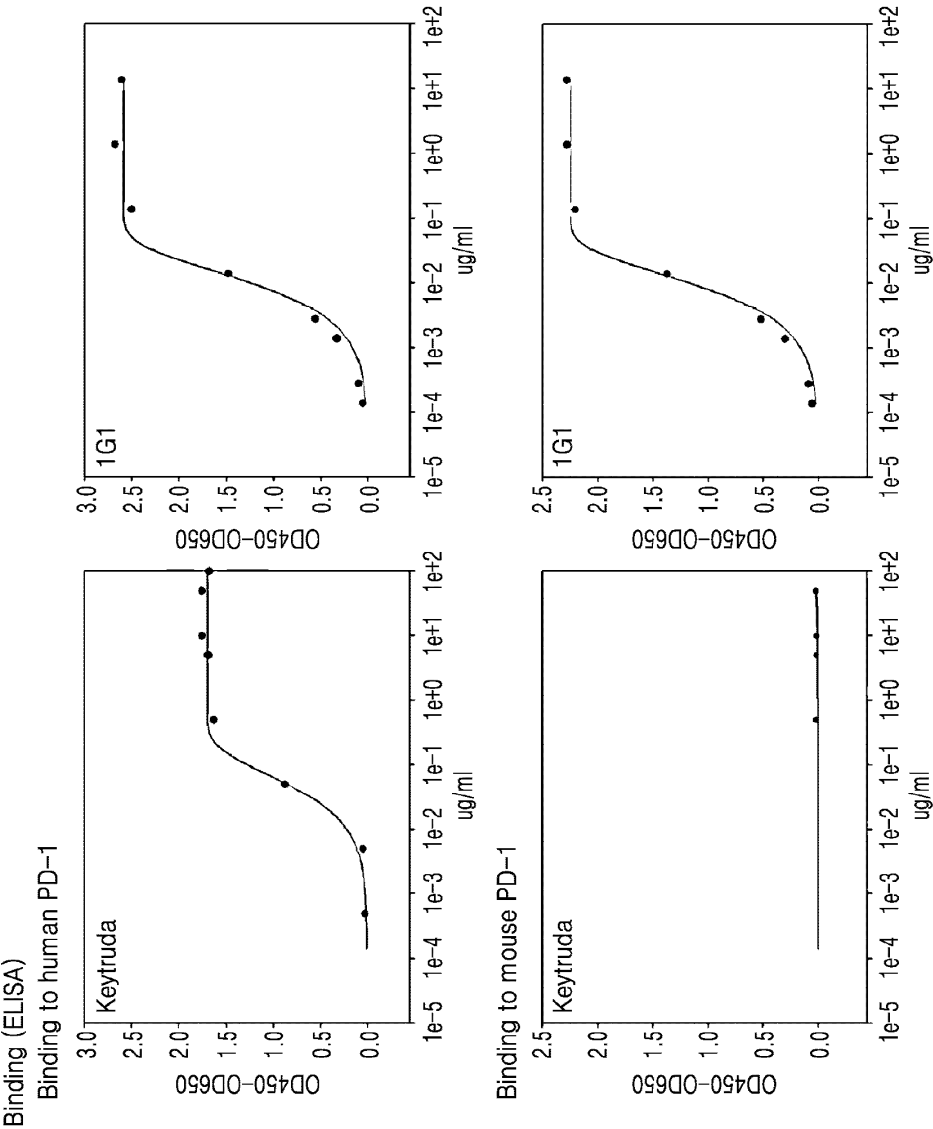
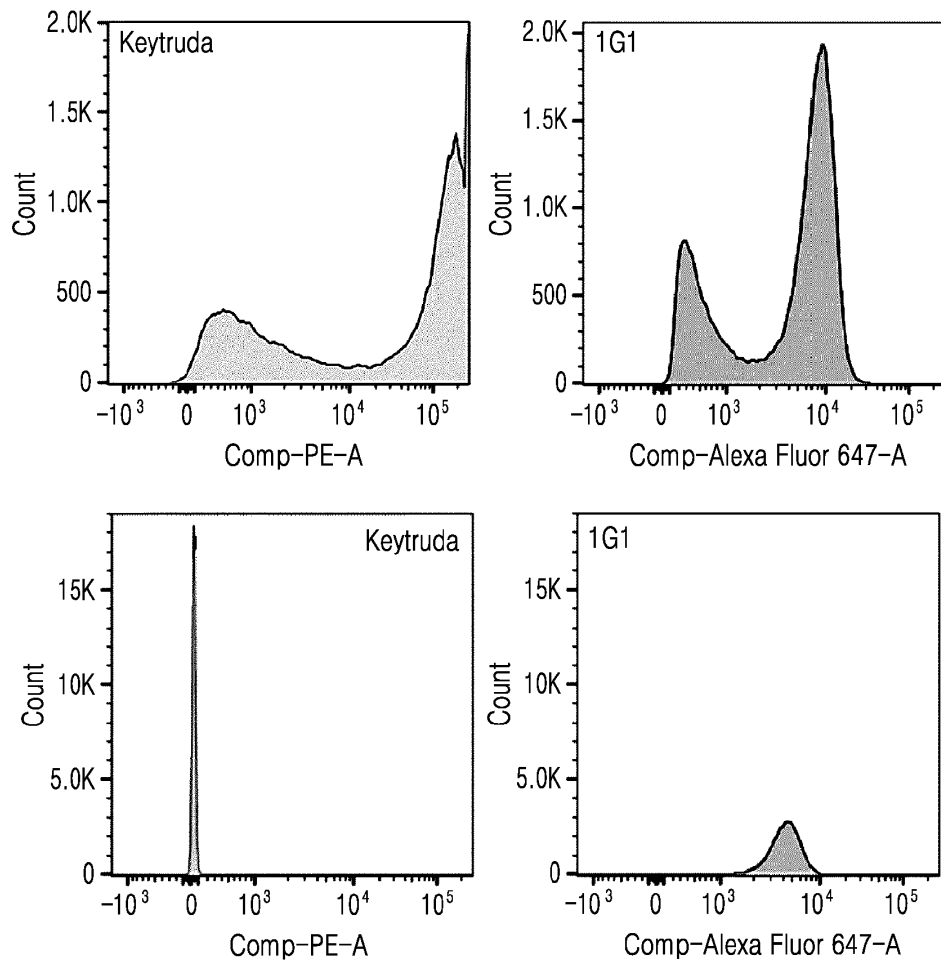


[표 1]



