

Figure 1

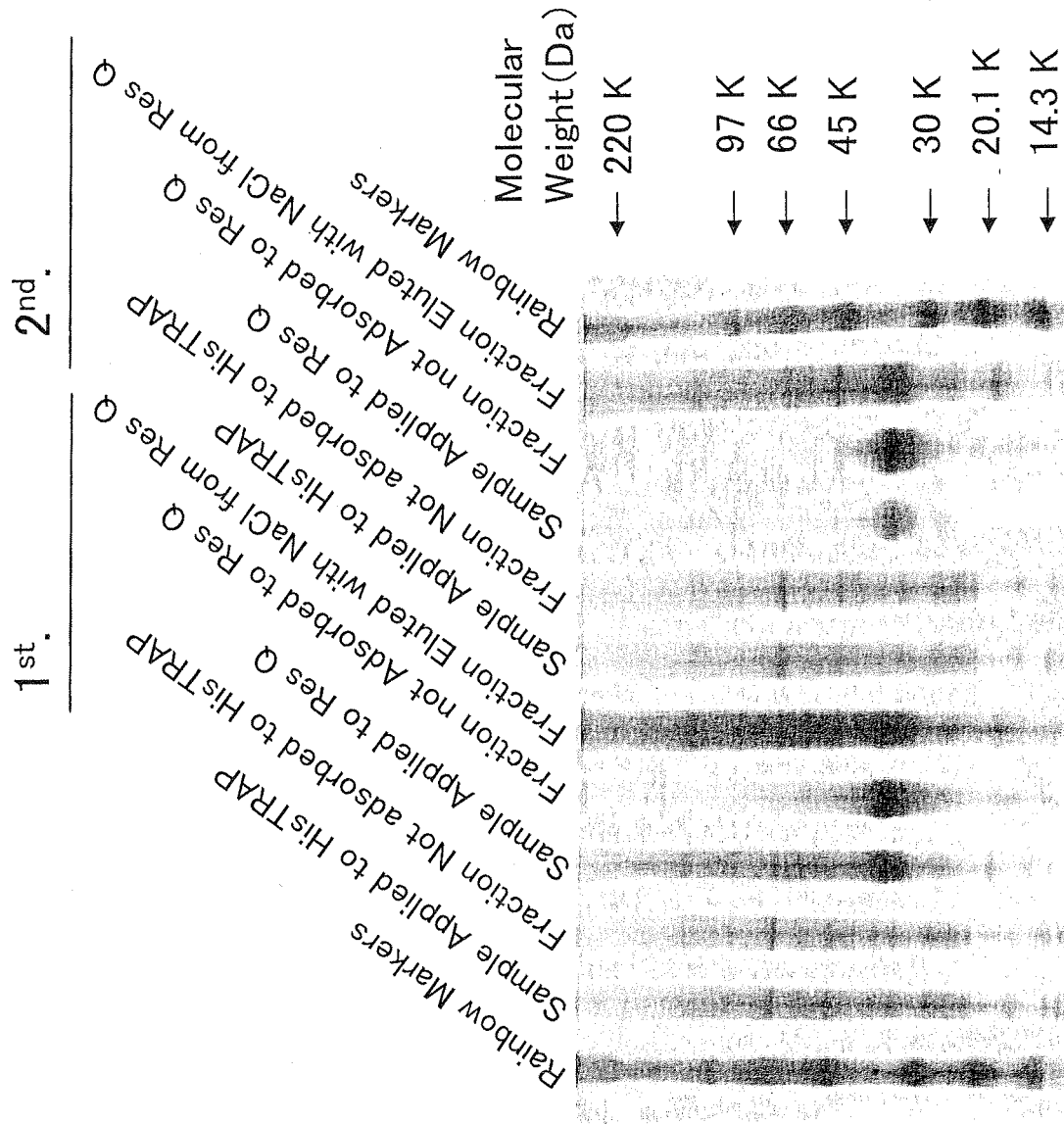
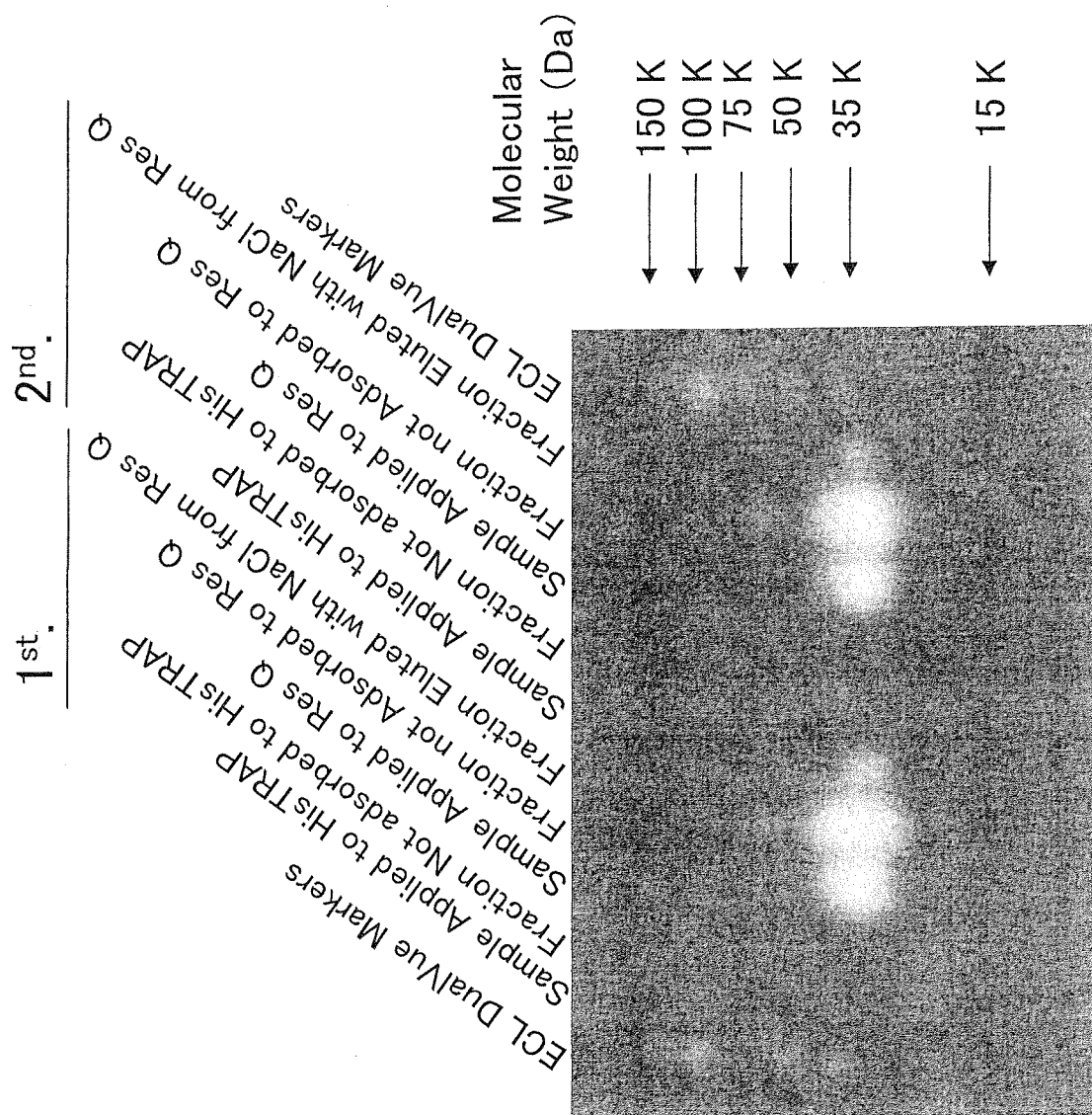


