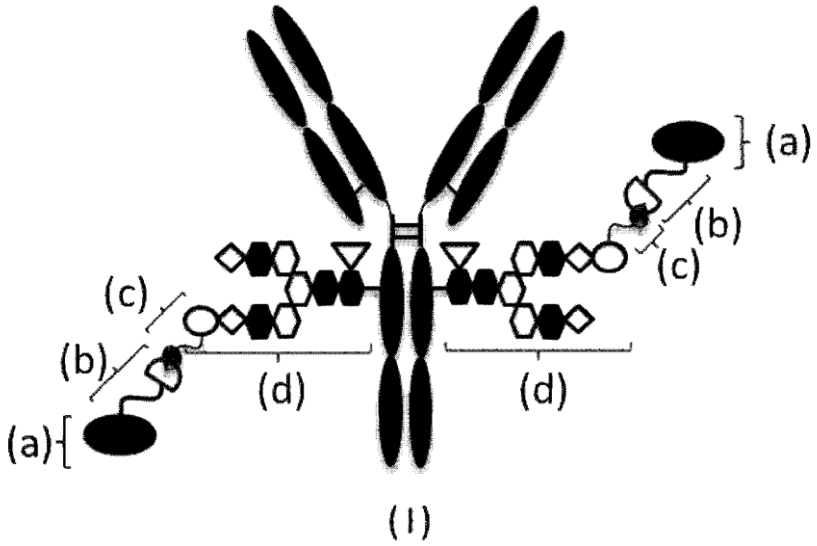
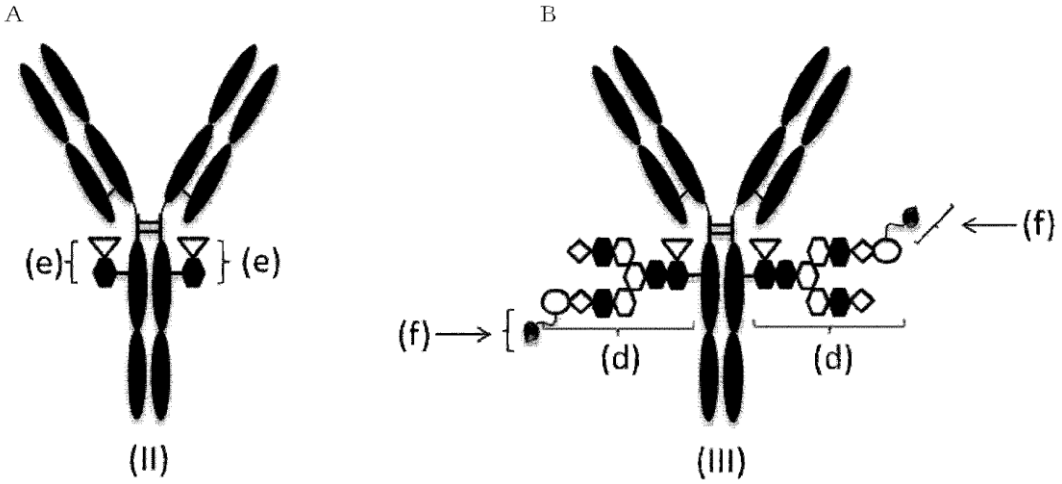
[Figure 1]



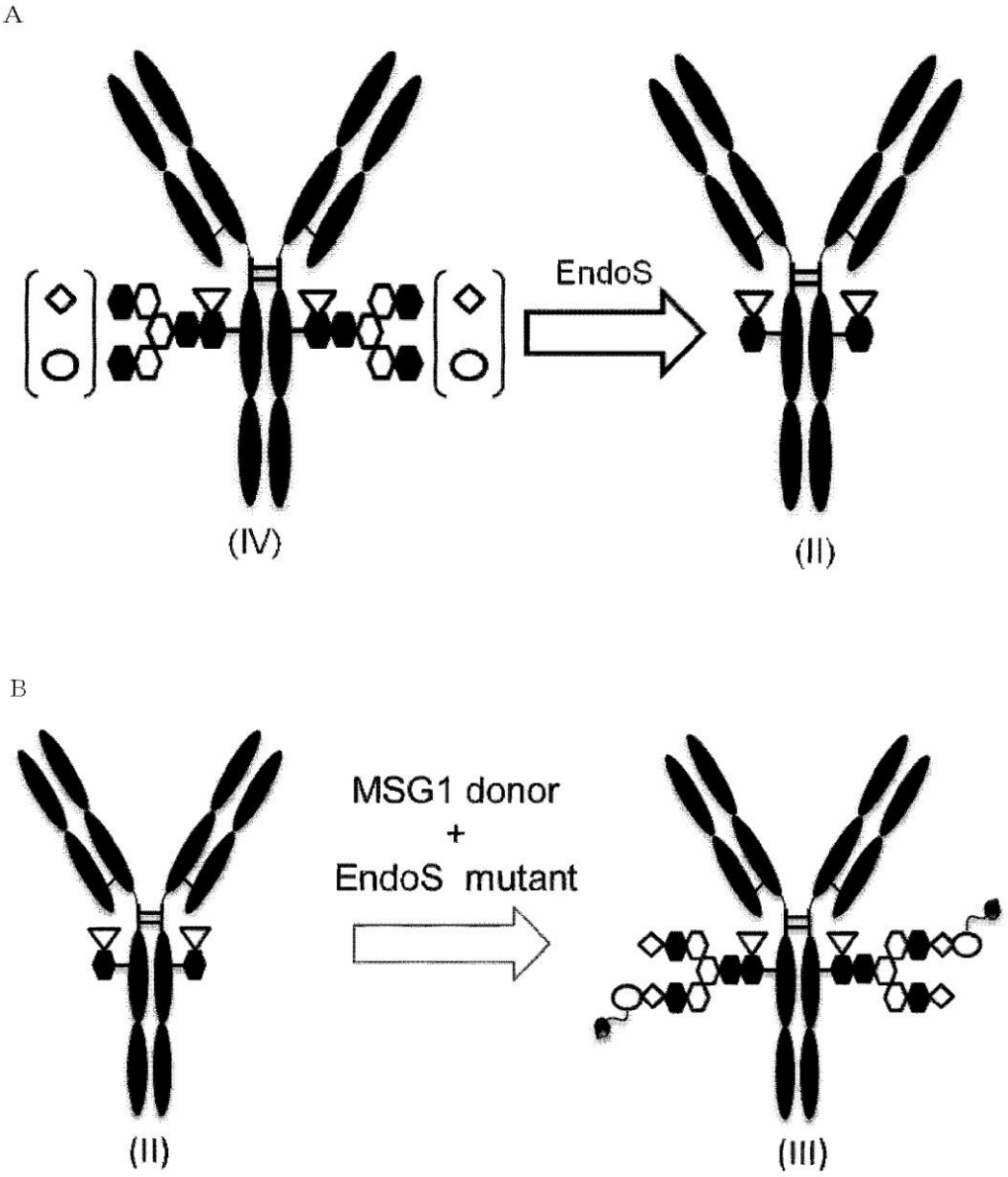

(I)

[Figure 2]

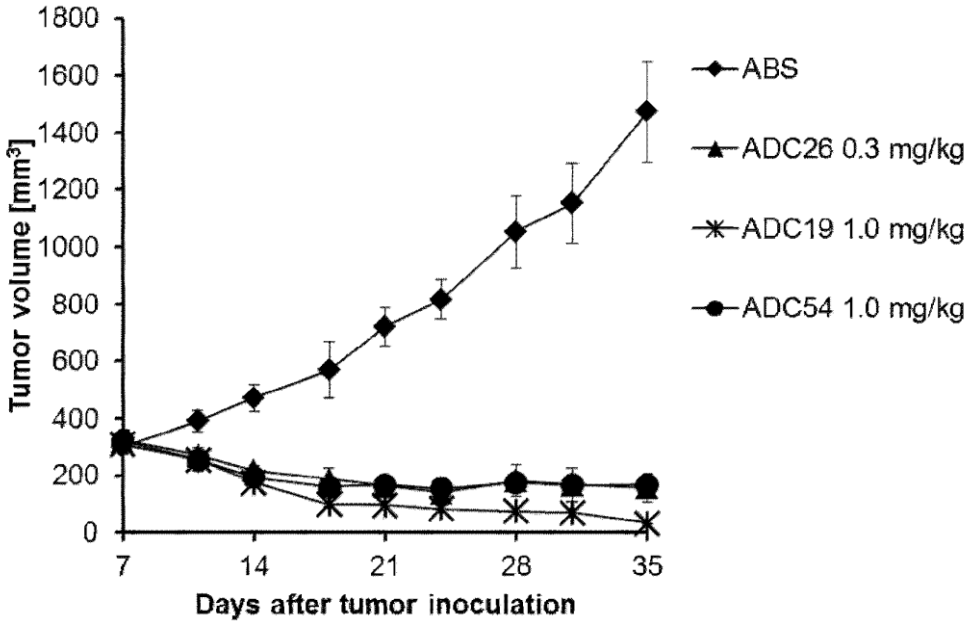



(II) (III)

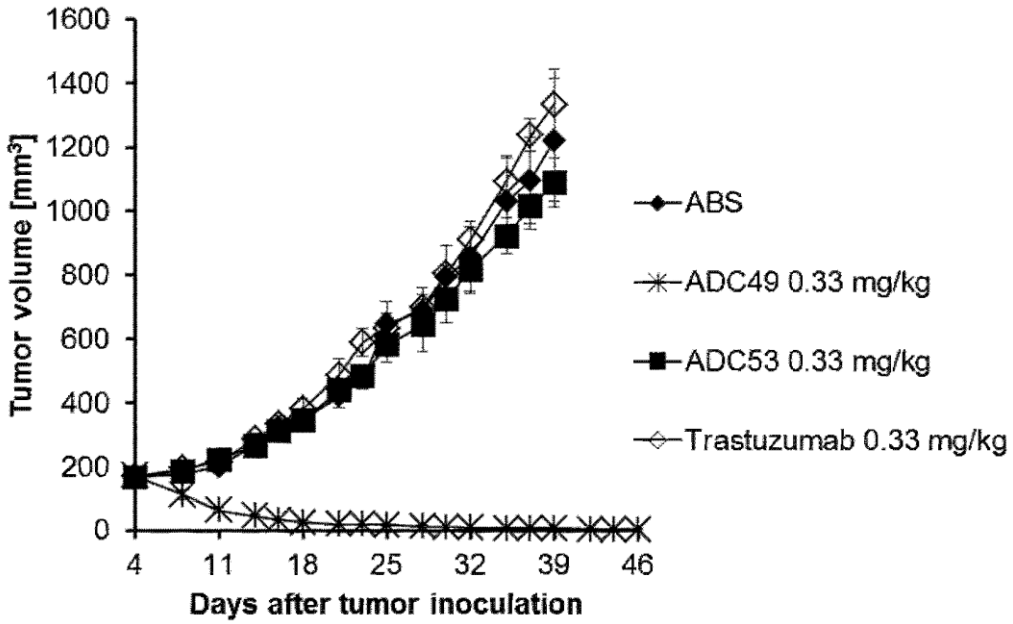
[Figure 3]



