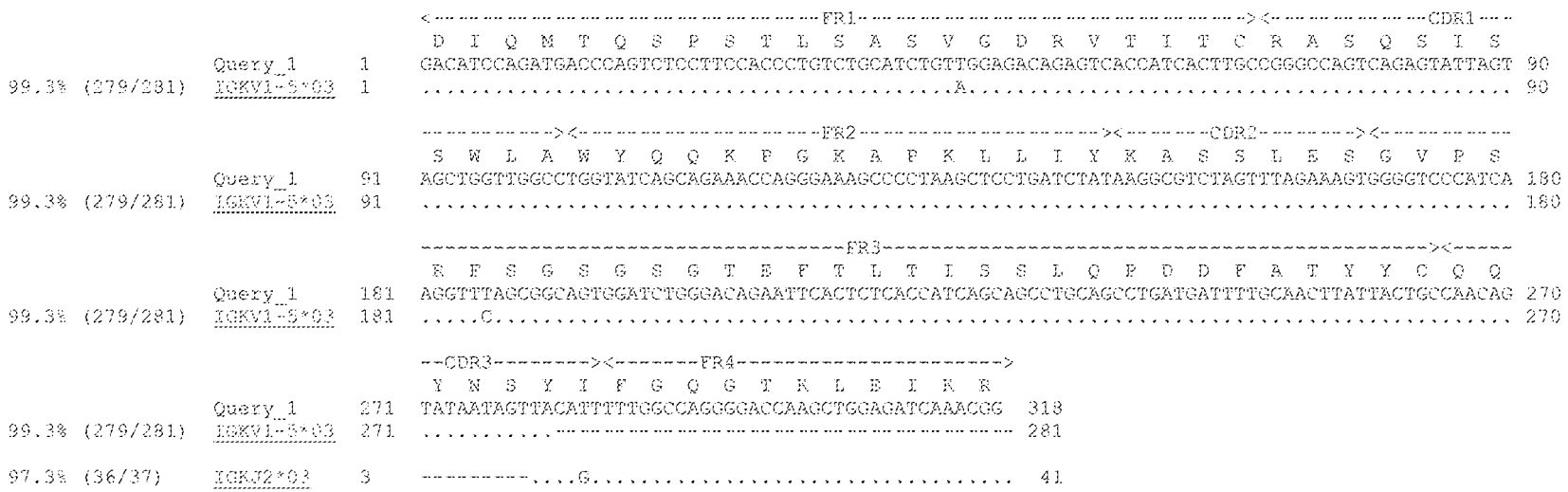


Figure 5. Efficacy study of HvCD37-6b15.1.1.vcMMAE in subcutaneously established human follicular B cell lymphoma **DoHH2** implanted in CB17/SCID mice.

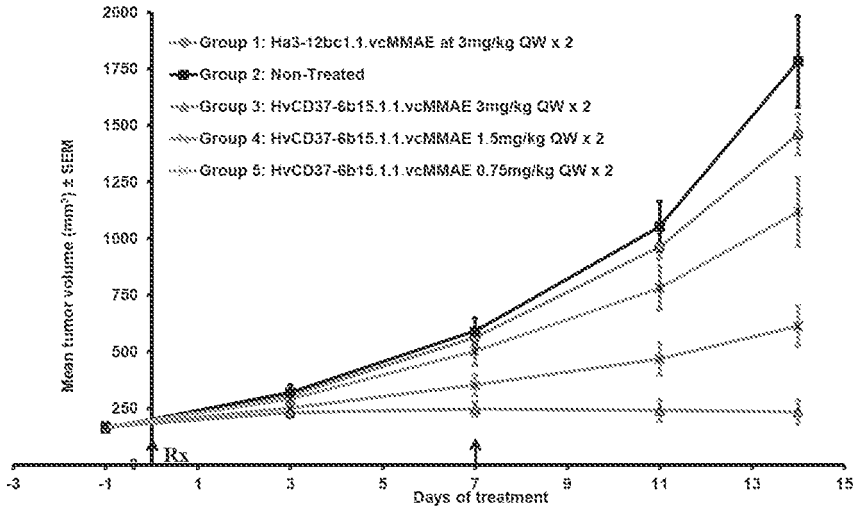


Figure 6. Efficacy Study of HvCD37-6b15.1.1.vcMMAE in Subcutaneously Established Xenograft Model of Human Lymphoma **Ramos-RR-XCL** implanted in CB17/SCID Mice.