Figure 2



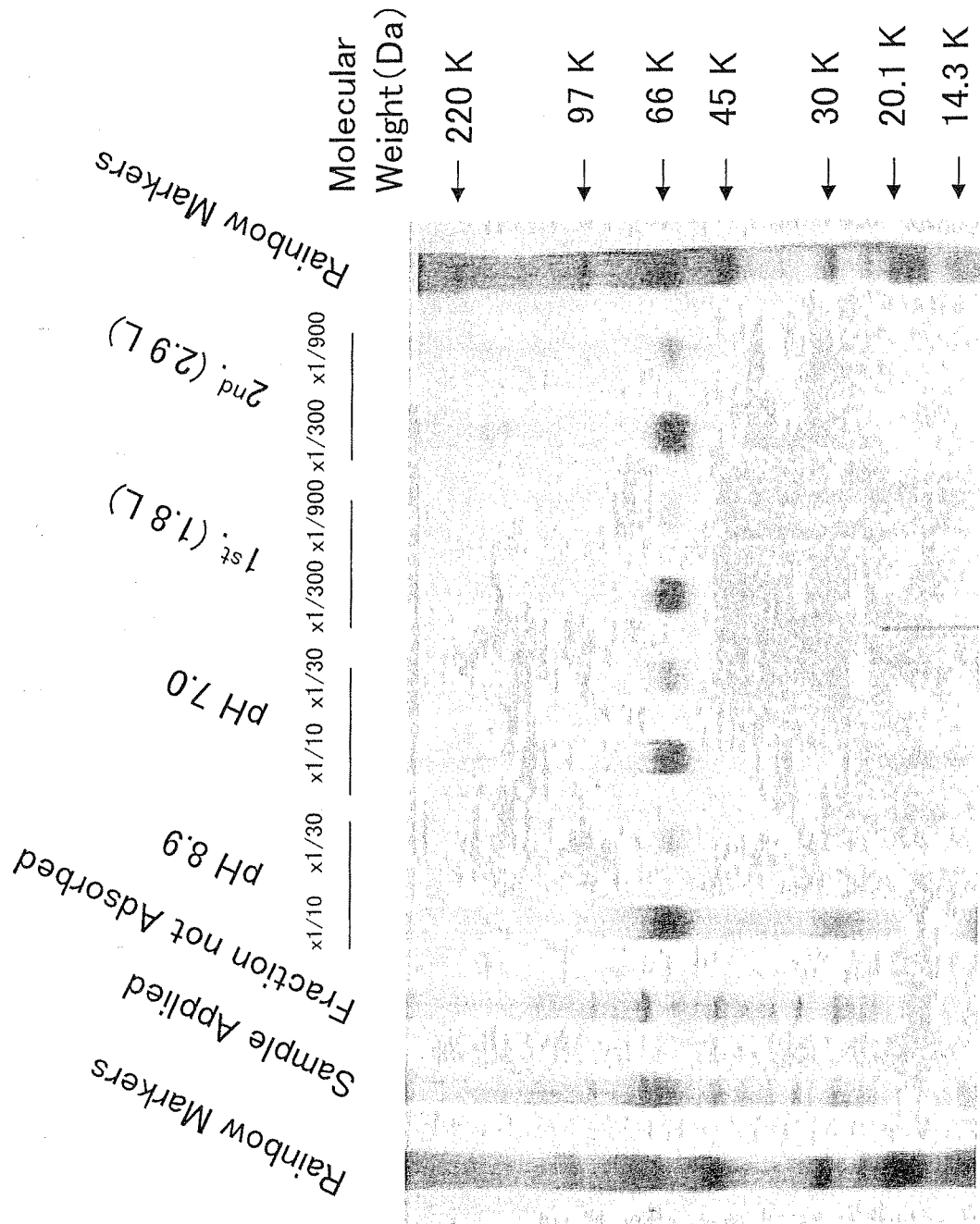


Figure 3

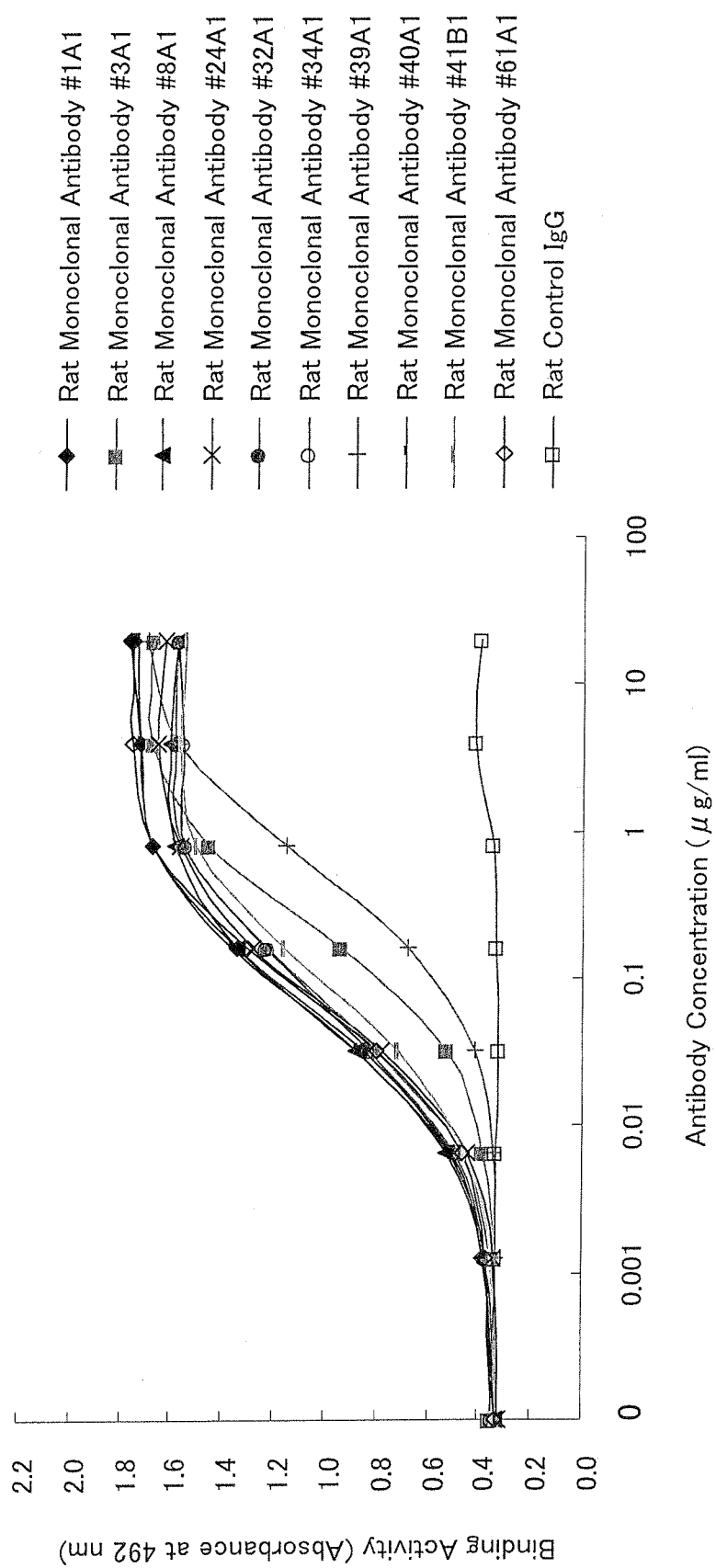


Figure 5

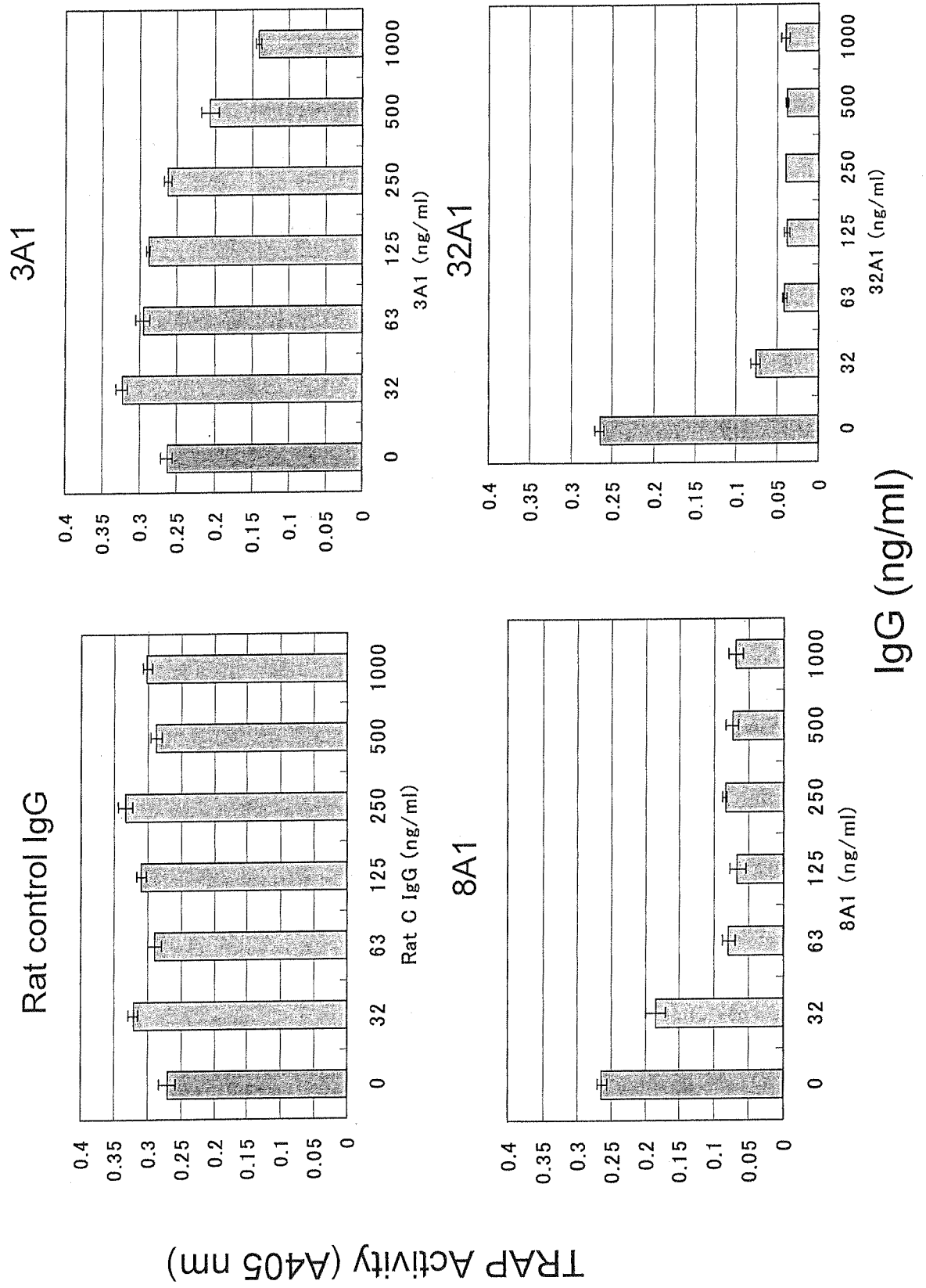


Figure 6

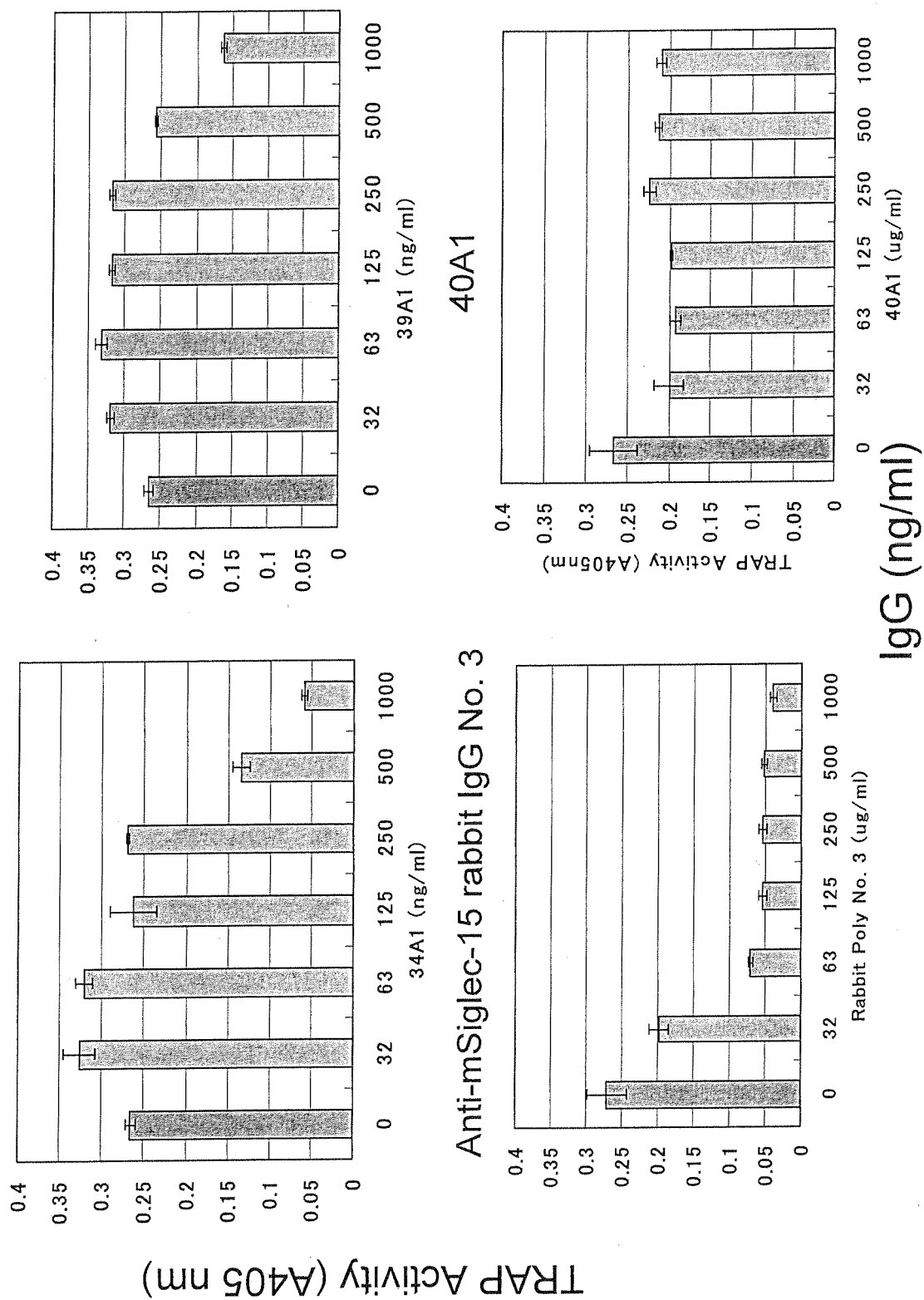


Figure 7

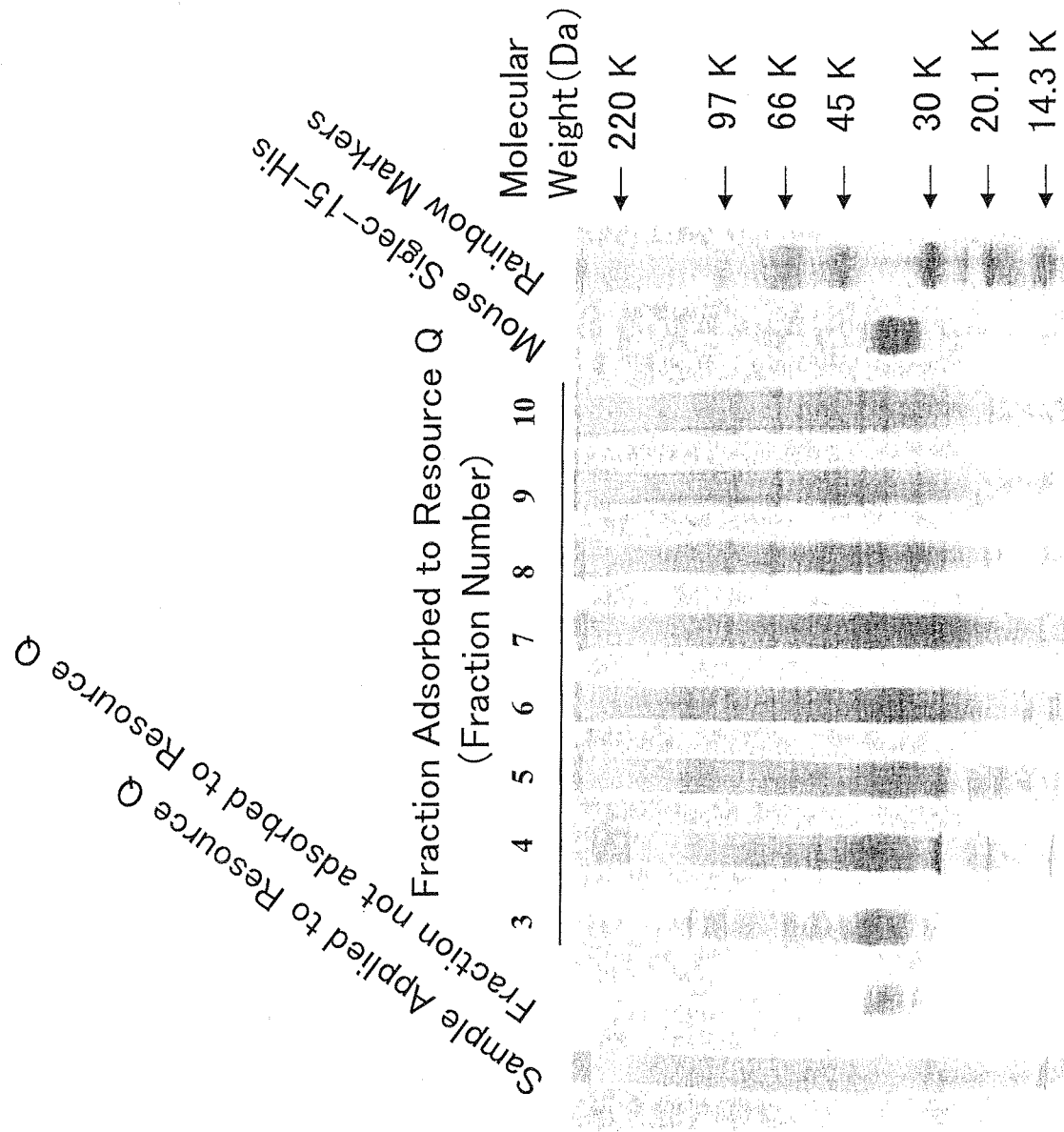


Figure 8

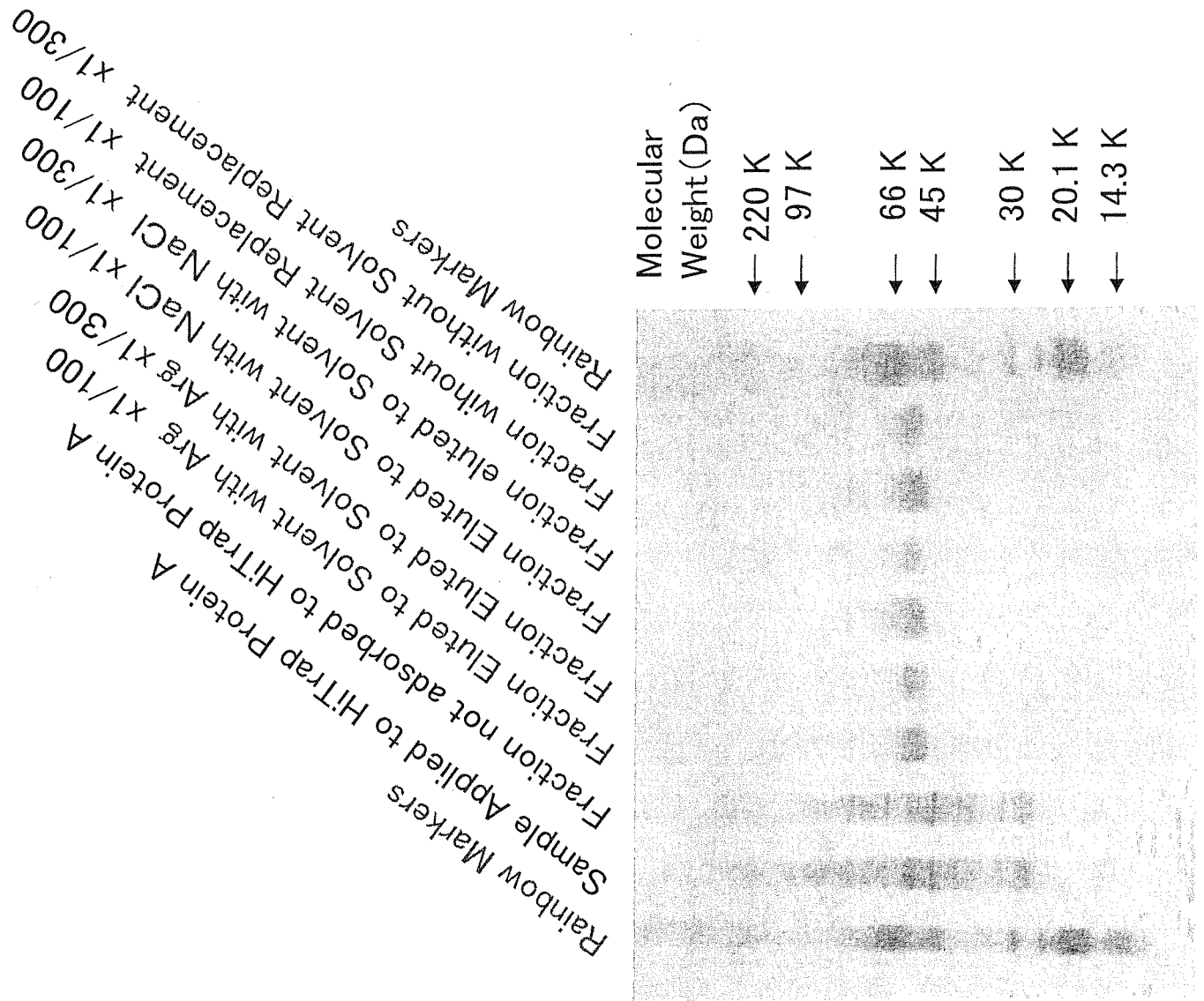


Figure 9

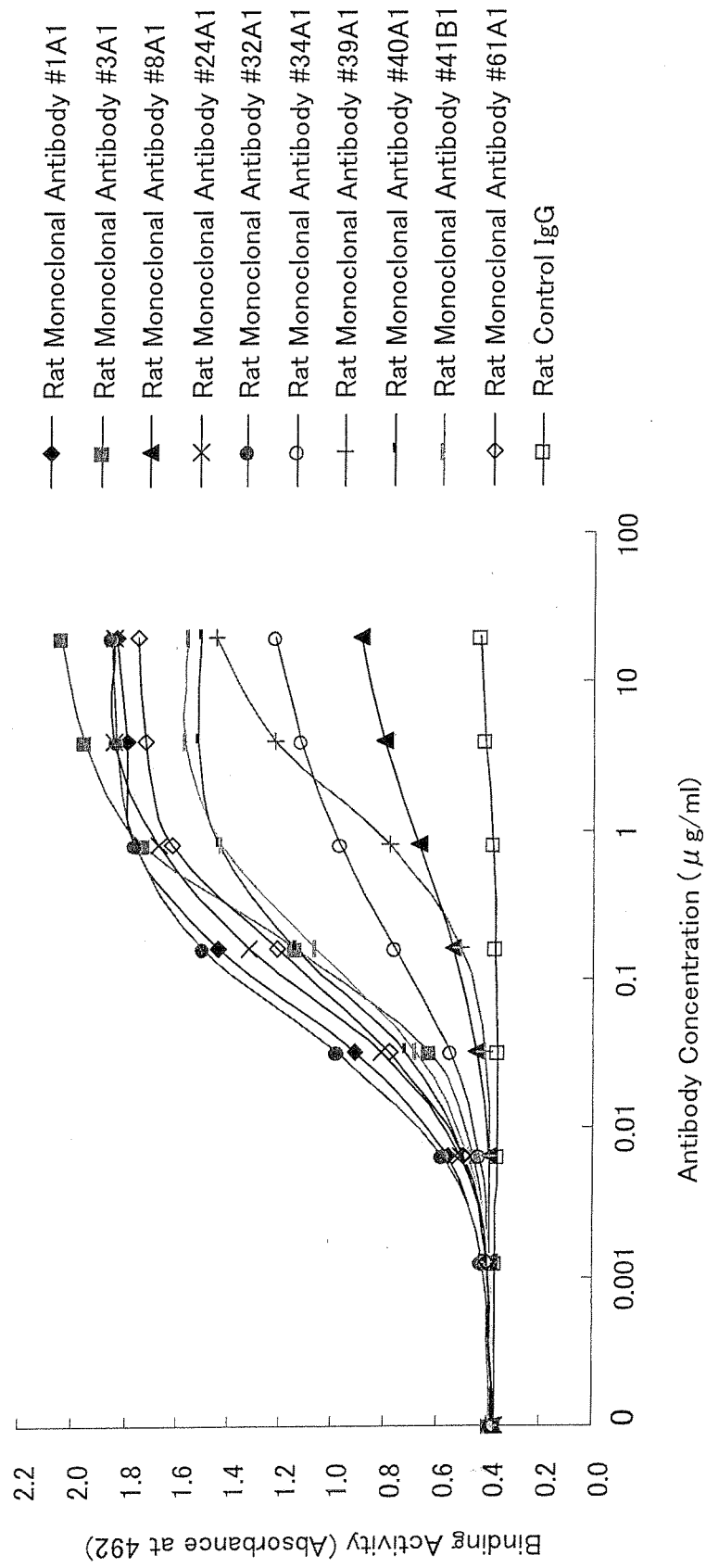
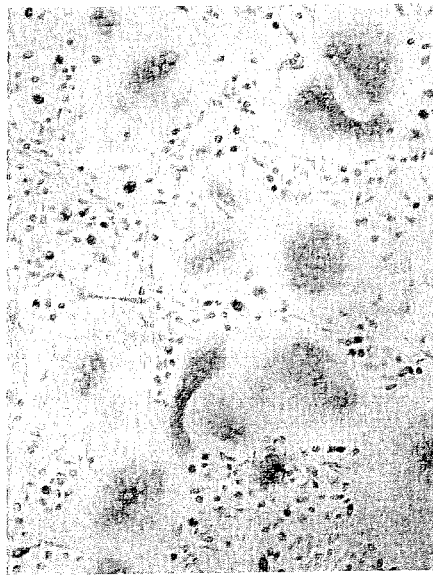
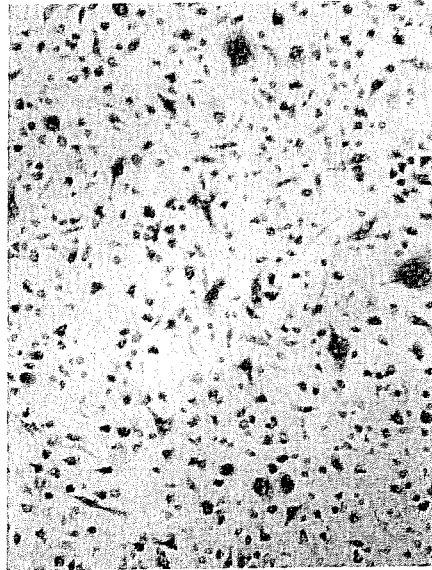


Figure 10

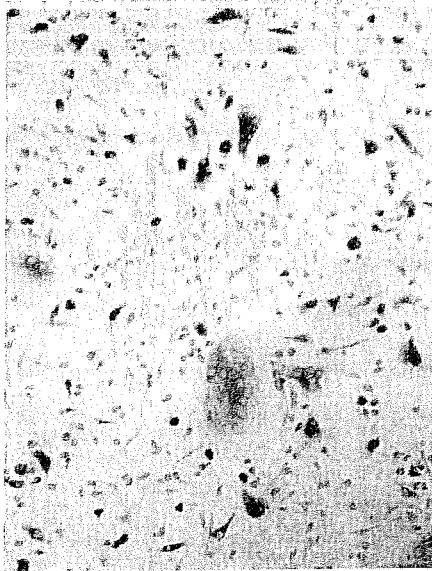
(A) Control



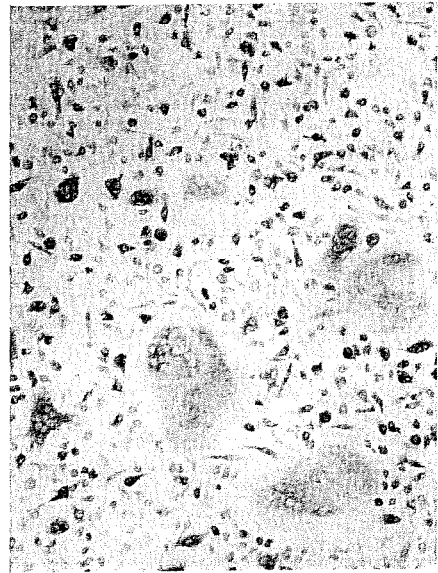
(B) #32A1 Antibody 30 μ g/ml



(C) #41B1 Antibody 30 μ g/ml



(D) #1A1 Antibody 30 μ g/ml



(E) Control IgG 30 μ g/ml

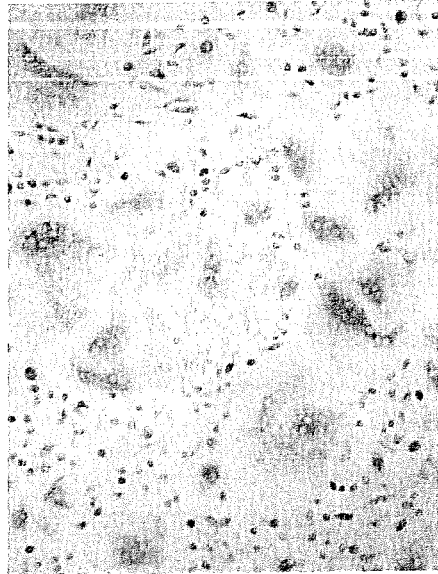
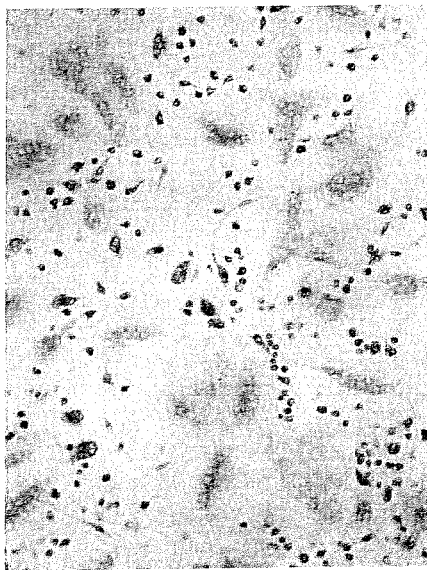
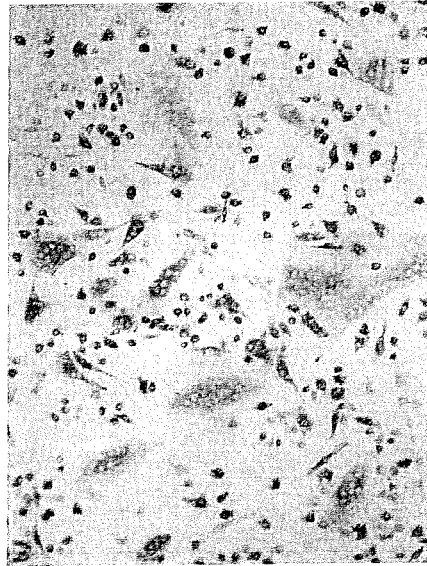


Figure 11

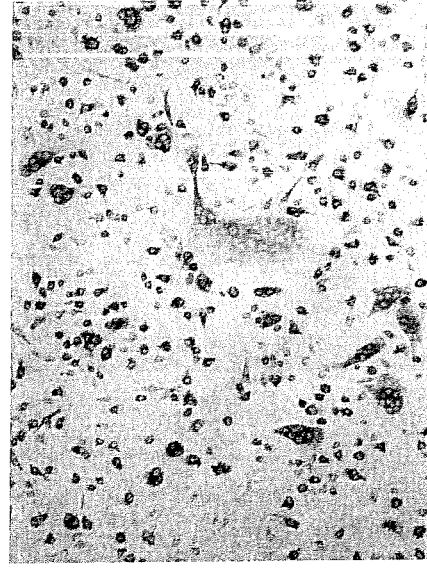
(A) Control



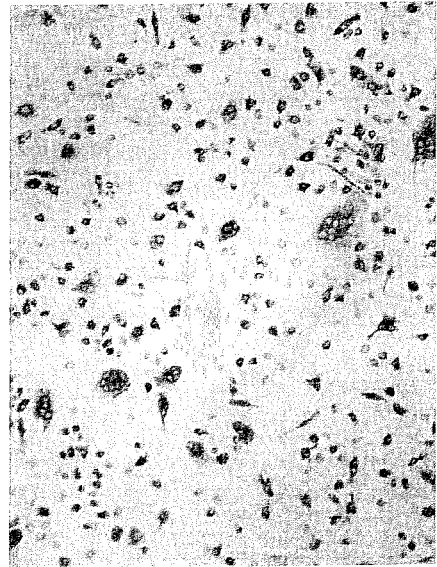
(B) #32A1 Antibody 0.1 μ g/ml



(C) #32A1 Antibody 0.3 μ g/ml



(D) #32A1 Antibody 1 μ g/ml



(E) #32A1 Antibody 3 μ g/ml

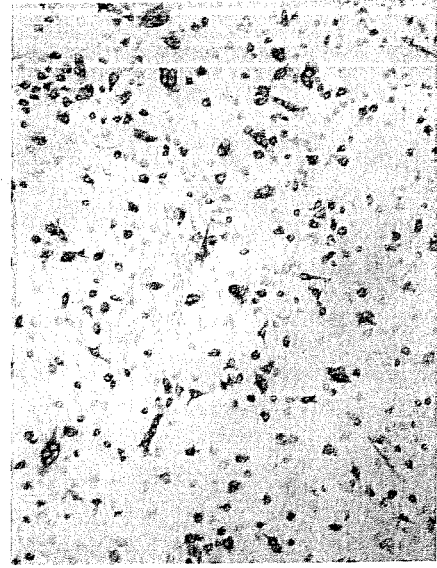


Figure 12

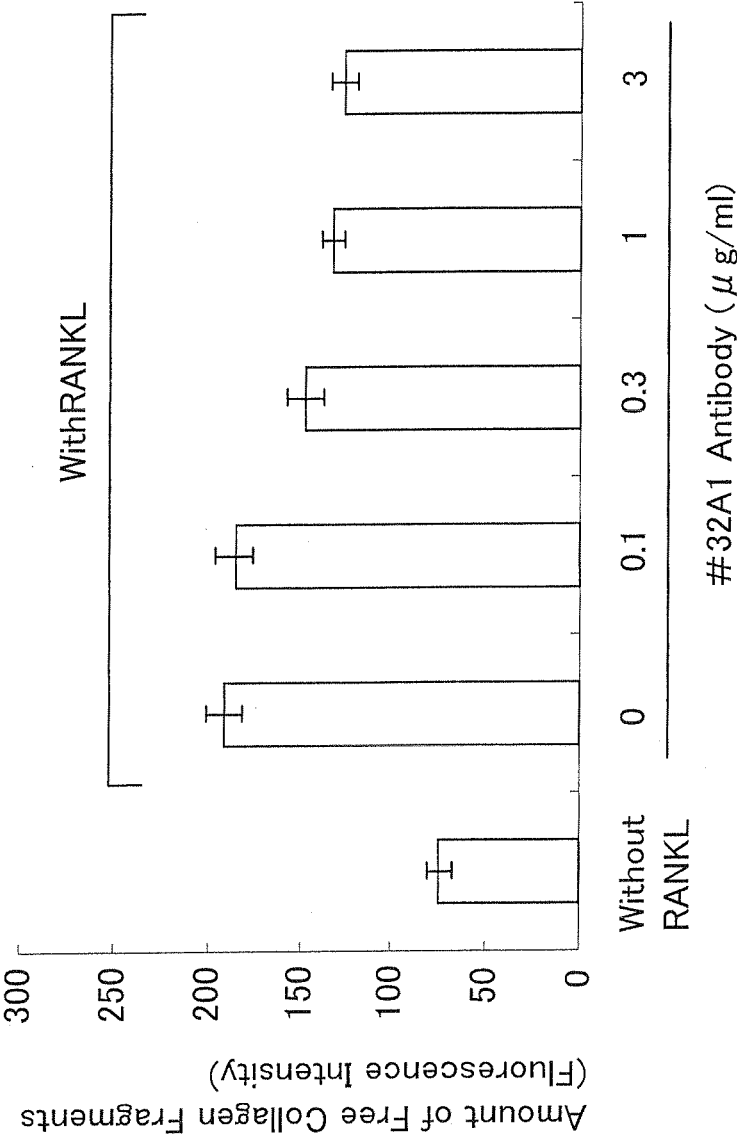
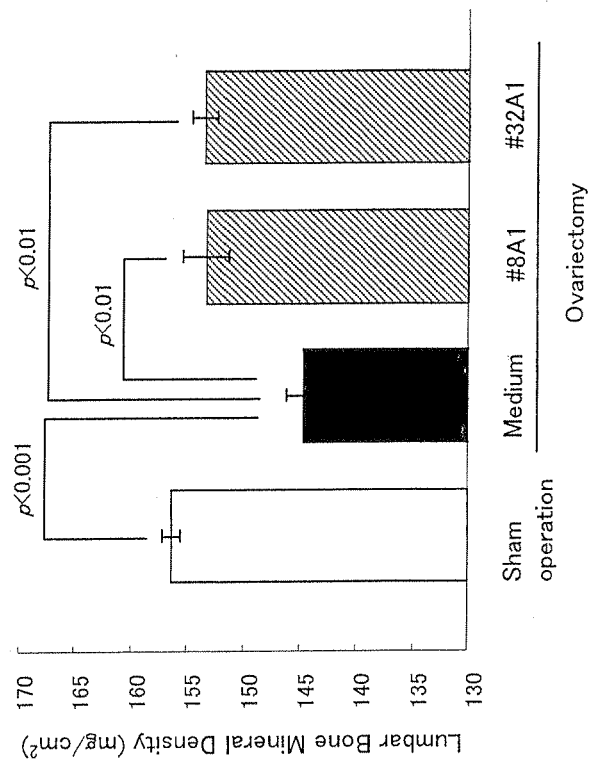


Figure 13

(A)



(B)

