

Pathway CDS in original expression construct 1051.0002 or 2102.0001 pCS-CFSD1-WPRE(new ori)

ATGAGGGGCATGAAGCTGCTGGGGGCTCTGCTGGCACTGGCCGCCCTACTGCAGGGGGCCGTGTCCCTGAAGATCGCAGCCTTC
AACATCCAGACATTGGGGAGACCAAGATGTCCAATGCCACCCTCGTCAGCTACATTGTGCAGATCCTGAGCCGCTATGACATC
GCCCTGGTCCAGGAGGTGAGAGACAGCCACCTGACTGCCGTGGGGAAGCTGCTGGACAACCTCAATCAGGATGCACCAAGACACC
TATCACTACGTGGTCAGTGAGCCACTGGGACGGAAACAGCTATAAGGAGCGCTACCTGTTCTGTGTACAGGCCCTGACCAGGTGTCT
GCAGTGGACAGCTACTACTACGATGATGGCTGCGAGCCCTGCGGGAACGACACCTTCAACCGGGAGCCAGCCATTGTGAGGTTT
TTCTCCCGTTTACAGAGGTGAGGGAGTTTGCCATTGTTCCCTGTCATGCGGCCCCGGGGGACGCGAGTAGCCGAGATCGACGCT
CTCTATGACGTCTACCTGGATGTCCAAGAGAAAATGGGGCTTGGAGGACGTCATGTTGATGGGCGACTTCAATGCTGGCTGCAGC
TATGTGAGACCCCTCCAGTGGTTCATCCAATCCGCTGTGGACAAGCCCCACCTTCCAGTGGCTGATCCCCGACAGCGCTGACACC
ACAGCTACACCCACCACTGTGCTTATGACAGGATCGTGGTTGCAGGGATGCTGCTCCGAGGCGCCGTTGTTCCTGACTCTGCT
CTTCCCTTTAACTTCCAGGCTGCCTATGGCCTGAGTGACCAACTGGCCCAAGCCATCAGTGACCACCTATCCAGTGGAGGTGATG
CTGAAGTGA (SEQ ID NO:139)

FIG. 1A

Pathway CDS in original expression construct 1051.0002 or 2102.0001 pCS-CFSD1-WPRE(new ori)
(translated, 282 amino acids)

MRGMKLLGALLALAALLQGAVSLKIAAFNIQTGETKMSNATLVSYIVQILSRDIALVQEVDRSHLTAVGKLLDNLNQDAPDT
YHYVVSEPLGRNSYKERYLFVYRPDQVSAVDSYDDGCEPCGNDTFNREPAIVRFFSRFTFVREFAIVPLHAAPGDAVAEIDA
LYDVYLDVQEKWGLEDMVLMGDFNAGCSYVRPSQWSSIRLWTSPTFQWLI PDSADTTATPTHCAVDRIVVAGMMLLRGAVVPDSA
LPFNFQAAYGLSDQLAQAI SDHYPVEVMLK (SEQ ID NO:140)

FIG. 1B

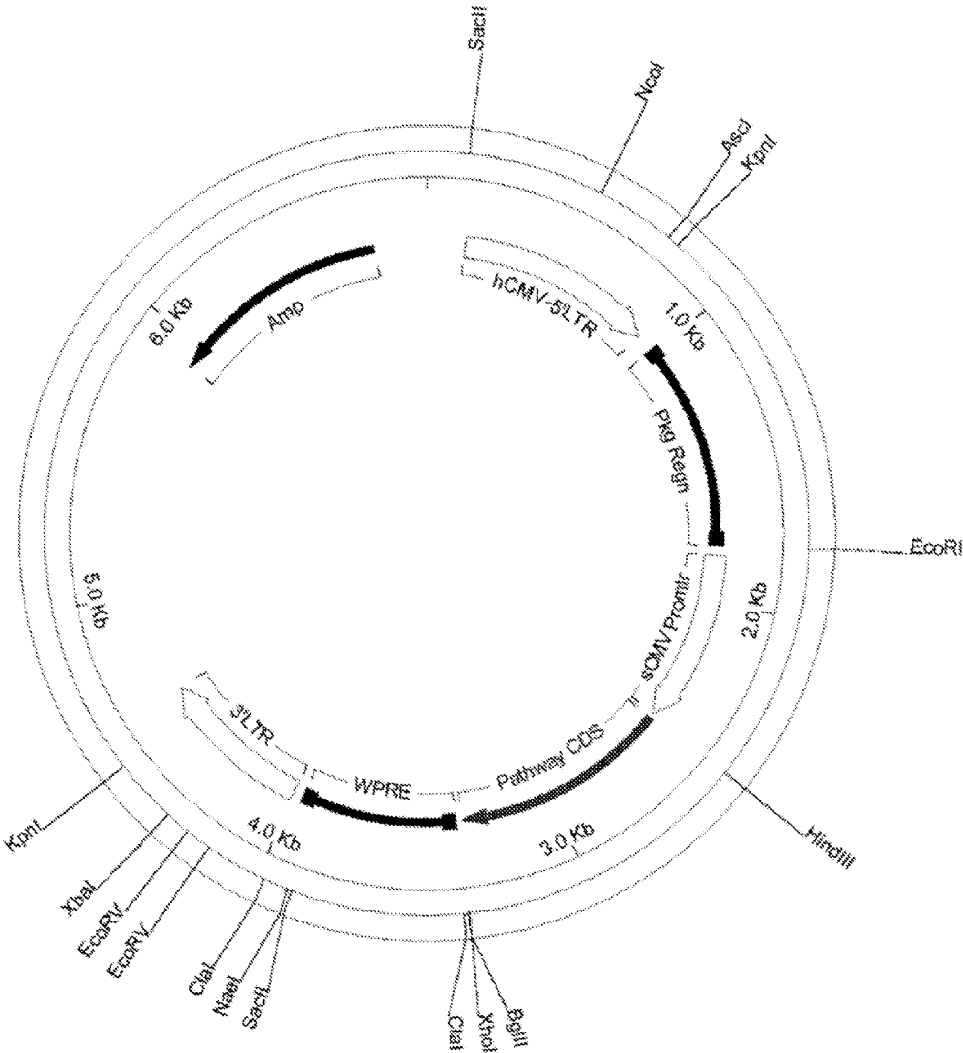


FIG. 3

LC CDS in 207attB-GS-h3E10LC-WPRE, GDDGA01.0004 (739 nucleotides)

GCGGCCGCGCCGCCACCATGATGTCCTTTGTCTCTCTGCTCCTGGTTGGCATCCTATTCCATGCCACCCAGGCCGACATCGTGC
TGACCCAGTCCCCCGCCTCCCTGGCTGTTTCTCCTGGCCAGAGAGCGACCATCTCCTGTGCGGGCCTCCAAGTCCGTGTCCACAT
CTAGCTACTCCTACATGCACTGGTATCAGCAGAAGCCCGGCCAGCCACCCAAGCTGCTGATCAAATACGCCTCCTACCTGGAAT
CCGGCGTGCCCGCTAGATTCTCCGGCTCTGGCTCTGGCACCAGACTTTACCCCTGAACATCCATCCTGTGGAGGAAGAGGACACCG
CCAACTACTACTGCCAGCACTCCCGCGAGTTCCCTTGGAACCTTTGGCGGTGGCACCAAGGTGGAAATCAAGCGAACTGTGGCTG
CACCATCTGTCTTCATCTTCCCGCATCTGATGAGCAGCTTAAGTCCGGAAGTGTAGCGTTGTGTGCTGCTGAATAACTTCT
ATCCCAGAGAGGCCAAAGTACAGTGGAAAGGTGGATAACGCCCTCCAATCGGGTAACTCCCAGGAGAGTGTACAGAGCAGGACA
GCAAGGACAGCACCTACAGCCTCAGCAGCACCCTGACGCTGAGCAAAGCAGACTACGAGAAACACAAAGTCTACGCCTGCGAAG
TCACCCATCAGGGCCTGAGCTCGCCCGTCACAAAGAGCTTCAACAGGGGAGAGTGTAGTGAGATCT (SEQ ID NO:141)