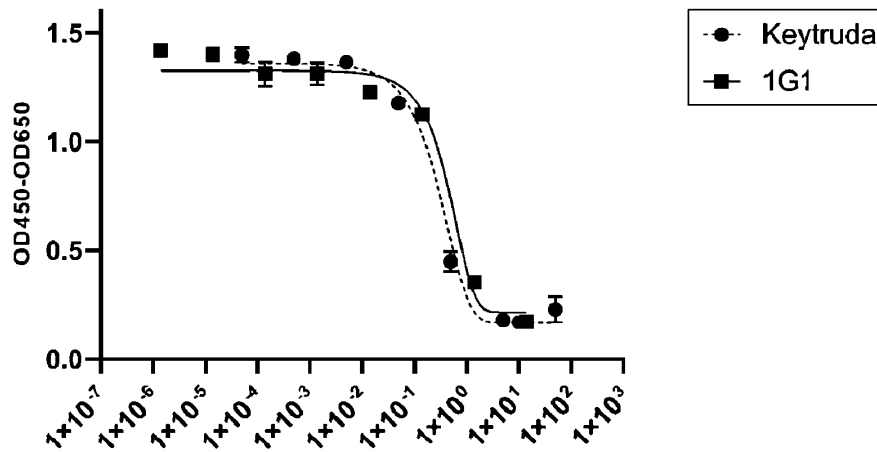
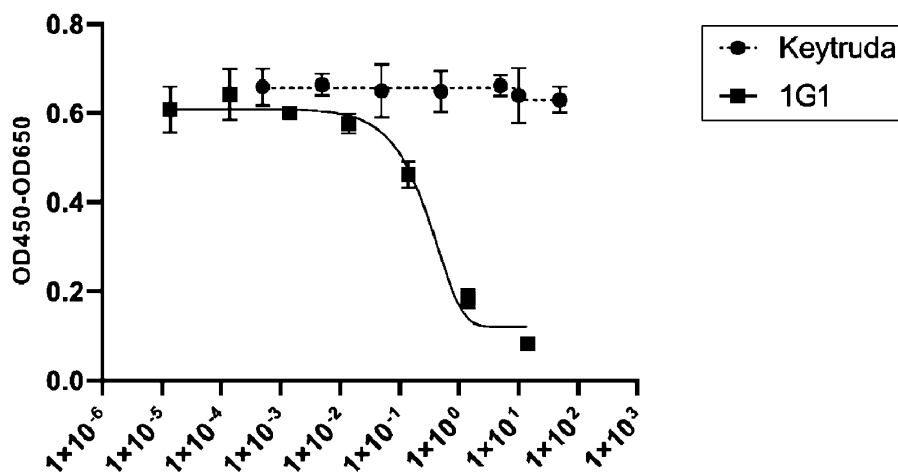
[圖2]

Binding (Flow Cytometry)

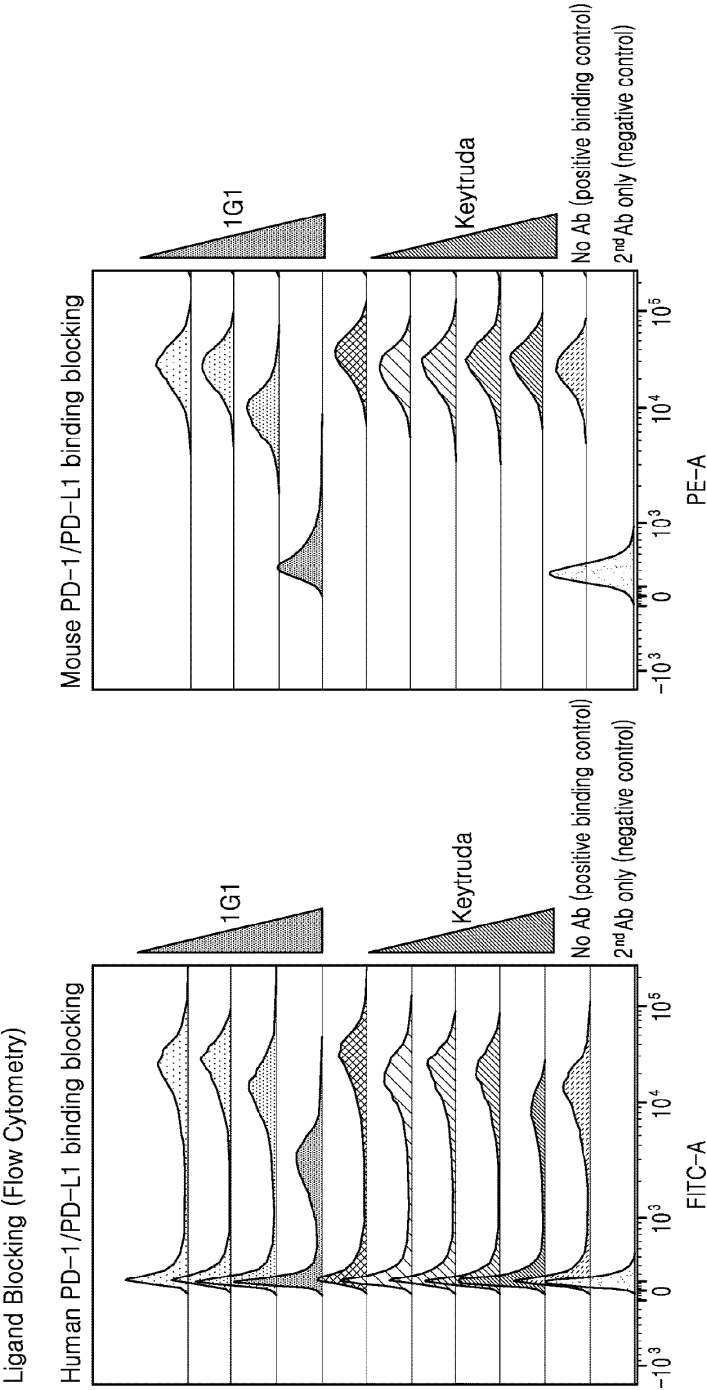


[도3]

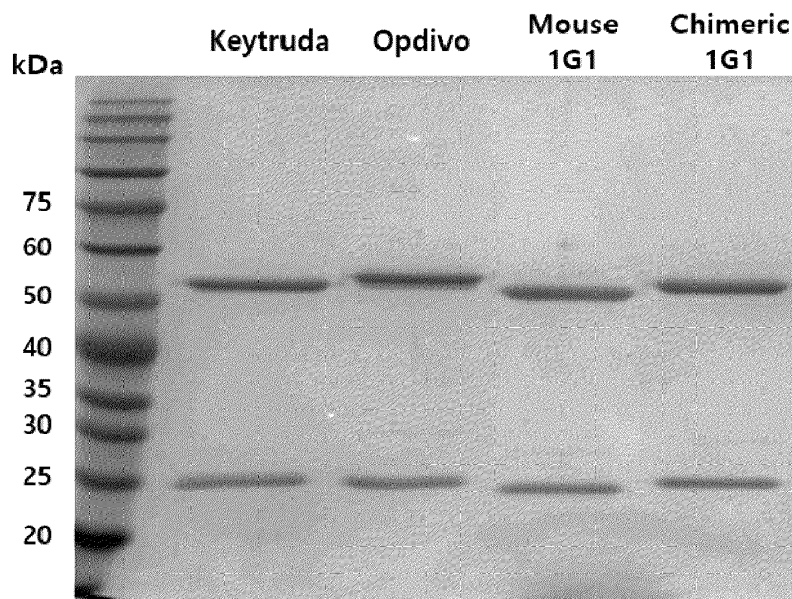
Ligand Blocking (ELISA)