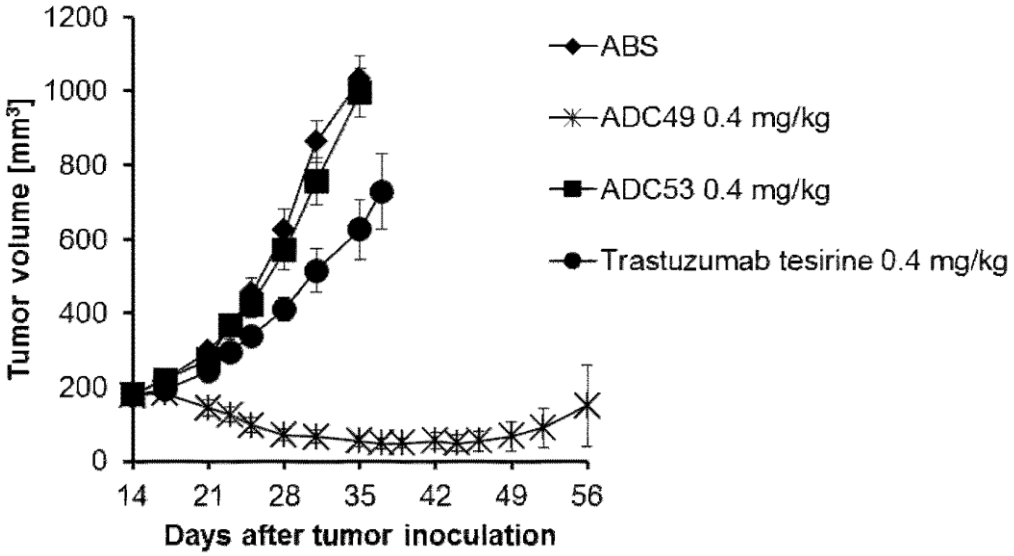
[Figure 4]



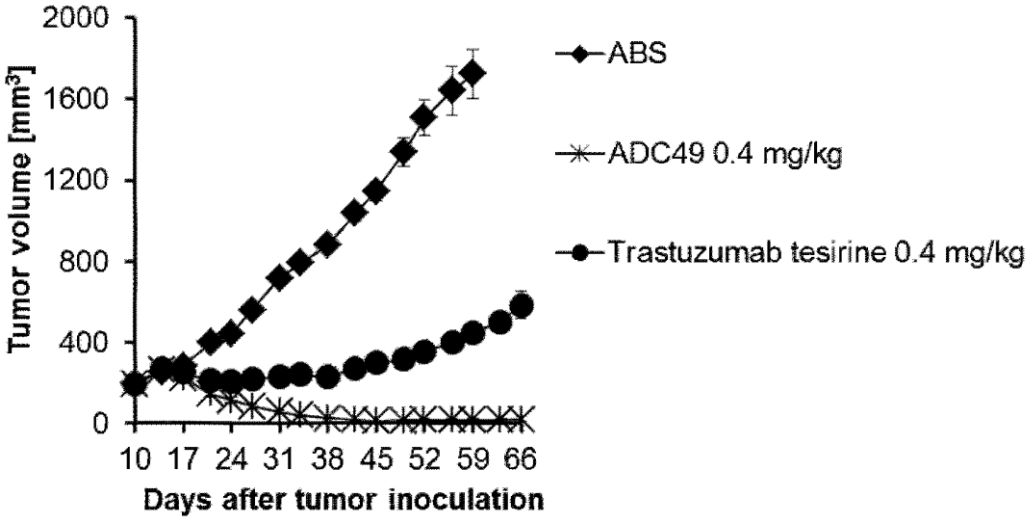

[Figure 5]



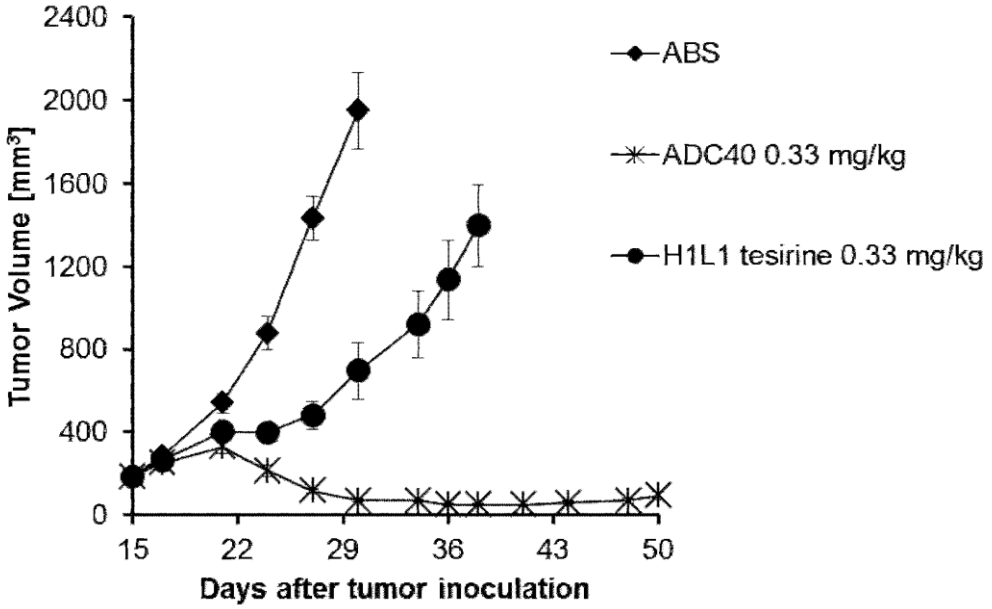
[Figure 6]



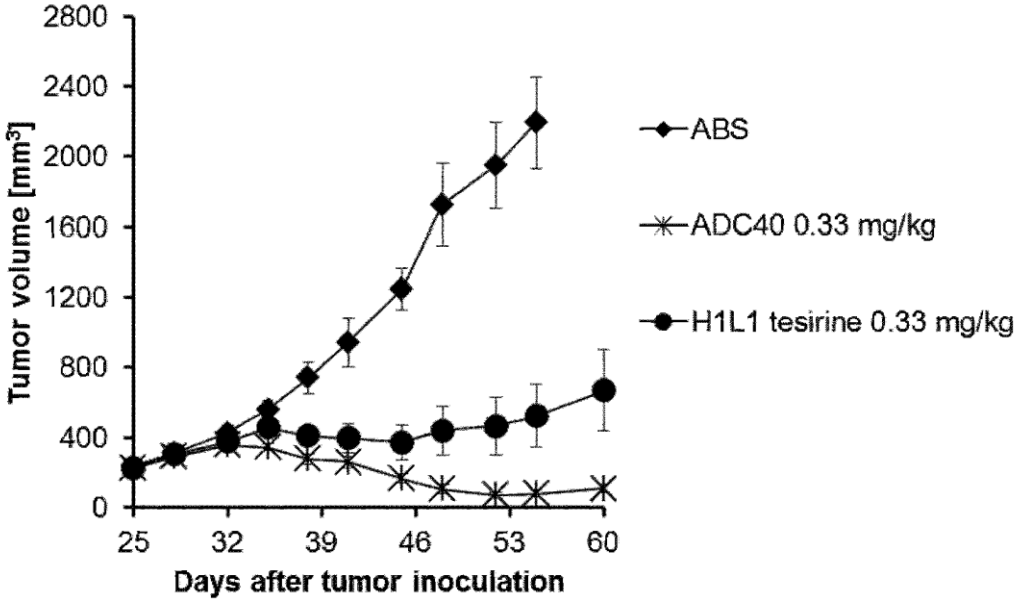

[Figure 7]



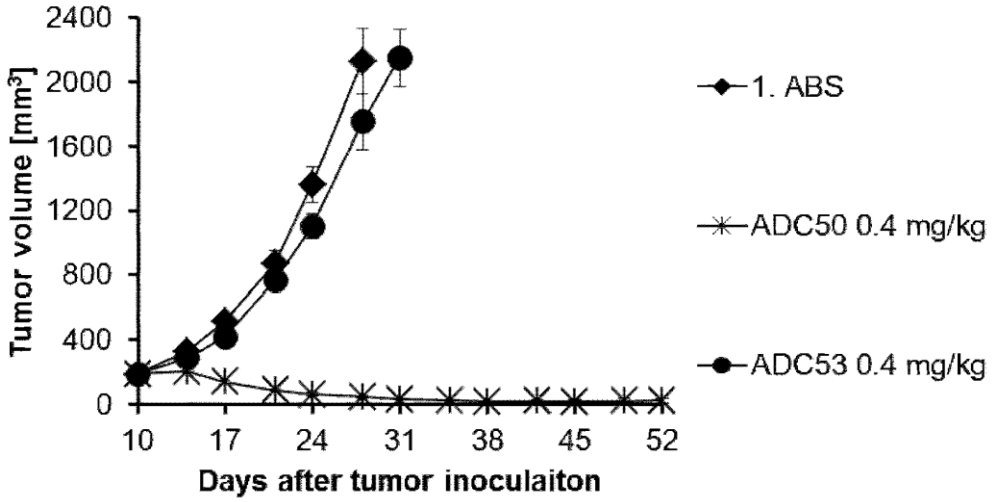
[Figure 8]




[Figure 9]



[Figure 10]




[Figure 11]

Full-length amino acid sequence of human CLDN6 (SEQ ID NO: 1)

MASAGMQILGVVLTLLGWVNGLVSCALPMWKVTAFIGNSIVVAQVVWEGLWMSCVVQSTGQMQCKVYDSL
LALPQDLQAARALCVIALLVALFGLLVYLAGAKCTTCVEEKDSKARLVLTSGIVFVISGVLTLIPVCWTA
HAIIRDFYNPLVAEAQKRELGASLYLGWAASGLLLLGGGLLCCTCPSGGSQGPSHYMARYSTSAPAISRG
PSEYPTKNYV