FIG. 4A

LC CDS in 207attB-GS-h3E10LC-WPRE, GDDGA01.0004 (translated, 237 amino acids)

MMSFVSLLLVGLFPHATQADIVLTQSPASLAVSPGQRATISCRASKSVSTSSYSYMHWYQOKPGQPPKLLIKYASYLESQV
PARFSGSGSCTDFTLNIHPVEEEDTANYYCQHSREFPWTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNFP
PREAKVQWKVDNALQSGNSQESVTEQDSKDYSLSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC (SEQ ID NO:142)

FIG. 4B

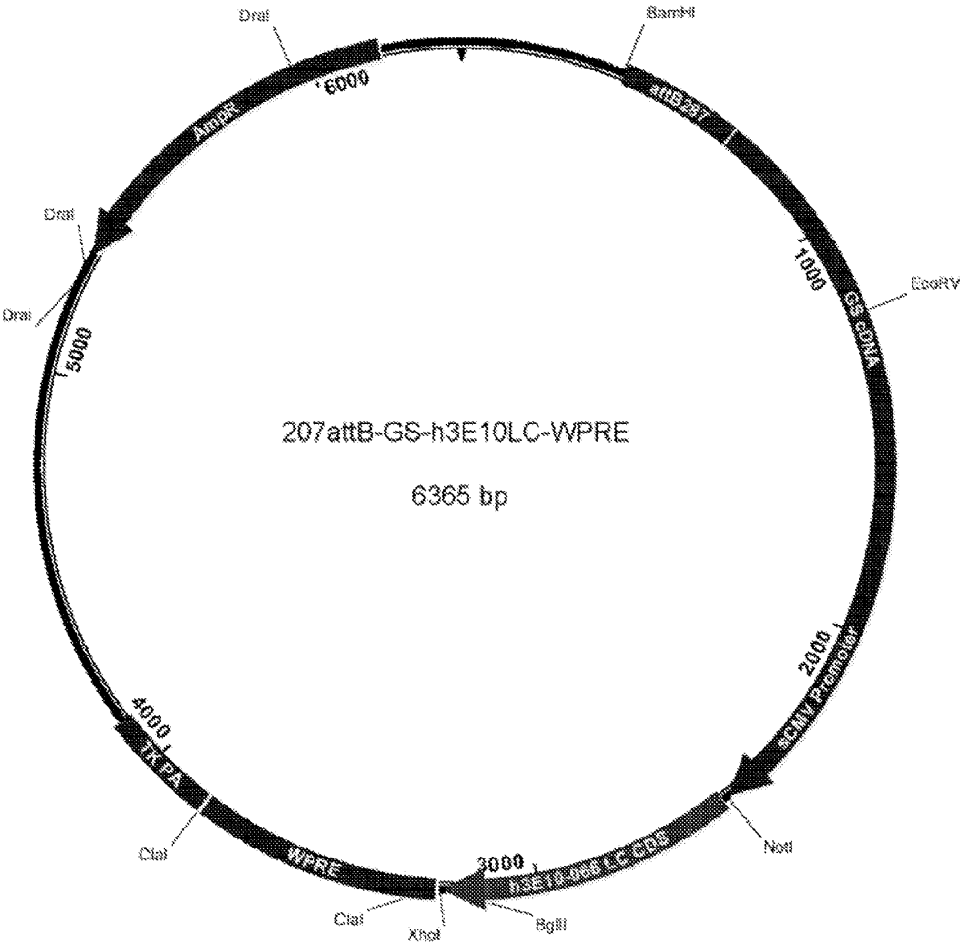


FIG. 5

HC CDS in 207attB-GS-h3E10HC-WPRE, GDDGA01.0005 (1419 nucleotides)

AAGCTTGCCGCCACCATGATGTCTTGTCTCTGTCTCTGCTCCTGGTTGGCATCCTATTCCATGCCACCCAGGCCGAGGTGCAGCTG
GTGCGAGTCTGGGGGAGGCTTGGTCCAGCCTGGGGGGTCCCGGAAACTCTCCTGTGCAGCCTCTGGATTCACTTTCAGTAACTAT
GGAATGCAC'TGGGTCCGCGCAGGCTCCAGGGAAGGGGGCTGGAGTGGGTGCATACATTAGTAGTGGCAGTAGTACCATCTACTAC
GCCGACACCGTGAAGGGCCGATTACCAATCTCCAGAGACAATGCCAAGAACACCCCTGTTCTTCAAATGAACAGCCTGAGAGCC
GAGGACACCGCTGTGTATTACTGTGCAAGA CGGGGTTTACTACTTGACTACTGGGGCCAGGGAACCCCTGGTCAACCGTCTCTCTCA
GCCTCCACCAAGGGCCCATCGGTCTTCCCCCTGGCACCCCTCTAGCAAGAGCACCTCTGGGGGCACAGCGGCCCTGGGCTGCCTG
GTCAAGGACTACTTCCCCGAACCGGTGACGGTGTCTGTGAACTCAGGCGCCCTGACCAGCGGCGTGCACACCTTCCCGGTGTCT
CTACAGTCTCTCAGGACTCTACTCCCTCAGCAGCGTGGTGACCGTGCCTCCAGCAGCTTGGGCACCCAGACCTACATCTGCAAC
GTGAATCACAAAGCCAGCAACACCAAGGTGGACAAGAAAGTTGAGCCCAAATCTTGTGACAAAACCTCACACATGCCACCGTGC
CCAGCACCTGAACCTCTGGGGGGACCGTCAGTCTTCTCTTCCCCCAGGACACCCCTCATGATCTCCCGGACCCCT
GAGGTACATGCGTGGTGGTGGACGTGAGCCACGAAGACCCCTGAGGTCAAGTTCAACTGGTACGTGGACGGCGTGGAGGTGCAT
AATGCCAAGACAAAGCCGCGGGAGGAGCAGTACAACAGCACGTACCGTGTGGTCAGCGTCTCTACCGTCTCTGCACAGGACTGG
CTGAATGGCAAGGAGTACAAGTGCAAGGTCTCCAACAAGCCCTCCAGCCCCATCGAGAAAACCATCTCCAAAGCCAAAGGG
CAGCCCCGAGAACCACAGGTGTACACCTGCCCCCATCCCGGGACGAGCTGACCAAGAACCAGGTGAGCCTGACCTGCCTGGTC
AAAGGCTTCTATCCCAGCGACATCGCCGTGGAGTGGGAGAGCAATGGGCAGCCGGAGAACAACTACAAGACCACGCCTCCCGTG
CTGGACTCCGACGGCTCCTTCTTCTCTATTCGAAGCTCACCGTGGACAAGAGCAGGTGGCAGCAGGGGAACGTCTTCTCATGC
TCCGTGATGCATGAGGCTCTGCACAACCACTACACGAGAAGAGCCTCTCCCTGTCTCCCGGGTATGACTCGAG
(SEQ ID NO:143)