Human PD-1/PD-L1 binding blocking**Mouse PD-1/PD-L1 binding blocking**

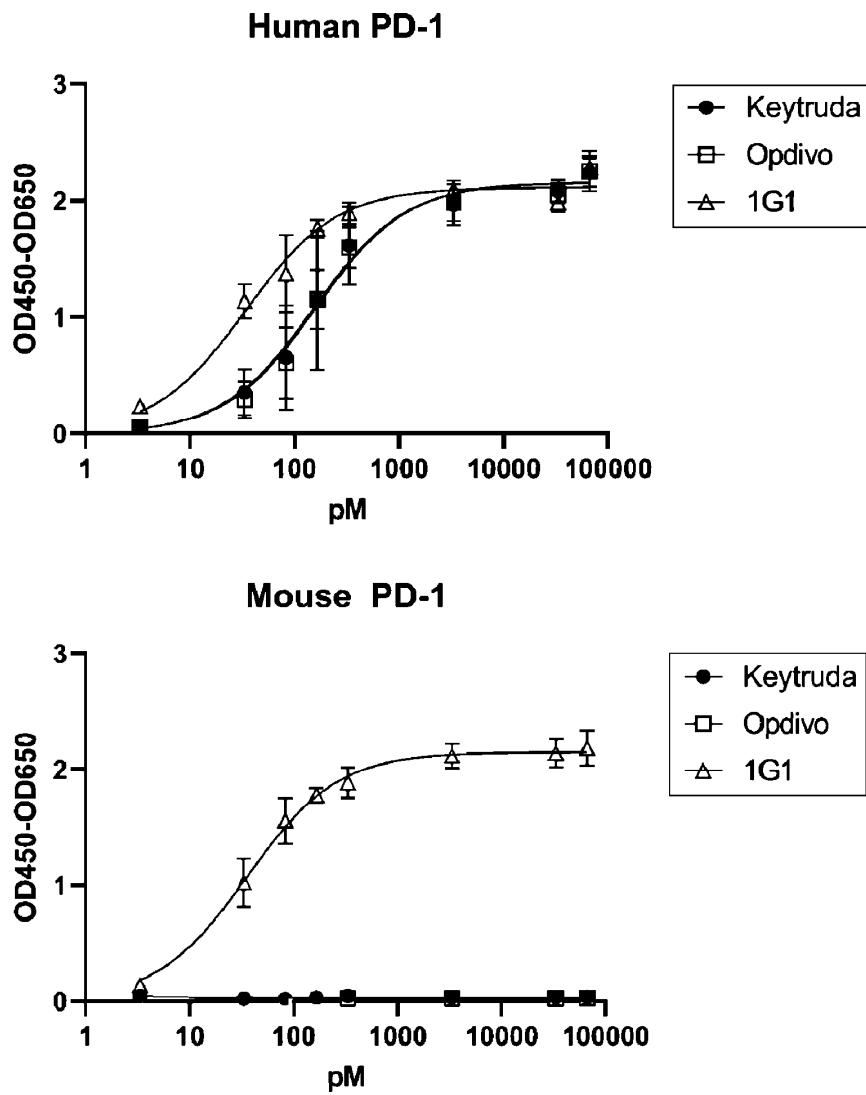
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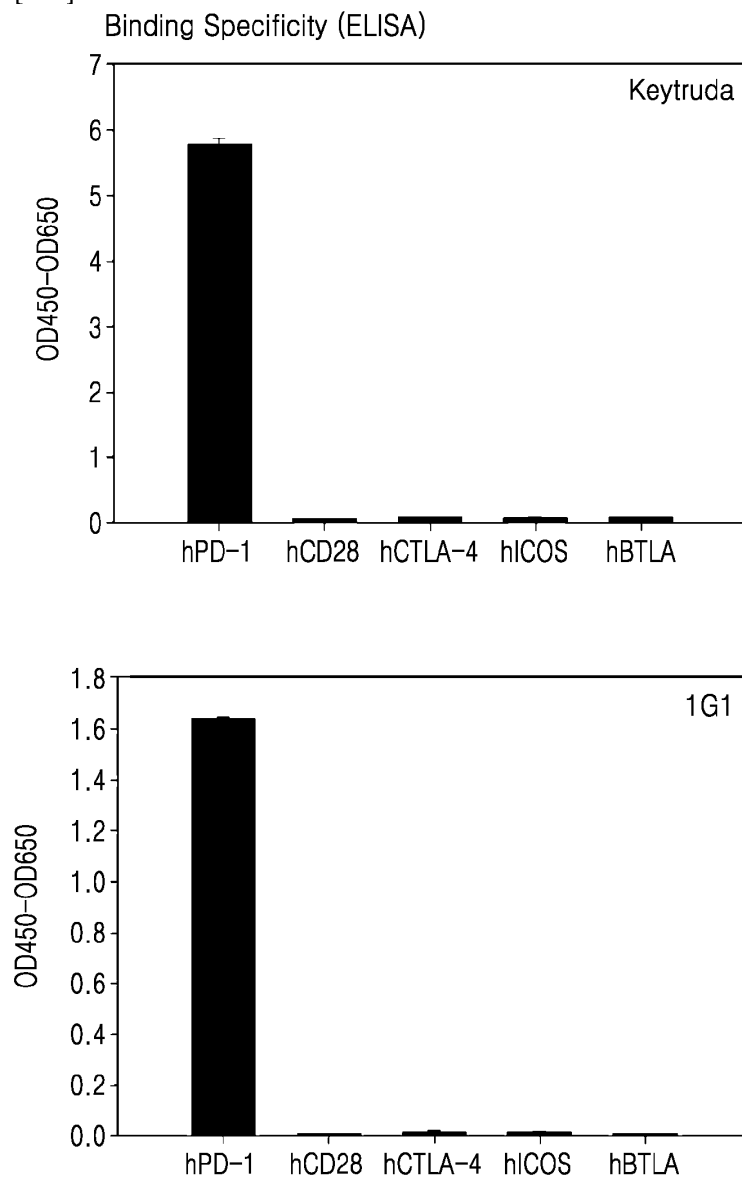
[E5]



[圖6]



[도 7]



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[도8]

Amino acid sequence**Heavy chain**

Humanized antibody 1G1-h61

MGWSCILFLVATATGVHSQVQLVQSGAEVKKPGASVKVSCKASGYTFTGYWM
HWVRQAPGQGLEWMGMIHPNSDTTTYNEKFKNRVTMTRDTSISTAYMELSRL
RSDDTAVYYCAGTDQAAWFAFWGQGTITVTVSSASTKGPSVFPLAPCSRSTSESTA
 ALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVTVPSSSLGKT
 YTCNVDPKPSNTKVDKRVESKYGPPCPSCAPEFLGGPSVFLFPPKPKDTLMISRTPE
 VTCVVDVDSQEDPEVQFNWYVDGVEVHNAKTKPREEQFNSTYRVVSVLTVLHQD
 WLNGKEYKCKVSNKGLPSSIEKTISKAKGQPREPQVYTLPPSQEEMTKNQVSLTCLV
 KGFYPSDIAVEWESNGQPENNYKTPPVLDSDGSFFLYSRLTVDKSRWQEGNVFSCS
 VMHEALHNHYTQKSLSLGLK**

Humanized antibody 1G1-h68

MGWSCILFLVATATGVHSQVQLVQSGAEVKKPGASVKVSCKASGYTFTGYWM
HWVRQAPGQGLEWIGMIHPNSDTTTYNEKFKNRVTMTRDTSISTAYMELSRLR
SDDTAVYYCTGTDQAAWFAFWGQGTITVTVSSASTKGPSVFPLAPCSRSTSESTAA
 LGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVTVPSSSLGKTYT
 CNVDHKPSNTKVDKRVESKYGPPCPSCAPEFLGGPSVFLFPPKPKDTLMISRTPEVT
 CVVVDVDSQEDPEVQFNWYVDGVEVHNAKTKPREEQFNSTYRVVSVLTVLHQDWL
 NGKEYKCKVSNKGLPSSIEKTISKAKGQPREPQVYTLPPSQEEMTKNQVSLTCLVKG
 FYPDSIAVEWESNGQPENNYKTPPVLDSDGSFFLYSRLTVDKSRWQEGNVFSCSVM
 HEALHNHYTQKSLSLGLK**