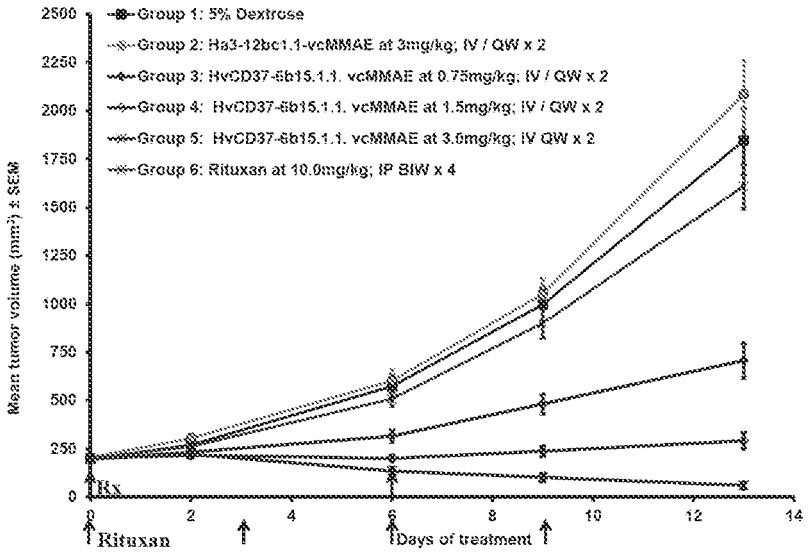


Figure 7. Efficacy study of HvCD37-6b15.1.1.vcMMAE in subcutaneously established human ***chronic lymphocytic leukemia JVM3*** implanted in CB17/SCID mice.

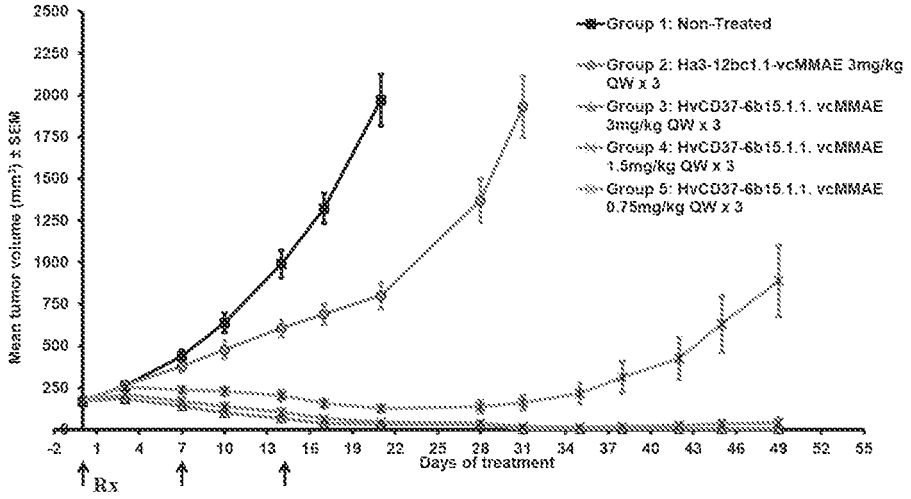


Figure 8. Efficacy study of HvCD37-6b15.1.1.vcMMAE in subcutaneously established human ***Acute Myelogenous Leukemia MV-4-11*** implanted in CB17/SCID mice.

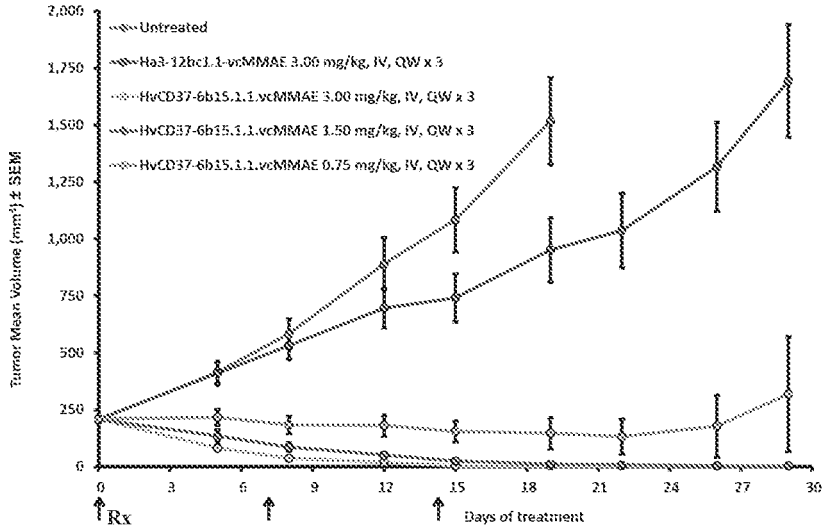


Figure 9. Efficacy study of HvCD37-6b15.1.1vcMMAE in subcutaneously established human Rituxan resistant lymphoma cell line Ramos-RR-XCL implanted in SCID mice