FIG. 6A

HC CDS in 207attB-GS-h3E10HC-WPRE, GDDGA01.0005 (translated, 464 amino acids)

MMSFVSLLLVGLPHATQAEVQLVESGGGLVQPGSRKLSCAASGFTFSNYGMHWVRQAPGKGLEWVAYISSGSSTIYYADTVK
GRFTISRDNKNTLFLQMNSLRAEDTAVYYCARRGLLLDYWGQGLVTVSSASTKGPSVFPPLAPSSKSTSGGTAAALGCLVKDYF
PEPVTVSWNSGALTSQVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPEL
LGGPSVFLFPPKPKDTLMISRTPETVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKE
YKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTPFPVLDSDG
SFFLYSKLTVDKSRWQQGNVFCSTMHEALHNHYTQKSLSLSPG (SEQ ID NO:144)

FIG. 6B

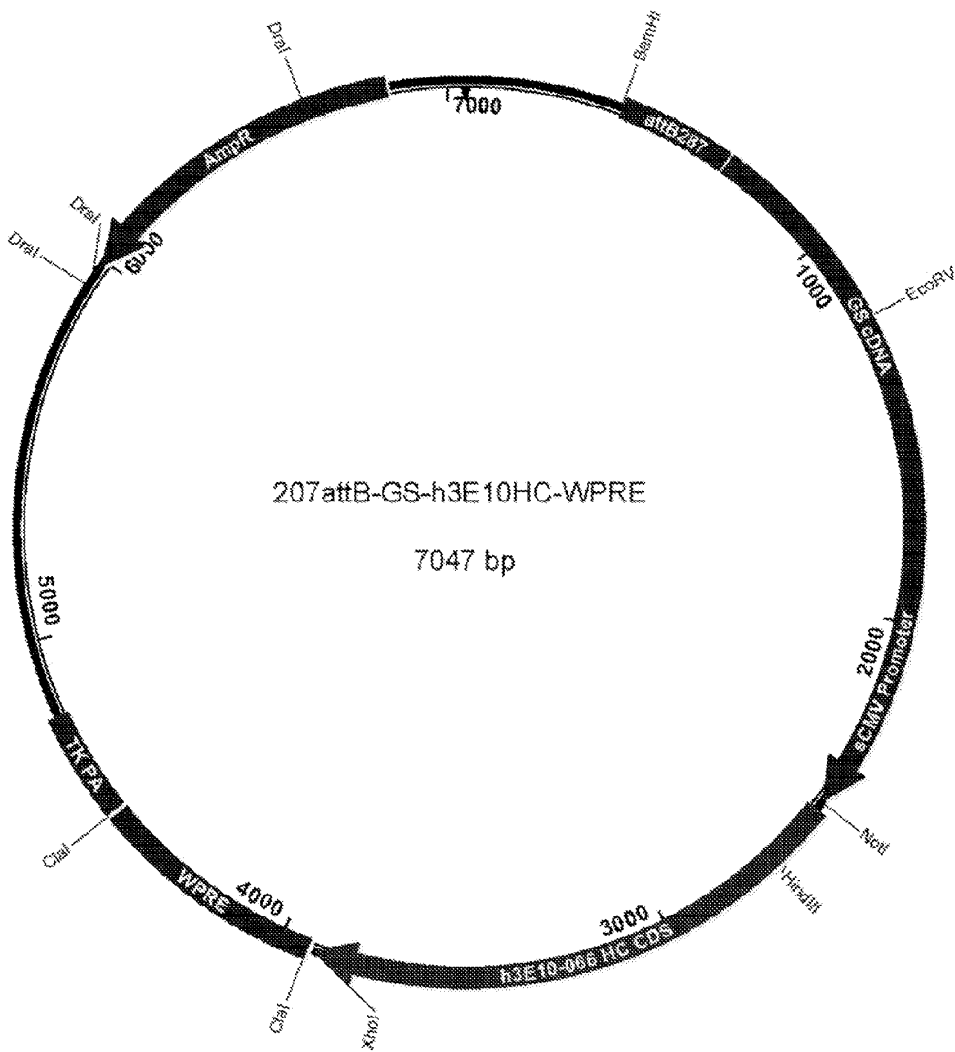


FIG. 7

Pathway CDS in 215-puc19attB287-GS-Pathway-WPRE-TKpa, GDD1008.0215 (876 nucleotides)

AAGCTTGCCGCCACCATGAGGGGCATGAAGCTGCTGGGGGCTCTGCTGGCACTGGCCGCCCTACTGCAGGGGGCCGTGTCCCTG
AAGATCGCAGCCTTCAACATCCAGACATTTGGGGAGACCAAGATGTCCAATGCCACCCTCGTCAGCTACATTGTGCAGATCCTG
AGCCGCTATGACATCGCCCTGGTCCAGGAGGTCAGAGACAGCCACCTGACTGCCGTGGGGAAGCTGCTGGACAACCTCAATCAG
GATGCACCCAGACACCTATCACTACGTGGTCAGTGAGCCACTGGGACGGAAACAGCTATAAGGAGCGCTACCTGTTCTGTGTACAGG
CCTGACCAGGTGTCTGCAGTGGACAGCTACTACTACGATGATGGCTGCGAGCCCTGCGGGAAACGACACCTTCAACCGGGAGCCA
GCCATTGTGAGGTTCTTCTCCCGTTCAAGAGGTCAGGGAGTTTGCCATTGTTCCCTGCATGCGGCCCGGGGGACGCAGTA
GCCGAGATCGACGCTCTCTATGACGCTCTACCTGGATGTCCAAGAGAAATGGGGCTTGGAGGACGTCATGTTGATGGGCGACTTC
AATGCTGGCTGCAGCTATGTGAGACCTCCCAAGTGGTCATCCATCCGCTGTGGACAAGCCCCACCTTCCAGTGGCTGATCCCC
GACAGCGCTGACACCAAGCTACACCCACCCACTGTGCCTATGACAGGATCGTGGTTGCAGGGGATGTGCTCCGAGGCCCGCTT
GTTCCCGACTCTGCTCTTCCCTTTAACTTCCAGGCTGCCTATGGCCTGAGTGACCAACTGGCCCAAGCCATCAGTGACCACTAT
CCAGTGGAGGTGATGCTGAAAGTGAATGAGATCTCGAG (SEQ ID NO:145)

FIG. 8A

Pathway CDS in 215-puc19attB287-GS-Pathway-WPRE-TKpa, GDD1008.0215 (translated, 282 amino acids)

MRGMKLLGALLALAALLQGAVALKIAAFNIQTFGETKMSNATLVSYIVQILSRDYDIALVQEVDRDHLTAVGKLLDNLNQDA
PDITYHYVVSEPLGRNSYKERYLFVYRPDQVSAVDSYYYDDGCEPCGNDTFNREPAIVRFFSRFTFVREFAIVPLHAAPGDA
VAEIDALYDYVLDVQEKWGLEDMVLMGDFNAGCSYVRPSQWSSIRLWTSPTFQWLIPDSADTTATPTHCAYDRIVVAGMLL
RGAVVPDSALPFNFQAAAYGLSDQLAQAI SDHYPEVVMLK (SEQ ID NO:146)