Humanized antibody 1G1-h70

MGWSCILFLVATATGVHSQVQLVQSGAEVKKPGASVKVSCKASGYTFTGYWM
HWVRQAPGQGLEWIGMIHPNSDTTTYNEKFKNRVTMTRDTSISTAYMELSRLR
SDDTAVYYCAGTDQAAWFAFWGQGTITVTVSSASTKGPSVFPLAPCSRSTSESTAA
 LGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVTVPSSSLGKTYT
 CNVDHKPSNTKVDKRVESKYGPPCPSCAPEFLGGPSVFLFPPKPKDTLMISRTPEVT
 CVVVDVDSQEDPEVQFNWYVDGVEVHNAKTKPREEQFNSTYRVVSVLTVLHQDWL
 NGKEYKCKVSNKGLPSSIEKTISKAKGQPREPQVYTLPPSQEEMTKNQVSLTCLVKG
 FYPDSIAVEWESNGQPENNYKTPPVLDSDGSFFLYSRLTVDKSRWQEGNVFSCSVM
 HEALHNHYTQKSLSLGLK**

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[도9]

Amino acid sequence

Light chain

Humanized antibody 1G1-h61

MGWSCILFLVATATGVHSDIVMTQTPLSLSVTPGQPASISCRSSQNIVHSNGDTYL
EWYLQKPGQSPKLLIYKVKRFSGVPDRFSGSGSGTDFTLKISRVEAEDVGVVY
CFQGSHPWTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE
AKVQWKVDNALQSGNSQESVTEQDSKDSTYLSSTLTLSKADYEKHKVYACEVTH
QGLSSPVTKSFNRGEC**

Humanized antibody 1G1-h68

MGWSCILFLVATATGVHSDIVMTQTPLSLSVTPGQPASISCRSSQNIVHSNGDTYL
EWYLQKPGQSPQLLIYKVKRFSGVPDRFSGSGSGTDFTLKISRVEAEDVGVVY
CFQGSHPWTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE
AKVQWKVDNALQSGNSQESVTEQDSKDSTYLSSTLTLSKADYEKHKVYACEVTH
QGLSSPVTKSFNRGEC**

Humanized antibody 1G1-h70

MGWSCILFLVATATGVHSDIVMTQTPLSLSVTPGQPASISCRSSQNIVHSQGDYTL
EWYLQKPGQSPQLLIYKVKRFSGVPDRFSGSGSGTDFTLKISRVEAEDVGVVY
CFQGSHPWTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE
AKVQWKVDNALQSGNSQESVTEQDSKDSTYLSSTLTLSKADYEKHKVYACEVTH
QGLSSPVTKSFNRGEC**

[~~10~~10a]

DNA sequence

Heavy chain

Humanized antibody 1G1-h61

ATGGGCTGGTCTTGTATTATTCTGTTTCTGGTCGCAACTGCTACAGGCGTGCAATC
TCAAGTTCAGCTGGTGCAGAGCGGCGCCGAGGTGAAGAAGCCTGGAGCCAG
CGTGAAAGTGCCTGCAAGGCCTCTGGCTACACCTTTACAGGCTACTGGAT
GCACTGGGTGCGGCAGGCCCTGGACAGGGCCTGGAATGGATGGGCATGA
TCCACCCCAACAGCGACACCACAACCTACAACGAGAAGTTCAAGAATAGAG
TGACCATGACAAGAGATAACAGCATCAGCACCGCCTACATGGAAGTGAAGCA
GACTGCGGTCCGATGACACAGCTGTGTACTATTGTGCCGGCACCGACCATG
CCGCTTGGTTCGCCTTCTGGGGGCAGGGCACACAGTCACCGTGAGCTCTG
CCAGCACCAAGGGCCCTTCCGTGTTTCCCTGGCCCTTGCTCCCGGTCCACATCT
GAGAGCACCGCCGCCCTGGGCTGTCTGGTGAAGGACTACTTCCCAGAGCCCGTG
ACCGTGAGCTGGAACAGCGGCGCCCTGACAAGCGGCGTGACACATTTCCCGCC
GTGCTGCAGAGCTCCGGCCTGTACTCCCTGTCTAGCGTGGTGACAGTGCCTTCCT
CTAGCCTGGGCACCAAGACATATACCTGTAACGTGGACCACAAGCCAAGCAATA
CCAAGGTGGATAAGCGGGTGGAGTCTAAGTACGGCCCTCCTTGCCCTAGCTGTCC
TGCTCCAGAGTTTCTGGGCGGCCCTTCCGTGTTCTGTTCACCCAAACCAAAG
GACACACTGATGATCTCTAGAACACCAGAGGTGACCTGCGTGGTGGTGGACGTG
AGCCAGGAGGATCCCGAGGTGCAGTTCAACTGGTACGTGGATGGCGTGGAGGTG
CACAATGCCAAGACCAAGCCAAGAGAGGAGCAGTTTAACTCTACATACAGGGTG
GTGAGCGTGCTGACCGTGCTGCACCAGGATTGGCTCAACGGCAAGGAGTATAAG
TGCAAGGTGTCCAATAAGGGCCTGCCCTCCTCTATCGAGAAGACAATCTCTAAGG
CTAAGGGCCAGCCAAGAGAGCCTCAGGTGTACACCCTGCCTCCAAGCCAGGAGG
AGATGACAAAGAACCAGGTGTCCCTGACATGTCTGGTGAAGGGCTTCTATCCCTC
CGACATCGCCGTGGAGTGGGAGTCTAATGGCCAGCCTGAGAACAATTACAAGAC
CACACCCCTGTGCTGGACTCTGATGGCAGCTTCTTTCTGTATTCCAGGCTGACC
GTGGATAAGTCTCGGTGGCAGGAGGGCAACGTGTTTCAGCTGCTCTGTGATGCAC
GAAGCCCTGCATAATCACTATACTCAGAAAAGTCTGTCACTGTCACTGGGAAAGT
GATAA

[~~FIG~~ 10b]**DNA sequence****Heavy chain**

Humanized antibody 1G1-h68

ATGGGCTGGTCTTGTATTATTCTGTTTCTGGTCGCAACTGCTACAGGCGTGCAATC
TCAAGTTCAGCTGGTGCAGAGCGGCGCCGAGGTGAAGAAGCCTGGAGCCAG
CGTGAAAGTGTCTGCAAGGCCTCTGGCTACACCTTTACAGGCTACTGGAT
GCACTGGGTGCGGCAGGCCCTGGACAGGGCCTGGAATGGATCGGCATGAT
CCACCCCAACAGCGACACCACAACCTACAACGAGAAGTTCAAGAATAGAGT
GACCATGACAAGAGATACCAGCATCAGCACCCGCTACATGGAACCTGAGCAG
ACTGCGGTCCGATGACACAGCTGTGTACTATTGTACCGGCACCGACCAGGC
CGCTTGGTTTCGCTTCTGGGGGCAGGGCACCAAGTCAACGTGAGCTCTGC
CAGACCAAGGGCCCTTCCGTGTTTCCCTGGCCCTTGCTCCCGGTCCACATCT
GAGAGCACCGCCGCCCTGGGCTGTCTGGTGAAGGACTACTTCCCAGAGCCCGTG
ACCGTGAGCTGGAACAGCGGCGCCCTGACAAGCGGCGTGCACACATTTCCCGCC
GTGCTGCAGAGCTCCGGCCTGTACTCCCTGTCTAGCGTGGTGACAGTGCCTTCCT
CTAGCCTGGGCACCAAGACATATACCTGTAACGTGGACCACAAGCCAAGCAATA
CCAAGGTGGATAAGCGGGTGGAGTCTAAGTACGGCCCTCCTTGCCCTAGCTGTCC
TGCTCCAGAGTTTCTGGGCGGCCCTTCCGTGTTCTGTTTCCACCCAAACCAAAG
GACACACTGATGATCTCTAGAACACCAGAGGTGACCTGCGTGGTGGTGACGTG
AGCCAGGAGGATCCCGAGGTGCAGTTCAACTGGTACGTGGATGGCGTGGAGGTG
CACAATGCCAAGACCAAGCCAAGAGAGGAGCAGTTTAACTCTACATACAGGGTG
GTGAGCGTGCTGACCGTGCTGCACCAGGATTGGCTCAACGGCAAGGAGTATAAG
TGCAAGGTGTCCAATAAGGGCCTGCCCTCCTCTATCGAGAAGACAATCTCTAAGG
CTAAGGGCCAGCCAAGAGAGCCTCAGGTGTACACCCTGCCTCCAAGCCAGGAGG
AGATGACAAAGAACCAGGTGTCCCTGACATGTCTGGTGAAGGGCTTCTATCCCTC
CGACATCGCCGTGGAGTGGGAGTCTAATGGCCAGCCTGAGAACAATTACAAGAC
CACACCCCTGTGCTGGACTCTGATGGCAGCTTCTTTCTGTATTCCAGGCTGACC
GTGGATAAGTCTCGGTGGCAGGAGGGCAACGTGTTTCAGCTGCTCTGTGATGCAC
GAAGCCCTGCATAATCACTATACTCAGAAAAGTCTGTCACTGTCACTGGGAAAAGT
GATAA