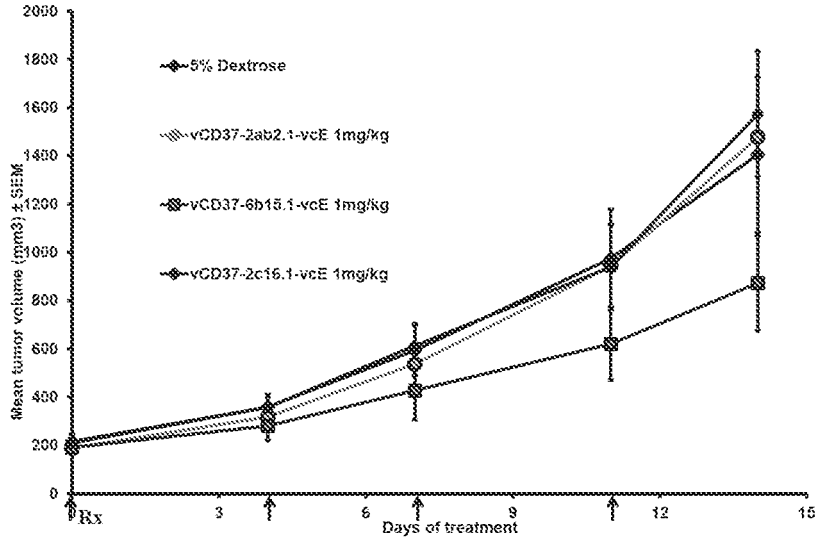
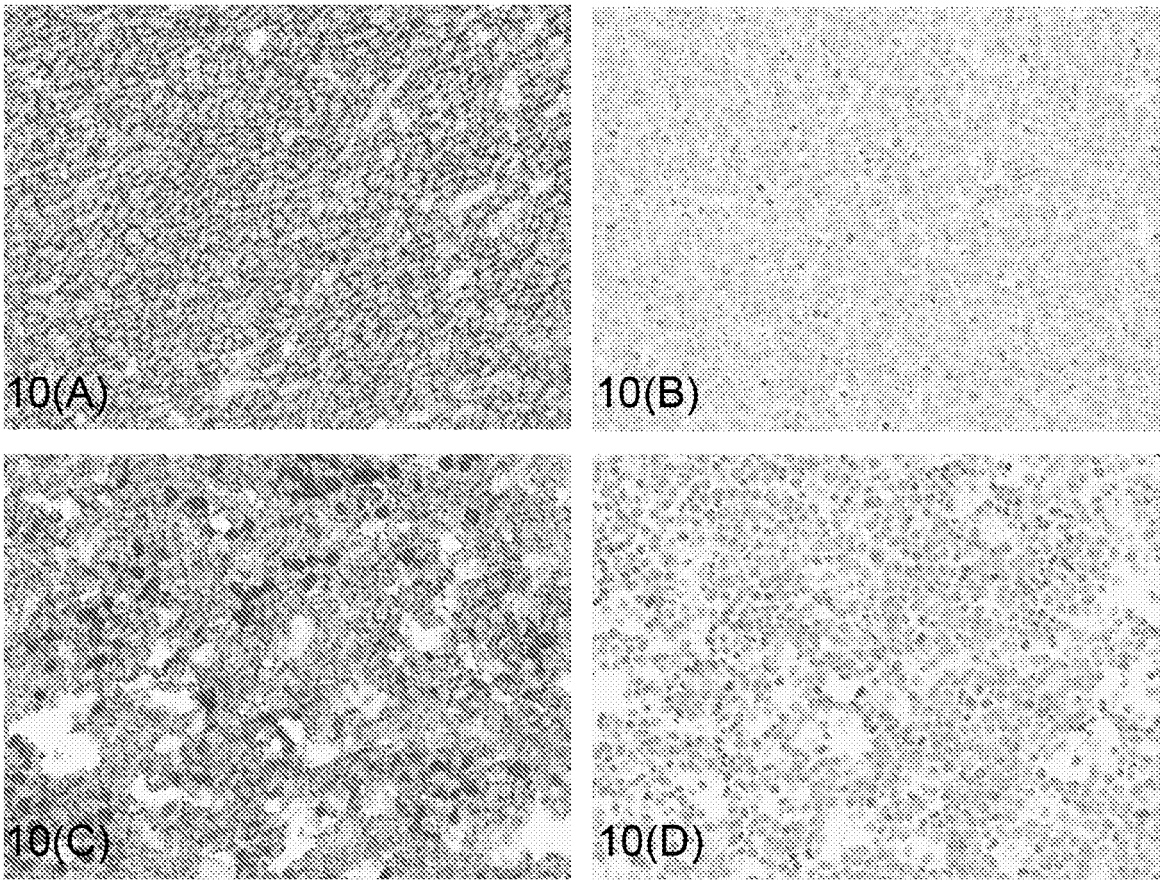