FIG. 8B

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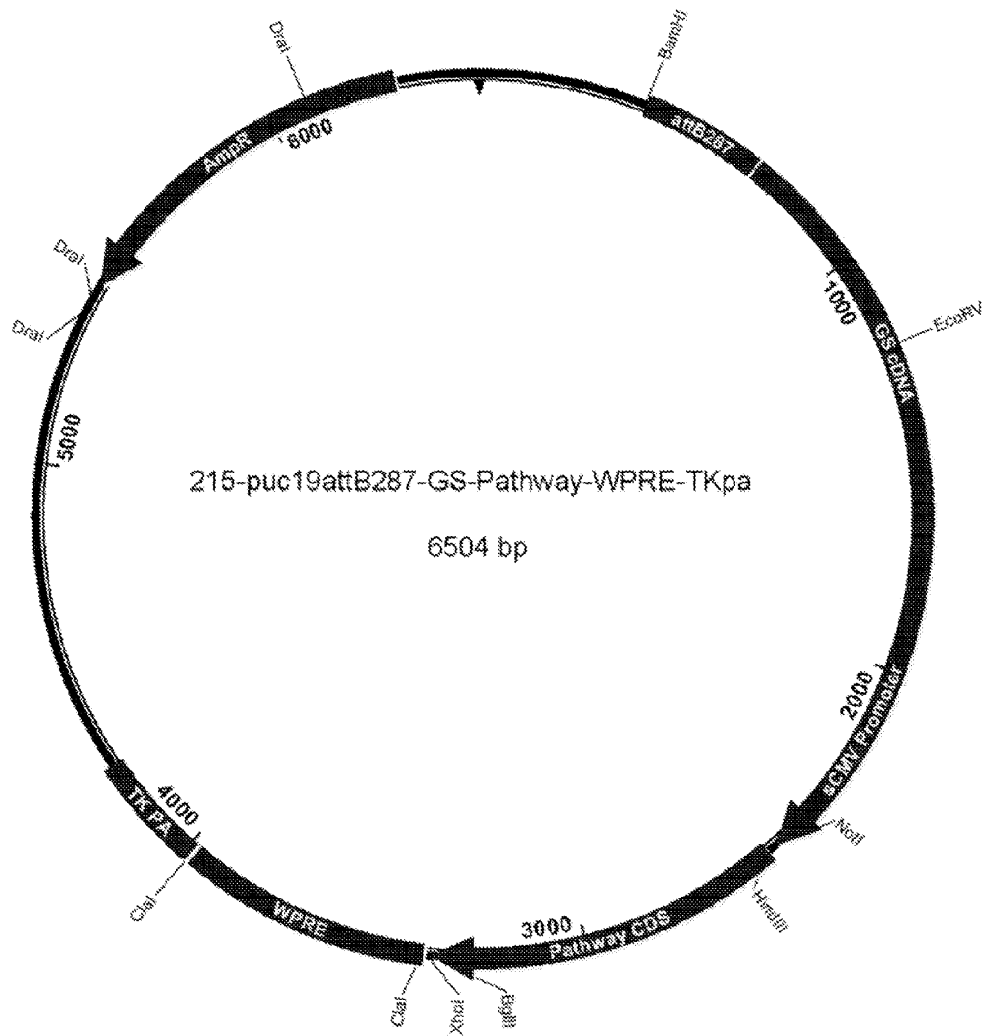


FIG. 9

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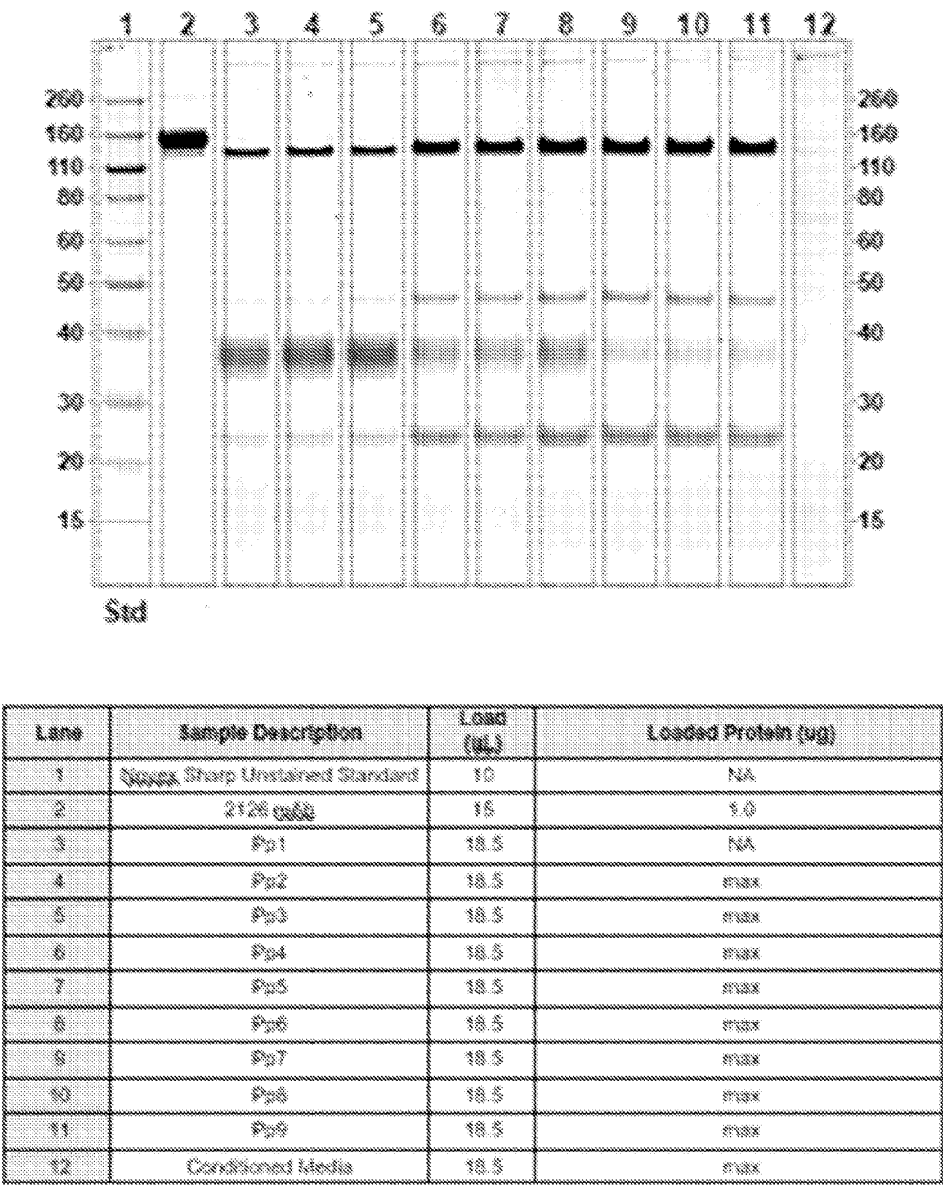