Nucleotide sequence of full-length cDNA for human CLDN6 (SEQ ID NO: 2)

atggcctctgccggaatgcagatcctgggagtcgtcctgacactgctgggctgggtgaatggcctggtct
cctgtgccctgcccatgtggaaggtgaccgctttcatcggcaacagcatcgtggtggcccaggtggtgtg
ggagggcctgtggatgtcctgcgtggtgcagagcaccggccagatgcagtgcaaggtgtacgactcactg
ctggcgctgccacaggacctgcaggctgcacgtgccctctgtgtcatcgccctccttgtggccctgttcg
gcttgctggtctaccttgctggggccaagtgtaccacctgtgtggaggagaaggattccaaggcccgcct
ggtgctcacctctgggattgtctttgtcatctcaggggtcctgacgctaatccccgtgtgctggacggcg
catgccatcatccgggacttctataacccccctggtggctgaggcccaaaagcgggagctgggggcctccc
tctacttgggctgggcggcctcaggcctttgttgctgggtgggggttgctgtgctgcacttgcccctc
gggggggtcccagggccccagccattacatggcccgctactcaacatctgcccctgccatctctcggggg
ccctctgagtaccctaccaagaattacgtctga

[Figure 12]

Full-length amino acid sequence of human CLDN9 (SEQ ID NO: 3)

MASTGLELLGMTLAVLGWLGTLVSCALPLWKVTAFIGNSIVVAQVVWEGLWMSCVVQSTGQMQCKVY
DSLLALPQDLQAARALCVIALLLALLGLLVAITGAQCTTCVEDEGAKARIVLTAGVILLLAGILVLI
PVCWTAHAIIQDFYNPLVAEALKRELGASLYLGWAAAALLMLGGGLLCCTCPPPQVERPRGPRLGYS
IPSRSGASGLDKRDYV

Nucleotide sequence of full-length cDNA for human CLDN9 (SEQ ID NO: 4)

atggcttcgaccggcttagaactgctgggcatgaccctggctgtgctgggctggctggggaccctgg
tgtcctgcgccctgcccctgtggaaggtgaccgccttcatcggcaacagcatcgtggtggcccaggt
ggtgtgggagggcctgtggatgtcctgcgtggtgcagagcacgggccagatgcagtgcaaggtgtac
gactcactgctggctctgccgcaggacctgcaggccgcacgtgccctctgtgtcattgccctcctgc
tggccctgcttggcctcctggtggccatcacaggtgcccagtgtaccacgtgtgtggaggacgaagg
tgccaaggcccgtatcgtgctcaccgcgggggtcatcctcctcctcgccggcatcctggtgctcatc
cctgtgtgctggacggcgcacgccatcatccaggacttctacaacccccctggtggctgaggccctca
agcgggagctgggggcctccctctacctgggctgggcggcggctgcactgcttatgctgggcggggg
gctcctctgctgcacgtgcccccccgccccaggtcgagcggccccgcggacctcggctgggctactcc
atcccctcccgctcgggtgcatctggactggacaagagggactacgtgtga

[Figure 13]

Amino acid sequence of CDRL1 of B1 antibody light chain (SEQ ID NO: 5)

RASQDINNYLN

Amino acid sequence of CDRL2 of B1 antibody light chain (SEQ ID NO: 6)

FTSRLHS

Amino acid sequence of CDRL3 of B1 antibody light chain (SEQ ID NO: 7)

QQGYPLPWT

[Figure 14]

Amino acid sequence of CDRL3 of humanized B1 antibody light chain L4 (SEQ ID NO: 8)

QQGNTLPWT

[Figure 15]

Amino acid sequence of CDRH1 of B1 antibody heavy chain (SEQ ID NO: 9)

GYTFTEYTMH

Amino acid sequence of CDRH2 of B1 antibody heavy chain (SEQ ID NO: 10)

GVNPNSGDTS

Amino acid sequence of CDRH3 of B1 antibody heavy chain (SEQ ID NO: 11)

PGGYDVGYYAMDY

[Figure 16]

Amino acid sequence of CDRL1 of C7 antibody light chain (SEQ ID NO: 12)

RASQDINNYLN

Amino acid sequence of CDRL2 of C7 antibody light chain (SEQ ID NO: 13)

STSRLHS

Amino acid sequence of CDRL3 of C7 antibody light chain (SEQ ID NO: 14)

QQGYPLPWT

[Figure 17]

Amino acid sequence of CDRH1 of C7 antibody heavy chain (SEQ ID NO: 15)

GYTFTEYTMH

Amino acid sequence of CDRH2 of C7 antibody heavy chain (SEQ ID NO: 16)

GVNPNSGDTS

Amino acid sequence of CDRH3 of C7 antibody heavy chain (SEQ ID NO: 17)

PGGYDVGYYAMDY

[Figure 18]

Nucleotide sequence of cDNA encoding variable region of B1 antibody light chain (SEQ ID NO: 18)

GATATCCAGATGACACAGACTGCATCCTCCCTGTCTGCCTCTCTTGGAGACAGAGTCACCATCAGTT
GCAGGGCAAGTCAGGACATTAACAATTATTTAAACTGGTATCAGCAGAAACCAGATGGAACTGTTAA
ACTCCTGATCTACTTCACATCAAGATTACACTCAGGAGTCCCATCAAGGTTCAGTGGCAGTGGGTCT
GGAACACATTATTCTCTCACCATTACTAACCTGGAACAAGAAGATATTGCCACTTACTTTTGCCAAC
AGGGTTATCCGCTTCCGTGGACGTTCGGTGGAGGCACCAAACTGGAAATCAAA

Amino acid sequence of variable region of B1 antibody light chain (SEQ ID NO: 19)

DIQMTQTASSLSASLGDRVTISCRASQDINNYLNWYQQKPDGTVKLLIYFTSRLHSGVPSRFSGSGS
GTHYSLTITNLEQEDIATYFCQQGYPLPWTFGGGTKLEIK

[Figure 19]

Nucleotide sequence of cDNA encoding variable region of B1 antibody heavy chain (SEQ ID NO: 20)

GAGGTCCAGCTTCAACAGTCTGGACCTGAACTGGTGAAGCCTGGGGCTTCAGTGAAGATATCCTGCA
AGACTTCTGGATACACATTCACTGAATACACCATGCACTGGGTGCAGCAGAGCCATGGAAAGAGCCT
TGAGTGGATTGGAGGTGTTAATCCTAATAGTGGTGATACTAGCTACAACCAGAAGTTCAAGGGCAAG
GCCACATTGACTGTTGACAAGTCCTCCAGCACAGCCTACATGGAGCTCCGCAGCCTGACATCTGAGG
ATTCTGCAGTCTATTACTGTGCAAGACCCGGGGGGTACGACGTGGGTTACTATGCTATGGACTACTG
GGGTCAAGGAACCTCAGTCACCGTCTCCTCA

Amino acid sequence of variable region of B1 antibody heavy chain (SEQ ID NO: 21)

EVQLQQSGPELVKPGASVKISCKTSGYTFTEYTMHWVQQSHGKSLEWIGGVNPNSGDTSYNQKFKGK
ATLTVDKSSSTAYMELRSLTSEDSAVYYCARPGGYDVGYYAMDYWGQGTSVTVSS

[Figure 20]

Nucleotide sequence of cDNA encoding variable region of C7 antibody light chain (SEQ ID NO: 22)

GATATCCAGATGACACAGACTGCATCCTCCCTGTCTGCCTCTCTTGGAGACAGAGTCACCATCAGTT
GCAGGGCAAGTCAGGACATTAACAATTATTTAAACTGGTATCAGCAGAAACCAGATGGAACTGTTAA
ACTCCTGATCTACTCCACATCAAGATTACACTCAGGAGTCCCATCAAGGTTCAGTGGCAGTGGGTCT
GGAACACATTATTCTCTCACCATTACTCACCTGGAACAAGAAGATATTGCCACTTACTTTTGCCAAC
AGGGTTATCCGCTTCCGTGGACGTTCGGTGGAGGCACCAAACTGGAAATCAAA

Amino acid sequence of variable region of C7 antibody light chain (SEQ ID NO: 23)

DIQMTQTASSLSASLGDRVTISCRASQDINNYLNWYQQKPDGTVKLLIYSTSRLHSGVPSRFSGSGS
GTHYSLTITHLEQEDIATYFCQQGYPLPWTFGGGTKLEIK

[Figure 21]

Nucleotide sequence of cDNA encoding variable region of C7 antibody heavy chain (SEQ ID NO: 24)

GAGGTCCAGCTTCAACAGTCTGGACCTGAACTGGTGAAGCCTGGGGCTTCAGTGAAGATATCCTGCA
AGACTTCTGGATACACATTCACTGAATACACCATGCACTGGGTGCAGCAGAGCCATGGAAAGAGCCT
TGAGTGGATTGGAGGTGTTAATCCTAATAGTGGTGATACTAGCTACAACCAGAAGTTCAAGGGCAAG
GCCACATTGACTGTTGACAAGTCCTCCAGCACAGCCTACATGGAGCTCCGCAGCCTGACATCTGAGG
ATTCTGCAGTCTATTACTGTGCAAGACCCGGGGGGTACGACGTGGGTTACTATGCTATGGACTACTG
GGGTCAAGGAACCTCAGTCACCGTCTCCTCA

Amino acid sequence of variable region of C7 antibody heavy chain (SEQ ID NO: 25)

EVQLQQSGPELVKPGASVKISCKTSGYTFTEYTMHWVQQSHGKSLEWIGGVNPNSGDTSYNQKFKGK
ATLTVDKSSSTAYMELRSLTSEDSAVYYCARPGGYDVGYYAMDYWGQGTSVTVSS

[Figure 22]

Amino acid sequence of chB1 light chain (SEQ ID NO: 28)

MVLQTQVFISLLLWISGAYGDIQMTQTASSLSASLGDRVTISCRASQDINNYLNWYQQKPDGTVKLL
IYFTSRLHSGVPSRFSGSGSGTHYSLTITNLEQEDIATYFCQQGYPLPWTFGGGTKLEIKRAVAAPS
VFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTL
SKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

Signal sequence (1 - 20), Light chain variable region (21 - 127), Light chain constant region (128 - 234)

DNA fragment including DNA sequence encoding amino acid sequence of chB1 light chain (SEQ ID NO: 29)

ccagcctccggactctagagccaccATGGTGCTGCAGACCCAGGTGTTCATCAGCCTGCTGCTGTGG
ATCAGCGGCGCCTACGGCGACATCCAGATGACCCAGACAGCCAGCAGCCTGAGCGCCAGCCTGGGCG
ATAGAGTGACCATCAGCTGCAGAGCCAGCCAGGACATCAACAACTACCTGAACTGGTATCAGCAGAA
ACCCGACGGCACCGTGAAGCTGCTGATCTACTTCACCAGCAGACTGCACAGCGGCGTGCCCAGCAGA
TTTTCTGGCAGCGGCTCTGGCACCCACTACAGCCTGACCATCACCAACCTGGAACAGGAAGATATCG
CTACCTACTTCTGTCAGCAAGGCTACCCCCTGCCCTGGACCTTTGGCGGCGGAACAAAGCTGGAAAT
CAAGCGGGCCGTGGCCGCTCCCTCCGTGTTCATCTTTCCACCCAGCGACGAGCAGCTGAAGTCCGGC
ACAGCTAGCGTCGTGTGCCTGCTGAACAACTTCTACCCCCGCGAGGCCAAGGTGCAGTGGAAGGTGG
ACAATGCCCTGCAGAGCGGCAACAGCCAGGAAAGCGTGACCGAGCAGGACAGCAAGGACTCCACCTA
CTCCCTGAGCAGCACCCTGACCCTGAGCAAGGCCGACTACGAGAAGCACAAGGTGTACGCCTGCGAA
GTGACCCACCAGGGCCTGTCTAGCCCCGTGACCAAGAGCTTCAACCGGGGCGAGTGTtgagtttaaa
cgggggaggctaact