[$\pm 10c$]

DNA sequence

Heavy chain

Humanized antibody 1G1-h70

ATGGGCTGGTCTTGTATTATTCTGTTTCTGGTCGCAACTGCTACAGGCGTGCAATTC
TCAAGTTCAGCTGGTGCAGAGCGGCGCCGAGGTGAAGAAGCCTGGAGCCAG
CGTGAAAGTGTCTTGCAAGGCCTCTGGCTACACCTTTACAGGCTACTGGAT
GCACTGGGTGCGGCAGGCCCTGGACAGGGCCTGGAATGGATCGGCATGAT
CCACCCCAACAGCGACACCACAACCTACAACGAGAAGTTCAAGAATAGAGT
GACCATGACAAGAGATACCAGCATCAGCACCGCCTACATGGAAGTGAAGCAG
ACTGCGGTCCGATGACACAGCTGTGTACTATTGTGCCGGCACCGACCAGGC
CGCTTGGTTTCGCCTTCTGGGGGCAGGGCACACAGTCACCGTGAGCTCTGC
CAGCACCAAGGGCCCTTCCGTGTTTCCCCTGGCCCCCTGCTCCCGGTCCACATCT
GAGAGCACCGCCGCCCTGGGCTGTCTGGTGAAGGACTACTTCCCAGAGCCCGTG
ACCGTGAGCTGGAACAGCGGCGCCCTGACAAGCGGCGTGACACATTTCCCGCC
GTGCTGCAGAGCTCCGGCCTGTACTCCCTGTCTAGCGTGGTGACAGTGCCTTCCT
CTAGCCTGGGCACCAAGACATATACCTGTAACGTGGACCACAAGCCAAGCAATA
CCAAGGTGGATAAGCGGGTGGAGTCTAAGTACGGCCCTCCTTGCCCTAGCTGTCC
TGCTCCAGAGTTTCTGGGCGGCCCTTCCGTGTTCTGTTTCCACCCAAACCAAAG
GACACACTGATGATCTCTAGAACACCAGAGGTGACCTGCGTGGTGGTGGACGTG
AGCCAGGAGGATCCCGAGGTGCAGTTCAACTGGTACGTGGATGGCGTGGAGGTG
CACAATGCCAAGACCAAGCCAAGAGAGGAGCAGTTTAACTCTACATACAGGGTG
GTGAGCGTGCTGACCGTGCTGCACCAGGATTGGCTCAACGGCAAGGAGTATAAG
TGCAAGGTGTCCAATAAGGGCCTGCCCTCCTCTATCGAGAAGACAATCTCTAAGG
CTAAGGGCCAGCCAAGAGAGCCTCAGGTGTACACCCTGCCTCCAAGCCAGGAGG
AGATGACAAAGAACCAGGTGTCCCTGACATGTCTGGTGAAGGGCTTCTATCCCTC
CGACATCGCCGTGGAGTGGGAGTCTAATGGCCAGCCTGAGAACAATTACAAGAC
CACACCCCTGTGCTGGACTCTGATGGCAGCTTCTTTCTGTATTCCAGGCTGACC
GTGGATAAGTCTCGGTGGCAGGAGGGCAACGTGTTCAAGCTGCTCTGTGATGCAC
GAAGCCCTGCATAATCACTATACTCAGAAAAGTCTGTCACTGTCACTGGGAAAGT
GATAA

[圖11]

DNA sequence**Light chain**

Humanized antibody 1G1-h61

ATGGGCTGGTCATGTATTATTCTGTTTCTGGTCGCAACTGCTACAGGGGTCCATAGT GATATCGTT
ATGACCCAGACCCCTCTGAGCCTGTCCGTGACCCAGGCCAACCTGCCTCTATCAGCTGTAG
AAGCAGCCAGAACATCGTGACAGCAACGGCGACACCTACCTGGAATGGTATCTGCAGAAA
CCTGGACAGAGCCCCAAGCTGCTGATCTACAAGGTGTCCAAGCGGTTTTCCGGCGTGCTGA
TAGATTACAGCGGATCTGGCAGCGGCACAGACTTCACCCTGAAGATTTCTAGAGTGGAGGCCG
AGGACGTGGGCGTCTACTACTGCTTCCAGGGCAGCCACGTGCCCTGGACATTCGGCGGCGG
AACAAAGGTGGAATCAAGAGGACAGTGGCCGCCCAAGCGTTCATCTTCCCCCTTCCGACG
 AGCAGCTGAAGTCTGGCACC GCCAGCGTGGTGTGCTGCTGAACAATTCTACCCTCGGGAGGCC
 AAGGTCCAGTGGAAAGGTGGATAACGCCCTGCAGTCTGGCAATAGCCAGGAGTCCGTGACCGAGCA
 GGACTCTAAGGATAGCACATATCCCTGTCTAGCACCTGACACTGAGCAAGGCCGATTACGAGA
 AGCACAAGGTGTATGCCTGTGAAGTCACCCATCAGGGGCTGTCATCACCCGTCCTAAGTCATTCA
 ATCGCGGAGAATGCTGATAA

Humanized antibody 1G1-h68

ATGGGCTGGTCATGTATTATTCTGTTTCTGGTCGCAACTGCTACAGGGGTCCATAGT GATATCGTT
ATGACCCAGACCCCTCTGAGCCTGTCCGTGACCCAGGCCAACCTGCCTCTATCAGCTGTAG
AAGCAGCCAGAACATCGTGACAGCAACGGCGACACCTACCTGGAATGGTATCTGCAGAAA
CCTGGACAGAGCCCCCAGCTGCTGATCTACAAGGTGTCCAAGCGGTTTTCCGGCGTGCTGA
TAGATTACAGCGGATCTGGCAGCGGCACAGACTTCACCCTGAAGATTTCTAGAGTGGAGGCCG
AGGACGTGGGCGTCTACTACTGCTTCCAGGGCAGCCACGTGCCCTGGACATTCGGCGGCGG
AACAAAGGTGGAATCAAGAGGACAGTGGCCGCCCAAGCGTTCATCTTCCCCCTTCCGACG
 AGCAGCTGAAGTCTGGCACC GCCAGCGTGGTGTGCTGCTGAACAATTCTACCCTCGGGAGGCC
 AAGGTCCAGTGGAAAGGTGGATAACGCCCTGCAGTCTGGCAATAGCCAGGAGTCCGTGACCGAGCA
 GGACTCTAAGGATAGCACATATCCCTGTCTAGCACCTGACACTGAGCAAGGCCGATTACGAGA
 AGCACAAGGTGTATGCCTGTGAAGTCACCCATCAGGGGCTGTCATCACCCGTCCTAAGTCATTCA
 ATCGCGGAGAATGCTGATAA