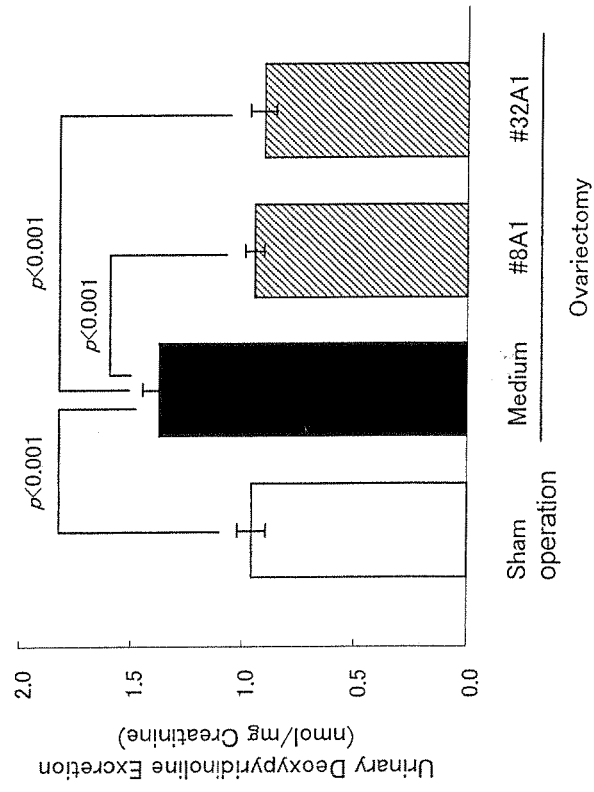


Figure 14

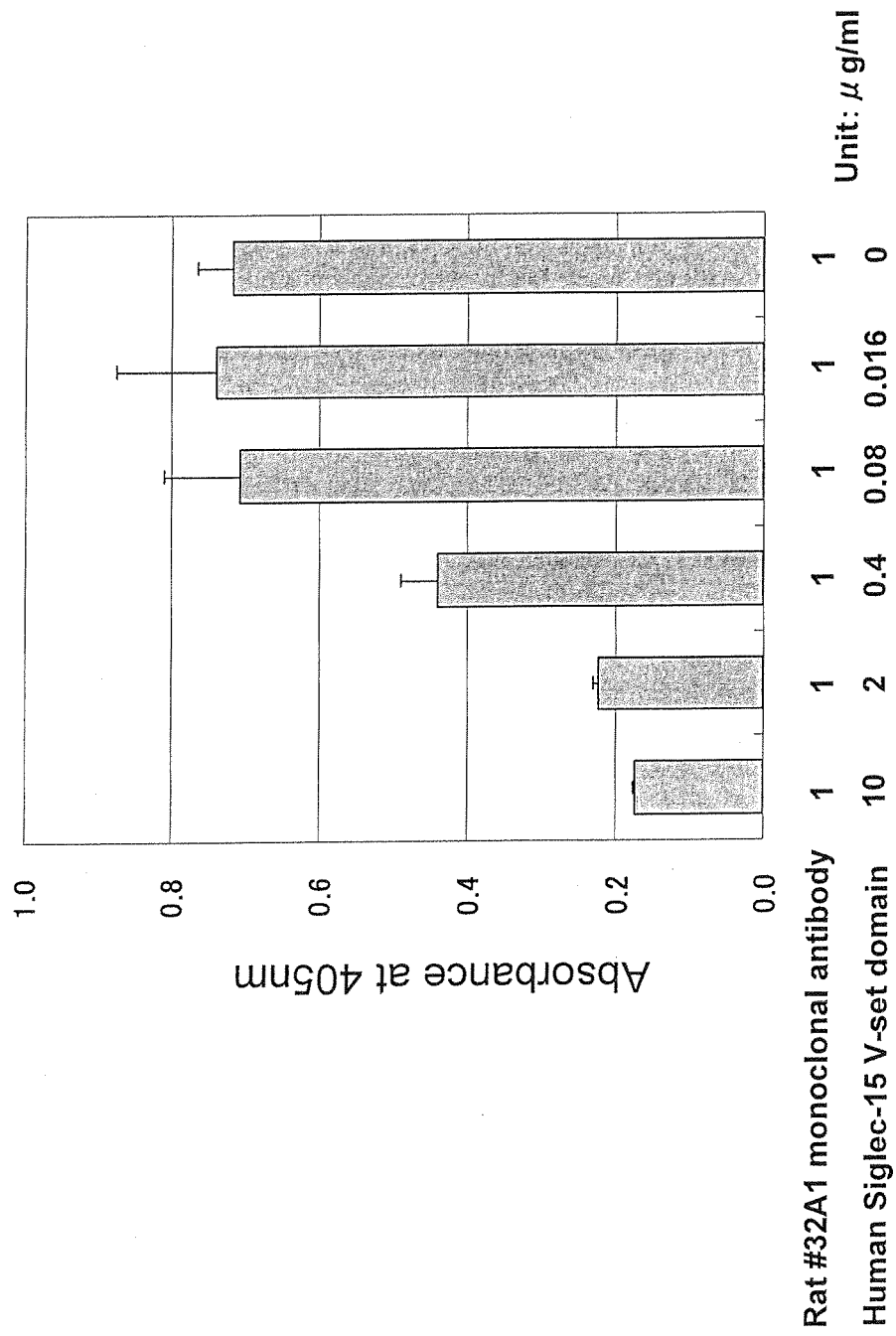


Figure 15

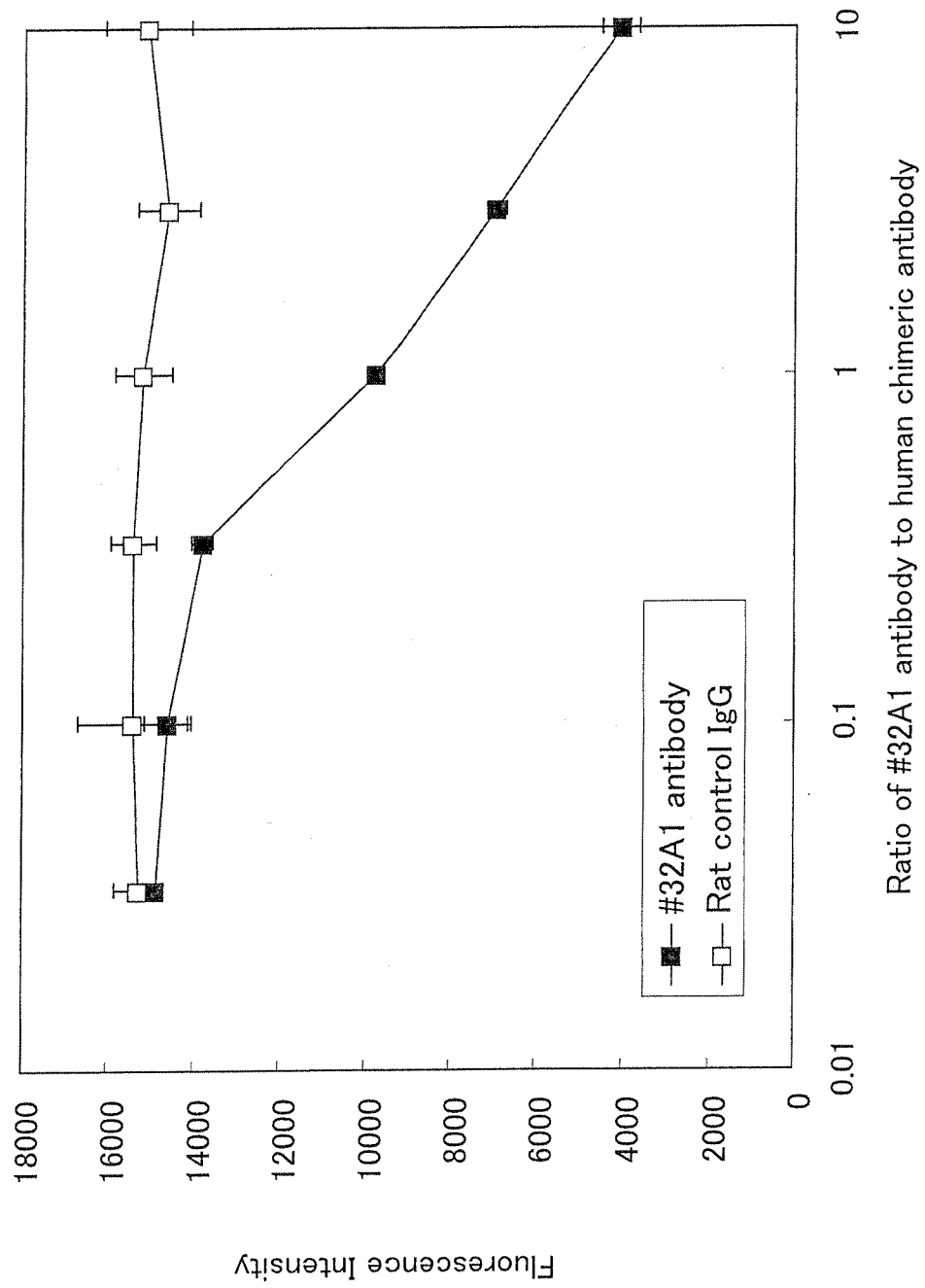


Figure 16

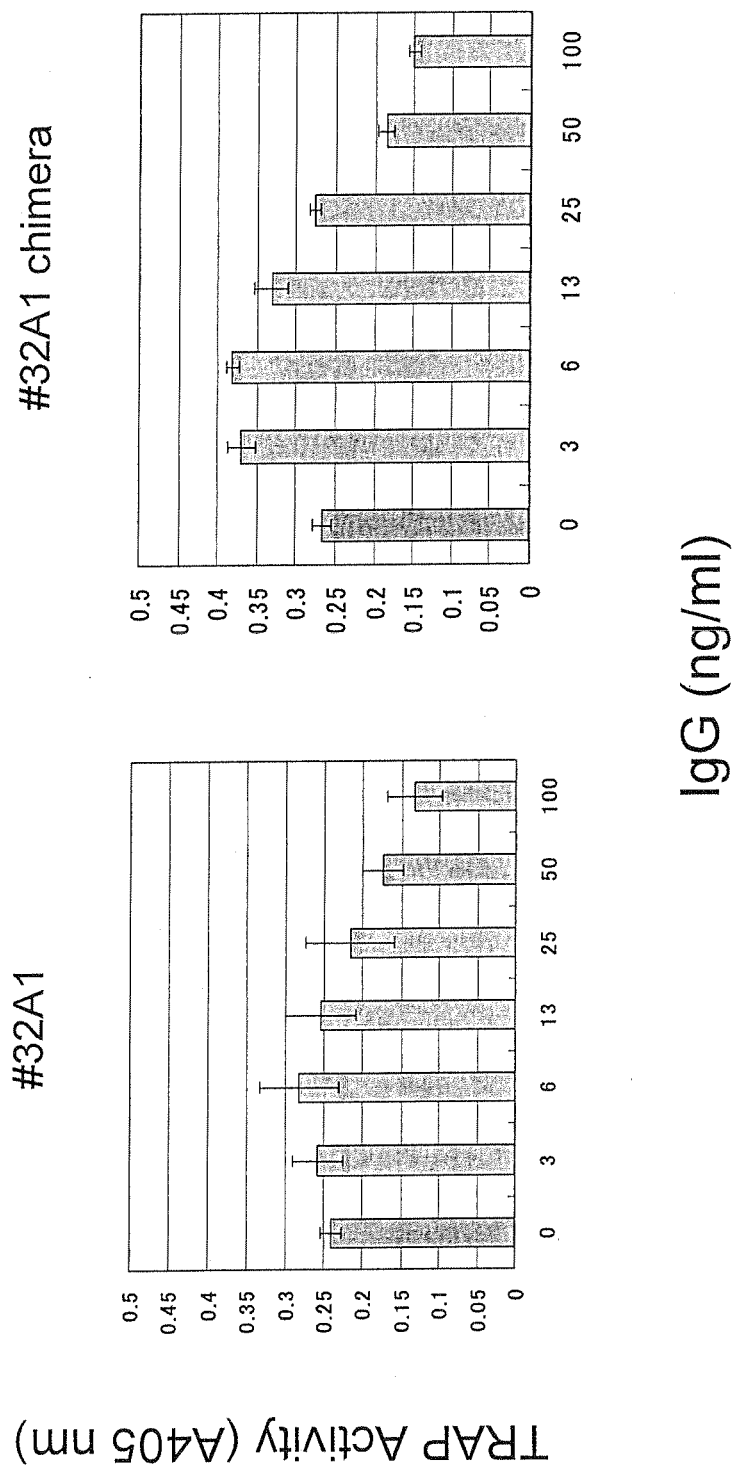
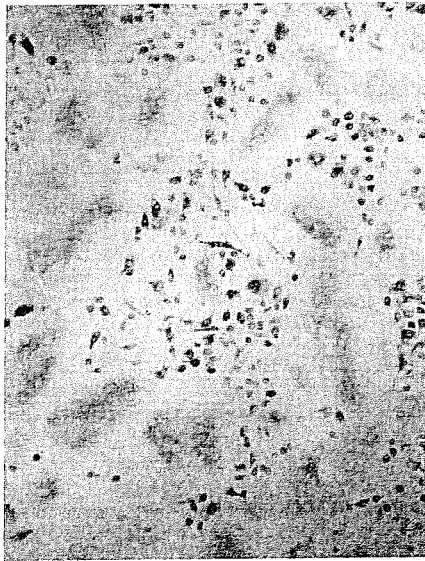
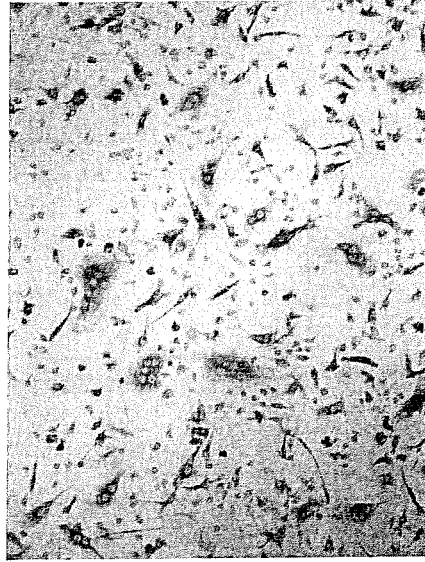


Figure 17

(A) Control



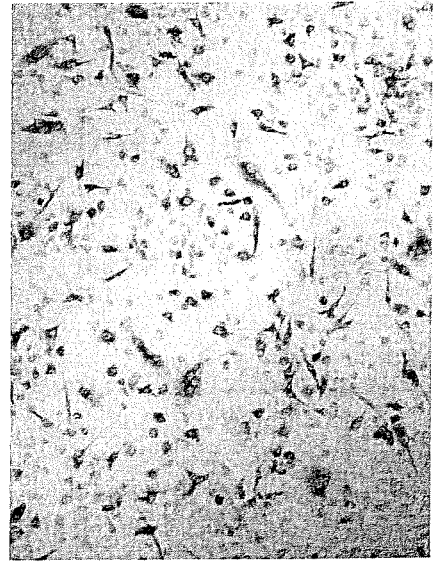
(B) Human chimeric antibody
0.3 μ g/ml



(C) Human chimeric antibody
1 μ g/ml



(D) Human chimeric antibody
3 μ g/ml



(E) Human chimeric antibody
10 μ g/ml

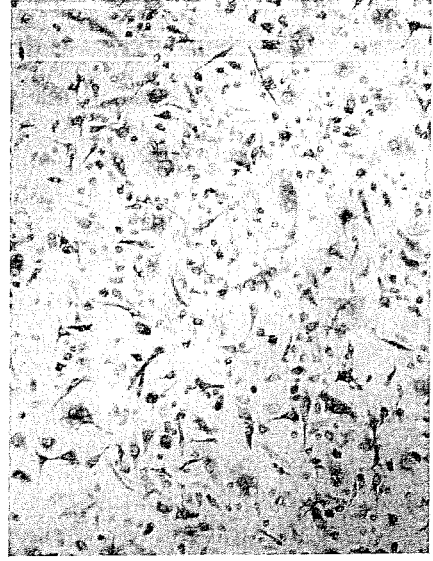


Figure 18

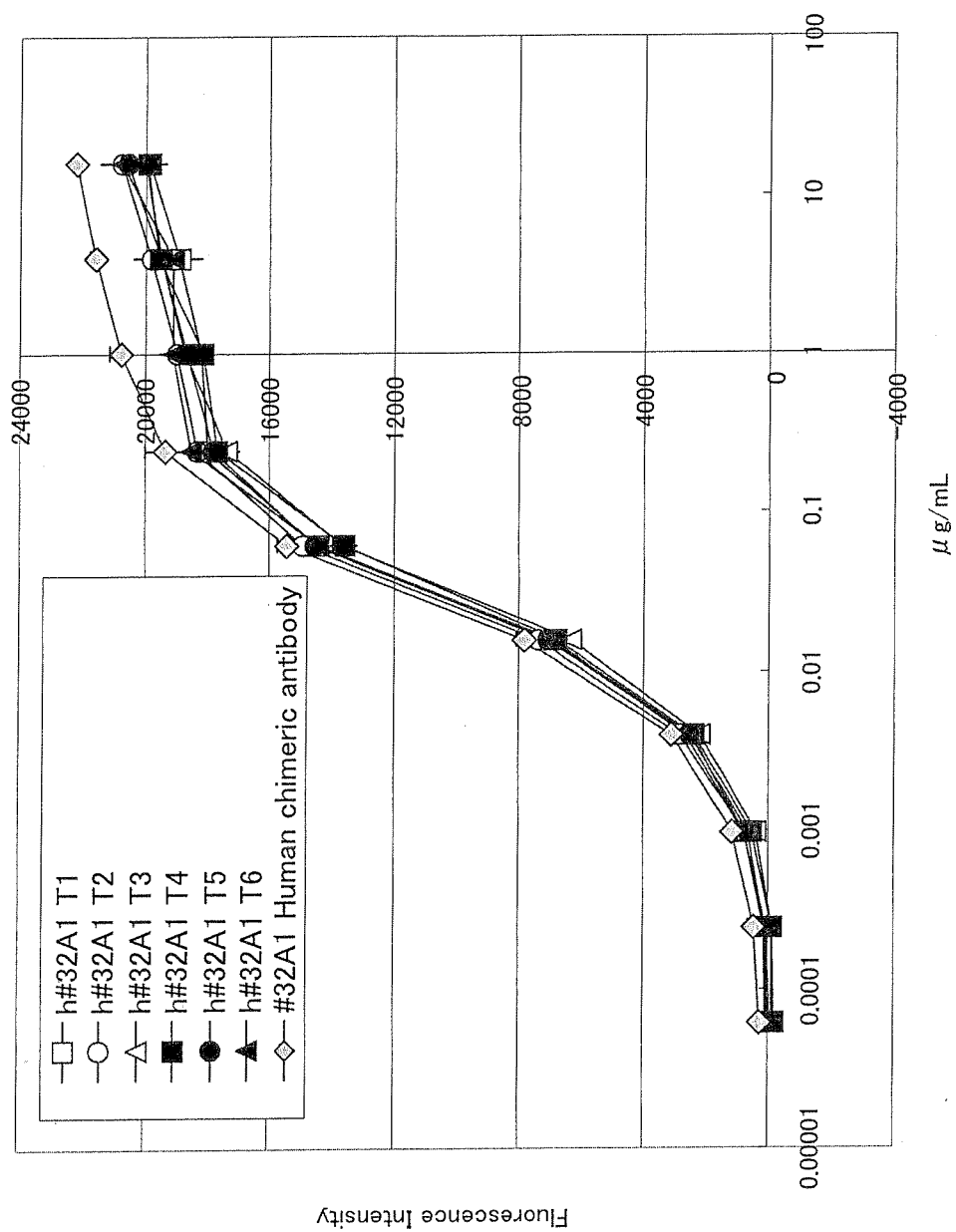


Figure 19

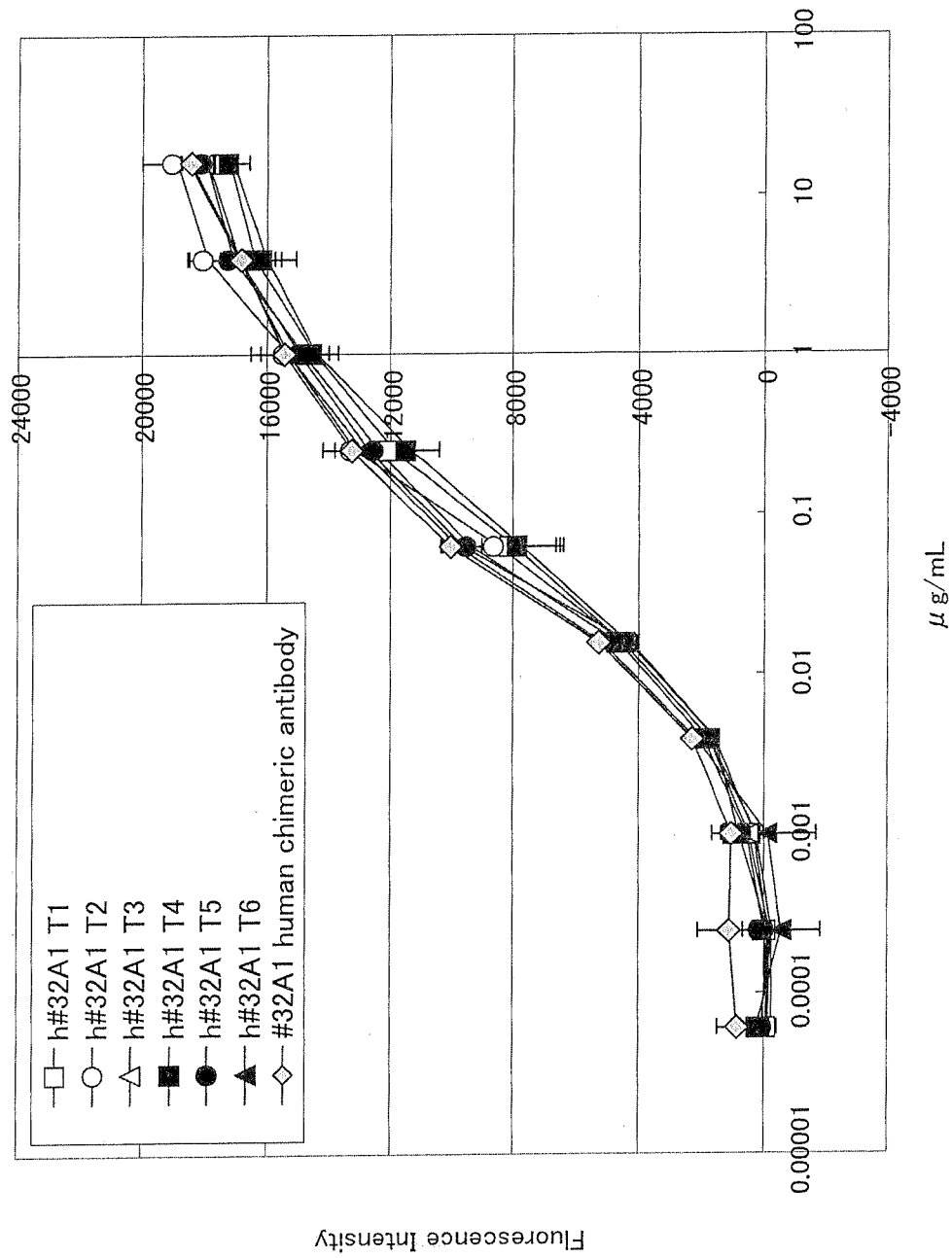
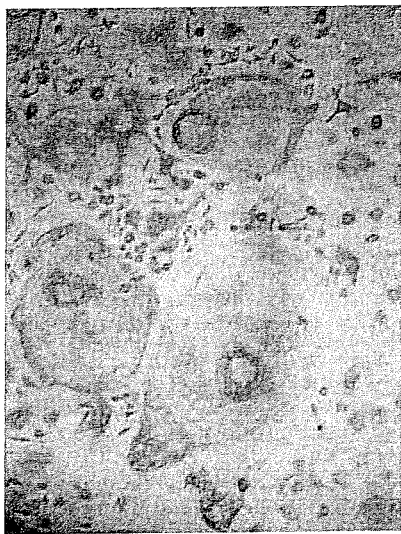
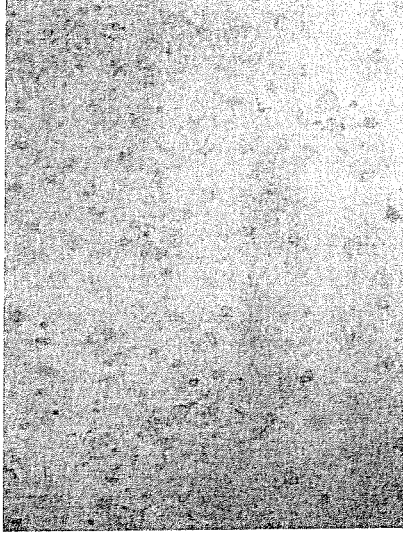