Figure 10



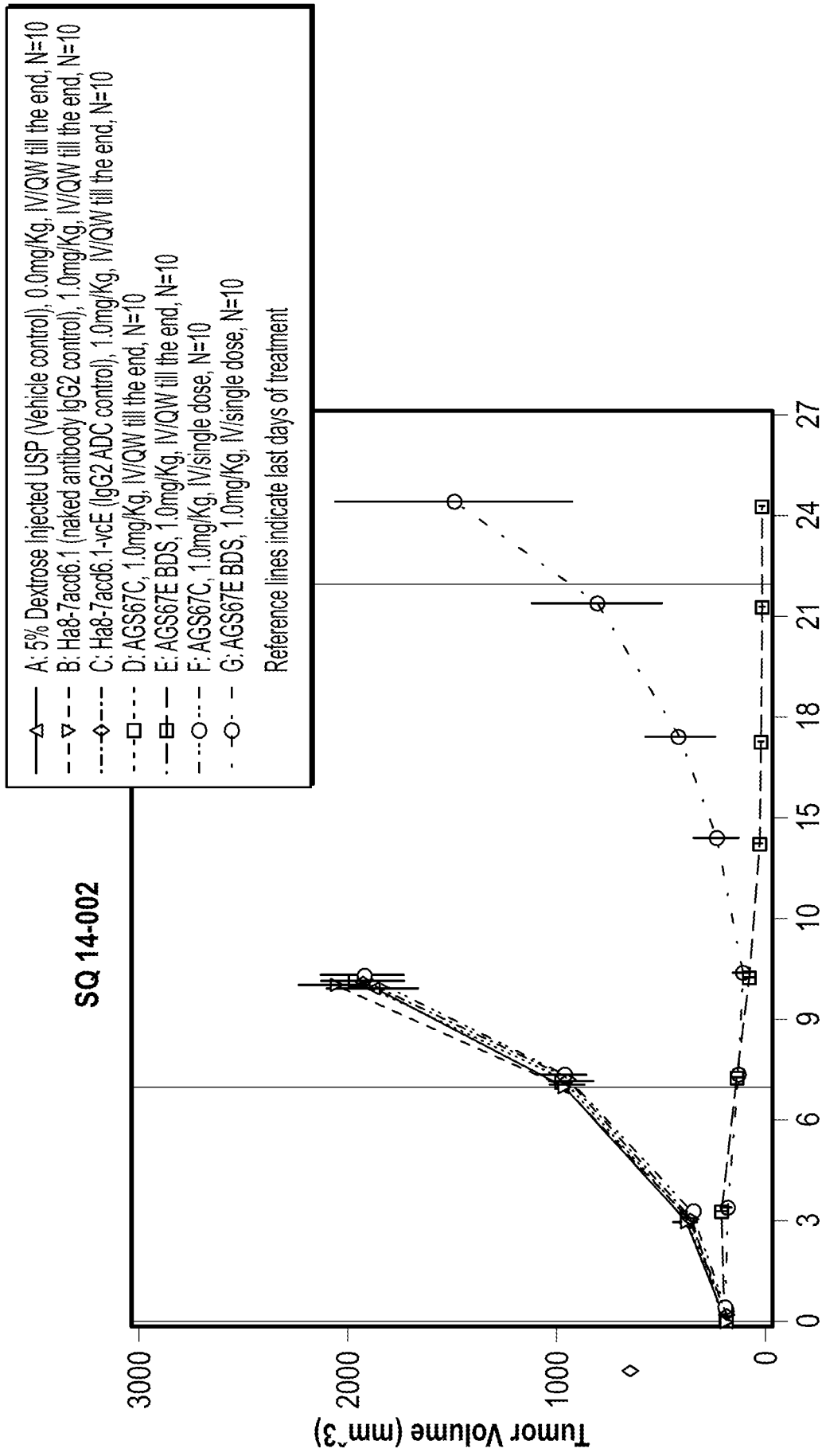

A: 5% Dextrose Injected USP (Vehicle control), 0.0mg/Kg, IV/QW till the end, N=10
B: Ha8-7acd6.1 (naked antibody IgG2 control), 1.0mg/Kg, IV/QW till the end, N=10
C: Ha8-7acd6.1-vcE (IgG2 ADC control), 1.0mg/Kg, IV/QW till the end, N=10
D: AGS67C, 1.0mg/Kg, IV/QW till the end, N=10
E: AGS67E BDS, 1.0mg/Kg, IV/QW till the end, N=10
F: AGS67C, 1.0mg/Kg, IV/single dose, N=10
G: AGS67E BDS, 1.0mg/Kg, IV/single dose, N=10
Reference lines indicate last days of treatment
SQ 14-002
Tumor Volume (mm^3)
3000
2000
1000
0
0
3
6
9
10
15
18
21
24
27
Time (Day)

FIG. 11