Signal sequence (26 - 85), Light chain variable region (86 - 406), Light chain constant region (407 - 727)

[Figure 23]

Amino acid sequence of variable region of chB1 light chain (SEQ ID NO: 30)

DIQMTQTASSLSASLGDRVTISCRASQDINNYLNWYQQKPDGTVKLLIYFTSRLHSGVPSRFSGSGS
GTHYSLTITNLEQEDIATYFCQQGYPLPWTFGGGTKLEIK

Nucleotide sequence encoding chB1 light chain variable region (SEQ ID NO: 31)

GACATCCAGATGACCCAGACAGCCAGCAGCCTGAGCGCCAGCCTGGGCGATAGAGTGACCATCAGCT
GCAGAGCCAGCCAGGACATCAACAACTACCTGAACTGGTATCAGCAGAAACCCGACGGCACCGTGAA
GCTGCTGATCTACTTCACCAGCAGACTGCACAGCGGCGTGCCCAGCAGATTTTCTGGCAGCGGCTCT
GGCACCCACTACAGCCTGACCATCACCAACCTGGAACAGGAAGATATCGCTACCTACTTCTGTCAGC
AAGGCTACCCCCTGCCCTGGACCTTTGGCGGCGGAACAAAGCTGGAAATCAAG

[Figure 24]

Amino acid sequence of chB1 heavy chain (SEQ ID NO: 32)

MKHLWFFLLLVAAPRWVLSEVQLQQSGPELVKPGASVKISCKTSGYTFTEYTMHWVQQSHGKSLEWI
GGVNPNSGDTSYNQKFKGKATLTVDKSSSTAYMELRSLTSEDSAVYYCARPGGYDVGYYAMDYWGQG
TSVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSS
GLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPEAAGGPSVFLFP
PKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQ
DWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIA
VEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSP
GK

Signal sequence (1 - 19), Heavy chain variable region (20 - 141), Heavy chain constant region (142 - 471)

Nucleotide sequence encoding chB1 heavy chain (SEQ ID NO: 33)

ATGAAACACCTGTGGTTCTTCCTCCTGCTGGTGGCAGCTCCCAGATGGGTGCTGAGCGAAGTGCAGC
TGCAGCAGTCTGGCCCCGAGCTCGTGAAACCTGGCGCCTCCGTGAAGATCAGCTGCAAGACCAGCGG
CTACACCTTCACCGAGTACACCATGCACTGGGTGCAGCAGAGCCACGGCAAGAGCCTGGAATGGATC
GGCGGCGTGAACCCCAACAGCGGCGACACCAGCTACAACCAGAAGTTCAAGGGCAAGGCCACCCTGA
CCGTGGACAAGAGCAGCAGCACCGCCTACATGGAACTGCGGAGCCTGACCAGCGAGGACAGCGCCGT
GTACTACTGTGCCAGACCTGGCGGCTACGACGTGGGCTACTACGCCATGGATTACTGGGGCCAGGGC
ACCAGCGTGACCGTCAGCTCAGCCTCCACCAAGGGCCCAAGCGTCTTCCCCCTGGCACCCTCCTCCA
AGAGCACCTCTGGCGGCACAGCCGCCCTGGGCTGCCTGGTCAAGGACTACTTCCCCGAACCCGTGAC
CGTGAGCTGGAACTCAGGCGCCCTGACCAGCGGCGTGCACACCTTCCCCGCTGTCCTGCAGTCCTCA
GGACTCTACTCCCTCAGCAGCGTGGTGACCGTGCCCTCCAGCAGCTTGGGCACCCAGACCTACATCT
GCAACGTGAATCACAAGCCCAGCAACACCAAGGTGGACAAGAGAGTTGAGCCCAAATCTTGTGACAA
AACTCACACATGCCCACCCTGCCCAGCACCTGAAGCCGCGGGGGGACCCTCAGTCTTCCTCTTCCCC
CCAAAACCCAAGGACACCCTCATGATCTCCCGGACCCCTGAGGTCACATGCGTGGTGGTGGACGTGA
GCCACGAAGACCCTGAGGTCAAGTTCAACTGGTACGTGGACGGCGTGGAGGTGCATAATGCCAAGAC
AAAGCCCCGGGAGGAGCAGTACAACAGCACGTACCGGGTGGTCAGCGTCCTCACCGTCCTGCACCAG
GACTGGCTGAATGGCAAGGAGTACAAGTGCAAGGTCTCCAACAAAGCCCTCCCAGCCCCCATCGAGA
AAACCATCTCCAAAGCCAAAGGCCAGCCCCGGGAACCACAGGTGTACACCCTGCCCCCATCCCGGGA
GGAGATGACCAAGAACCAGGTCAGCCTGACCTGCCTGGTCAAAGGCTTCTATCCCAGCGACATCGCC
GTGGAGTGGGAGAGCAATGGCCAGCCCGAGAACAACTACAAGACCACCCCTCCCGTGCTGGACTCCG
ACGGCTCCTTCTTCCTCTACAGCAAGCTCACCGTGGACAAGAGCAGGTGGCAGCAGGGCAACGTCTT
CTCATGCTCCGTGATGCATGAGGCTCTGCACAACCACTACACCCAGAAGAGCCTCTCCCTGTCTCCC
GGCAAA

Signal sequence (1 - 57), Heavy chain variable region (58 - 423), Heavy chain constant region (424 - 1413)

[Figure 25]

Amino acid sequence of variable region of chB1 heavy chain (SEQ ID NO: 34)

EVQLQQSGPELVKPGASVKISCKTSGYTFTEYTMHWVQQSHGKSLEWIGGVNPNSGDTSYNQKFKGK
ATLTVDKSSSTAYMELRSLTSEDSAVYYCARPGGYDVGYYAMDYWGQGTSVTVSS

Nucleotide sequence encoding variable region of chB1 heavy chain (SEQ ID NO: 35)

GAAGTGCAGCTGCAGCAGTCTGGCCCCGAGCTCGTGAAACCTGGCGCCTCCGTGAAGATCAGCTGCA
AGACCAGCGGCTACACCTTCACCGAGTACACCATGCACTGGGTGCAGCAGAGCCACGGCAAGAGCCT
GGAATGGATCGGCGGCGTGAACCCCAACAGCGGCGACACCAGCTACAACCAGAAGTTCAAGGGCAAG
GCCACCCTGACCGTGGACAAGAGCAGCAGCACCGCCTACATGGAACTGCGGAGCCTGACCAGCGAGG
ACAGCGCCGTGTACTACTGTGCCAGACCTGGCGGCTACGACGTGGGCTACTACGCCATGGATTACTG
GGGCCAGGGCACCAGCGTGACCGTCAGCTCA

[Figure 26]

Amino acid sequence of humanized antibody light chain hL1 (SEQ ID NO: 36)

MVLQTQVFISLLLWISGAYGDIQMTQSPSSLSASVGDRVTITCRASQDINNYLNWYQQKPGKAPKLL
IYFTSRLHSGVPSRFSGSGSGTDYTLTISSLQPEDFATYYCQQGYPLPWTFGQGTKVEIKRTVAAPS
VFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTL
SKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

Signal sequence (1 - 20), Light chain variable region (21 - 127), Light chain constant region (128 - 234)

Nucleotide sequence encoding humanized antibody light chain hL1 (SEQ ID NO: 37)

ATGGTGCTGCAGACCCAGGTGTTCATCTCCCTGCTGCTGTGGATCTCCGGCGCGTACGGCGACATCC
AGATGACCCAGAGCCCTAGCAGCCTGAGCGCCAGCGTGGGCGACAGAGTGACCATCACCTGTAGAGC
CAGCCAGGACATCAACAACTACCTGAACTGGTATCAGCAGAAGCCCGGCAAGGCCCCCAAGCTGCTG
ATCTACTTCACCAGCAGACTGCACAGCGGCGTGCCCAGCAGATTTTCTGGCAGCGGCTCCGGCACCG
ACTACACCCTGACAATCAGCAGCCTGCAGCCCGAGGACTTCGCCACCTACTACTGCCAGCAGGGCTA
CCCCCTGCCTTGGACATTTGGCCAGGGCACCAAGGTGGAAATCAAGCGTACGGTGGCCGCCCCCTCC
GTGTTCATCTTCCCCCCCTCCGACGAGCAGCTGAAGTCCGGCACCGCCTCCGTGGTGTGCCTGCTGA
ATAACTTCTACCCCAGAGAGGCCAAGGTGCAGTGGAAGGTGGACAACGCCCTGCAGTCCGGGAACTC
CCAGGAGAGCGTGACCGAGCAGGACAGCAAGGACAGCACCTACAGCCTGAGCAGCACCCTGACCCTG
AGCAAAGCCGACTACGAGAAGCACAAGGTGTACGCCTGCGAGGTGACCCACCAGGGCCTGAGCTCCC
CCGTCACCAAGAGCTTCAACAGGGGGGAGTGT

Signal sequence (1 - 60), Light chain variable region (61 - 381), Light chain constant region (382 - 702)

[Figure 27]

Amino acid sequence of variable region of humanized antibody light chain hL1 (SEQ ID NO: 38)

DIQMTQSPSSLSASVGDRVTITCRASQDINNYLNWYQQKPGKAPKLLIYFTSRLHSGVPSRFSGSGS
GTDYTLTISSLQPEDFATYYCQQGYPLPWTFGQGTKVEIK

Nucleotide sequence encoding variable region of humanized antibody light chain hL1 (SEQ ID NO: 39)

GACATCCAGATGACCCAGAGCCCTAGCAGCCTGAGCGCCAGCGTGGGCGACAGAGTGACCATCACCT
GTAGAGCCAGCCAGGACATCAACAACTACCTGAACTGGTATCAGCAGAAGCCCGGCAAGGCCCCCAA
GCTGCTGATCTACTTCACCAGCAGACTGCACAGCGGCGTGCCCAGCAGATTTTCTGGCAGCGGCTCC
GGCACCGACTACACCCTGACAATCAGCAGCCTGCAGCCCGAGGACTTCGCCACCTACTACTGCCAGC
AGGGCTACCCCCTGCCTTGGACATTTGGCCAGGGCACCAAGGTGGAAATCAAG