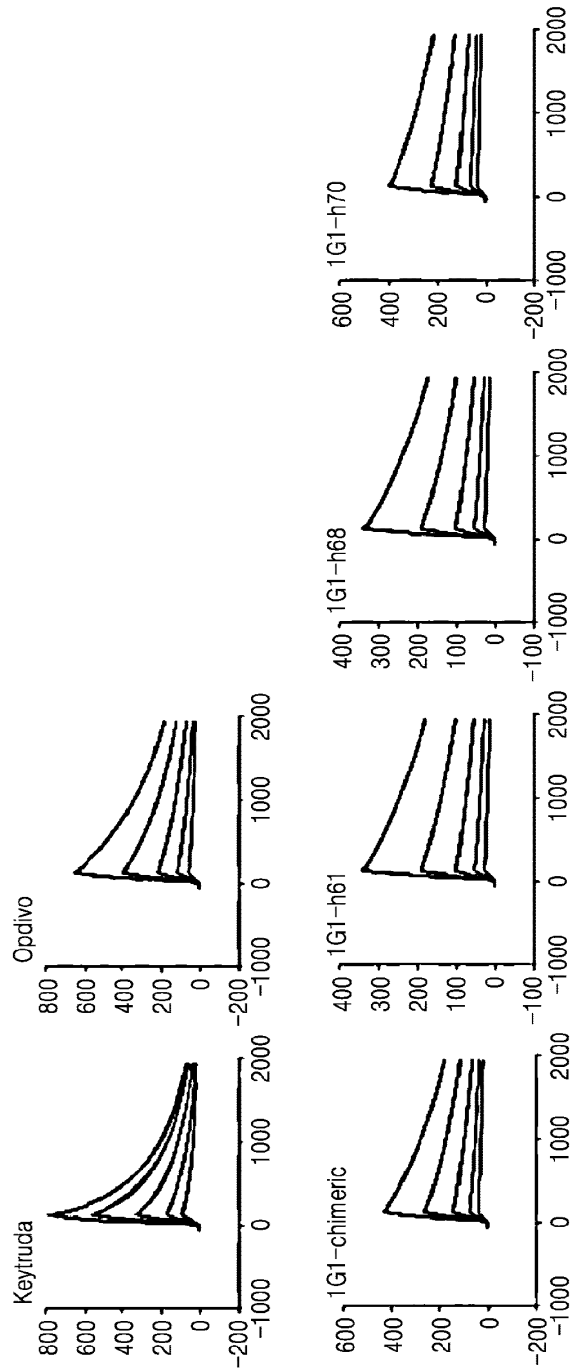
Humanized antibody 1G1-h70

ATGGGCTGGTCATGTATTATTCTGTTTCTGGTCGCAACTGCTACAGGGGTCCATAGT GATATCGTTAT
GACCCAGACCCCTCTGAGCCTGTCCGTGACCCAGGCCAACCTGCCTCTATCAGCTGTAGAA
GCAGCCAGAACATCGTGACAGCCAGGGCGACACCTACCTGGAATGGTATCTGCAGAAACCT
GGACAGAGCCCCCAGCTGCTGATCTACAAGGTGTCCAAGCGGTTTTCCGGCGTGCTGATAG
ATTACAGCGGATCTGGCAGCGGCACAGACTTCACCCTGAAGATTTCTAGAGTGGAGGCCGAGG
ACGTGGGCGTCTACTACTGCTTCCAGGGCAGCCACGTGCCCTGGACATTCGGCGGCGGAACA
AAGGTGGAATCAAGAGGACAGTGGCCGCCCAAGCGTTCATCTTCCCCCTTCCGACGAGCA
 GCTGAAGTCTGGCACC GCCAGCGTGGTGTGCTGCTGAACAATTCTACCCTCGGGAGGCCAAGGT
 CCAGTGGAAAGGTGGATAACGCCCTGCAGTCTGGCAATAGCCAGGAGTCCGTGACCGAGCAGGACT
 CTAAGGATAGCACATATCCCTGTCTAGCACCTGACACTGAGCAAGGCCGATTACGAGAAGCACA
 AGGTGTATGCCTGTGAAGTCACCCATCAGGGGCTGTCATCACCCGTCCTAAGTCATTCAATCGCGG
 AGAATGCTGATAA