FIG. 10

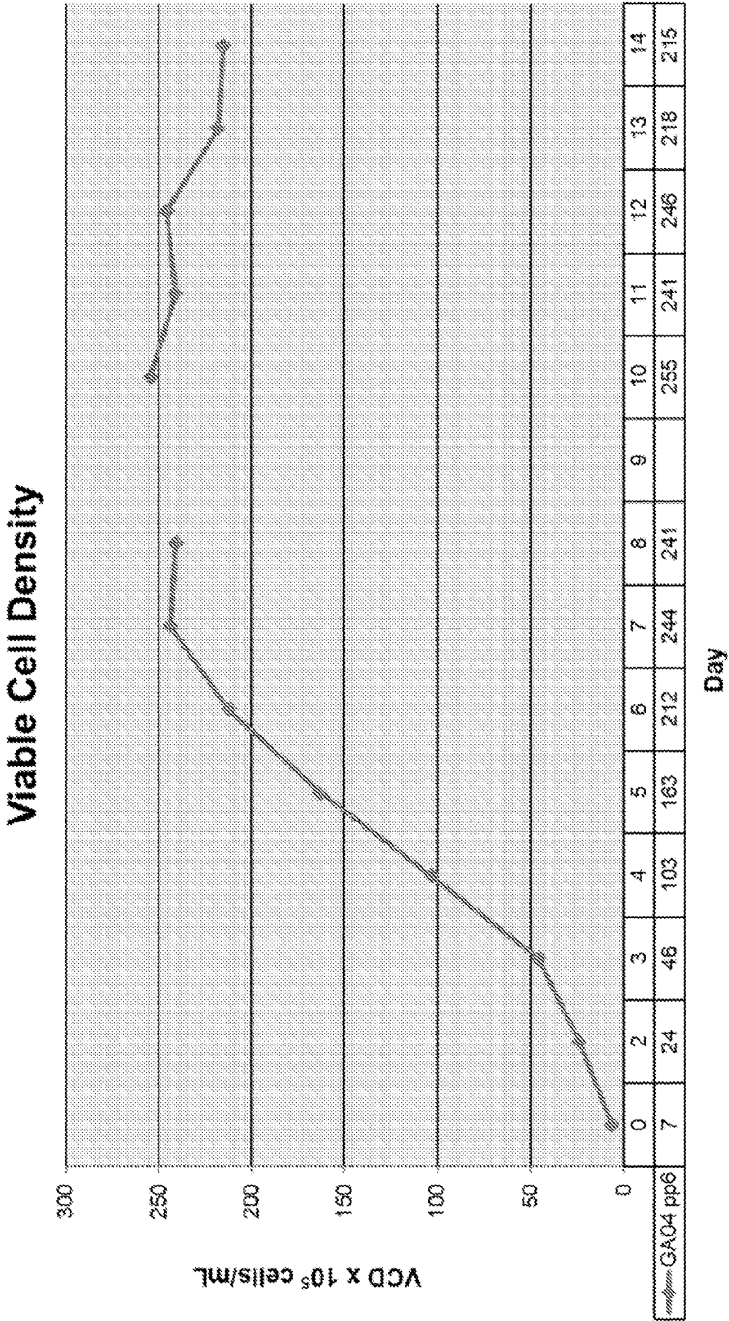


FIG. 11

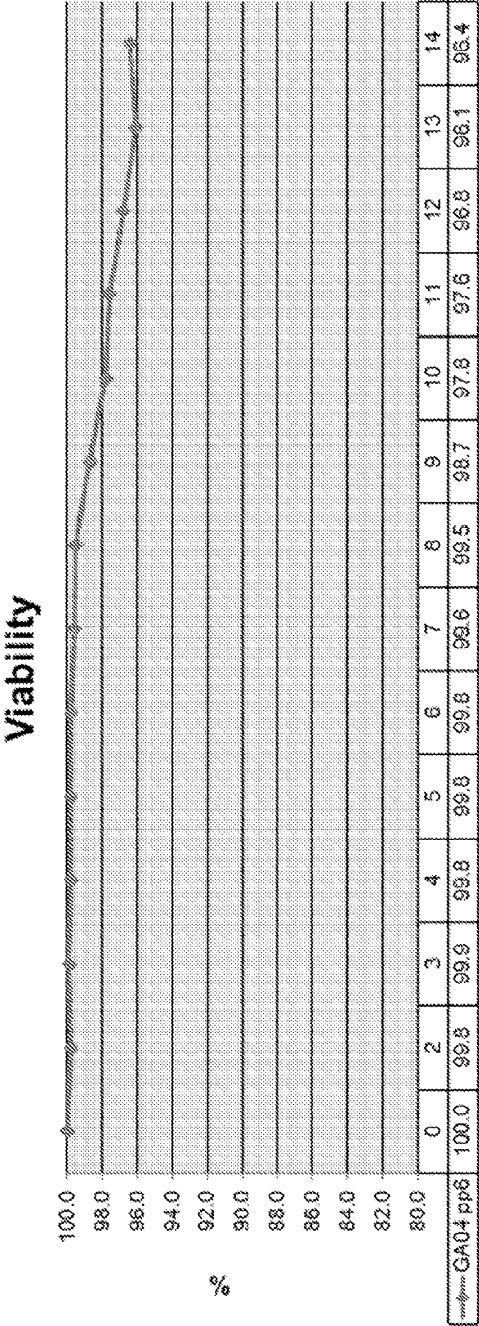


FIG. 12

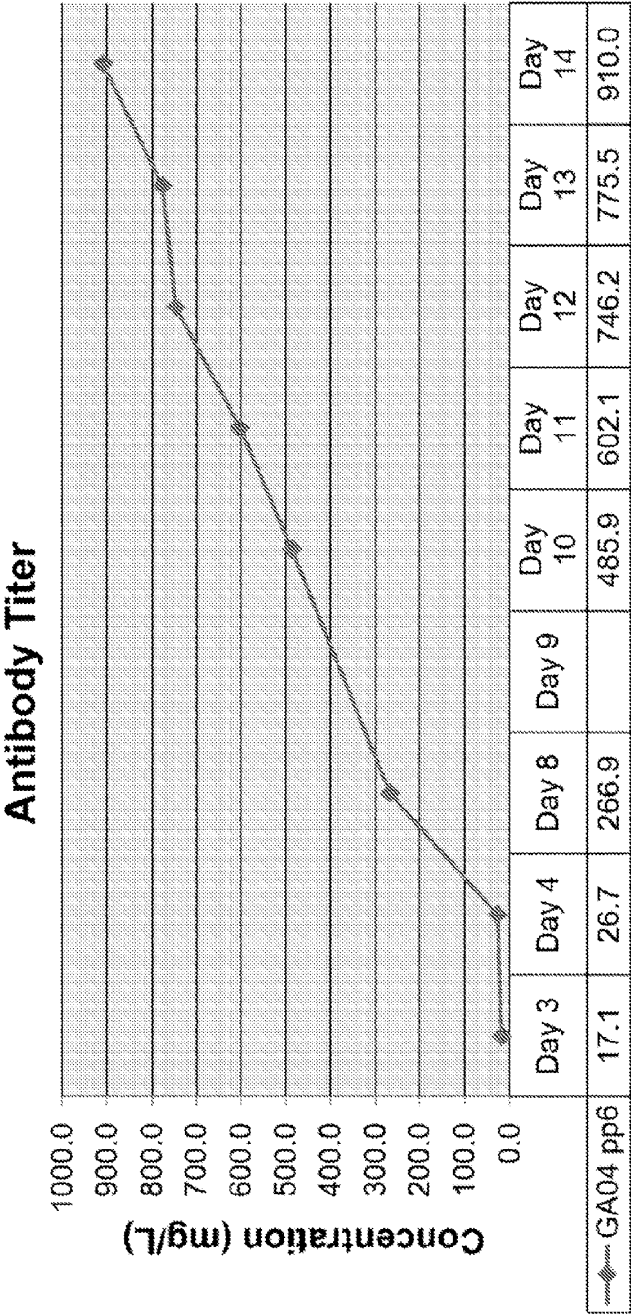


FIG. 13

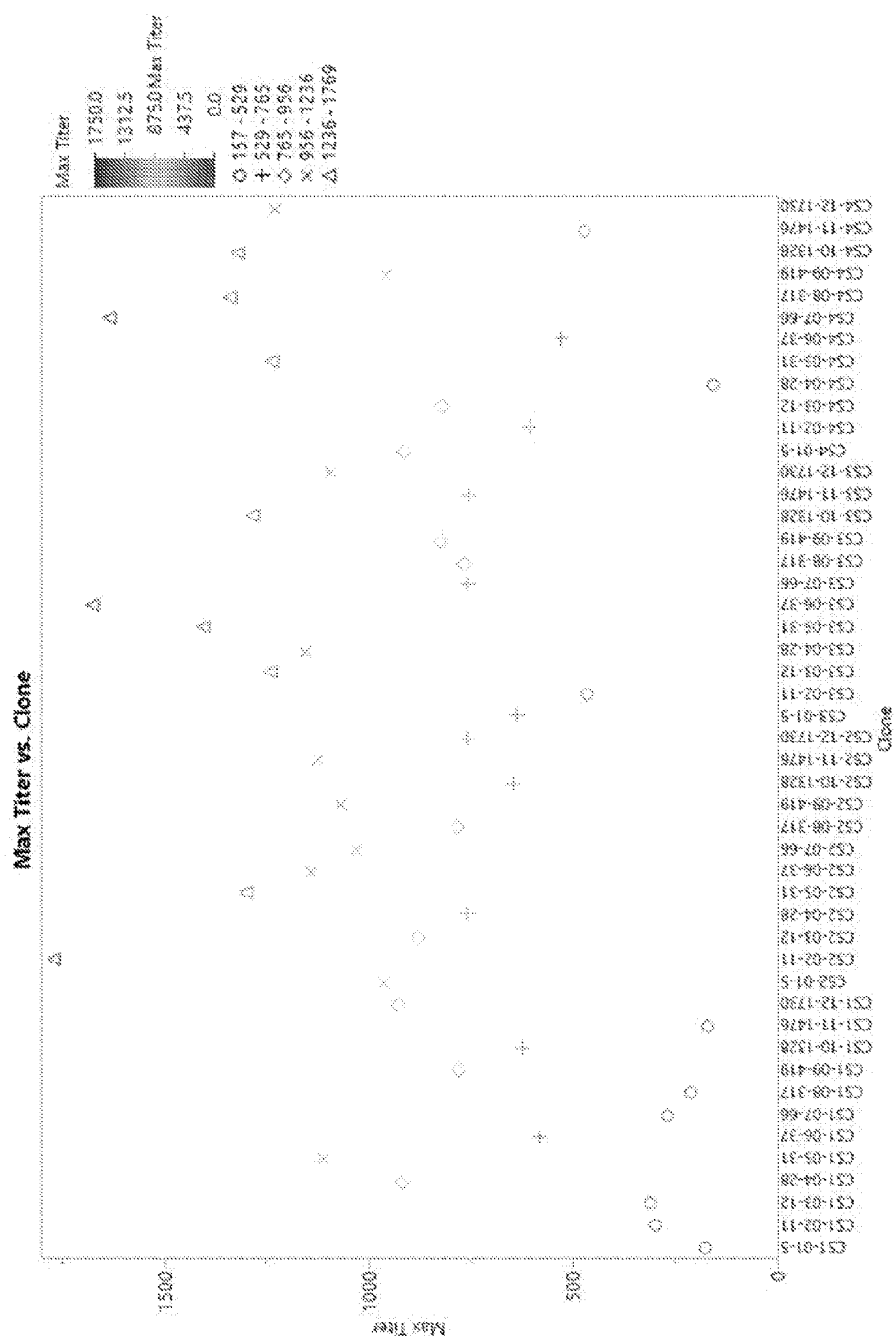


FIG. 14

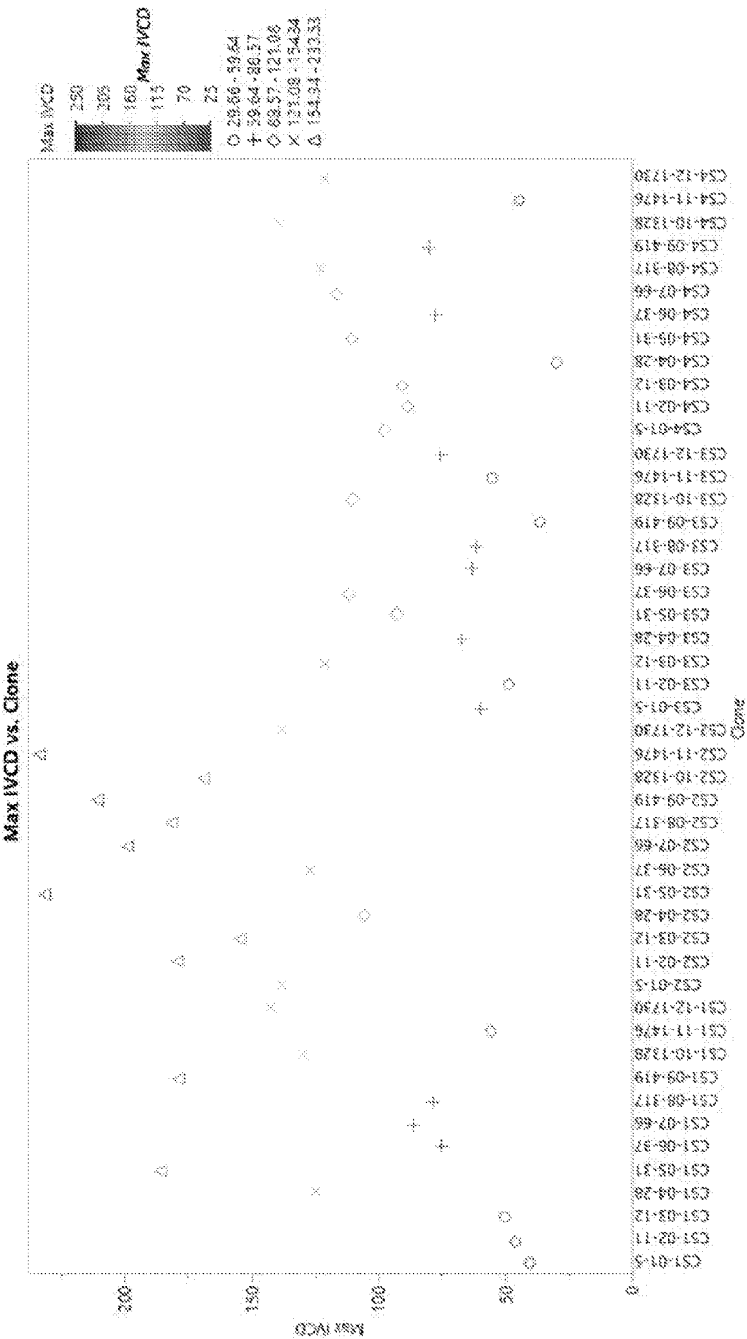


FIG. 15

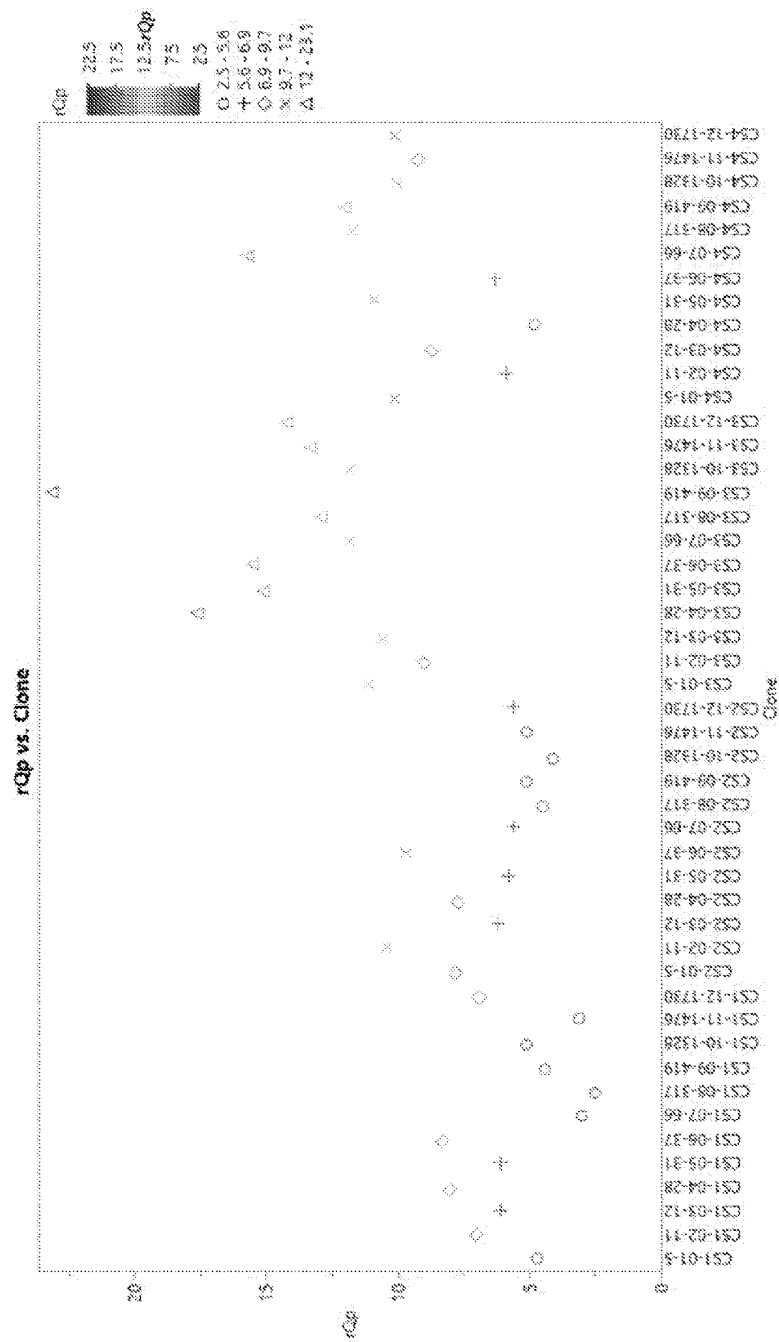


FIG. 16

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WT 3E10 antibody sequences

>3E10-HC

EVQLVESGGGLVKPGGSRKLSCAASGFTFSDYGMHWVRQAPEKGLEWVAYISSGSSTIYYADTVKGRFTISRDNAK
NTLFLQMTSLRSEDAMYYCARRGLLLDYWGQGTTLTVSAASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEP
VTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPC
PAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSV
LTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEW
ESNGQPENNYKTTTPFVLDSGDSFFLYSKLTVDKSRWQQGNVPSFCSVMHEALHNHYTQKSLSLSPGK (SEQ ID