Figure 20

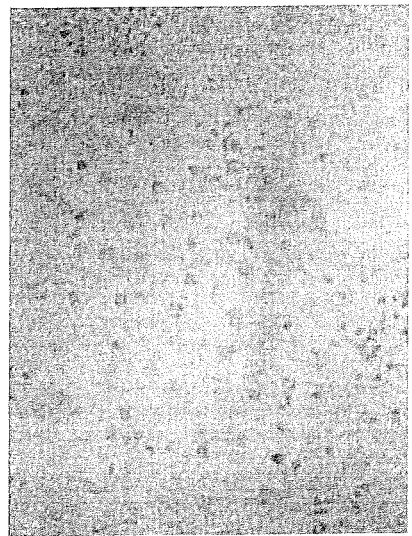
(A) Control: 30 ng/ml TNF α



(B) TNF α + 1 μ g/ml #32A1



(C) TNF α + 1 μ g/ml #32A1 chimera



(D) TNF α + 100 ng/ml OCIF/OPG

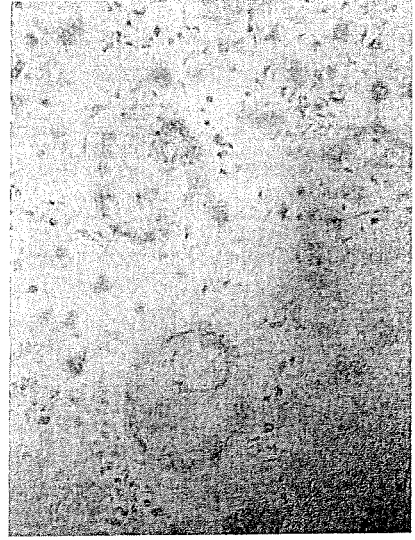
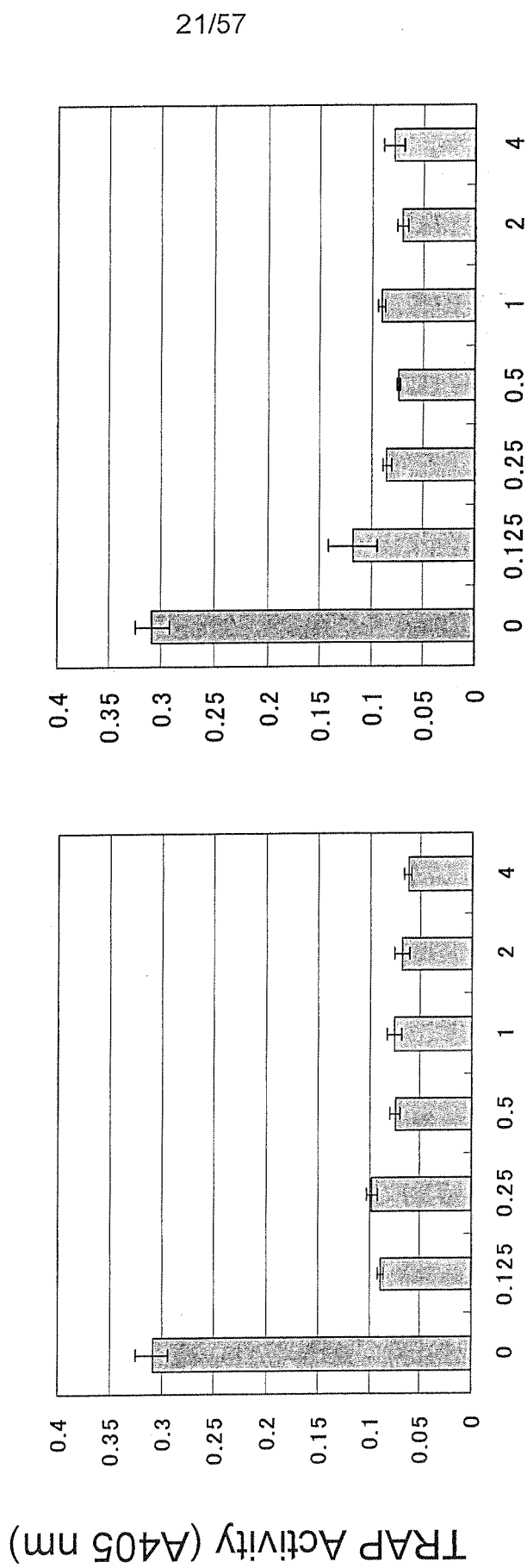


Figure 21



IgG (μg/ml)

Figure 22

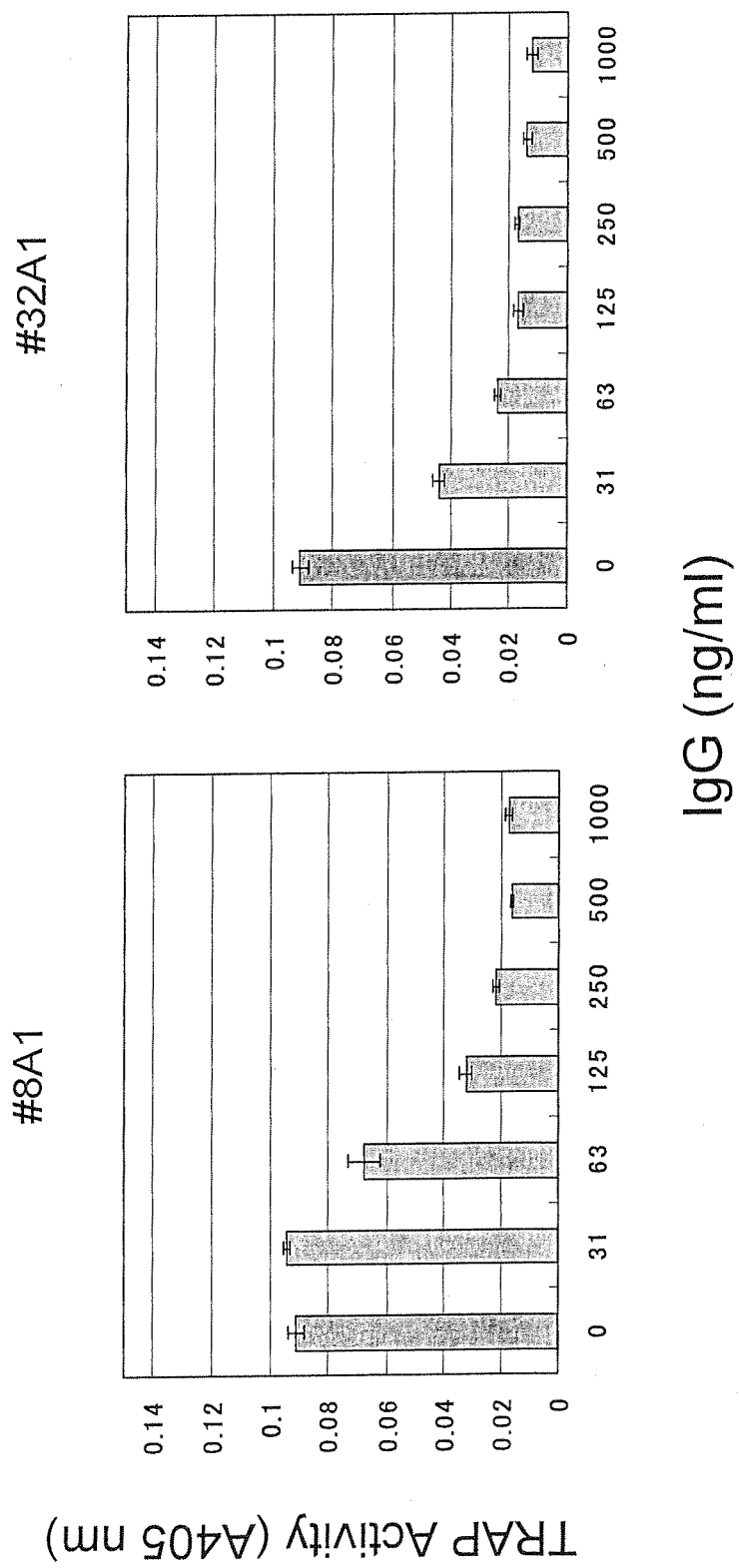


Figure 23

SEQ ID NO:27: Cloned Nucleotide Sequence of Rat #32A1 Heavy Chain (Variable Region + alpha)

ATGAAGTTGTGGTTGAGCTGGATATTCCTTGTTGTTCTTTCAAAGGTGTGAGGTGTGAGGTGCAAATTTTGGAGACTGG
AGGAGGCTTGGTGAAGCCCGGTGGTTCCTGAGACTGTCTTGCAACGTCTGGATTCAATTTCAATGATTATTCATGA
ACTGGGTCCGTCAGGCTCCAGAAAAGGGGCTAGAGTGGGTGCTCAAATAAGGAACAAAATTTATACTTATGCCACATTT
TATGCGGAGTCTTTGGAAGGCAGAGTCACAATCTCACGAGACGATTCCGAAAGCAGTGTCTACCTGCAAGTGAGCAGTTT
AAGAGCTGAAGACACTGCCATTTATTACTGTACAAGATCCCTAAGTGGGGGAGACTACTTTGATTACTGGGGCCAAGGAG
TCATGGTCACAGTCTCCTTAGCTGAAACAACAGCCCCATCTGTCTATCCACTGGCTCCTGGAAGTCTCTCAAAGTAAC
TCCATGGTGACCCTGGGATGC

Signal Sequence (1-57), Variable Region (58-420), Partial Sequence of Constant Region (421-501)

SEQ ID NO:28: Amino Acid Sequence Encoded by Cloned rat #32A1 Heavy Chain (Variable Region + alpha)

MKLWLSWIFLVVLFKGVRCVQILETGGGLVKPGGSLRLSCATSGFNFNDYFMNWVRQAPEKGLEWVAQIRNKIYTYATF
YAESLEGRVTISRDDSESSVYLQVSSLRAEDTAIYYCTRSLTGGDYFDYWGGQGMVTVSLAETTAPSVYPLAPGTALKSN
SMVTLGC

Signal Sequence (1-19), Variable Region (20-140), Partial Sequence of Constant Region (141-167)

Figure 24

SEQ ID NO:29: Cloned Nucleotide Sequence of Rat #32A1 Light Chain (Variable Region + alpha)

ATGGAGACAGACAGACTCCTGCTATGGGCACTGCTGCTCTGGGTTCCAGGCTCCACTGGTGACATTGTCTTGACCCAGTC
TCCTGCTTTGGCTGTGTCTCTAGGGCAGAGGGCCACAATCTCCTGTAGGGCCAGCCAAAGTGCACTATTTCTGGATATA
GTTTTATACACTGGTACCAACAGAAACCAGGACAGCAACCCAGACTCCTCATCTATCGTGCATCCAACCTAGCCTCTGGG
ATCCCGGCCAGGTTTCAGTGGCAGTGGGTCTGGGACAGACTTCACCCTCACCATCAATCCTGTGCAGGCTGATGATATTGC
AACCTATTTCTGTGCAGCAGAGTAGGAAATCTCCGTGGACGTTCCGTGGAGGCACCAAGCTGGAATTGAGACGGGCTGATG
CTGCACCAACTGTATCT

Signal Sequence (1-60), Variable Region (61-396), Partial Sequence of Constant Region (397-417)

SEQ ID NO:30: Amino Acid Sequence Encoded by Cloned Rat #32A1 Light Chain (Variable Region + alpha)

METDRLLLWALLLVPGSTGDIVLTQSPALAVSLGQRATISCRASQSVTISGYSTFIHWYQQKPGQPRLLIYRASNLASG
IPARFSGSGSDFTLTINPVQADDIATYFCQQSRKSPWTFAGGTKLELRRADAAPTVS

Signal Sequence (1-20), Variable Region (21-132), Partial Sequence of Constant Region (133-139)

Figure 25

SEQ ID NO: 40: Nucleotide Sequence of #32A1 Human Chimeric Antibody Heavy Chain

ATGAAACACCTGTGGTTCTTCTCCTGCTGGTGGCAGCTCCCAGATGGGTGCTGAGCGAGGTGCAAATTTTGGAGACTGG
 AGGAGGCTTGGTGAAGCCCGGTGGTTCCTGAGACTGTCTTGTGCAACGTCTGGATTCAATTTCAATGATTATTTTCATGA
 ACTGGGTCCGTCAGGCTCCAGAAAAGGGGCTAGAGTGGGTTGCTCAAATAAGGAACAAAATTTATACTTATGCCACATTT
 TATGCGGAGTCTTTGGAAGGCAGAGTCACAATCTCACGAGACGATTCCGAAAGCAGTGTCTACCTGCAAGTGAGCAGTTT
 AAGAGCTGAAGACACTGCCATTTATTACTGTACAAGATCCCTAACTGGGGGAGACTACTTTGATTACTGGGGCCAAGGAG
 TCATGGTCACAGTCAGCTCAGCCTCCACCAAGGGCCCAAGCGTCTTCCCCCTGGCACCTCCTCCAAGAGCACCTCTGGC
 GGCACAGCCGCCCTGGGCTGCCTGGTCAAGGACTACTTCCCCGAACCCGTGACCGTGAGCTGGAAGTCAAGGCGCCCTGAC
 CAGCGGCGTGACACCTTCCCCGCTGTCTGCAGTCTCAGGACTCTACTCCCTCAGCAGCGTGGTGACCGTGCCCTCCA
 GCAGCTTGGGCACCCAGACCTACATCTGCAACGTGAATCACAAGCCCAGCAACACCAAGGTGGACAAGAGAGTTGAGCCC
 AAATCTTGTGACAAAACCTCACACATGCCACCCCTGCCAGCACCTGAACTCCTGGGGGGACCCCTCAGTCTTCTCTTCCC
 CCAAAACCCAAGGACACCCCTCATGATCTCCCGGACCCCTGAGGTCACATGCGTGGTGGTGACGTGAGCCACGAAGACC
 CTGAGGTCAAGTTCAACTGGTACGTGGACGGCGTGGAGGTGCATAATGCCAAGACAAAGCCCCGGGAGGAGCAGTACAAC
 AGCACGTACCGGGTGGTCAGCGTCCTCACCCTCCTGCACCAGGACTGGCTGAATGGCAAGGAGTACAAGTGAAGGTCTC
 CAACAAAGCCCTCCCAGCCCCATCGAGAAAACCATCTCCAAAGCCAAAGGCCAGCCCCGGGAACACAGGTGTACACCC
 TGCCCCCATCCCGGGAGGAGATGACCAAGAACCAGGTGAGCCTGACCTGCCTGGTCAAAGGCTTCTATCCCAGCGACATC
 GCCGTGGAGTGGGAGAGCAATGGCCAGCCCGAGAACAACTACAAGACCACCCCTCCCGTGTGGACTCCGACGGCTCCTT
 CTTCTCTACAGCAAGCTCACCCTGGACAAGAGCAGGTGGCAGCAGGGCAACGTCTTCTCATGCTCCGTGATGCATGAGG
 CTCTGCACAACCACTACACCCAGAAGAGCCTCTCCCTGTCTCCCGGCAAATGA

Signal Sequence (1-57), Variable Region (58-420), Constant Region (421-1413,
 including stop codon)

SEQ ID NO: 41: Amino Acid Sequence of #32A1 Human Chimeric Antibody Heavy Chain

MKHLWFFLLLVAPRWVLSEVQILETGGGLVKPGSLRLSCATSGFNFDYFMNWVRQAPEKGLEWVAQIRNKIYTYATF
 YAESLEGRVTISRDDSESSVYLQVSSLRAEDTAIYYCTRSLTGGDYFDYWGGQVMVTVSSASTKGPSVFPLAPSSKSTSG
 GTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEP
 KSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYN
 STYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDI
 AVEWESNGQPENNYKTTTPVLDSDGSFFLYSKLTVDKSRWQQGNVFCFSVMHEALHNHYTQKSLSLSPGK

Signal Sequence (1-19), Variable Region (20-140), Constant Region (141-470)

Figure 26

SEQ ID NO: 42: Nucleotide Sequence of #32A1 Human Chimeric Antibody Light Chain

ATGGTGCTGCAGACCCAGGTGTTTCATCTCCCTGCTGCTGTGGATCTCCGGCGCATATGGCGACATTGTCTTGACCCAGTC
TCCTGCTTTGGCTGTGTCTCTAGGGCAGAGGGCCACAATCTCCTGTAGGGCCAGCCAAAGTGTCATTTCTGGATATA
GTTTTATACACTGGTACCAACAGAAACCAGGACAGCAACCCAGACTCCTCATCTATCGTGCATCCAACCTAGCCTCTGGG
ATCCCGGCCAGGTTTCAGTGGCAGTGGGTCTGGGACAGACTTCACCCTCACCATCAATCCTGTGCAGGCTGATGATATTGC
AACCTATTTCTGTCAGCAGAGTAGGAAATCTCCGTGGACGTTTCGCTGGAGGCACCAAGCTGGAATTGAGACGTACGGTGG
CCGCCCCCTCCGTGTTTCATCTTCCCCCCTCCGACGAGCAGCTGAAGTCCGGCACCGCCTCCGTGGTGTGCTGCTGAAT
AACTTCTACCCAGAGAGGCCAAGGTGCAGTGAAGGTGGACAACGCCCTGCAGTCCGGGAACTCCCAGGAGAGCGTGAC
CGAGCAGGACAGCAAGGACAGCACCTACAGCCTGAGCAGCACCTGACCCTGAGCAAAGCCGACTACGAGAAGCACAAAGG
TGTACGCCTGCGAGGTGACCCACCAGGGCCTGAGCTCCCCCGTCACCAAGAGCTTCAACAGGGGGGAGTGTTAG

Signal Sequence (1-60), Variable Region (61-396), Constant Region (397-714, including stop codon)

SEQ ID NO: 43: Amino Acid Sequence of #32A1 Human Chimeric Antibody Light Chain

MVLQTQVFISLLLWISGAYGDIVLTQSPALAVSLGQRATISCRASQSVTISGYSFIHWYQQKPGQQRLLIYRASNLASG
IPARFSGSGSGTDFTLTINPVQADDIATYFCQQSRKSPWTFAGGTKLELRRTVAAPSVFIFPPSDEQLKSGTASVVCLLN
NFYPREAKVQWKVDNALQSGNSQESVTEQDSKSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

Signal Sequence (1-20), Variable Region (21-132), Constant Region (133-237)

Figure 27

SEQ ID NO:50: Nucleotide Sequence of h#32A1-T1H

ATGAAACACCTGTGGTTCTTCCTCCTGCTGGTGGCAGCTCCCAGATGGGTGCTGAGCGAGGTGC
 AACTGGTGGAGAGCGGCGGCGGACTTGTGCAACCTGGCGGCTCCCTGAGACTTAGCTGTGCCGC
 CTCGGCTTCAACTTCAACGACTACTTCATGAACTGGGTGAGACAAGCCCCTGGCAAGGGCCTG
 GAGTGGGTGGCCCAAATCAGAAACAAGATCTACACCTACGCCACCTTCTACGCCGAGAGCCTTG
 AGGGCAGATTACACCATCTCCAGAGACAACGCCAAGAACAGCCTGTACCTTCAAATGAACTCCCT
 GAGAGCCGAGGACACCGCCGTGTACTACTGTGCCAGAAGCCTTACCGGCGGCGACTACTTCGAC
 TACTGGGGCCAAGGCACCCTGGTGACCGTGAGCTCAGCCTCCACCAAGGGCCCAAGCGTCTTCC
 CCCTGGCACCCCTCCTCCAAGAGCACCTCTGGCGGCACAGCCGCCCTGGGCTGCCTGGTCAAGGA
 CTACTTCCCCGAACCCGTGACCGTGAGCTGGAACCTCAGGCGCCCTGACCAGCGGCGTGACACCC
 TTCCCCGCTGTCCTGCAGTCCTCAGGACTCTACTCCCTCAGCAGCGTGGTGACCGTGCCCTCCA
 GCAGCTTGGGCACCCAGACCTACATCTGCAACGTGAATCACAAGCCCAGCAACACCAAGGTGGA
 CAAGAGAGTTGAGCCCAAATCTTGTGACAAAACCTCACACATGCCACCCCTGCCAGCACCTGAA
 CTCCTGGGGGGACCCTCAGTCTTCTCTTCCCCC AAAACCCAAGGACACCCTCATGATCTCCC
 GGACCCCTGAGGTACATGCGTGGTGGTGGACGTGAGCCACGAAGACCCTGAGGTCAAGTTCAA
 CTGGTACGTGGACGGCGTGAGGTGCATAATGCCAAGACAAAGCCCCGGGAGGAGCAGTACAAC
 AGCACGTACCGGGTGGTCAGCGTCTCACCCTGCTGCACCAGGACTGGCTGAATGGCAAGGAGT
 ACAAGTGCAAGGTCTCCAACAAAGCCCTCCCAGCCCCCATCGAGAAAACCATCTCCAAGGCCAA
 AGGCCAGCCCCGGGAACACAGGTGTACACCCTGCCCCCATCCCGGGAGGAGATGACCAAGAAC
 CAGGTACGCCTGACCTGCCTGGTCAAAGGCTTCTATCCCAGCGACATCGCCGTGGAGTGGGAGA
 GCAATGGCCAGCCCGAGAACAATAAGACCACCCCTCCCGTGCTGGACTCCGACGGCTCCTT
 CTTCTCTACAGCAAGCTCACCGTGGACAAGAGCAGGTGGCAGCAGGGCAACGTCTTCTCATGC
 TCCGTGATGCATGAGGCTCTGCACAACCACTACACCAGAAGAGCCTCTCCCTGTCTCCCGGCA
 AA

Signal Sequence (1-57) , Variable Region (58-420) , Constant Region (421-1410)

SEQ ID NO:51: Amino Acid Sequence of h#32A1-T1H

MKHLWFFLLLVAAPRWVLSEVQLVESGGGLVQPGGSLRLSCAASGTFNFDYFMNWVRQAPGKGL
 EWVAQIRNKIYTYATFYAESLEGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARSLTGGDYFD
 YWGQGTLLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHT
 FPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKRVKPKSCDKTHTCPPCPAPE
 LLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYN
 STYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKN
 QVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTTPVLDSDGSFFLYSKLTVDKSRWQQGNVFC
 SVMHEALHNHYTQKSLSLSPGK

Signal Sequence (1-19) , Variable Region (20-140) , Constant Region (141-470)

Figure 28

SEQ ID NO:52: Nucleotide Sequence of h#32A1-T2H

ATGAAACACCTGTGGTTCTTCCTCCTGCTGGTGGCAGCTCCCAGATGGGTGCTGAGCGAGGTGC
 AACTGGTGGAGAGCGGCGGCGGACTGGTGC AACCTGGCGGCTCCCTGAGACTGAGCTGTGCCGC
 CTCGGGCTTCAACTTCAACGACTACTTCATGAACTGGGTGAGACAAGCCCCTGAGAAGGGCCTG
 GAGTGGGTGGCCCAAATCAGAAACAAGATCTACACCTACGCCACCTTCTACGCCGAGAGCCTGG
 AGGGCAGAGTGACCATCTCCAGAGACAACGCCAAGAACAGCCTGTACCTGCAAATGTCCTCCCT
 GAGAGCCGAGGACACCGCCGTGTACTACTGTGCCAGAAGCCTGACCGGCGGCGACTACTTCGAC
 TACTGGGGCCAAGGCACCCTGGTGACCGTGAGCTCAGCCTCCACCAAGGGCCCAAGCGTCTTCC
 CCCTGGCACCCCTCCTCCAAGAGCACCTCTGGCGGCACAGCCGCCCTGGGCTGCCTGGTCAAGGA
 CTA CT TCCCCGAACCCGTGACCGTGAGCTGGA ACTCAGGCGCCCTGACCAGCGGCGTGACACCC
 TTCCCCGCTGTCTCTGCAGTCTCTCAGGACTCTACTCCCTCAGCAGCGTGGTGACCGTGCCCTCCA
 GCAGCTTGGGCACCCAGACCTACATCTGCAACGTGAATCACAAGCCCAGCAACACCAAGGTGGA
 CAAGAGAGTTGAGCCCAAATCTTGTGACAAACTCACACATGCCACCCCTGCCCAGCACCTGAA
 CTCCTGGGGGGACCCCTCAGTCTTCTCTTCCCCC AAAACCCAAGGACACCCTCATGATCTCCC
 GGACCCCTGAGGTACATGCGTGGTGGTGGACGTGAGCCACGAAGACCCTGAGGTCAAGTTCAA
 CTGGTACGTGGACGGCGTGGAGGTGCATAATGCCAAGACAAAGCCCCGGGAGGAGCAGTACAAC
 AGCACGTACCGGGTGGTCAGCGTCTCTACCGTCTCTGCACCAGGACTGGCTGAATGGCAAGGAGT
 ACAAGTGCAAGGTCTCCAACAAAGCCCCTCCCAGCCCCCATCGAGAAAACCATCTCCAAAGCCAA
 AGGCCAGCCCCGGGAACCACAGGTGTACACCCTGCCCCCATCCCGGGAGGAGATGACCAAGAAC
 CAGGTGACCTGACCTGCCTGGTCAAAGGCTTCTATCCCAGCGACATCGCCGTGGAGTGGGAGA
 GCAATGGCCAGCCCGAGAACA ACTACAAGACCACCCCTCCCGTGCTGGACTCCGACGGCTCCTT
 CTTCTCTACAGCAAGCTCACCGTGGACAAGAGCAGGTGGCAGCAGGGCAACGTCTTCTCATGC
 TCCGTGATGCATGAGGCTCTGCACAACCACTACACCCAGAAGAGCCTCTCCCTGTCTCCCGGCA
 AA