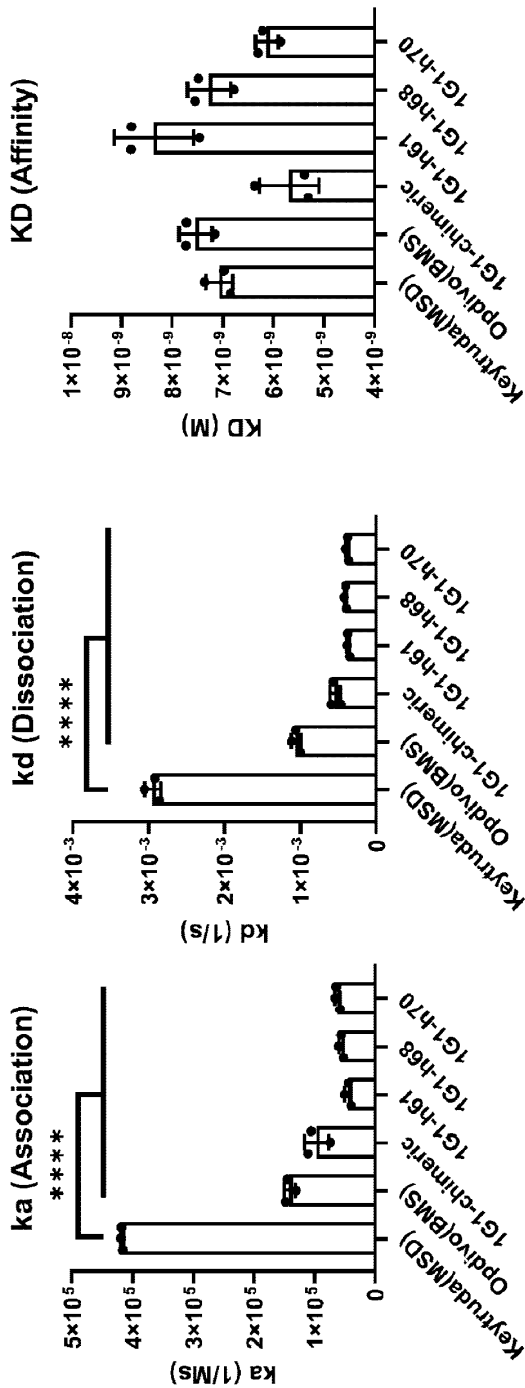
WO 2022/169274

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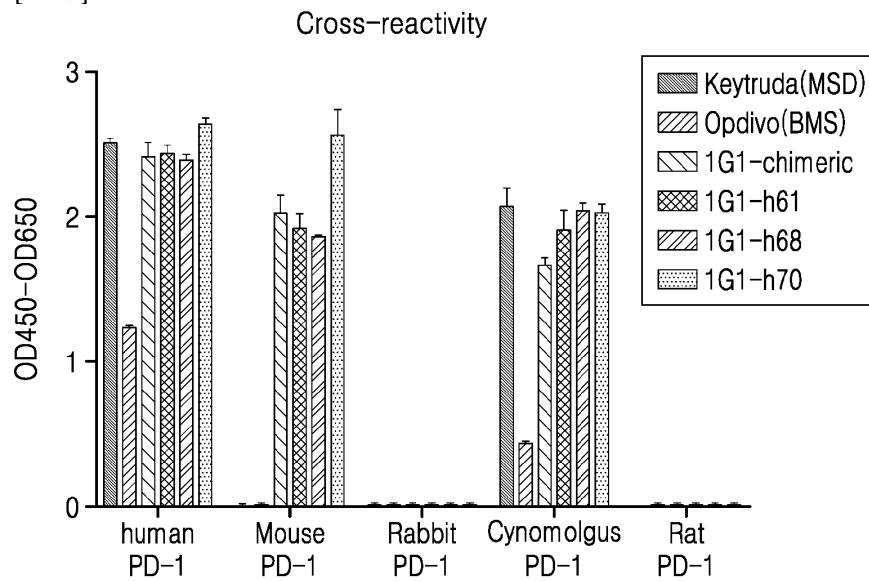
[도 12a]



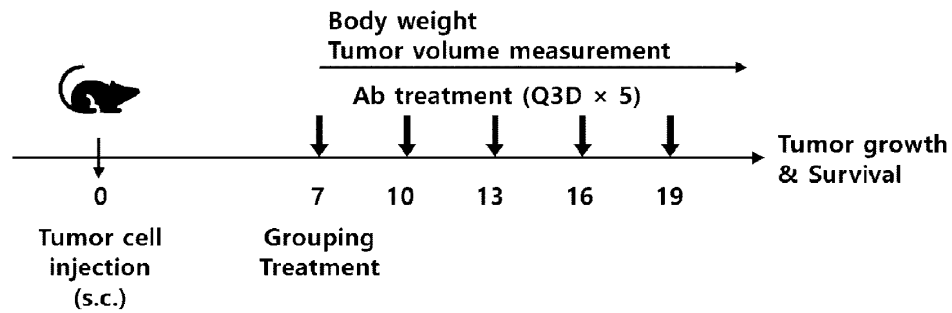
[도 12b]



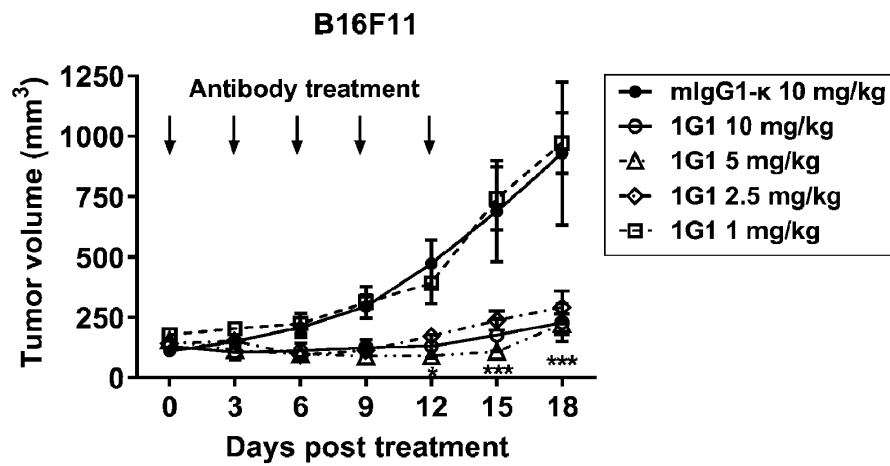
[도13]



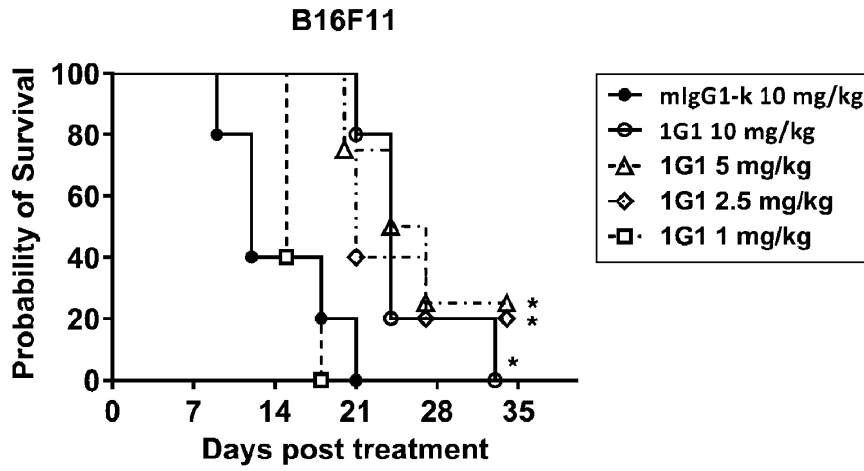
[도14]



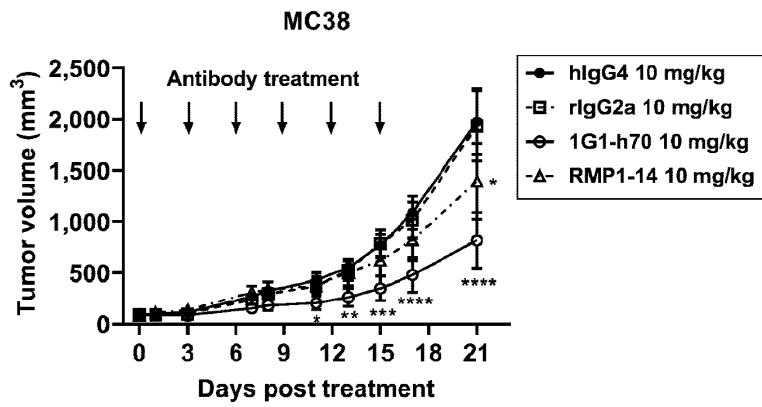
[도15]



[도16]

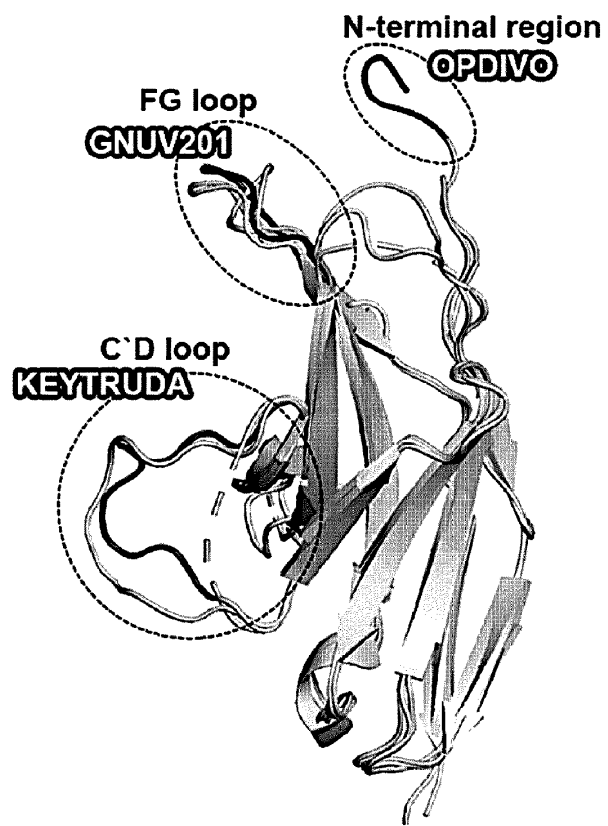


[도17]