[Figure 28]

Amino acid sequence of humanized antibody light chain hL2 (SEQ ID NO: 40)

MVLQTQVFISLLLWISGAYGDIQMTQSPSSLSASVGDRVTITCRASQDINNYLNWYQQKPGKAVKLL
IYFTSRLHSGVPSRFSGSGSGTHYTLTISSLQPEDFATYYCQQGYPLPWTFGQGTKVEIKRTVAAPS
VFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTL
SKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

Signal sequence (1 - 20), Light chain variable region (21 - 127), Light chain constant region (128 - 234)

Nucleotide sequence encoding humanized antibody light chain hL2 (SEQ ID NO: 41)

ATGGTGCTGCAGACCCAGGTGTTCATCTCCCTGCTGCTGTGGATCTCCGGCGCGTACGGCGACATCC
AGATGACCCAGAGCCCTAGCAGCCTGAGCGCCAGCGTGGGCGACAGAGTGACCATCACCTGTAGAGC
CAGCCAGGACATCAACAACTACCTGAACTGGTATCAGCAGAAACCCGGCAAGGCCGTGAAGCTGCTG
ATCTACTTCACCAGCAGACTGCACAGCGGCGTGCCCAGCAGATTTTCTGGCAGCGGCTCTGGCACCC
ACTACACCCTGACAATCAGCAGCCTGCAGCCCGAGGACTTCGCCACCTACTACTGCCAGCAGGGCTA
CCCCCTGCCTTGGACATTTGGCCAGGGCACCAAGGTGGAAATCAAGCGTACGGTGGCCGCCCCCTCC
GTGTTCATCTTCCCCCCCTCCGACGAGCAGCTGAAGTCCGGCACCGCCTCCGTGGTGTGCCTGCTGA
ATAACTTCTACCCCAGAGAGGCCAAGGTGCAGTGGAAGGTGGACAACGCCCTGCAGTCCGGGAACTC
CCAGGAGAGCGTGACCGAGCAGGACAGCAAGGACAGCACCTACAGCCTGAGCAGCACCCTGACCCTG
AGCAAAGCCGACTACGAGAAGCACAAGGTGTACGCCTGCGAGGTGACCCACCAGGGCCTGAGCTCCC
CCGTCACCAAGAGCTTCAACAGGGGGGAGTGT

Signal sequence (1 - 60), Light chain variable region (61 - 381), Light chain constant region (382 - 702)

[Figure 29]

Amino acid sequence of variable region of humanized antibody light chain hL2 (SEQ ID NO: 42)

DIQMTQSPSSLSASVGDRVTITCRASQDINNYLNWYQQKPGKAVKLLIYFTSRLHSGVPSRFSGSGS
GTHYTLTISSLQPEDFATYYCQQGYPLPWTFGQGTKVEIK

Nucleotide sequence encoding variable region of humanized antibody light chain hL2 (SEQ ID NO: 43)

GACATCCAGATGACCCAGAGCCCTAGCAGCCTGAGCGCCAGCGTGGGCGACAGAGTGACCATCACCT
GTAGAGCCAGCCAGGACATCAACAACTACCTGAACTGGTATCAGCAGAAACCCGGCAAGGCCGTGAA
GCTGCTGATCTACTTCACCAGCAGACTGCACAGCGGCGTGCCCAGCAGATTTTCTGGCAGCGGCTCT
GGCACCCACTACACCCTGACAATCAGCAGCCTGCAGCCCGAGGACTTCGCCACCTACTACTGCCAGC
AGGGCTACCCCCTGCCTTGGACATTTGGCCAGGGCACCAAGGTGGAAATCAAG

[Figure 30]

Amino acid sequence of humanized antibody light chain hL3 (SEQ ID NO: 44)

MVLQTQVFISLLLWISGAYGDIQMTQSPSSLSASVGDRVTITCRASQDINNYLNWYQQKPGGAVKLL
IYFTSRLHSGVPSRFSGSGSGTDYTLTISSLQPEDFATYYCQQGYPLPWTFGGGTKVEIKRTVAAPS
VFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTL
SKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

Signal sequence (1 - 20), Light chain variable region (21 - 127), Light chain constant region (128 - 234)

Nucleotide sequence encoding humanized antibody light chain hL3 (SEQ ID NO: 45)

ATGGTGCTGCAGACCCAGGTGTTCATCTCCCTGCTGCTGTGGATCTCCGGCGCGTACGGCGACATCC
AGATGACCCAGAGCCCTAGCAGCCTGAGCGCCAGCGTGGGCGACAGAGTGACCATCACCTGTAGAGC
CAGCCAGGACATCAACAACTACCTGAACTGGTATCAGCAGAAACCCGGCGGAGCCGTGAAGCTGCTG
ATCTACTTCACCAGCAGACTGCACAGCGGCGTGCCCAGCAGATTTTCTGGCAGCGGCTCCGGCACCG
ACTACACCCTGACAATCAGCAGCCTGCAGCCCGAGGACTTCGCCACCTACTACTGCCAGCAGGGCTA
CCCCCTGCCCTGGACATTTGGCGGCGGAACAAAGGTGGAAATCAAGCGTACGGTGGCCGCCCCCTCC
GTGTTCATCTTCCCCCCCTCCGACGAGCAGCTGAAGTCCGGCACCGCCTCCGTGGTGTGCCTGCTGA
ATAACTTCTACCCCAGAGAGGCCAAGGTGCAGTGGAAGGTGGACAACGCCCTGCAGTCCGGGAACTC
CCAGGAGAGCGTGACCGAGCAGGACAGCAAGGACAGCACCTACAGCCTGAGCAGCACCCTGACCCTG
AGCAAAGCCGACTACGAGAAGCACAAGGTGTACGCCTGCGAGGTGACCCACCAGGGCCTGAGCTCCC
CCGTCACCAAGAGCTTCAACAGGGGGGAGTGT

Signal sequence (1 - 60), Light chain variable region (61 - 381), Light chain constant region (382 - 702)

[Figure 31]

Amino acid sequence of variable region of humanized antibody light chain hL3 (SEQ ID NO: 46)

DIQMTQSPSSLSASVGDRVTITCRASQDINNYLNWYQQKPGGAVKLLIYFTSRLHSGVPSRFSGSGS
GTDYTLTISSLQPEDFATYYCQQGYPLPWTFGGGTKVEIK

Nucleotide sequence encoding variable region of humanized antibody light chain hL3 (SEQ ID NO: 47)

GACATCCAGATGACCCAGAGCCCTAGCAGCCTGAGCGCCAGCGTGGGCGACAGAGTGACCATCACCT
GTAGAGCCAGCCAGGACATCAACAACTACCTGAACTGGTATCAGCAGAAACCCGGCGGAGCCGTGAA
GCTGCTGATCTACTTCACCAGCAGACTGCACAGCGGCGTGCCCAGCAGATTTTCTGGCAGCGGCTCC
GGCACCGACTACACCCTGACAATCAGCAGCCTGCAGCCCGAGGACTTCGCCACCTACTACTGCCAGC
AGGGCTACCCCCTGCCCTGGACATTTGGCGGCGGAACAAAGGTGGAAATCAAG

[Figure 32]

Amino acid sequence of humanized antibody light chain hL4 (SEQ ID NO: 48)

MVLQTQVFISLLLWISGAYGDIQMTQSPSSLSASVGDRVTITCRASQDINNYLNWYQQKPGGAVKLL
IYFTSRLHSGVPSRFSGSGSGTDYTLTISSLQPEDFATYYCQQGNTLPWTFGGGTKVEIKRTVAAPS
VFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTL
SKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

Signal sequence (1 - 20), Light chain variable region (21 - 127), Light chain constant region (128 - 234)

Nucleotide sequence encoding humanized antibody light chain hL4 (SEQ ID NO: 49)

ATGGTGCTGCAGACCCAGGTGTTCATCTCCCTGCTGCTGTGGATCTCCGGCGCGTACGGCGACATCC
AGATGACCCAGAGCCCTAGCAGCCTGAGCGCCAGCGTGGGCGACAGAGTGACCATCACCTGTAGAGC
CAGCCAGGACATCAACAACTACCTGAACTGGTATCAGCAGAAACCCGGCGGAGCCGTGAAGCTGCTG
ATCTACTTCACCAGCAGACTGCACAGCGGCGTGCCCAGCAGATTTTCTGGCAGCGGCTCCGGCACCG
ACTACACCCTGACAATCAGCAGCCTGCAGCCCGAGGACTTCGCCACCTACTACTGCCAGCAGGGCAA
CACCCTGCCCTGGACATTTGGCGGAGGCACCAAGGTGGAAATCAAGCGTACGGTGGCCGCCCCCTCC
GTGTTCATCTTCCCCCCCTCCGACGAGCAGCTGAAGTCCGGCACCGCCTCCGTGGTGTGCCTGCTGA
ATAACTTCTACCCCAGAGAGGCCAAGGTGCAGTGGAAGGTGGACAACGCCCTGCAGTCCGGGAACTC
CCAGGAGAGCGTGACCGAGCAGGACAGCAAGGACAGCACCTACAGCCTGAGCAGCACCCTGACCCTG
AGCAAAGCCGACTACGAGAAGCACAAGGTGTACGCCTGCGAGGTGACCCACCAGGGCCTGAGCTCCC
CCGTCACCAAGAGCTTCAACAGGGGGGAGTGT

Signal sequence (1 - 60), Light chain variable region (61 - 381), Light chain constant region (382 - 702)

[Figure 33]

Amino acid sequence of variable region of humanized antibody light chain hL4 (SEQ ID NO: 50)

DIQMTQSPSSLSASVGDRVTITCRASQDINNYLNWYQQKPGGAVKLLIYFTSRLHSGVPSRFSGSGS

GTDYTLTISSLQPEDFATYYCQQGNTLPWTFGGGTKVEIK

Nucleotide sequence encoding variable region of humanized antibody light chain hL4 (SEQ ID NO: 51)

GACATCCAGATGACCCAGAGCCCTAGCAGCCTGAGCGCCAGCGTGGGCGACAGAGTGACCATCACCT

GTAGAGCCAGCCAGGACATCAACAACTACCTGAACTGGTATCAGCAGAAACCCGGCGGAGCCGTGAA

GCTGCTGATCTACTTCACCAGCAGACTGCACAGCGGCGTGCCCAGCAGATTTTCTGGCAGCGGCTCC

GGCACCGACTACACCCTGACAATCAGCAGCCTGCAGCCCGAGGACTTCGCCACCTACTACTGCCAGC

AGGGCAACACCCTGCCCTGGACATTTGGCGGAGGCACCAAGGTGGAAATCAAG

[Figure 34]