NO:1)

>3E10-VH

EVQLVESGGGLVKPGGSRKLSCAASGFTFSDYGMHWVRQAPEKGLEWVAYISSGSSTIYYADTVKGRFTISRDNAK
NTLFLQMTSLRSEDAMYYCARRGLLLDYWGQGTTLTVSS (SEQ ID NO:2)

>3E10-VH-CDR1

DYGMH (SEQ ID NO:3)

>3E10-VH-CDR2

YISSGSSTIYYADTVKG (SEQ ID NO:4)

>3E10-VH-CDR3

RGLLLDY (SEQ ID NO:5)

>3E10-HC-SP

MGWSCIILFLVATATGVHS (SEQ ID NO:6)

>3E10-LC

DIVLTQSPASLAVSLGQRATISCRASKSVSTSSYSYMHWYQQKPGQPPKLLIKYASYLESQVPAFSGSGSGTDFT
LNIHPVEEEDAATYYCQHSREFPWTFGGGTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQW
KVDNALQSGNSQESVTEQDSKDSSTLSKADYEEKHKVYACEVTHQGLSSPVTKSFNRGEC (SEQ ID
NO:7)

>3E10-VL

DIVLTQSPASLAVSLGQRATISCRASKSVSTSSYSYMHWYQQKPGQPPKLLIKYASYLESQVPAFSGSGSGTDFT
LNIHPVEEEDAATYYCQHSREFPWTFGGGTKLEIK (SEQ ID NO:8)

>3E10-VL-CDR1

RASKSVSTSSYSYMH (SEQ ID NO:9)

>3E10-VL-CDR2

YASYLES (SEQ ID NO:10)

>3E10-VL-CDR3

QHSREFPWT (SEQ ID NO:11)