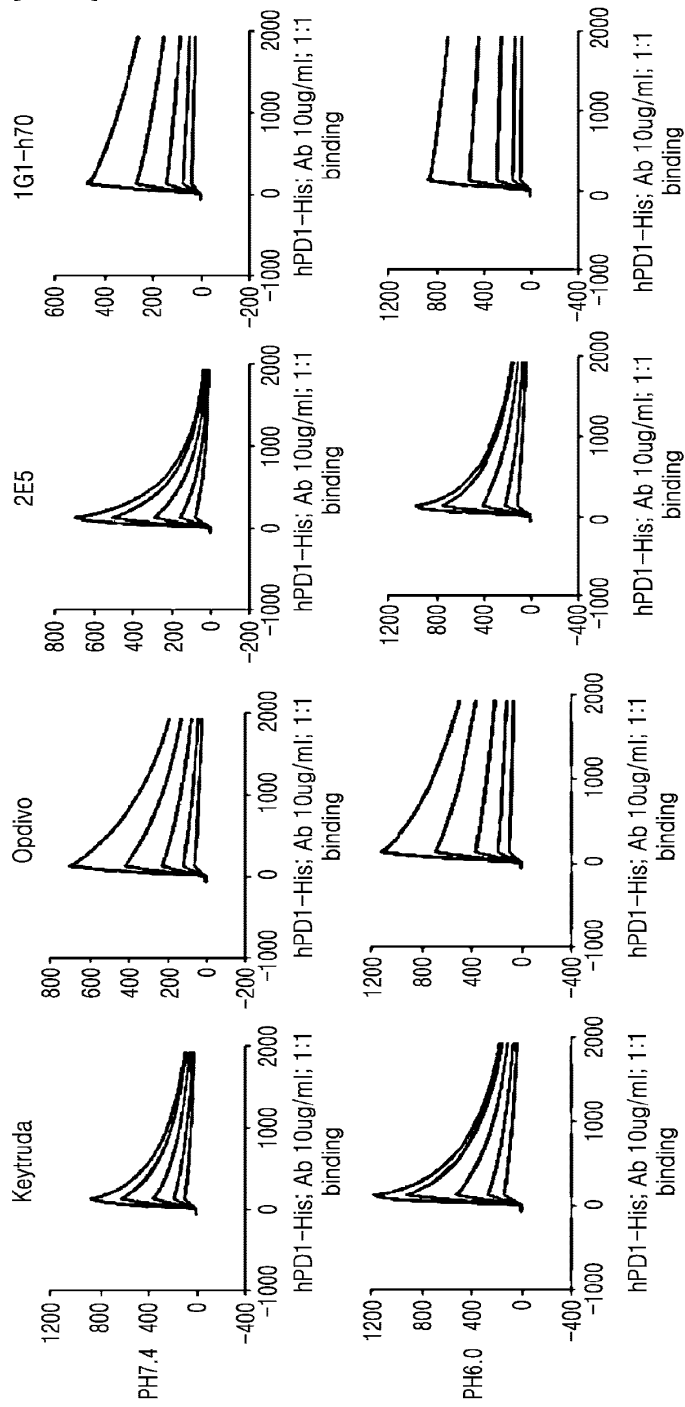


	1	3	7	8	11	13	15	17
hlgG4 vs. 1G-h70	0.7322	0.3268	0.0662	0.0655	0.0179	0.0025	0.0008	0.0168
rlgG2a vs. RMP1-14	0.882	0.7618	>0.9999	0.9993	0.5105	0.4331	0.0542	0.1256

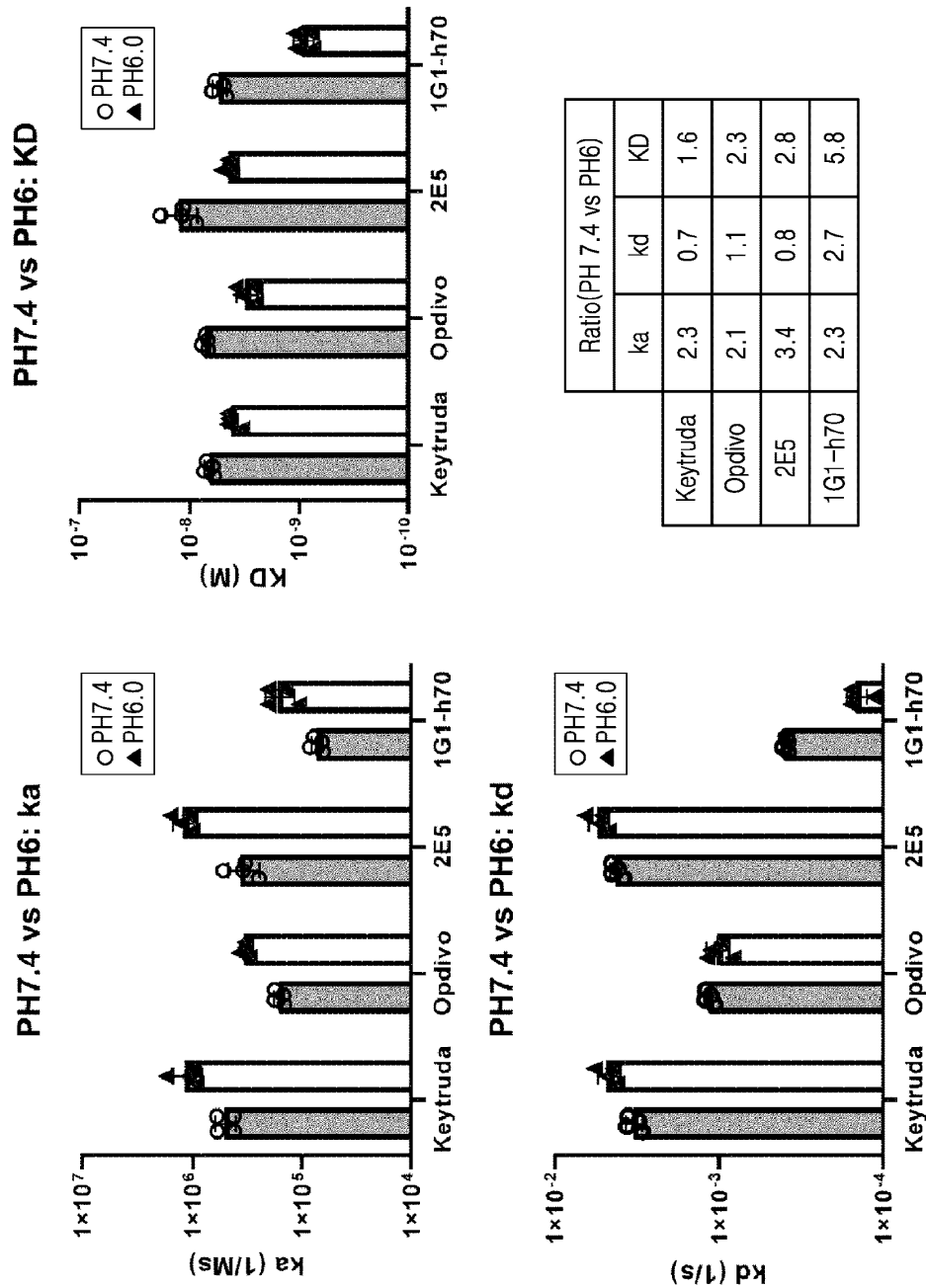
[도18]



[Figure 19a]



[도19b]



PH7.4 vs PH6: ka

PH7.4 vs PH6: kd

PH7.4 vs PH6: KD