Amino acid sequence of humanized antibody heavy chain hH1 (SEQ ID NO: 52)

MKHLWFFLLLVAAPRWVLSQVQLVQSGAEVKKPGASVKVSCKASGYTFTEYTMHWVRQAPGQGLEWM
GGVNPNSGDTSYAQKFQGRVTITADTSTSTAYMELSSLRSEDTAVYYCARPGGYDVGYYAMDYWGQG
TLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSS
GLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPEAAGGPSVFLFP
PKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQ
DWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIA
VEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSP
GK

Signal sequence (1 - 19), Heavy chain variable region (20 - 141), Heavy chain constant region (142 - 471)

Nucleotide sequence encoding humanized antibody heavy chain hH1 (SEQ ID NO: 53)

ATGAAACACCTGTGGTTCTTCCTCCTGCTGGTGGCAGCTCCCAGATGGGTGCTGAGCCAGGTGCAGC
TGGTGCAGTCTGGCGCCGAAGTGAAGAAACCAGGCGCCAGCGTGAAGGTGTCCTGCAAGGCCAGCGG
CTACACCTTTACCGAGTACACCATGCACTGGGTGCGCCAGGCTCCAGGCCAGGGACTGGAATGGATG
GGCGGCGTGAACCCCAACAGCGGCGATACAAGCTACGCCCAGAAATTCCAGGGCAGAGTGACCATCA
CCGCCGACACCAGCACCTCCACCGCCTACATGGAACTGAGCAGCCTGCGGAGCGAGGACACCGCCGT
GTACTACTGTGCTAGACCTGGCGGCTACGACGTGGGCTACTACGCCATGGATTACTGGGGCCAGGGC
ACCCTCGTGACCGTCAGCTCAGCCTCCACCAAGGGCCCAAGCGTCTTCCCCCTGGCACCCTCCTCCA
AGAGCACCTCTGGCGGCACAGCCGCCCTGGGCTGCCTGGTCAAGGACTACTTCCCCGAACCCGTGAC
CGTGAGCTGGAACTCAGGCGCCCTGACCAGCGGCGTGCACACCTTCCCCGCTGTCCTGCAGTCCTCA
GGACTCTACTCCCTCAGCAGCGTGGTGACCGTGCCCTCCAGCAGCTTGGGCACCCAGACCTACATCT
GCAACGTGAATCACAAGCCCAGCAACACCAAGGTGGACAAGAGAGTTGAGCCCAAATCTTGTGACAA
AACTCACACATGCCCACCCTGCCCAGCACCTGAAGCCGCGGGGGGACCCTCAGTCTTCCTCTTCCCC
CCAAAACCCAAGGACACCCTCATGATCTCCCGGACCCCTGAGGTCACATGCGTGGTGGTGGACGTGA
GCCACGAAGACCCTGAGGTCAAGTTCAACTGGTACGTGGACGGCGTGGAGGTGCATAATGCCAAGAC
AAAGCCCCGGGAGGAGCAGTACAACAGCACGTACCGGGTGGTCAGCGTCCTCACCGTCCTGCACCAG
GACTGGCTGAATGGCAAGGAGTACAAGTGCAAGGTCTCCAACAAAGCCCTCCCAGCCCCCATCGAGA
AAACCATCTCCAAAGCCAAAGGCCAGCCCCGGGAACCACAGGTGTACACCCTGCCCCCATCCCGGGA
GGAGATGACCAAGAACCAGGTCAGCCTGACCTGCCTGGTCAAAGGCTTCTATCCCAGCGACATCGCC
GTGGAGTGGGAGAGCAATGGCCAGCCCGAGAACAACTACAAGACCACCCCTCCCGTGCTGGACTCCG
ACGGCTCCTTCTTCCTCTACAGCAAGCTCACCGTGGACAAGAGCAGGTGGCAGCAGGGCAACGTCTT
CTCATGCTCCGTGATGCATGAGGCTCTGCACAACCACTACACCCAGAAGAGCCTCTCCCTGTCTCCC
GGCAAA

Signal sequence (1 - 57), Heavy chain variable region (58 - 423), Heavy chain constant region (424 - 1413)

[Figure 35]
Amino acid sequence of variable region of humanized antibody heavy chain hH1 (SEQ ID NO: 54)

QVQLVQSGAEVKKPGASVKVSCKASGYTFTEYTMHWVRQAPGQGLEWMGGVNPNSGDTSYAQKFQGR

VTITADTSTSTAYMELSSLRSEDTAVYYCARPGGYDVGYYAMDYWGQGTLVTVSS

Nucleotide sequence encoding variable region of humanized antibody heavy chain hH1 (SEQ ID NO: 55)

CAGGTGCAGCTGGTGCAGTCTGGCGCCGAAGTGAAGAAACCAGGCGCCAGCGTGAAGGTGTCCTGCA

AGGCCAGCGGCTACACCTTTACCGAGTACACCATGCACTGGGTGCGCCAGGCTCCAGGCCAGGGACT

GGAATGGATGGGCGGCGTGAACCCCAACAGCGGCGATACAAGCTACGCCCAGAAATTCCAGGGCAGA

GTGACCATCACCGCCGACACCAGCACCTCCACCGCCTACATGGAACTGAGCAGCCTGCGGAGCGAGG

ACACCGCCGTGTACTACTGTGCTAGACCTGGCGGCTACGACGTGGGCTACTACGCCATGGATTACTG

GGGCCAGGGCACCCTCGTGACCGTCAGCTCA

[Figure 36]

Amino acid sequence of humanized antibody heavy chain hH2 (SEQ ID NO: 56)

MKHLWFFLLLVAAPRWVLSEVQLVQSGAEVKKPGASVKVSCKTSGYTFTEYTMHWVRQAPGKSLEWM
GGVNPNSGDTSYAQKFQGRVTITADTSTSTAYMELSSLRSEDTAVYYCARPGGYDVGYYAMDYWGQG
TLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSS
GLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPEAAGGPSVFLFP
PKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQ
DWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIA
VEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSP
GK

Signal sequence (1 - 19), Heavy chain variable region (20 - 141), Heavy chain constant region (142 - 471)

Nucleotide sequence encoding humanized antibody heavy chain hH2 (SEQ ID NO: 57)

ATGAAACACCTGTGGTTCTTCCTCCTGCTGGTGGCAGCTCCCAGATGGGTGCTGAGCGAAGTGCAGC
TGGTGCAGTCTGGCGCCGAAGTGAAGAAACCAGGCGCCAGCGTGAAGGTGTCCTGCAAGACCAGCGG
CTACACCTTTACCGAGTACACCATGCACTGGGTGCGCCAGGCCCCTGGCAAGAGCCTGGAATGGATG
GGCGGCGTGAACCCCAACAGCGGCGATACAAGCTACGCCCAGAAATTCCAGGGCAGAGTGACCATCA
CCGCCGACACCAGCACCTCCACCGCCTACATGGAACTGAGCAGCCTGCGGAGCGAGGACACCGCCGT
GTACTACTGTGCTAGACCTGGCGGCTACGACGTGGGCTACTACGCCATGGATTACTGGGGCCAGGGC
ACCCTCGTGACCGTCAGCTCAGCCTCCACCAAGGGCCCAAGCGTCTTCCCCCTGGCACCCTCCTCCA
AGAGCACCTCTGGCGGCACAGCCGCCCTGGGCTGCCTGGTCAAGGACTACTTCCCCGAACCCGTGAC
CGTGAGCTGGAACTCAGGCGCCCTGACCAGCGGCGTGCACACCTTCCCCGCTGTCCTGCAGTCCTCA
GGACTCTACTCCCTCAGCAGCGTGGTGACCGTGCCCTCCAGCAGCTTGGGCACCCAGACCTACATCT
GCAACGTGAATCACAAGCCCAGCAACACCAAGGTGGACAAGAGAGTTGAGCCCAAATCTTGTGACAA
AACTCACACATGCCCACCCTGCCCAGCACCTGAAGCCGCGGGGGGACCCTCAGTCTTCCTCTTCCCC
CCAAAACCCAAGGACACCCTCATGATCTCCCGGACCCCTGAGGTCACATGCGTGGTGGTGGACGTGA
GCCACGAAGACCCTGAGGTCAAGTTCAACTGGTACGTGGACGGCGTGGAGGTGCATAATGCCAAGAC
AAAGCCCCGGGAGGAGCAGTACAACAGCACGTACCGGGTGGTCAGCGTCCTCACCGTCCTGCACCAG
GACTGGCTGAATGGCAAGGAGTACAAGTGCAAGGTCTCCAACAAAGCCCTCCCAGCCCCCATCGAGA
AAACCATCTCCAAAGCCAAAGGCCAGCCCCGGGAACCACAGGTGTACACCCTGCCCCCATCCCGGGA
GGAGATGACCAAGAACCAGGTCAGCCTGACCTGCCTGGTCAAAGGCTTCTATCCCAGCGACATCGCC
GTGGAGTGGGAGAGCAATGGCCAGCCCGAGAACAACTACAAGACCACCCCTCCCGTGCTGGACTCCG
ACGGCTCCTTCTTCCTCTACAGCAAGCTCACCGTGGACAAGAGCAGGTGGCAGCAGGGCAACGTCTT
CTCATGCTCCGTGATGCATGAGGCTCTGCACAACCACTACACCCAGAAGAGCCTCTCCCTGTCTCCC
GGCAAA

Signal sequence (1 - 57), Heavy chain variable region (58 - 423), Heavy chain constant region (424 - 1413)

[Figure 37]

Amino acid sequence of variable region of humanized antibody heavy chain hH2 (SEQ ID NO: 58)

EVQLVQSGAEVKKPGASVKVSCKTSGYTFTEYTMHWVRQAPGKSLEWMGGVNPNSGDTSYAQKFQGR

VTITADTSTSTAYMELSSLRSEDTAVYYCARPGGYDVGYYAMDYWGQGTLVTVSS

Nucleotide sequence encoding variable region of humanized antibody heavy chain hH2 (SEQ ID NO: 59)

GAAGTGCAGCTGGTGCAGTCTGGCGCCGAAGTGAAGAAACCAGGCGCCAGCGTGAAGGTGTCCTGCA

AGACCAGCGGCTACACCTTTACCGAGTACACCATGCACTGGGTGCGCCAGGCCCCTGGCAAGAGCCT

GGAATGGATGGGCGGCGTGAACCCCAACAGCGGCGATACAAGCTACGCCCAGAAATTCCAGGGCAGA

GTGACCATCACCGCCGACACCAGCACCTCCACCGCCTACATGGAACTGAGCAGCCTGCGGAGCGAGG

ACACCGCCGTGTACTACTGTGCTAGACCTGGCGGCTACGACGTGGGCTACTACGCCATGGATTACTG

GGGCCAGGGCACCCTCGTGACCGTCAGCTCA

[Figure 38]