Signal Sequence (1-57) , Variable Region (58-420) , Constant Region (421-1410)

SEQ ID NO:53: Amino Acid Sequence of h#32A1-T2H

MKHLWFFLLLV AAPRWVLSEVQLVESGGGLVQPGGSLRLS CAASGFNFDYFMNWVRQAPEKGL
 EWVAQIRNKIYTYATFYAESLEGRVTISRDN AKNSLYLQMSSLRAEDTAVYYCARSLTG GDYFD
 YWGQGTILVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHT
 FPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPE
 LLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYN
 STYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKN
 QVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNV FSC
 SVMHEALHNHYTQKSLSLSPGK

Signal Sequence (1-19) , Variable Region (20-140) , Constant Region (141-470)

Figure 29

SEQ ID NO:54: Nucleotide Sequence of h#32A1-T3H

ATGAAACACCTGTGGTTCTTCCTCCTGCTGGTGGCAGCTCCCAGATGGGTGCTGAGCGAGGTGC
 AGATCGTGGAGAGCGGCGGCGGACTTGTGCAGCCTGGCGGCTCCCTGAGACTTAGCTGTGCCAC
 CTCCGGCTTCAACTTCAACGACTACTTCATGAACTGGGTGAGACAGGCCCCCTGAGAAGGGCCTG
 GAGTGGGTGGCCAGATCAGAAACAAGATCTACACCTACGCCACCTTCTACGCCGAGAGCCTTG
 AGGGCAGAGTGACCATCTCCAGAGACGACAGCGAGTCCAGCGTGACCTTCAGATGTCCAGCCT
 GAGAGCCGAGGACACCGCCGTGTACTACTGTACCAGAAGCCTTACCGGCGGCGACTACTTCGAC
 TACTGGGGCCAGGGCACCCCTGGTGACCGTGAGCTCAGCCTCCACCAAGGGCCCAAGCGTCTTCC
 CCCTGGCACCCCTCCTCCAAGAGCACCTCTGGCGGCACAGCCGCCCTGGGCTGCCTGGTCAAGGA
 CTACTTCCCCGAACCCGTGACCGTGAGCTGGAACCTCAGGCGCCCTGACCAGCGGCGTGACACCC
 TTCCCCGCTGTCTGCAGTCTCTCAGGACTCTACTCCCTCAGCAGCGTGGTGACCGTGCCCTCCA
 GCAGCTTGGGCACCCAGACCTACATCTGCAACGTGAATCACAAGCCCAGCAACACCAAGGTGGA
 CAAGAGAGTTGAGCCCAAATCTTGTGACAAAACCTCACACATGCCACCCCTGCCCAGCACCTGAA
 CTCCTGGGGGGACCCCTCAGTCTTCTCTTCCCCCCTTCAAGGACACCCCTCATGATCTCCC
 GGACCCCTGAGGTACATGCGTGGTGGTGGACGTGAGCCACGAAGACCCTGAGGTCAAGTTCAA
 CTGGTACGTGGACGGCGTGGAGGTGCATAATGCCAAGACAAAGCCCCGGGAGGAGCAGTACAAC
 AGCACGTACCGGGTGGTCAGCGTCTCACCCTCCTGCACCAGGACTGGCTGAATGGCAAGGAGT
 ACAAGTGCAAGGTCTCCAACAAAGCCCTCCCAGCCCCCATCGAGAAAACCATCTCCAAAGCCAA
 AGGCCAGCCCCGGGAACACAGGTGTACCCCTGCCCCCATCCCGGGAGGAGATGACCAAGAAC
 CAGGTGACCTGACCTGCCTGGTCAAAGGCTTCTATCCCAGCGACATCGCCGTGGAGTGGGAGA
 GCAATGGCCAGCCCCGAGAACAACACTACAAGACCACCCCTCCCGTGCTGGACTCCGACGGCTCCTT
 CTTCCTCTACAGCAAGCTCACCGTGGACAAGAGCAGGTGGCAGCAGGGCAACGTCTTCTCATGC
 TCCGTGATGCATGAGGCTCTGCACAACCACTACACCCAGAAGAGCCTCTCCCTGTCTCCCGGCA
 AA

Signal Sequence (1-57) , Variable Region (58-420) , Constant Region (421-1410)

SEQ ID NO:55: Amino Acid Sequence of h#32A1-T3H

MKHLWFFLLLVAAAPRWVLSEVQIVESGGGLVQPGGSLRLSCATSGFNFNDYFMNWVRQAPEKGL
 EWVAQIRNKIYTYATFYAESLEGRVTISRDDSESSVYLQMSSLRAEDTAVYYCTRSLTGGDYFD
 YWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHT
 FPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPE
 LLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYN
 STYRVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKN
 QVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFC
 SVMHEALHNHYTQKSLSLSPGK

Signal Sequence (1-19) , Variable Region (20-140) , Constant Region (141-470)

Figure 30

SEQ ID NO:56: Nucleotide Sequence of h#32A1-T5H

ATGAAACACCTGTGGTTCTTCCTCCTGCTGGTGGCAGCTCCCAGATGGGTGCTGAGCGAGGTGC
 AGGTGGTGGAGAGCGGCGGCGGACTTGTGCAGCCTGGCGGCTCCCTGAGACTTAGCTGTGCCAC
 CTCCGGCTTCAACTTCAACGACTACTTCATGAACTGGGTGAGACAGGCCCCCTGGCAAGGGCCTG
 GAGTGGGTGGCCAGATCAGAAACAAGATCTACACCTACGCCACCTTCTACGCCGAGAGCCTTG
 AGGGCAGATTACCATCTCCAGAGACAACAGCAAGTCCACCGTGTACCTTCAGATGAACTCCCT
 GAGAGCCGAGGACACCGCCGTGTACTACTGTACCAGAAGCCTTACCGGCGGCGACTACTTCGAC
 TACTGGGGCCAGGGCACCCTGGTGACCGTGAGCTCAGCCTCCACCAAGGGCCCAAGCGTCTTCC
 CCCTGGCACCCTCTCTCAAGAGCACCTCTGGCGGCACAGCCGCCCTGGGCTGCCTGGTCAAGGA
 CTACTTCCCCGAACCCGTGACCGTGAGCTGGAACCTCAGGCGCCCTGACCAGCGGCGTGACACCC
 TTCCCCGCTGTCTCTGCAGTCCTCAGGACTCTACTCCCTCAGCAGCGTGGTGACCGTGCCCTCCA
 GCAGCTTGGGCACCCAGACCTACATCTGCAACGTGAATCACAAGCCCAGCAACACCAAGGTGGA
 CAAGAGAGTTGAGCCCAAATCTTGTGACAAAACCTCACACATGCCCCACCCTGCCCAGCACCTGAA
 CTCTCTGGGGGGACCCCTCAGTCTTCTCTTCCCCCCTCAAGGACACCCTCATGATCTCCC
 GGACCCCTGAGGTACATGCGTGGTGGTGGACGTGAGCCACGAAGACCCTGAGGTCAAGTTCAA
 CTGGTACGTGGACGGCGTGGAGGTGCATAATGCCAAGACAAAGCCCCGGGAGGAGCAGTACAAC
 AGCACGTACCGGGTGGTCAGCGTCTCTACCGTCTCTGCACCAGGACTGGCTGAATGGCAAGGAGT
 ACAAGTGCAAGGTCTCCAACAAAGCCCTCCCAGCCCCCATCGAGAAAACCATCTCCAAAGCCAA
 AGGCCAGCCCCGGGAACACAGGTGTACACCCTGCCCCCATCCCGGGAGGAGATGACCAAGAAC
 CAGGTCAGCCTGACCTGCCTGGTCAAAGGCTTCTATCCCAGCGACATCGCCGTGGAGTGGGAGA
 GCAATGGCCAGCCCCGAGAACAACACTACAAGACCACCCTCCCGTGCTGGACTCCGACGGCTCCTT
 CTTCTCTACAGCAAGCTCACCGTGGACAAGAGCAGGTGGCAGCAGGGCAACGTCTTCTCATGC
 TCCGTGATGCATGAGGCTCTGCACAACCACTACACCCAGAAGAGCCTCTCCCTGTCTCCCGGCA
 AA

Signal Sequence (1-57) , Variable Region (58-420) , Constant Region
 (421-1410)

SEQ ID NO:57: Amino Acid Sequence of h#32A1-T5H

MKHLWFFLLLVAAPRWVLSEVQVVESSGGGLVQPGGSLRLSCATSGFNFNDYFMNWVRQAPGKGL
 EWVAQIRNKIYTYATFYAESLEGRFTISRDNKSTVYLQMNSLRAEDTAVYYCTRSLTGGDYFD
 YWGQGTLLTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHT
 FPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPE
 LLGGPSVFLFPPKPKDTLMISRTPEVTCVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYN
 STYRVSVLTIVLHQDWLNGKEYKCKVSNKALPAPIEKTKAKGQPREPQVYTLPPSREEMTKN
 QVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTTPVLDSDGSFFLYSKLTVDKSRWQQGNVFSC
 SVMHEALHNHYTQKSLSLSPGK

Signal Sequence (1-19) , Variable Region (20-140) , Constant Region
 (141-470)

Figure 31

SEQ ID NO:58: Nucleotide Sequence of h#32A1-T6H

ATGAAACACCTGTGGTTCTTCCTCCTGCTGGTGGCAGCTCCCAGATGGGTGCTGAGCGAGGTGC
 AGGTGGTGGAGAGCGGCGGCGGACTTGTGCAGCCTGGCGGCTCCCTGAGACTTAGCTGTGCCAC
 CTCCGGCTTCAACTTCAACGACTACTTCATGAACTGGGTGAGACAGGCCCTGAGAAGGGCCTG
 GAGTGGGTGGCCCAGATCAGAAACAAGATCTACACCTACGCCACCTTCTACGCCGAGAGCCTTG
 AGGGCAGAGTGACCATCTCCAGAGACAACAGCAAGTCCACCGTGTACCTTCAGATGTCCAGCCT
 TAGAGCCGAGGACACCGCCGTGTACTACTGTACCAGAAGCCTTACCGGCGGCGACTACTTCGAC
 TACTGGGGCCAGGGCACCCTTGTGACAGTGAGCTCAGCCTCCACCAAGGGCCCAAGCGTCTTCC
 CCCTGGCACCCCTCCTCCAAGAGCACCTCTGGCGGCACAGCCGCCCTGGGCTGCCTGGTCAAGGA
 CTACTTCCCCGAACCCGTGACCGTGAGCTGGAACCTCAGGCGCCCTGACCAGCGGCGTGCACACC
 TTCCCCGCTGTCCTGCAGTCCTCAGGACTCTACTCCCTCAGCAGCGTGGTGACCGTGCCCTCCA
 GCAGCTTGGGCACCCAGACCTACATCTGCAACGTGAATCACAAGCCCAGCAACACCAAGGTGGA
 CAAGAGAGTTGAGCCCAAATCTTGTGACAAAACCTCACACATGCCCACCCCTGCCCAGCACCTGAA
 CTCCTGGGGGGACCCCTCAGTCTTCTCTTCCCCC AAAACCCAAGGACACCCTCATGATCTCCC
 GGACCCCTGAGGTACATGCGTGGTGGTGGACGTGAGCCACGAAGACCCTGAGGTCAAGTTCAA
 CTGGTACGTGGACGGCGTGGAGGTGCATAATGCCAAGACAAAGCCCCGGGAGGAGCAGTACAAC
 AGCACGTACCGGGTGGTCAGCGTCCTCACCCTCCTGCACCAGGACTGGCTGAATGGCAAGGAGT
 ACAAGTGCAAGGTCTCCAACAAAGCCCTCCCAGCCCCCATCGAGAAAACCATCTCCAAGCCAA
 AGGCCAGCCCCGGGAACACAGGTGTACACCCTGCCCCCATCCCGGGAGGAGATGACCAAGAAC
 CAGGTACGCCTGACCTGCCTGGTCAAAGGCTTCTATCCCAGCGACATCGCCGTGGAGTGGGAGA
 GCAATGGCCAGCCCAGACAACACTACAAGACCACCCCTCCCGTGCTGGACTCCGACGGCTCCTT
 CTTCCTCTACAGCAAGCTCACCGTGGACAAGAGCAGGTGGCAGCAGGGCAACGTCTTCTCATGC
 TCCGTGATGCATGAGGCTCTGCACAACCACTACACCCAGAAGAGCCTCTCCCTGTCTCCCGGCA
 AA

Signal Sequence (1-57) , Variable Region (58-420) , Constant Region
 (421-1410)

SEQ ID NO:59: Amino Acid Sequence of h#32A1-T6H

MKHLWFFLLLVAAPRWVLSEVQVVESGGGLVQPGGSLRLSCATSGFNFNDYFMNWVRQAPEKGL
 EWVAQIRNKIYTYATFYAESLEGRVTISRDNKSTVYLQMSSLRAEDTAVYYCTRSLTGGDYFD
 YWGQGTLLTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHT
 FPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPE
 LLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYN
 STYRVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKN
 QVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTTPVLDSDGSFFLYSKLTVDKSRWQQGNVFSC
 SVMHEALHNHYTQKSLSLSPGK

Signal Sequence (1-19) , Variable Region (20-140) , Constant Region
 (141-470)

Figure 32

SEQ ID NO:60: Nucleotide Sequence of h#32A1-T1L

ATGGTGCTGCAGACCCAGGTGTTTCATCTCCCTGCTGCTGTGGATCTCCGGCGCATATGGCGACA
TCGTGATGACCCAGAGCCCTGACTCCCTTGCCGTGTCCCTGGGCGAGAGAGCCACCATCAACTG
TAGAGCCTCCCAGAGCGTGACCATCTCCGGCTACAGCTTCATCCACTGGTACCAGCAGAAGCCT
GGCCAGCCTCCTAAGCTTCTGATCTACAGAGCCTCCAACCTTGCCAGCGGCGTGCCTGCCAGAT
TCTCCGGCAGCGGCTCCGGCACCGACTTCACCCTGACCATCAGCTCCCTTCAGGCCGAGGACGT
GGCCGTGTACTACTGTCTCAGCAGAGCAGAAAGTCCCCTTGGACCTTCGGCGGCGGCACCAAGGTG
GAGATCAAGCGTACGGTGGCCGCCCCCTCCGTGTTTCATCTTCCCCCCCCCTCCGACGAGCAGCTGA
AGTCCGGCACCGCCTCCGTGGTGTGCCTGCTGAATAACTTCTACCCCAGAGAGGCCAAGGTGCA
GTGGAAGGTGGACAACGCCCTGCAGTCCGGGAACCTCCAGGAGAGCGTGACCGAGCAGGACAGC
AAGGACAGCACCTACAGCCTGAGCAGCACCCCTGACCCTGAGCAAAGCCGACTACGAGAAGCACA
AGGTGTACGCCTGCGAGGTGACCCACCAGGGCCTGAGCTCCCCCGTCAACCAAGAGCTTCAACAG
GGGGGAGTGT

Signal Sequence (1-60) , Variable Region (61-399) , Constant Region
(400-714)

SEQ ID NO:61: Amino Acid Sequence of h#32A1-T1L

MVLQTQVFISLLLWISGAYGDIVMTQSPDSLAVSLGERATINCRASQSVTISGYSFHWHYQQKP
GQPPKLLIYRASNLASGVPARFSGSGTDFTLTISSLQAEDVAVYYCQQSRKSPWTFGGGTKV
EIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDS
KDSTYLSLSLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

Signal Sequence (1-20) , Variable Region (21-133) , Constant Region
(134-238)

Figure 33

SEQ ID NO:62: Nucleotide Sequence of h#32A1-T2L

ATGGTGCTGCAGACCCAGGTGTTTCATCTCCCTGCTGCTGTGGATCTCCGGCGCATATGGCGACA
TCGTGATGACCCAGAGCCCTGACTCCCTTGCCGTGTCCCTGGGCGAGAGAGCCACCATCAGCTG
TAGAGCCTCCCAGAGCGTGACCATCTCCGGCTACAGCTTCATCCACTGGTACCAGCAGAAGCCT
GGCCAGCCTCCTAGACTTCTGATCTACAGAGCCTCCAACCTTGCCAGCGGCGTGCCTGCCAGAT
TCTCCGGCAGCGGCTCCGGCACCGACTTCACCCTGACCATCAGCTCCCTTCAGGCCGAGGACGT
GGCCGTGTACTTCTGTCTCAGCAGAGCAGAAAGTCCCCTTGGACCTTCGCCGGCGGCACCAAGGTG
GAGATCAAGCGTACGGTGGCCGCCCCCTCCGTGTTTCATCTTCCCCCCTCCGACGAGCAGCTGA
AGTCCGGCACCGCCTCCGTGGTGTGCCTGCTGAATAACTTCTACCCAGAGAGGCCAAGGTGCA
GTGGAAGGTGGACAACGCCCTGCAGTCCGGGAACCTCCAGGAGAGCGTGACCGAGCAGGACAGC
AAGGACAGCACCTACAGCCTGAGCAGCACCTGACCCTGAGCAAAGCCGACTACGAGAAGCACA
AGGTGTACGCCTGCGAGGTGACCCACCAGGGCCTGAGCTCCCCCGTCACCAAGAGCTTCAACAG
GGGGGAGTGT

Signal Sequence (1-60) , Variable Region (61-399) , Constant Region
(400-714)

SEQ ID NO:63: Amino Acid Sequence of h#32A1-T2L

MVLQTQVFISLLWISGAYGDIVMTQSPDSLAVSLGERATISCRASQSVTISGYSFHWHYQQKP
GQPPRLLIYRASNLASGVPARFSGSGSGTDFTLTISLQAEDVAVYFCQQSRKSPWTFAGGTKV
EIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDS
KDSTYLSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

Signal Sequence (1-20) , Variable Region (21-133) , Constant Region
(134-238)

Figure 34

SEQ ID NO:64: Nucleotide Sequence of h#32A1-T3L

ATGGTGCTGCAGACCCAGGTGTTTCATCTCCCTGCTGCTGTGGATCTCCGGCGCATATGGCGACA
TCGTGCTTACCCAGAGCCCTGACTCCCTTGCCGTGTCCCTGGGCGAGAGAGCCACCATCAGCTG
TAGAGCCTCCCAGAGCGTGACCATCTCCGGCTACAGCTTCATCCACTGGTACCAGCAGAAGCCT
GGCCAGCAGCCTAGACTTCTGATCTACAGAGCCTCCAACCTTGCCAGCGGCATCCCTGCCAGAT
TCTCCGGCAGCGGCTCCGGCACCGACTTCACCCTGACCATCAGCTCCCTTCAGGCCGAGGACGT
GGCCACCTACTTCTGTCAGCAGAGCAGAAAGTCCCCTTGACCTTCGCCGGCGGCACCAAGGTG
GAGATCAAGCGTACGGTGGCCGCCCCCTCCGTGTTTCATCTTCCCCCCTCCGACGAGCAGCTGA
AGTCCGGCACCGCCTCCGTGGTGTGCCTGCTGAATAACTTCTACCCAGAGAGGCCAAGGTGCA
GTGGAAGGTGGACAACGCCCTGCAGTCCGGGAACCTCCAGGAGAGCGTGACCGAGCAGGACAGC
AAGGACAGCACCTACAGCCTGAGCAGCACCTGACCCTGAGCAAAGCCGACTACGAGAAGCACA
AGGTGTACGCCTGCGAGGTGACCCACCAGGGCCTGAGCTCCCCCGTCAACCAAGAGCTTCAACAG
GGGGGAGTGT

Signal Sequence (1-60) , Variable Region (61-399) , Constant Region
(400-714)

SEQ ID NO:65: Amino Acid Sequence of h#32A1-T3L

MVLQTQVFISLLLWISGAYGDIVLTQSPDSLAVSLGERATISCRASQSVTISGYSFHWHYQQKP
GQQPRLLIYRASNLASGIPARFSGSGSGTDFTLTISLQAEDVATYFCQQSRKSPWTFAGGTKV
EIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDS
KDSTYLSLSLTLSKADYEEKHKVYACEVTHQGLSSPVTKSFNRGEC

Signal Sequence (1-20) , Variable Region (21-133) , Constant Region
(134-238)

Figure 35

SEQ ID NO:66: Nucleotide Sequence of h#32A1-T4L

ATGGTGTCTGCAGACCCAGGTGTTTCATCTCCCTGCTGCTGTGGATCTCCGGCGCATATGGCGACA
 TCGTGCTTACCCAGAGCCCTGCCCTTGCCGTGTCCCTGGGCGAGAGAGCCACCATCAGCTGTAG
 AGCCTCCCAGAGCGTGACCATCTCCGGCTACAGCTTCATCCACTGGTACCAGCAGAAGCCTGGC
 CAGCAGCCTAGACTTCTGATCTACAGAGCCTCCAACCTTGCCAGCGGCATCCCTGCCAGATTCT
 CCGGCAGCGGCTCCGGCACCGACTTCACCCTGACCATCAGCTCCCTTCAGGCCGAGGACGTGGC
 CACCTACTTCTGTCAGCAGAGCAGAAAGTCCCCCTTGGACCTTCGCCGGCGGCACCAAGCTGGAG
 ATCAAGCGTACGGTGGCCGCCCCCTCCGTGTTTCATCTTCCCCCCTCCGACGAGCAGCTGAAGT
 CCGGCACCGCCTCCGTGGTGTGCCTGCTGAATAACTTCTACCCCAGAGAGGCCAAGGTGCAGTG
 GAAGGTGGACAACGCCCTGCAGTCCGGGAACCTCCAGGAGAGCGTGACCGAGCAGGACAGCAAG
 GACAGCACCTACAGCCTGAGCAGCACCTGACCCTGAGCAAAGCCGACTACGAGAAGCACAAGG
 TGTACGCCTGCGAGGTGACCCACCAGGGCCTGAGCTCCCCCGTCACCAAGAGCTTCAACAGGGG
 GGAGTGT

Signal Sequence (1-60) , Variable Region (61-396) , Constant Region
 (397-711)

SEQ ID NO:67: Amino Acid Sequence of h#32A1-T4L

MVLQTQVFISLLWISGAYGDIVLTQSPALAVSLGERATISCRASQSVTISGYSFIHWYQQKPG
 QQPRLLIYRASNLASGIPARFSGSGSGTDFTLTISSLQAEDVATYFCQQSRKSPWTFAGGTKLE
 IKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSK
 DSTYSLSSLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