>3E10-LC-SP

MGWSCIILFLVATATGVHS (SEQ ID NO:12)

FIG. 17

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D31N 3E10 antibody sequences

>3E10-HC_D31N

EVQLVESGGGLVKPGGSRKLSCAASGFTFSNYGMHWVRQAPEKGLEWVAYISSGSSTIYYADTVKGRFTISRDNAKNTLF
LQMTSLRSEDTAMYYCARRGLLLDYWGQGTTLTVSAASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSG
ALTSGVHTFPAVLQSSGLYSLSSVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHSTCPPCPAPELLGGPSVF
LFPPKPKDTLMI SRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKC
KVSNAKALPAPIEKTISKAKGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTTPVLDSD
GSFFLYSKLTVDKSRWQQGNVFSQVMHBAHNNHYTQKSLSLSPGK (SEQ ID NO:13)

>3E10-VH_D31N

EVQLVESGGGLVKPGGSRKLSCAASGFTFSNYGMHWVRQAPEKGLEWVAYISSGSSTIYYADTVKGRFTISRDNAKNTLF
LQMTSLRSEDTAMYYCARRGLLLDYWGQGTTLTVSS (SEQ ID NO:14)

>3E10-VH-CDR1_D31N

NYGMH (SEQ ID NO:15)