Amino acid sequence of humanized antibody heavy chain hH3 (SEQ ID NO: 60)

MKHLWFFLLLVAAPRWVLSEVQLVQSGAEVKKPGASVKVSCKTSGYTFTEYTMHWVRQAPGQGLEWM
GGVNPNSGDTSYAQKFQGRVTLTVDKSTSTAYMELSSLRSEDTAVYYCARPGGYDVGYYAMDYWGQG
TLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSS
GLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPEAAGGPSVFLFP
PKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQ
DWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIA
VEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSP
GK

Signal sequence (1 - 19), Heavy chain variable region (20 - 141), Heavy chain constant region (142 - 471)

Nucleotide sequence encoding humanized antibody heavy chain hH3 (SEQ ID NO: 61)

ATGAAACACCTGTGGTTCTTCCTCCTGCTGGTGGCAGCTCCCAGATGGGTGCTGAGCGAAGTGCAGC
TGGTGCAGTCTGGCGCCGAAGTGAAGAAACCAGGCGCCAGCGTGAAGGTGTCCTGCAAGACCAGCGG
CTACACCTTTACCGAGTACACCATGCACTGGGTGCGCCAGGCTCCAGGCCAGGGACTGGAATGGATG
GGCGGCGTGAACCCCAACAGCGGCGATACAAGCTACGCCCAGAAATTCCAGGGCAGAGTGACCCTGA
CCGTGGACAAGAGCACCAGCACCGCCTACATGGAACTGAGCAGCCTGCGGAGCGAGGACACCGCCGT
GTACTACTGTGCTAGACCTGGCGGCTACGACGTGGGCTACTACGCCATGGATTACTGGGGCCAGGGC
ACCCTCGTGACCGTCAGCTCAGCCTCCACCAAGGGCCCAAGCGTCTTCCCCCTGGCACCCTCCTCCA
AGAGCACCTCTGGCGGCACAGCCGCCCTGGGCTGCCTGGTCAAGGACTACTTCCCCGAACCCGTGAC
CGTGAGCTGGAACTCAGGCGCCCTGACCAGCGGCGTGCACACCTTCCCCGCTGTCCTGCAGTCCTCA
GGACTCTACTCCCTCAGCAGCGTGGTGACCGTGCCCTCCAGCAGCTTGGGCACCCAGACCTACATCT
GCAACGTGAATCACAAGCCCAGCAACACCAAGGTGGACAAGAGAGTTGAGCCCAAATCTTGTGACAA
AACTCACACATGCCCACCCTGCCCAGCACCTGAAGCCGCGGGGGGACCCTCAGTCTTCCTCTTCCCC
CCAAAACCCAAGGACACCCTCATGATCTCCCGGACCCCTGAGGTCACATGCGTGGTGGTGGACGTGA
GCCACGAAGACCCTGAGGTCAAGTTCAACTGGTACGTGGACGGCGTGGAGGTGCATAATGCCAAGAC
AAAGCCCCGGGAGGAGCAGTACAACAGCACGTACCGGGTGGTCAGCGTCCTCACCGTCCTGCACCAG
GACTGGCTGAATGGCAAGGAGTACAAGTGCAAGGTCTCCAACAAAGCCCTCCCAGCCCCCATCGAGA
AAACCATCTCCAAAGCCAAAGGCCAGCCCCGGGAACCACAGGTGTACACCCTGCCCCCATCCCGGGA
GGAGATGACCAAGAACCAGGTCAGCCTGACCTGCCTGGTCAAAGGCTTCTATCCCAGCGACATCGCC
GTGGAGTGGGAGAGCAATGGCCAGCCCGAGAACAACTACAAGACCACCCCTCCCGTGCTGGACTCCG
ACGGCTCCTTCTTCCTCTACAGCAAGCTCACCGTGGACAAGAGCAGGTGGCAGCAGGGCAACGTCTT
CTCATGCTCCGTGATGCATGAGGCTCTGCACAACCACTACACCCAGAAGAGCCTCTCCCTGTCTCCC
GGCAAA

Signal sequence (1 - 57), Heavy chain variable region (58 - 423), Heavy chain constant region (424 - 1413)

[Figure 39]

Amino acid sequence of variable region of humanized antibody heavy chain hH3 (SEQ ID NO: 62)

EVQLVQSGAEVKKPGASVKVSCKTSGYTFTEYTMHWVRQAPGQGLEWMGGVNPNSGDTSYAQKFQGR

VTLTVDKSTSTAYMELSSLRSEDTAVYYCARPGGYDVGYYAMDYWGQGTLVTVSS

Nucleotide sequence encoding variable region of humanized antibody heavy chain hH3 (SEQ ID NO: 63)

GAAGTGCAGCTGGTGCAGTCTGGCGCCGAAGTGAAGAAACCAGGCGCCAGCGTGAAGGTGTCCTGCA

AGACCAGCGGCTACACCTTTACCGAGTACACCATGCACTGGGTGCGCCAGGCTCCAGGCCAGGGACT

GGAATGGATGGGCGGCGTGAACCCCAACAGCGGCGATACAAGCTACGCCCAGAAATTCCAGGGCAGA

GTGACCCTGACCGTGGACAAGAGCACCAGCACCGCCTACATGGAACTGAGCAGCCTGCGGAGCGAGG

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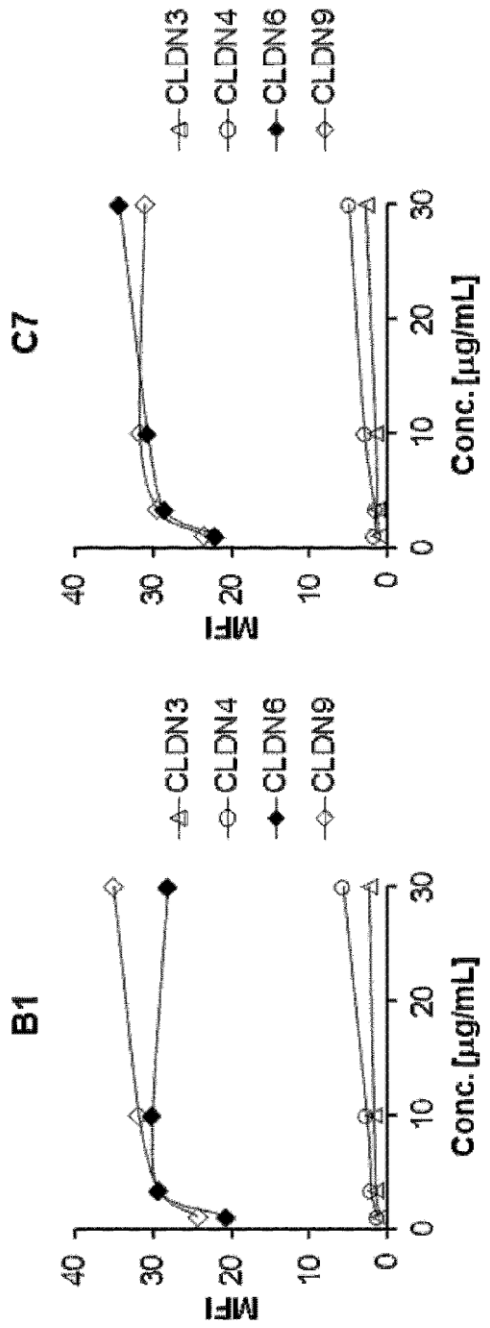
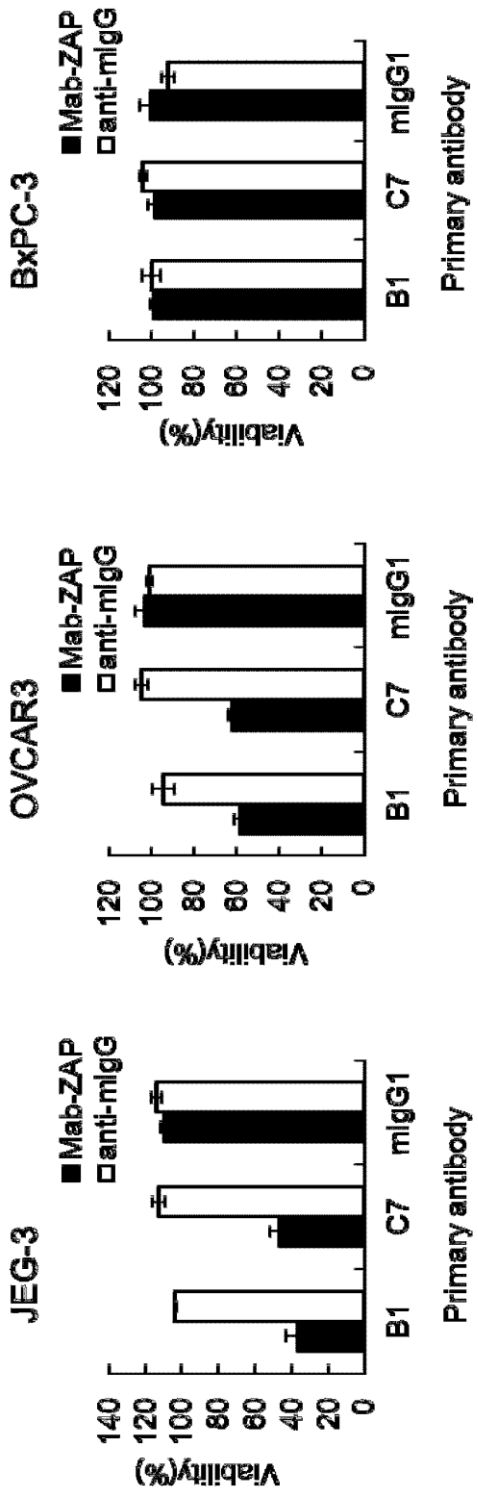
GGGCCAGGGCACCCTCGTGACCGTCAGCTCA

[Figure 40]