Signal Sequence (1-20) , Variable Region (21-132) , Constant Region
 (133-237)

Figure 36

SEQ ID NO:68: Nucleotide Sequence of h#32A1-T5L

ATGGTGCTGCAGACCCAGGTGTTTCATCTCCCTGCTGCTGTGGATCTCCGGCGCATATGGCGACA
TCGTGCTTACCCAGAGCCCTGACTCCCTTGCCGTGTCCCTGGGCGAGAGAGCCACCATCAACTG
TAGAGCCTCCCAGAGCGTGACCATCTCCGGCTACAGCTTCATCCACTGGTACCAGCAGAAGCCT
GGCCAGCCTCCTAAGCTTCTGATCTACAGAGCCTCCAACCTTGCCAGCGGCATCCCTGCCAGAT
TCTCCGGCAGCGGCTCCGGCACCGACTTCACCCTGACCATCAGCTCCCTTCAGGCCGAGGACGT
GGCCACCTACTACTGTCAGCAGAGCAGAAAGTCCCCTTGACCTTCGGCCAGGGCACCAAGGTG
GAGATCAAGCGTACGGTGGCCGCCCCCTCCGTGTTTCATCTTCCCCCCTCCGACGAGCAGCTGA
AGTCCGGCACCGCCTCCGTGGTGTGCCTGCTGAATAACTTCTACCCAGAGAGGCCAAGGTGCA
GTGGAAGGTGGACAACGCCCTGCAGTCCGGGAACCTCCAGGAGAGCGTGACCGAGCAGGACAGC
AAGGACAGCACCTACAGCCTGAGCAGCACCTGACCCTGAGCAAAGCCGACTACGAGAAGCACA
AGGTGTACGCCTGCGAGGTGACCCACCAGGGCCTGAGCTCCCCCGTACCAAGAGCTTCAACAG
GGGGGAGTGT

Signal Sequence (1-60) , Variable Region (61-399) , Constant Region
(400-714)

SEQ ID NO:69: Amino Acid Sequence of h#32A1-T5L

MVLQTQVFISLLLWISGAYGDIVLTQSPDSLAVSLGERATINCRASQSVTISGYSFHWHYQQKP
GQPPKLLIYRASNLASGIPARFSGSGSGTDFTLTISLQAEDVATYYCQQSRKSPWTFGQGTKV
EIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDS
KDSTYLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

Signal Sequence (1-20) , Variable Region (21-133) , Constant Region
(134-238)

Figure 37

SEQ ID NO:70: Nucleotide Sequence of h#32A1-T6L

ATGGTGCTGCAGACCCAGGTGTTTCATCTCCCTGCTGCTGTGGATCTCCGGCGCATATGGCGACA
TCGTGCTTACCCAGAGCCCTGACTCCCTTGCCGTGTCCCTGGGCGAGAGAGCCACCATCAGCTG
TAGAGCCTCCCAGAGCGTGACCATCTCCGGCTACAGCTTCATCCACTGGTACCAGCAGAAGCCT
GGCCAGCCTCCTAGACTGCTGATCTACAGAGCCTCCAACCTTGCCAGCGGCATCCCTGCCAGAT
TCTCCGGCAGCGGCTCCGGCACCGACTTCACCCTGACCATCAGCTCCCTTCAGGCCGAGGACGT
GGCCACCTACTTCTGTGTCAGCAGAGCAGAAAGTCCCCTTGACCTTCGCCGGCGGCACCAAGGTG
GAGATCAAGCGTACGGTGGCCGCCCCCTCCGTGTTCATCTTCCCCCCTCCGACGAGCAGCTGA
AGTCCGGCACCGCCTCCGTGGTGTGCCTGCTGAATAACTTCTACCCAGAGAGGCCAAGGTGCA
GTGGAAGGTGGACAACGCCCTGCAGTCCGGGAACCTCCAGGAGAGCGTGACCGAGCAGGACAGC
AAGGACAGCACCTACAGCCTGAGCAGCACCTGACCCTGAGCAAAGCCGACTACGAGAAGCACA
AGGTGTACGCCTGCGAGGTGACCCACCAGGGCCTGAGCTCCCCCGTCACCAAGAGCTTCAACAG
GGGGGAGTGT

Signal Sequence (1-60) , Variable Region (61-399) , Constant Region
(400-714)

SEQ ID NO:71: Amino Acid Sequence of h#32A1-T6L

MVLQTQVFISLLLWISGAYGDIVLTQSPDSLAVSLGERATISCRASQSVTISGYSFHWHYQQKP
GQPPRLLIYRASNLASGIPARFSGSGSGTDFTLTISSLQAEDVATYFCQQSRKSPWTFAGGTKV
EIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDS
KDSTYLSSTLTLSKADYEKHKVYACEVTHQGLSPVTKSFNRGEC

Signal Sequence (1-20) , Variable Region (21-133) , Constant Region
(134-238)

Figure 38

SEQ ID NO:72: Amino Acid Sequence of h#32A1-T7H

EVQLVESGGGLVQPGGSLRLSCAASGFNFNDYFMNWVRQAPEKGLEWVAQIRNKIYTYATFYAE
SLEGRFTISRDNANKNSLYLQMNSLRAEDTAVYYCARSLTGGDYFDYWGQGTLLTVTVSSASTKGPS
VFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVTV
PSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLM
ISRTPQVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNG
KEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVE
WESNGQPENNYKTTTPVLDSDGSFFLYSKLTVDKSRWQQGNVVFSCSVMEALHNHYTQKSLSLS
PGK

Variable Region (1-121), Constant Region (122-451)

SEQ ID NO:73: Amino Acid Sequence of h#32A1-T8H

EVQLVESGGGLVQPGGSLRLSCAASGFNFNDYFMNWVRQAPGKGLEWVAQIRNKIYTYATFYAE
SLEGRVTISRDNANKNSLYLQMNSLRAEDTAVYYCARSLTGGDYFDYWGQGTLLTVTVSSASTKGPS
VFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVTV
PSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLM
ISRTPQVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNG
KEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVE
WESNGQPENNYKTTTPVLDSDGSFFLYSKLTVDKSRWQQGNVVFSCSVMEALHNHYTQKSLSLS
PGK

Variable Region (1-121), Constant Region (122-451)

SEQ ID NO:74: Amino Acid Sequence of h#32A1-T9H

EVQLVESGGGLVQPGGSLRLSCAASGFNFNDYFMNWVRQAPGKGLEWVAQIRNKIYTYATFYAE
SLEGRFTISRDNANKNSLYLQMSSLRAEDTAVYYCARSLTGGDYFDYWGQGTLLTVTVSSASTKGPS
VFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVTV
PSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLM
ISRTPQVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNG
KEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVE
WESNGQPENNYKTTTPVLDSDGSFFLYSKLTVDKSRWQQGNVVFSCSVMEALHNHYTQKSLSLS
PGK

Variable Region (1-121), Constant Region (122-451)

Figure 39

SEQ ID NO:75: Amino Acid Sequence of h#32A1-T10H

EVQLVESGGGLVQPGGSLRLSCAASGFMNFNDYFMNWVRQAPEKGLEWVAQIRNKIYTYATFYAE
SLEGRVTISRDNANKNSLYLQMNSLRAEDTAVYYCARSLTGGDYFDYWGQGTLVTVSSASTKGPS
VFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTV
PSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLM
ISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNG
KEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVE
WESNGQPENNYKTTTPVLDSDGSFFLYSKLTVDKSRWQQGNVFSQSVMHEALHNHYTQKSLSLS
PGK

Variable Region (1-121), Constant Region (122-451)

SEQ ID NO:76: Amino Acid Sequence of h#32A1-T11H

EVQLVESGGGLVQPGGSLRLSCAASGFMNFNDYFMNWVRQAPEKGLEWVAQIRNKIYTYATFYAE
SLEGRFTISRDNANKNSLYLQMSSLRAEDTAVYYCARSLTGGDYFDYWGQGTLVTVSSASTKGPS
VFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTV
PSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLM
ISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNG
KEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVE
WESNGQPENNYKTTTPVLDSDGSFFLYSKLTVDKSRWQQGNVFSQSVMHEALHNHYTQKSLSLS
PGK

Variable Region (1-121), Constant Region (122-451)

SEQ ID NO:77: Amino Acid Sequence of h#32A1-T12H

EVQLVESGGGLVQPGGSLRLSCAASGFMNFNDYFMNWVRQAPGKGLEWVAQIRNKIYTYATFYAE
SLEGRVTISRDNANKNSLYLQMSSLRAEDTAVYYCARSLTGGDYFDYWGQGTLVTVSSASTKGPS
VFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTV
PSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLM
ISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNG
KEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVE
WESNGQPENNYKTTTPVLDSDGSFFLYSKLTVDKSRWQQGNVFSQSVMHEALHNHYTQKSLSLS
PGK

Variable Region (1-121), Constant Region (122-451)

Figure 40

SEQ ID NO:78: Amino Acid Sequence of h#32A1-T7L

DIVMTQSPDSLAVSLGERATISCRASQSVTISGYFSFIHWYQQKPGQPPKLLIYRASNLASGVPA
RFSGSGSGTDFTLTISLQAEDVAVYYCQQSRKSPWTFGGGTKVEIKRTVAAPSVFIFPPSDEQ
LKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDYSLSSSTLTLSKADYK
HKVYACEVTHQGLSSPVTKSFNRGEC

Variable Region (1-113), Constant Region (114-218)

SEQ ID NO:79: Amino Acid Sequence of h#32A1-T8L

DIVMTQSPDSLAVSLGERATINCRASQSVTISGYFSFIHWYQQKPGQPPRLLIYRASNLASGVPA
RFSGSGSGTDFTLTISLQAEDVAVYYCQQSRKSPWTFGGGTKVEIKRTVAAPSVFIFPPSDEQ
LKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDYSLSSSTLTLSKADYK
HKVYACEVTHQGLSSPVTKSFNRGEC

Variable Region (1-113), Constant Region (114-218)

SEQ ID NO:80: Amino Acid Sequence of h#32A1-T9L

DIVMTQSPDSLAVSLGERATINCRASQSVTISGYFSFIHWYQQKPGQPPKLLIYRASNLASGVPA
RFSGSGSGTDFTLTISLQAEDVAVYFCQQSRKSPWTFGGGTKVEIKRTVAAPSVFIFPPSDEQ
LKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDYSLSSSTLTLSKADYK
HKVYACEVTHQGLSSPVTKSFNRGEC

Variable Region (1-113), Constant Region (114-218)

SEQ ID NO:81: Amino Acid Sequence of h#32A1-T10L

DIVMTQSPDSLAVSLGERATINCRASQSVTISGYFSFIHWYQQKPGQPPKLLIYRASNLASGVPA
RFSGSGSGTDFTLTISLQAEDVAVYYCQQSRKSPWTFAGGTKVEIKRTVAAPSVFIFPPSDEQ
LKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDYSLSSSTLTLSKADYK
HKVYACEVTHQGLSSPVTKSFNRGEC

Variable Region (1-113), Constant Region (114-218)

SEQ ID NO:82: Amino Acid Sequence of h#32A1-11L

DIVMTQSPDSLAVSLGERATISCRASQSVTISGYFSFIHWYQQKPGQPPRLLIYRASNLASGVPA
RFSGSGSGTDFTLTISLQAEDVAVYYCQQSRKSPWTFGGGTKVEIKRTVAAPSVFIFPPSDEQ
LKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDYSLSSSTLTLSKADYK
HKVYACEVTHQGLSSPVTKSFNRGEC

Variable Region (1-113), Constant Region (114-218)

Figure 41

SEQ ID NO:83: Amino Acid Sequence of h#32A1-T12L

DIVMTQSPDSLAVSLGERATISCRASQSVTISGYFSFIHWYQQKPGQPPKLLIYRASNLASGVPA
RFSGSGSGTDFTLTISSLQAEDVAVYFCQQSRKSPWTFGGGTKVEIKRTVAAPSVFIFPPSDEQ
LKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDYSLSTLTLSKADYEK
HKVYACEVTHQGLSSPVTKSFNRGEC

Variable Region (1-113), Constant Region (114-218)

SEQ ID NO:84: Amino Acid Sequence of h#32A1-T13L

DIVMTQSPDSLAVSLGERATISCRASQSVTISGYFSFIHWYQQKPGQPPKLLIYRASNLASGVPA
RFSGSGSGTDFTLTISSLQAEDVAVYYCQQSRKSPWTFAGGTKVEIKRTVAAPSVFIFPPSDEQ
LKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDYSLSTLTLSKADYEK
HKVYACEVTHQGLSSPVTKSFNRGEC

Variable Region (1-113), Constant Region (114-218)

SEQ ID NO:85: Amino Acid Sequence of h#32A1-T14L

DIVMTQSPDSLAVSLGERATINCRASQSVTISGYFSFIHWYQQKPGQPPRLLIYRASNLASGVPA
RFSGSGSGTDFTLTISSLQAEDVAVYFCQQSRKSPWTFGGGTKVEIKRTVAAPSVFIFPPSDEQ
LKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDYSLSTLTLSKADYEK
HKVYACEVTHQGLSSPVTKSFNRGEC

Variable Region (1-113), Constant Region (114-218)

SEQ ID NO:86: Amino Acid Sequence of h#32A1-T15L

DIVMTQSPDSLAVSLGERATINCRASQSVTISGYFSFIHWYQQKPGQPPRLLIYRASNLASGVPA
RFSGSGSGTDFTLTISSLQAEDVAVYYCQQSRKSPWTFAGGTKVEIKRTVAAPSVFIFPPSDEQ
LKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDYSLSTLTLSKADYEK
HKVYACEVTHQGLSSPVTKSFNRGEC

Variable Region (1-113), Constant Region (114-218)

SEQ ID NO:87: Amino Acid Sequence of h#32A1-T16L

DIVMTQSPDSLAVSLGERATINCRASQSVTISGYFSFIHWYQQKPGQPPKLLIYRASNLASGVPA
RFSGSGSGTDFTLTISSLQAEDVAVYFCQQSRKSPWTFAGGTKVEIKRTVAAPSVFIFPPSDEQ
LKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDYSLSTLTLSKADYEK
HKVYACEVTHQGLSSPVTKSFNRGEC

Variable Region (1-113), Constant Region (114-218)

Figure 42

SEQ ID NO:88: Amino Acid Sequence of h#32A1-T17L

DIVMTQSPDSLAVSLGERATISCRASQSVTISGYSTFIHWYQQKPGQPPRLLIYRASNLASGVPA
 RFSGSGSGTDFTLTISLQAEDVAVYFCQQSRKSPWTFGGGTKVEIKRTVAAPSVFIFPPSDEQ
 LKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDYSLSTLTLSKADYEK
 HKVYACEVTHQGLSSPVTKSFNRGEC

Variable Region (1-113), Constant Region (114-218)

SEQ ID NO:89: Amino Acid Sequence of h#32A1-T18L

DIVMTQSPDSLAVSLGERATISCRASQSVTISGYSTFIHWYQQKPGQPPRLLIYRASNLASGVPA
 RFSGSGSGTDFTLTISLQAEDVAVYYCQQSRKSPWTFAGGTKVEIKRTVAAPSVFIFPPSDEQ
 LKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDYSLSTLTLSKADYEK
 HKVYACEVTHQGLSSPVTKSFNRGEC

Variable Region (1-113), Constant Region (114-218)

SEQ ID NO:90: Amino Acid Sequence of h#32A1-T19L

DIVMTQSPDSLAVSLGERATISCRASQSVTISGYSTFIHWYQQKPGQPPKLLIYRASNLASGVPA
 RFSGSGSGTDFTLTISLQAEDVAVYFCQQSRKSPWTFAGGTKVEIKRTVAAPSVFIFPPSDEQ
 LKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDYSLSTLTLSKADYEK
 HKVYACEVTHQGLSSPVTKSFNRGEC

Variable Region (1-113), Constant Region (114-218)

SEQ ID NO:91: Amino Acid Sequence of h#32A1-T20L

DIVMTQSPDSLAVSLGERATINCRASQSVTISGYSTFIHWYQQKPGQPPRLLIYRASNLASGVPA
 RFSGSGSGTDFTLTISLQAEDVAVYFCQQSRKSPWTFAGGTKVEIKRTVAAPSVFIFPPSDEQ
 LKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDYSLSTLTLSKADYEK
 HKVYACEVTHQGLSSPVTKSFNRGEC

Variable Region (1-113), Constant Region (114-218)

SEQ ID NO:92: Amino Acid Sequence of h#32A1-T21L

EILMTQSPATLSLSPGERATLSCRASQSVTISGYSTFIHWYQQKPGQAPRLLIYRASNLASGIPA
 RFSGSGSGTDFTLTISLLEPEDFALYYCQQSRKSPWTFGQGTKVEIKRTVAAPSVFIFPPSDEQ
 LKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDYSLSTLTLSKADYEK
 HKVYACEVTHQGLSSPVTKSFNRGEC

Variable Region (1-113), Constant Region (114-218)

Figure 43

SEQ ID NO:93: Amino Acid Sequence of h#32A1-T22L

EILMTQSPATLSLSPGERATLSCRASQSVTISGYSFHWHYQQKPGQAPRLLIYRASNLASGIPA
RFGSGSGTDFTLTISSLEPEDFALYFCQQSRKSPWTFAGGTKVEIKRTVAAPSVFIFPPSDEQ
LKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDYSLSSSTLTLSKADYEK
HKVYACEVTHQGLSSPVTKSFNRGEC

Variable Region (1-113), Constant Region (114-218)

SEQ ID NO:94: Amino Acid Sequence of h#32A1-T23L

EILLTQSPATLSLSPGERATLSCRASQSVTISGYSFHWHYQQKPGQAPRLLIYRASNLASGIPA
RFGSGSGTDFTLTISSLEPEDFALYYCQQSRKSPWTFGQGTKVEIKRTVAAPSVFIFPPSDEQ
LKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDYSLSSSTLTLSKADYEK
HKVYACEVTHQGLSSPVTKSFNRGEC

Variable Region (1-113), Constant Region (114-218)

SEQ ID NO:95: Amino Acid Sequence of h#32A1-T24L

EILLTQSPATLSLSPGERATLSCRASQSVTISGYSFHWHYQQKPGQAPRLLIYRASNLASGIPA
RFGSGSGTDFTLTISSLEPEDFALYYCQQSRKSPWTFGQGTKVEIKRTVAAPSVFIFPPSDEQ
LKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDYSLSSSTLTLSKADYEK
HKVYACEVTHQGLSSPVTKSFNRGEC

Variable Region (1-113), Constant Region (114-218)

SEQ ID NO:96: Amino Acid Sequence of h#32A1-T25L

DILLTQSPATLSLSPGERATLSCRASQSVTISGYSFHWHYQQKPGQQPRLLIYRASNLASGIPA
RFGSGSGTDFTLTISSLEPEDFATYFCQQSRKSPWTFAGGTKVEIKRTVAAPSVFIFPPSDEQ
LKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDYSLSSSTLTLSKADYEK
HKVYACEVTHQGLSSPVTKSFNRGEC

Variable Region (1-113), Constant Region (114-218)

Figure 44

TRAP Activity (A405 nm)

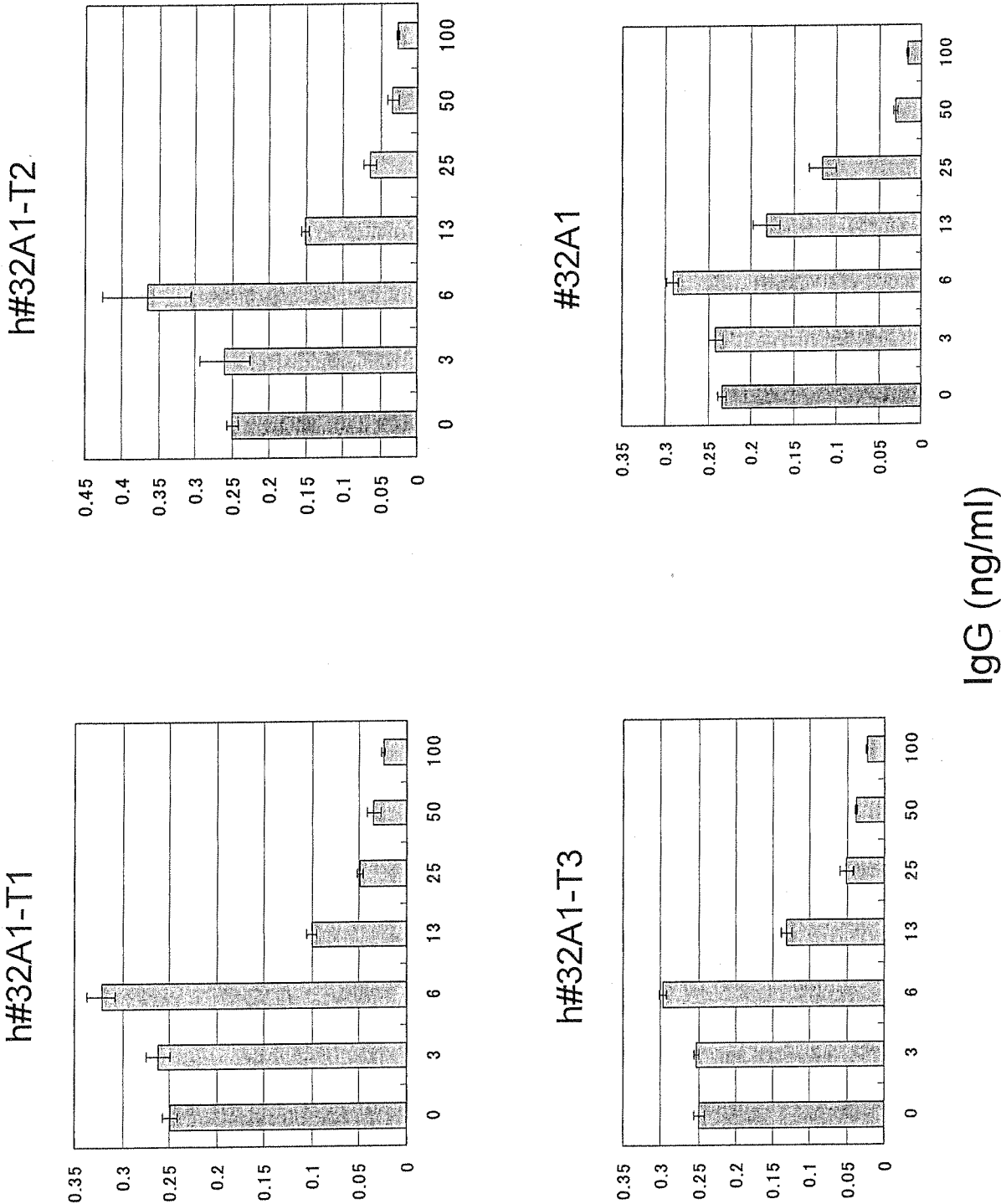


Figure 45

TRAP Activity (A405 nm)