[Figure 41]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OVCAR3
BxPC-3
Mab-ZAP
anti-mIgG
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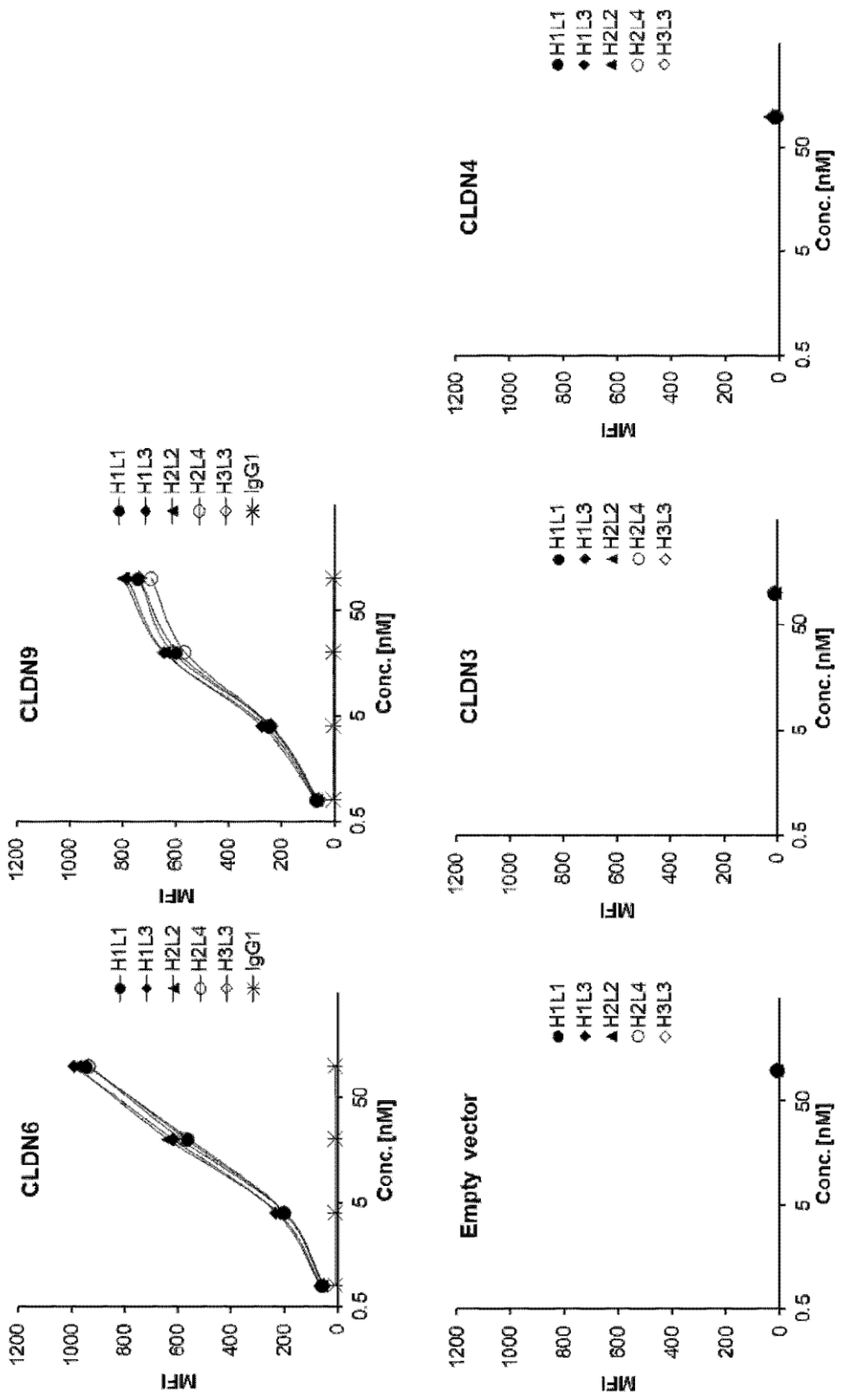
20
40
60
80
100
120
140
B1
C7
mIgG1
Primary antibody

[Figure 42]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CLDN4
CLDN6
CLDN3
Empty vector
MFI
Conc. [nM]
H1L1
H1L3
H2L2
H2L4
H3L3
IgG1

[Figure 43]

Amino acid sequence of trastuzumab light chain (SEQ ID NO: 64)

DIQMTQSPSSLSASVGDRVTITCRASQDVNTAVAWYQQKPGKAPKLLIYSASFLYSGVPSRFSGSRS
GTDFTLTISSLQPEDFATYYCQQHYTTPPTFGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVC
LLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGL
SSPVTKSFNRGEC

Amino acid sequence of trastuzumab heavy chain (SEQ ID NO: 65)

EVQLVESGGGLVQPGGSLRLSCAASGFNIKDTYIHWVRQAPGKGLEWVARIYPTNGYTRYADSVKGR
FTISADTSKNTAYLQMNSLRAEDTAVYYCSRWGGDGFYAMDYWGQGTLVTVSSASTKGPSVFPLAPS
SKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTY
ICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVD
VSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPI
EKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLD
SDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK

[Figure 44]

Amino acid sequence of trastuzumab variant light chain (SEQ ID NO: 73)

MVLQTQVFISLLLWISGAYGDIQMTQSPSSLSASVGDRVTITCRASQDVNTAVAWYQQKPGKAPKLLIYSAS
FLYSGVPSRFSGSRSGTDFTLTISSLQPEDFATYYCQQHYTTPPTFGQGTKVEIKRTVAAPSVFIFPPSDEQ
LKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEV
THQGLSSPVTKSFNRGEC

Signal sequence (1 - 20), Light chain variable region (21 - 127), Light chain constant region (128 - 234)

Amino acid sequence of trastuzumab variant heavy chain (SEQ ID NO: 75)

MKHLWFFLLLVAAPRWVLSEVQLVESGGGLVQPGGSLRLSCAASGFNIKDTYIHWVRQAPGKGLEWVARIYP
TNGYTRYADSVKGRFTISADTSKNTAYLQMNSLRAEDTAVYYCSRWGGDGFYAMDYWGQGTLVTVSSASTKG
PSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLG
TQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPEAAGGPSVFLFPPKPKDTLMISRTPEVTCVVVDV
SHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISK
AKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKL
TVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK

Signal sequence (1 - 19), Heavy chain variable region (20 - 139), Heavy chain constant region (140 - 469)

[Figure 45]

```
chB1_H   1 EVQLQQSGPELVKPGASVKISCKTSGYTFTEYTMHWVQQSHGKSLEWIGGVNPNSGDTSYNQKFKGKATL 70
hH1      1 Q...V....A.VK.........V....A.....................R.AP.QG...M.....................A...Q.RV.I 70
hH2      1 ....V....A.VK.........V.....................R.AP.........M.....................A...Q.RV.I 70
hH3      1 ....V....A.VK.........V.....................R.AP.QG...M.....................A...Q.RV.. 70

chB1_H  71 TVDKSSSTAYMELRSLTSEDSAVYYCARPGGYDVGYYAMDYWGQGTSVTVSS                        122
hH1     71 .A.T.T.........S..R....T.....................................L.....          122
hH2     71 .A.T.T.........S..R....T.....................................L.....          122
hH3     71 .....T.........S..R....T.....................................L.....          122
```

[Figure 46]

```
chB1_L   1 DIQMTQTASSLSASLGDRVTISCRASQDINNYLNWYQQKPDGTVKLLIYFTSRLHSGVPS 60
hL1      1 .......SP.......V.........T.....................GKAP.......... 60
hL2      1 .......SP.......V.........T.....................GKA........... 60
hL3      1 .......SP.......V.........T.....................G.A........... 60
hL4      1 .......SP.......V.........T.....................G.A........... 60

chB1_L  61 RFSGSGSGTHYSLTITNLEQEDIATYFCQQGYPLPWTFGGGTKLEIK              107
hL1     61 ..........D.T...SS.QP..F...Y.................Q...V...          107
hL2     61 ..........T...SS.QP..F...Y.................Q...V...          107
hL3     61 ..........D.T...SS.QP..F...Y.................V...             107
hL4     61 ..........D.T...SS.QP..F...Y.....NT.........V...             107
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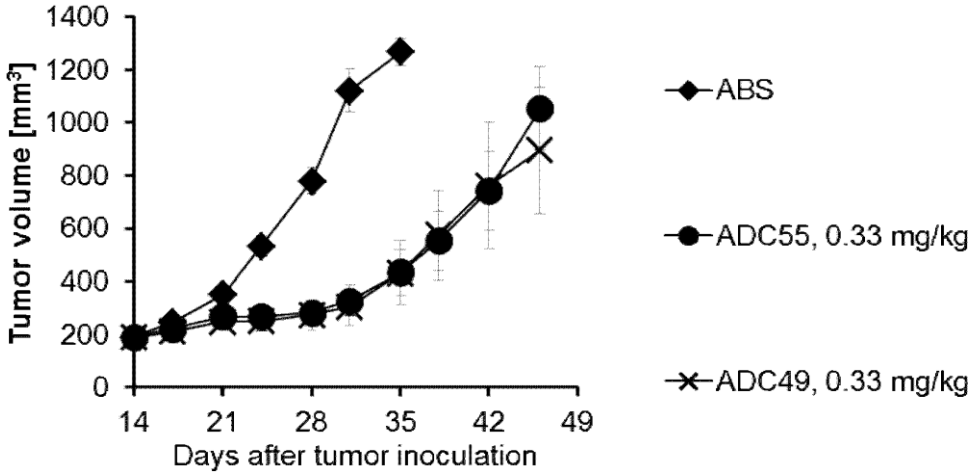
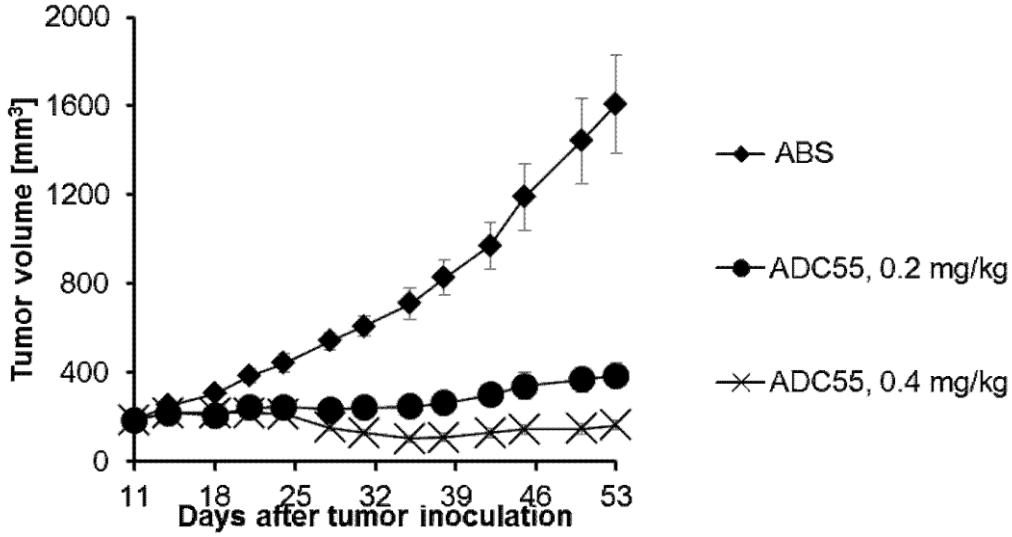
[Figure 47]




[Figure 48]




[Figure 49]