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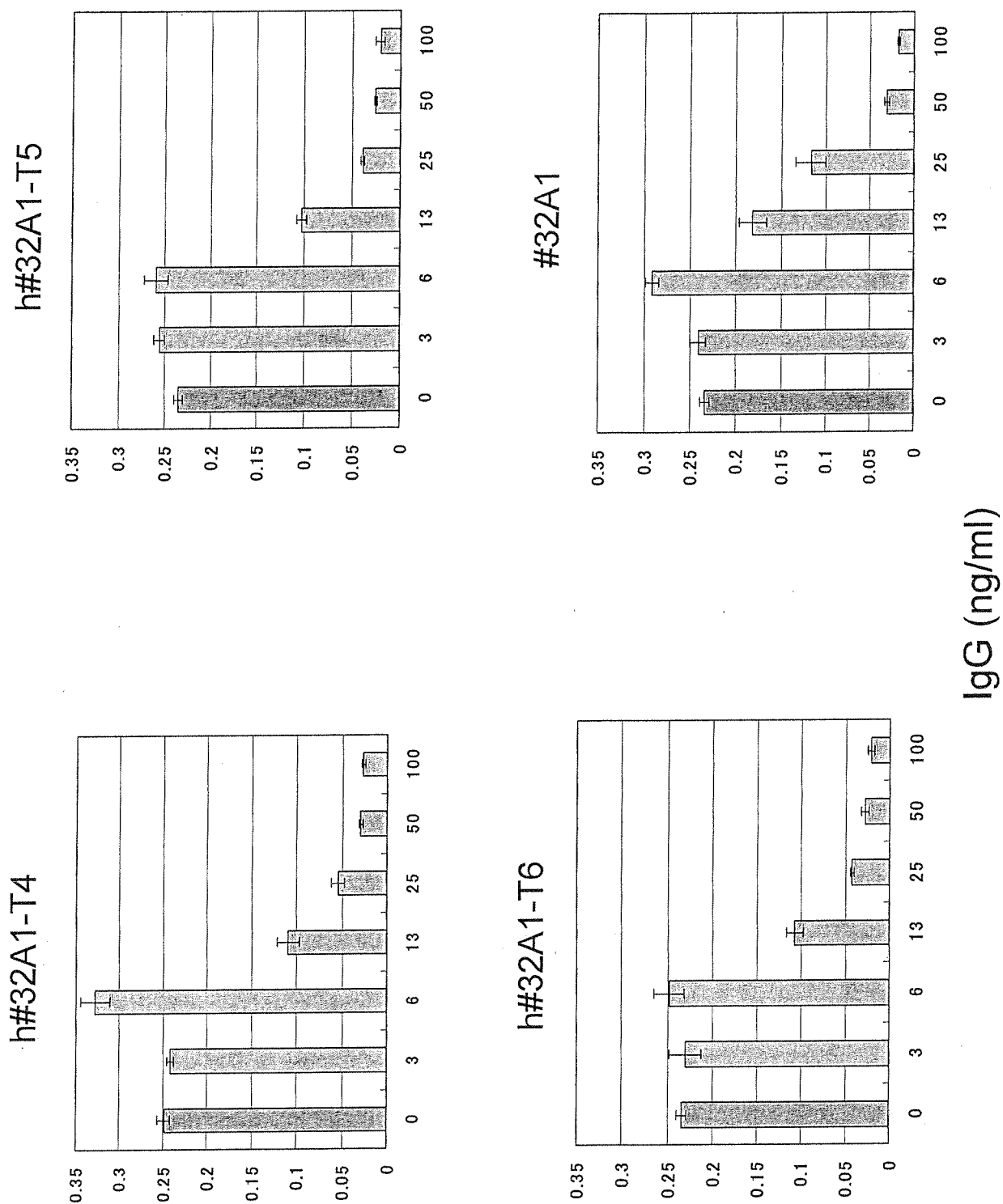


Figure 46

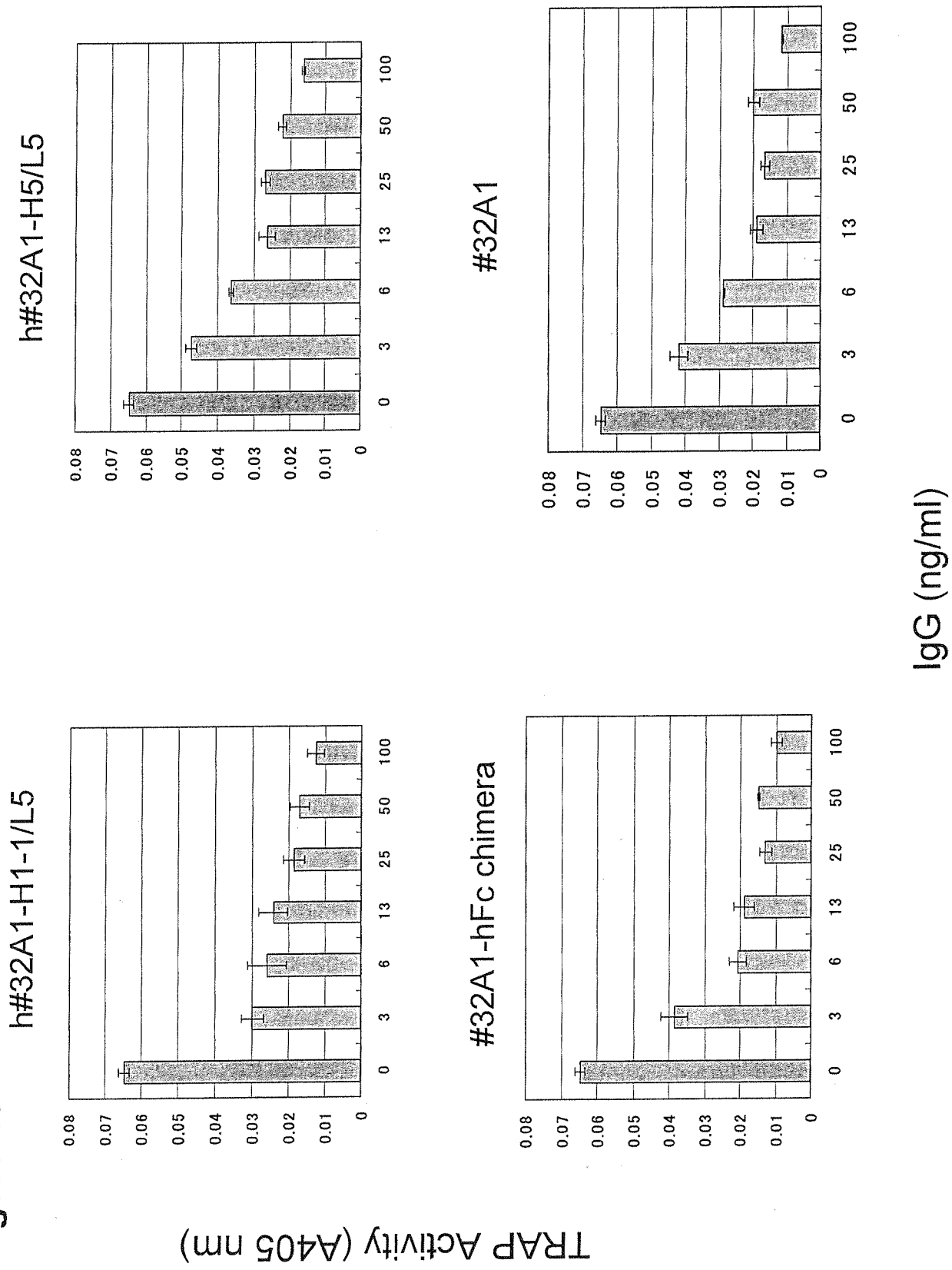


Figure 47

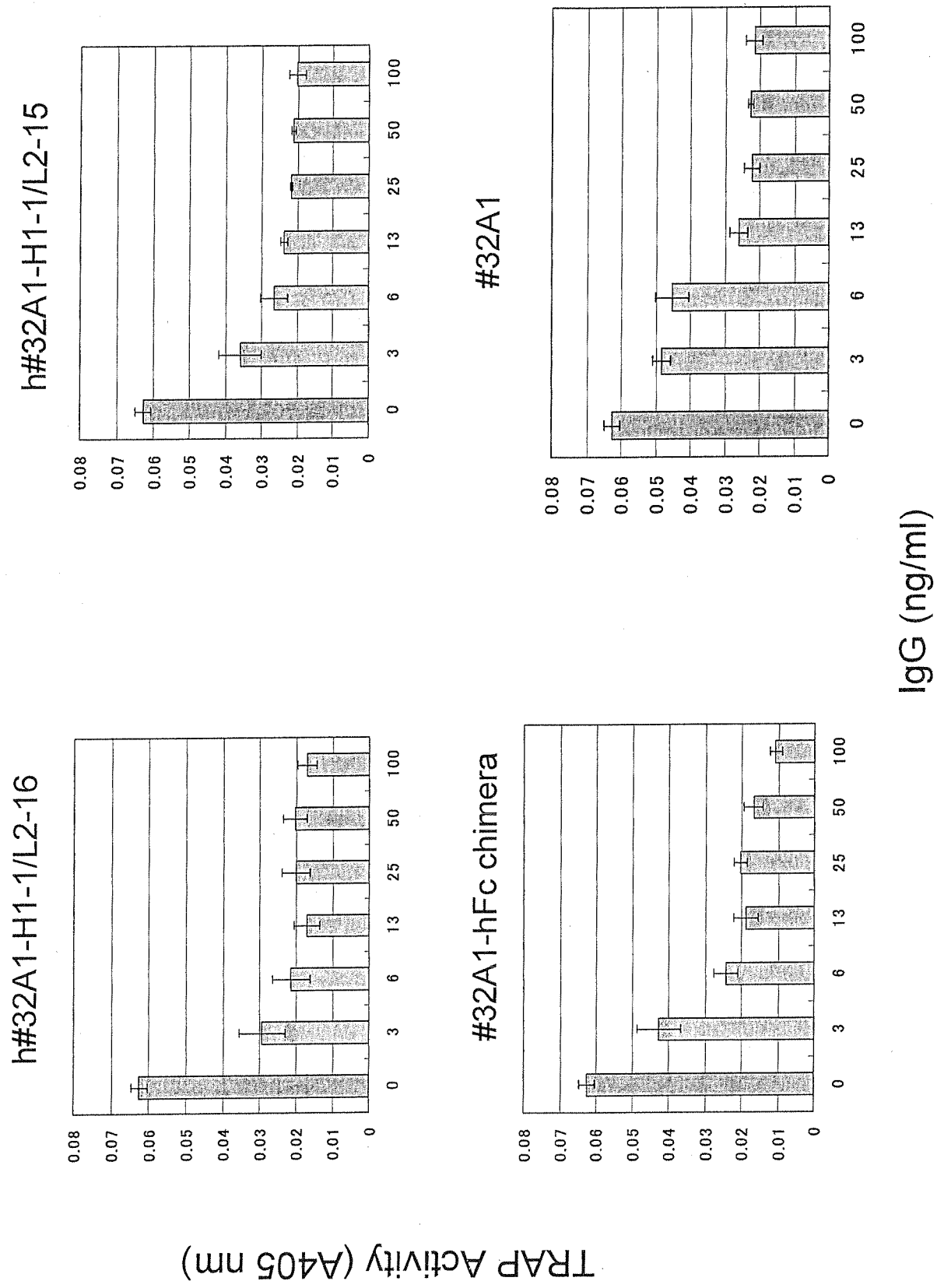


Figure 48

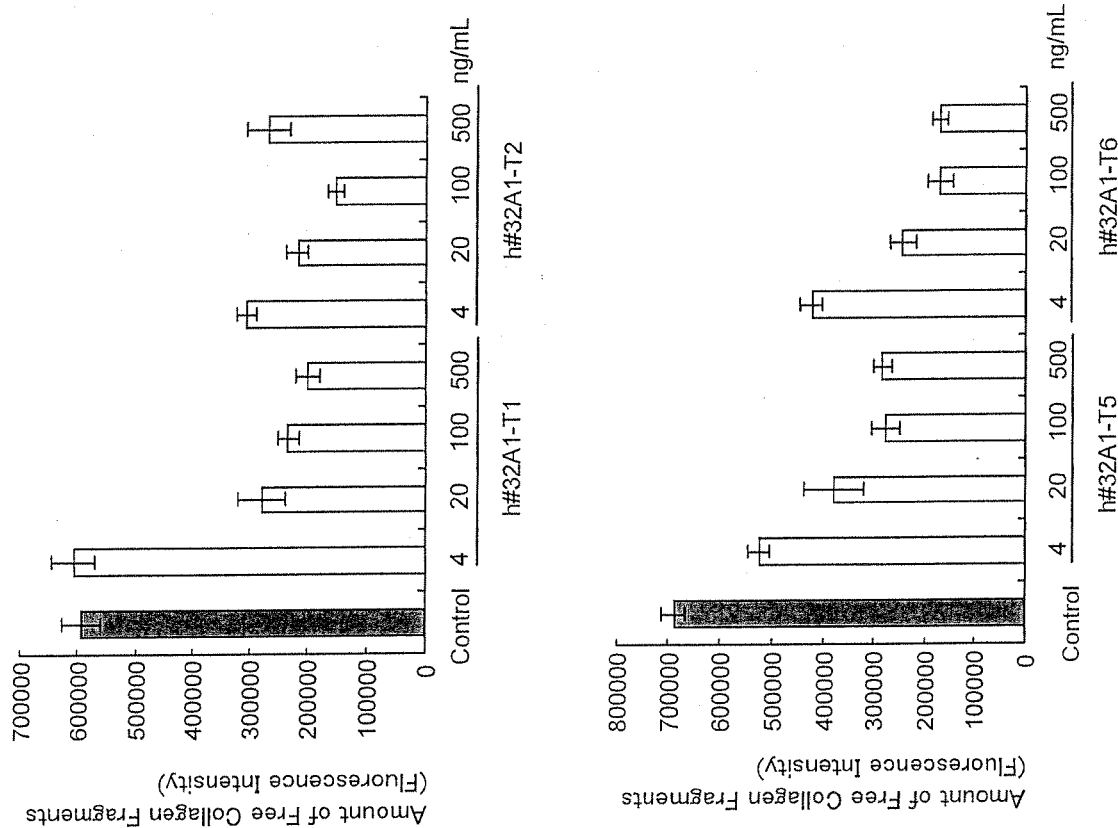
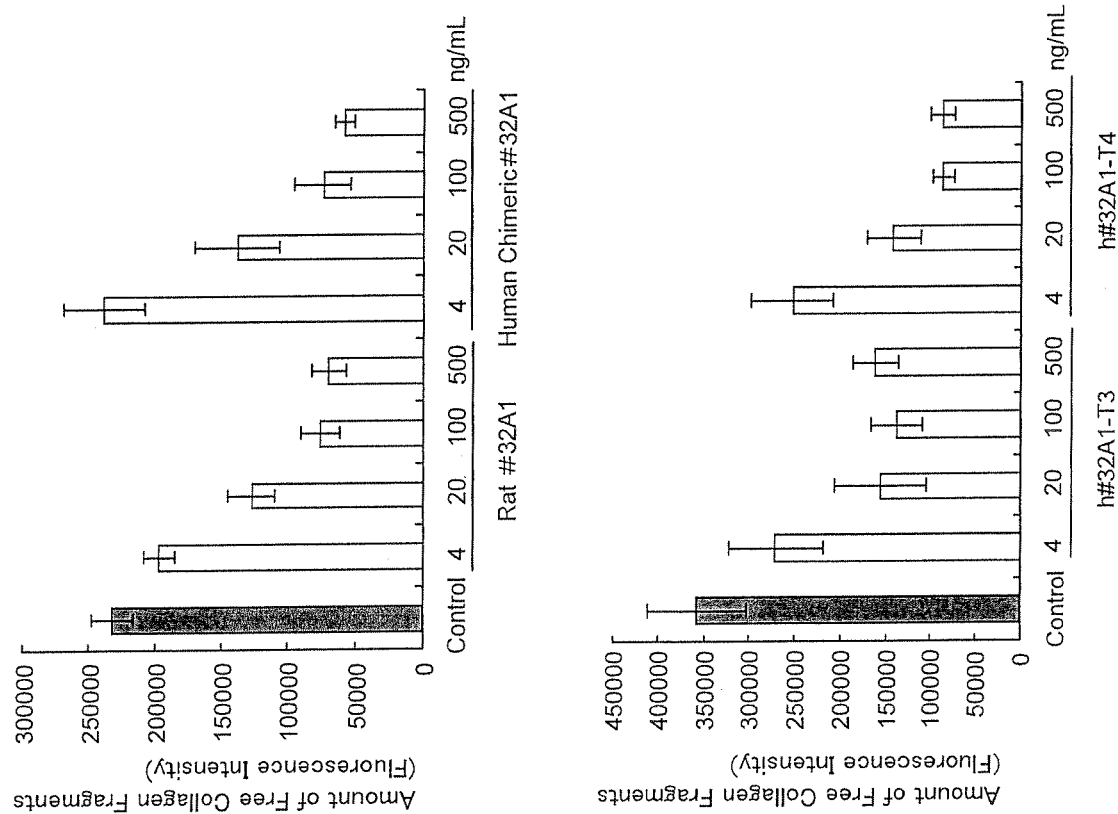
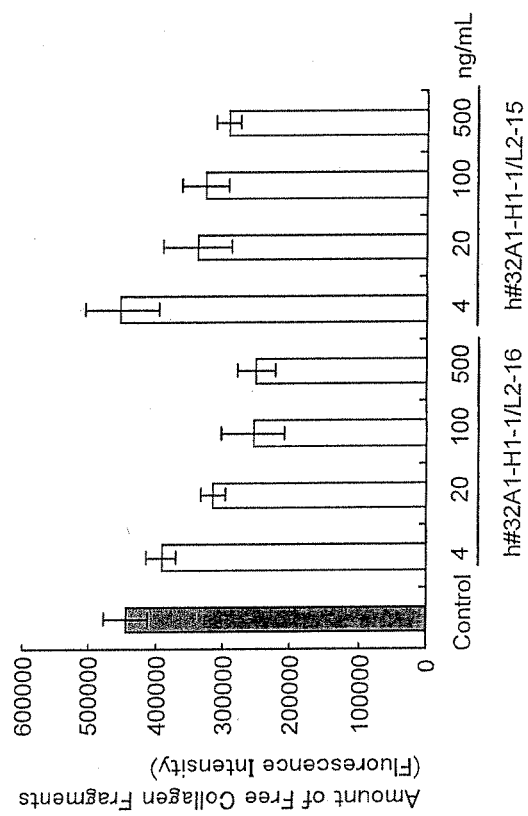
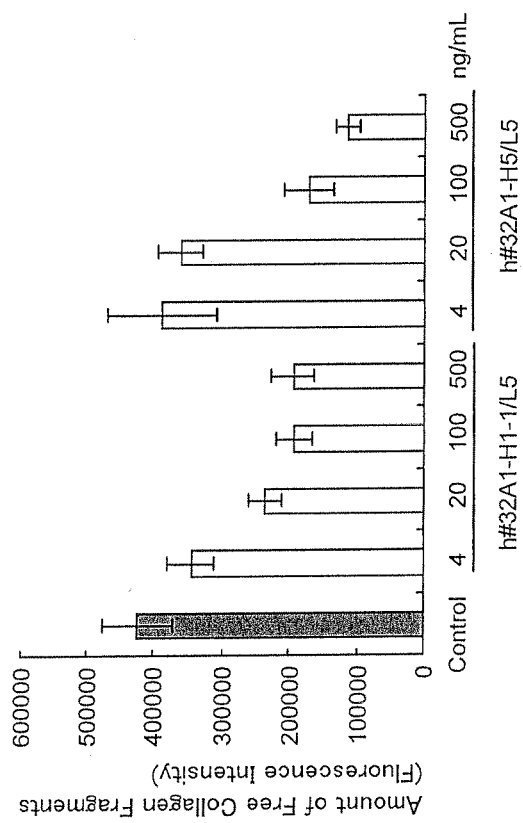


Figure 49



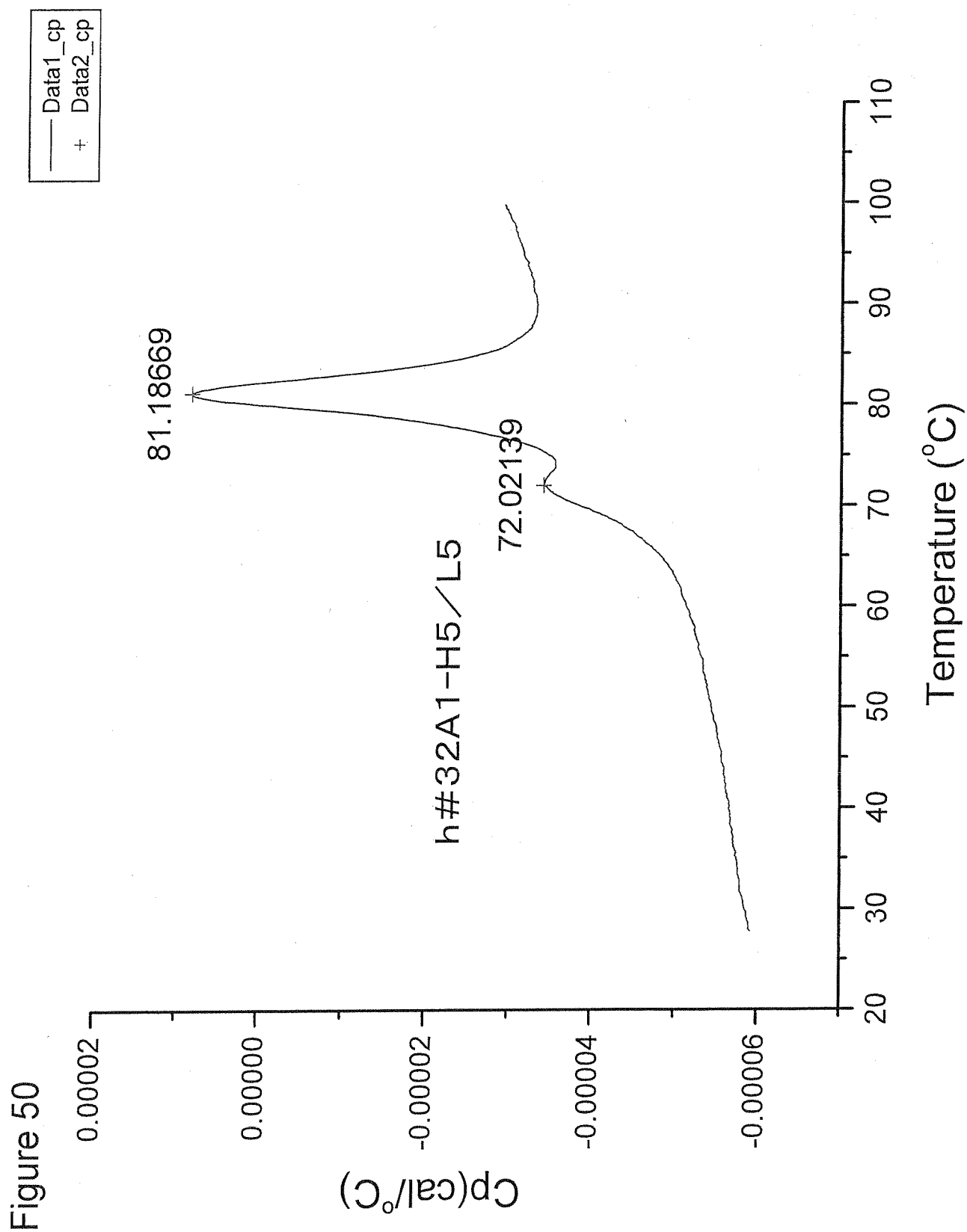
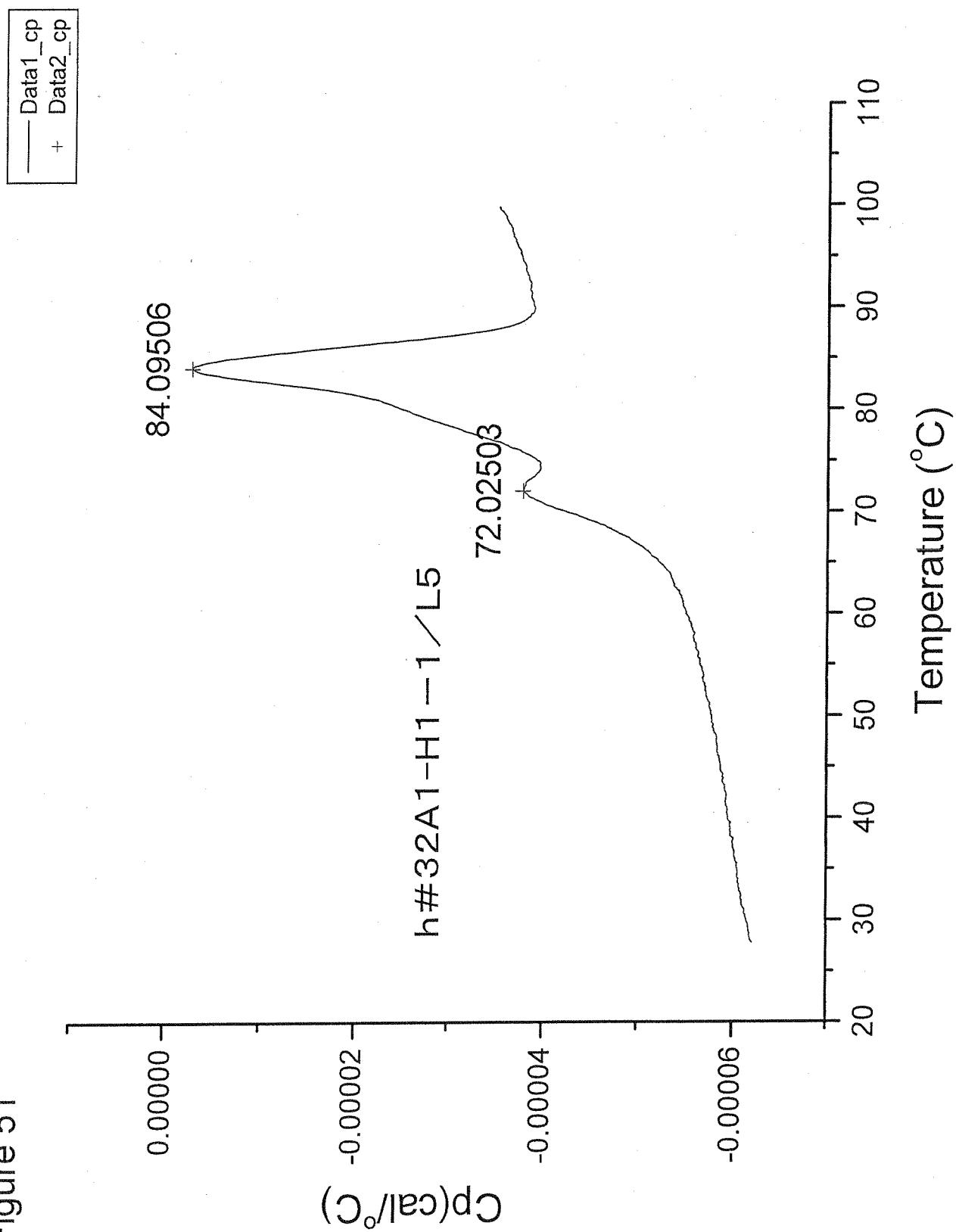
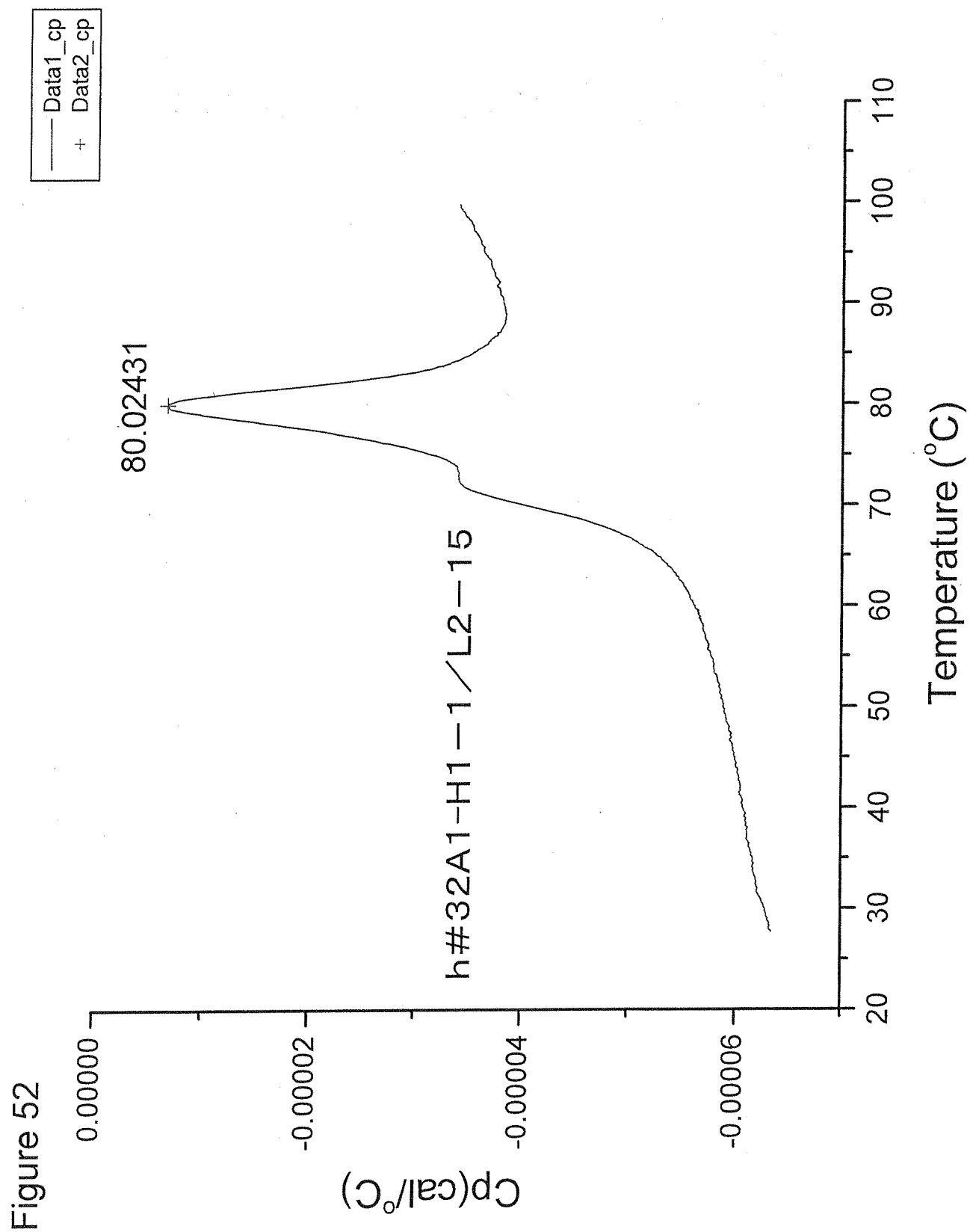


Figure 51





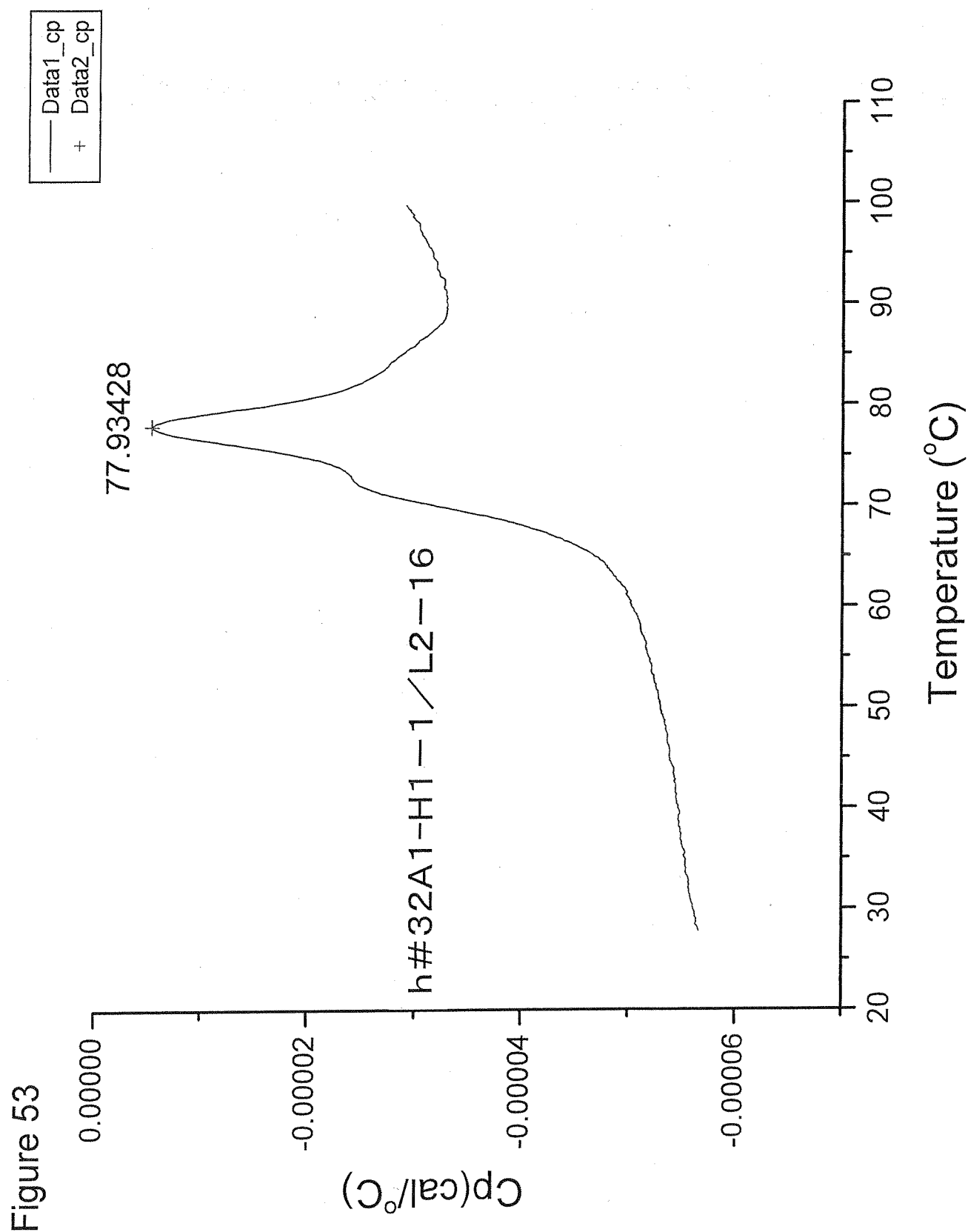


Figure 54

SEQ ID NO:98: Nucleotide Sequence of h#32A1-H1-1

ATGAAACACCTGTGGTTCTTCCTCCTGCTGGTGGCAGCTCCCAGATGGGTGCTGAGCGAAGTCC
 AGCTTGTGGAAAGCGGAGGGGGACTCGTTCAGCCAGGAGGCTCTCTGCGCCTGTCATGCGCTGC
 CAGCGGATTTAATTTCAATGATTATTTTATGAACTGGGTGAGGCAGGCTCCGGGAAAAGGGCTG
 GAATGGGTGCGCCAGATCAGAAACAAGATCTATACTTACGCTACATTCTACGCCGCATCTGTAA
 AGGGGAGGTTTACAATTAGTCGCGACAATGCAAAAAATAGTCTGTATCTCCAAATGAACTCCCT
 CCGCGCAGAGGATACTGCTGTCTACTACTGCGCCAGGTCCTTGACTGGCGGCGACTATTTTGAT
 TACTGGGGACAGGGCACCCTGGTGACGGTGAGCTCAGCCAGCACCAAGGGCCCTTCCGTGTTCC
 CTCTGGCCCCCTTGTAGCCGTTCCACCAGCGAGTCCACCGCCGCCCTTGCTGTCTGGTGAAGGA
 CTACTTCCCTGAGCCTGTGACCGTGAGCTGGAACCTCCGGAGCCCTTACCAGCGGCGTGACACCC
 TTCCCTGCCGTGCTGCAGTCCAGCGGCCTTTACTCCCTGAGCTCCGTGGTGACCGTGCTAGCT
 CCAACTTCGGCACCCAAACCTACACCTGTAACGTGGACCACAAGCCTAGCAACACCAAGGTGGA
 CAAGACCGTGAGCGTAAGTGTGTGTGGAGTGTCTCTCTGCTGCCCTCCTGTGGCCGGA
 CCTTCCGTGTTCTTTTCCCTCCTAAGCCTAAGGACACCCTGATGATCAGCCGTACCCCTGAGG
 TGACCTGTGTGGTGGTGGACGTGTCCCACGAGGACCCTGAGGTGCAGTTCAACTGGTACGTGGA
 CGGCGTGAGGTGCACAACGCCAAGACCAAGCCTCGTGAGGAGCAATTCAACAGCACCTTCCGT
 GTGGTGTCCGTGCTTACCGTGGTGCACCAAGACTGGCTGAACGGCAAGGAGTACAAGTGTAAAG
 TGAGCAACAAGGGACTTCCTGCCCCCTATCGAGAAGACCATCTCCAAGACCAAGGGCCAACCTCG
 TGAGCCTCAAGTGTACACCCTTCCCTCCTAGCCGTGAGGAGATGACCAAGAACCAAGTGTCCCTT
 ACCTGTCTGGTGAAGGGCTTCTACCCTAGCGACATCGCCGTGGAGTGGGAGTCCAACGGACAAC
 CTGAGAACAACCTACAAGACCACCCCTCCTATGCTTGACAGCGACGGCTCCTTCTTCTGTACAG
 CAAGCTGACCGTGGACAAGTCCCCTTGGCAACAAGGCAACGTGTTTCCGTGATGCAC
 GAGGCCCTGCACAACCACTACACCCAAAAGAGCCTTCCCTGAGCCCTGGAAAG

Signal Sequence (1-57) , Variable Region (58-420) , Constant Region
(421-1398)

SEQ ID NO:99: Amino Acid Sequence of h#32A1-H1-1

MKHLWFFLLLVAAAPRWVLSEVQLVESGGGLVQPGGSLRLSCAASGFNFDYFMNWVRQAPGKGL
 EWVAQIRNKIYTYATFYAASVKGRFTISRDNKNSLYLQMNSLRAEDTAVYYCARSLTGDDYFD
 YWGQGTLLVTVSSASTKGPSVFPLAPCSRSTSESTAALGCLVKDYFPEPVTVSWNSGALTSGVHT
 FPAVLQSSGLYSLSSVVTVPSSNFGTQTYTCNVDPKPSNTKVDKTKVERKCCVECPPCPAPPVAG
 PSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVQFNWYVDGVEVHNAKTKPREEQFNSTFR
 VVSVLTVVHQDWLNGKEYKCKVSNKGLPAPIEKTISKTKGQPREPQVYTLPPSREEMTKNQVSL
 TCLVKGFIYPSDIAVEWESNGQPENNYKTPPMLDSDGSFFLYSKLTVDKSRWQQGNVVFSCSVMH
 EALHNHYTQKSLSLSPGK

Signal Sequence (1-19) , Variable Region (20-140) , Constant Region
(141-466)

Figure 55

SEQ ID NO:100: Nucleotide Sequence of h#32A1-H5

ATGAAACACCTGTGGTTCTTCCTCCTGCTGGTGGCAGCTCCCAGATGGGTGCTGAGCGAGGTGC
 AGGTGGTGGAGAGCGGCGGCGGACTTGTGCAGCCTGGCGGCTCCCTGAGACTTAGCTGTGCCAC
 CTCCGGCTTCAACTTCAACGACTACTTCATGAACTGGGTGAGACAGGCCCCCTGGCAAGGGCCTG
 GAGTGGGTGGCCCAGATCAGAAACAAGATCTACACCTACGCCACCTTCTACGCCGAGAGCCTTG
 AGGGCAGATTACCATCTCCAGAGACAACAGCAAGTCCACCGTGTACCTTCAGATGAACTCCCT
 GAGAGCCGAGGACACCGCCGTGTACTACTGTACCAGAAGCCTTACCGGCGGCGACTACTTCGAC
 TACTGGGGCCAGGGCACCCCTGGTGACCGTGAGCTCAGCCAGCACCAAGGGCCCTTCCGTGTTCC
 CTCTGGCCCCCTTGTAGCCGTTCCACCAGCGAGTCCACCGCCGCCCTTGGCTGTCTGGTGAAGGA
 CTACTTCCCTGAGCCTGTGACCGTGAGCTGGAACCTCCGAGCCCTTACCAGCGGCGTGACACCC
 TTCCCTGCCGTGCTGCAGTCCAGCGGCCTTTACTCCCTGAGCTCCGTGGTGACCGTGCCTAGCT
 CCAACTTCGGCACCCAAACCTACACCTGTAACGTGGACCACAAGCCTAGCAACACCAAGGTGGA
 CAAGACCGTGGAGCGTAAGTGTGTGTGGAGTGTCTCTTGTCTGCCCCCTCCTGTGGCCGGA
 CCTTCCGTGTTCTTTTCCCTCCTAAGCCTAAGGACACCCTGATGATCAGCCGTACCCCTGAGG
 TGACCTGTGTGGTGGTGGACGTGTCCCACGAGGACCCTGAGGTGCAGTTCAACTGGTACGTGGA
 CGGCGTGGAGGTGCACAACGCCAAGACCAAGCCTCGTGAGGAGCAATTCAACAGCACCTTCCGT
 GTGGTGTCCGTGCTTACCGTGGTGCACCAAGACTGGCTGAACGGCAAGGAGTACAAGTGTAAAG
 TGAGCAACAAGGGACTTCCCTGCCCCCTATCGAGAAGACCATCTCCAAGACCAAGGGCCAACCTCG
 TGAGCCTCAAGTGTACACCCTTCTCCTAGCCGTGAGGAGATGACCAAGAACCAAGTGTCCCTT
 ACCTGTCTGGTGAAGGGCTTCTACCCTAGCGACATCGCCGTGGAGTGGGAGTCCAACGGACAAC
 CTGAGAACAACCTACAAGACCACCCCTCCTATGCTTGACAGCGACGGCTCCTTCTTCTGTACAG
 CAAGCTGACCGTGGACAAGTCCCGTTGGCAACAAGGCAACGTGTTTCACTGTTCCGTGATGCAC
 GAGGCCCTGCACAACCACTACACCCAAAAGAGCCTTTCCTGAGCCCTGGAAAG

Signal Sequence (1-57) , Variable Region (58-420) , Constant Region (421-1398)

SEQ ID NO:101: Amino Acid Sequence of h#32A1-H5

MKHLWFFLLLVAAAPRWVLSEVQVVESSGGGLVQPGGSLRLSCATSGFNFNDYFMNWVRQAPGKGL
 EWVAQIRNKIYTYATFYAESLEGRFTISRDNKSTVYLQMNSLRAEDTAVYYCTRSLTGDDYFD
 YWGQGTLLTVSSASTKGPSVFPLAPCSRSTSESTAALGCLVKDYFPEPVTVSWNSGALTSGVHT
 FPAVLQSSGLYSLSSVVTVPSSNFGTQTYTCNVDHKPSNTKVDKTVKCCVECPPCPAPPVAG
 PSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVQFNWYVDGVEVHNAKTKPREEQFNSTFR
 VVSVLTVVHQDNLNGKEYKCKVSNKGLPAPIEKTISKTKGQPREPQVYTLPPSREEMTKNQVSL
 TCLVKGFPYPSDIAVEWESNGQPENNYKTTTPMLDSDGSFFLYSKLTVDKSRWQQGNVVFSCSVMH
 EALHNHYTQKSLSLSPGK

Signal Sequence (1-19) , Variable Region (20-140) , Constant Region (141-466)

Figure 56

SEQ ID NO:102: Nucleotide Sequence of h#32A1-L2-15

ATGGTGCTGCAGACCCAGGTGTTTCATCTCCCTGCTGCTGTGGATCTCCGGCGCATATGGCGAAA
TTCTGATGACGCAGAGTCCTGCAACTCTTAGTCTGTACCTGGCGAGAGAGCCACACTCAGCTG
CCGAGCGTCCCAGTCCGTGACCATTAGCGGCTATTCTTTTATTTCATTGGTATCAGCAAAAGCCT
GGACAGGCGCCAAGGCTGCTCATTTACAGAGCAAGCAACCTTGCCTCTGGCATTCCAGCAAGAT
TCAGCGGGAGCGGATCAGGGACAGATTTACCTTGACCATCTCCTCCCTGGAGCCGGAGGATTT
CGCGTTGTATTATTGTGTCAGCAATCTAGGAAGAGTCCATGGACATTTGGCCAGGGCACCAAAGTG
GAGATCAAGCGTACGGTGGCCGCCCTCCGTGTTTCATCTTCCCCCCTCCGACGAGCAGCTGA
AGTCCGGCACCGCCTCCGTGGTGTGCCTGCTGAATAACTTCTACCCAGAGAGGCCAAGGTGCA
GTGGAAGGTGGACAACGCCCTGCAGTCCGGGAACCTCCAGGAGAGCGTGACCGAGCAGGACAGC
AAGGACAGCACCTACAGCCTGAGCAGCACCTGACCCTGAGCAAAGCCGACTACGAGAAGCACA
AGGTGTACGCCTGCGAGGTGACCCACCAGGGCCTGAGCTCCCCCGTCACCAAGAGCTTCAACAG
GGGGGAGTGT

Signal Sequence (1-60) , Variable Region (61-399) , Constant Region
(400-714)

SEQ ID NO:103: Amino Acid Sequence of h#32A1-L2-15

MVLQTQVFISLLWISGAYGEILMTQSPATLSLSPGERATLSCRASQSVTISGYSFHWYQQKP
GQAPRLLIYRASNLASGIPARFSGSGTDFTLTISSLEPEDFALYYCQQRKSPWTFGQGTKV
EIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDS
KDSTYLSSTLTLSKADYEEKHKVYACEVTHQGLSSPVTKSFNRGEC

Signal Sequence (1-20) , Variable Region (21-133) , Constant Region
(134-238)

Figure 57

SEQ ID NO:104: Nucleotide Sequence of h#32A1-L2-16

ATGGTGCTGCAGACCCAGGTGTTTCATCTCCCTGCTGCTGTGGATCTCCGGCGCATATGGCGAAA
 TCCTGATGACACAGAGTCCTGCGACCCCTCTCCCTCTCACCAGGCGAGAGGGCCACCCTGTCTTG
 TAGAGCCAGCCAGTCAGTCACTATTAGTGGATACTCATTTATCCATTGGTATCAACAGAAACCA
 GGACAGGCGCCTCGGCTTCTGATCTACCGCGCCTCAAACCTTGCTCTGGCATCCCCGCGAGGT
 TCTCTGGCTCTGGCAGCGGTACCGATTTTACACTGACTATCTCAAGCCTCGAACCTGAAGACTT
 CGCACTGTACTTTTGCCAGCAGAGCAGGAAGTCCCCCTGGACTTTTGCACAGGGAACCAAAGTC
 GAAATCAAGCGTACGGTGGCCGCCCCCTCCGTGTTTCATCTTCCCCCCTCCGACGAGCAGCTGA
 AGTCCGGCACCGCCTCCGTGGTGTGCCTGCTGAATAACTTCTACCCCAGAGAGGCCAAGGTGCA
 GTGGAAGGTGGACAACGCCCTGCAGTCCGGGAACCTCCCAGGAGAGCGTGACCGAGCAGGACAGC
 AAGGACAGCACCTACAGCCTGAGCAGCACCTGACCCTGAGCAAAGCCGACTACGAGAAGCACA
 AGGTGTACGCCTGCGAGGTGACCCACCAGGGCCTGAGCTCCCCCGTCACCAAGAGCTTCAACAG
 GGGGGAGTGT

Signal Sequence (1-60) , Variable Region (61-399) , constant Region
 (400-714)

SEQ ID NO:105: Amino Acid Sequence of h#32A1-L2-16

MVLQTQVFISLLLWISGAYGEILMTQSPATLSLSPGERATLSCRASQSVTISGYSFHWYQQKP
 GQAPRLLIYRASNLASGIPARFSGSGSGTDFTLTISSELPEDFALYFCQQSRKSPWTFQAQGTKV
 EIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDS
 KDSTYLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

Signal Sequence (1-20) , Variable Region (21-133) , constant Region
 (134-238).