>3E10-VH-CDR1a

XYGMH, where X is D or N (SEQ ID NO:16)

>3E10-VH-CDR2_D31N

YISSGSSTIYYADTVKG (SEQ ID NO:17)

>3E10-VH-CDR3_D31N

RGLLLDY (SEQ ID NO:18)

>3E10-HC-SP_D31N

MGWSCIILFLVATATGVHS (SEQ ID NO:19)

>3E10-VL_D31N

DIVLTQSPASLAIVSLGQRATISCRASKSVSTSSYSYMHWYQQKPGQPPKLLIKYASYLESQVPAVFSGSGSGTDFTLNIIH
PVEEEDAATYYCQHSREFPWTFGGGTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQS
GNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC (SEQ ID NO:20)

>3E10-VL-VR_D31N

DIVLTQSPASLAIVSLGQRATISCRASKSVSTSSYSYMHWYQQKPGQPPKLLIKYASYLESQVPAVFSGSGSGTDFTLNIIH
PVEEEDAATYYCQHSREFPWTFGGGTKLEIK (SEQ ID NO:21)

>3E10-VL-CDR1_D31N

RASKSVSTSSYSYMH (SEQ ID NO:22)

>3E10-VL-CDR2_D31N

YASYLES (SEQ ID NO:23)

>3E10-VL-CDR3_D31N

QHSREFPWT (SEQ ID NO:24)

>3E10-LC-SP_D31N

MGWSCIILFLVATATGVHS (SEQ ID NO:25)

FIG. 18A

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Other known 3E10 CDR variants

3E10-VH-CDR2 Variants3E10-VH-CDR2.1 YISSGSSTIYYADSVKG (SEQ ID NO:26)3E10-VH-CDR2.2 YISSSSSTIYYADSVKG (SEQ ID NO:27)3E10-VL-CDR1 Variants3E10-VL-CDR1.1 RASKSVSTSSYSYLA (SEQ ID NO:28)3E10-VL-CDR1.2 RASKTVSTSSYSYMH (SEQ ID NO:29)3E10-VL-CDR2 Variants3E10-VL-CDR2.1 YASYLQS (SEQ ID NO:30)

FIG. 18B

Additionally contemplated 3E10 CDR variants

3E10-VH-CDR2 Variants3E10-VH-CDR2.3 YISSX₁SSTIYYADX₂VKG, where:X₁ and X₂ are separately any amino acid (SEQ ID NO:31)3E10-VL-CDR1 Variants3E10-VL-CDR1.3 RASKX₁VSTSSYSYX₂X₃, where:X₁, X₂, and X₃ are separately any amino acid (SEQ ID NO:32)3E10-VL-CDR2 Variants3E10-VL-CDR2.2 YASYLX₁S, where:X₁ is any amino acid (SEQ ID NO:33)

FIG. 18C

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Charge-conserved Variant 3E10 CDRs

VH CDR1 Variants

3E10-VH-CDR1.c1 QYGMH (SEQ ID NO:34)
 3E10-VH-CDR1.c2 EYGMH (SEQ ID NO:35)
 3E10-VH-CDR1.c3 X_1YGMX_2 , where:
 X_1 is D or N, and X_2 is K or R (SEQ ID NO:36)
 3E10-VH-CDR1.c4 $QYGMX_1$, where X_1 is K or R (SEQ ID NO:37)
 3E10-VH-CDR1.c5 $EYGMX_1$, where X_1 is K or R (SEQ ID NO:38)

VH CDR2 Variants

3E10-VH-CDR2.c1 YISSGSSTIYYAETVKG (SEQ ID NO:39)
 3E10-VH-CDR2.c2 YISSGSSTIYYADTVX₁G, where X_1 is R or H (SEQ ID NO:40)
 3E10-VH-CDR2.c3 YISSGSSTIYYAETVX₁G, where X_1 is R or H (SEQ ID NO:41)

VH CDR3 Variants

3E10-VH-CDR3.c1 $X_1GLLLDY$, where X_1 is K or H (SEQ ID NO:42)
 3E10-VH-CDR3.c2 RGLLLEY (SEQ ID NO:43)
 3E10-VH-CDR3.c3 $X_1GLLLEY$, where X_1 is K or H (SEQ ID NO:44)

VL CDR1 Variants

3E10-VL-CDR1.c1 $X_1ASKSVSTSSYSYMH$, where X_1 is K or H (SEQ ID NO:45)
 3E10-VL-CDR1.c2 $RASX_1SVSTSSYSYMH$, where X_1 is R or H (SEQ ID NO:46)
 3E10-VL-CDR1.c3 $RASKSVSTSSYSYMX_1$, where X_1 is K or R (SEQ ID NO:47)
 3E10-VL-CDR1.c4 $X_1ASX_2SVSTSSYSYMH$, where:
 X_1 is K or H, and X_2 is R or H (SEQ ID NO:48)
 3E10-VL-CDR1.c5 $X_1ASKSVSTSSYSYMX_2$, where:
 X_1 is K or H, and X_2 is K or R (SEQ ID NO:49)
 3E10-VL-CDR1.c6 $RASX_1SVSTSSYSYMX_2$, where:
 X_1 is R or H, and X_2 is K or R (SEQ ID NO:50)

VL CDR2 Variants

3E10-VL-CDR2.c1 YASYLDS (SEQ ID NO:51)

VL CDR3 Variants

3E10-VL-CDR3.c1 $QX_1SREFPWT$, where X_1 is K or R (SEQ ID NO:52)
 3E10-VL-CDR3.c2 $QHSX_1EFPWT$, where X_1 is K or H (SEQ ID NO:53)
 3E10-VL-CDR3.c3 QHSRDFPWT (SEQ ID NO:54)
 3E10-VL-CDR3.c4 QX_1SX_2EFPWT , where:
 X_1 is K or R, and X_2 is K or H (SEQ ID NO:55)
 3E10-VL-CDR3.c5 $QX_1SRDFPWT$, where X_1 is K or R (SEQ ID NO:56)
 3E10-VL-CDR3.c6 $QHSX_1DFPWT$, where X_1 is K or H (SEQ ID NO:57)

FIG. 19

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Compound Variant 3E10 CDRs

VH CDR1 Variants3E10-VH-CDR1m X_1YGMX_2 , where: X_1 is D, E, N, Q, R, or K and X_2 is K, R, or H (SEQ ID NO:58)3E10-VH-CDR1m2 X_1YGMH , where: X_1 is D, E, N, Q, R, or K (SEQ ID NO:64)VH CDR2 Variants3E10-VH-CDR2m $YISSX_1SSTIYYAX_2X_3VX_4G$, where: X_1 is G or S, X_2 is D or E, X_3 is T or S, and X_4 is K, R, or H (SEQ ID NO:59)VH CDR3 Variants3E10-VH-CDR3m X_1GLLLX_2Y , where: X_1 is K, R, or H, and X_2 is D or E (SEQ ID NO:60)VL CDR1 Variants3E10-VL-CDR1m $X_1ASX_2X_3VSTSSYSYX_4X_5$, where: X_1 is K, R, or H, X_2 is K, R, or H, X_3 is T or S, X_4 is M or L, and X_5 is K, R, H, or A (SEQ ID NO:61)VL CDR2 Variants3E10-VL-CDR2m $YASYLX_1S$, where: X_1 is D, E, N, or Q (SEQ ID NO:62)VL CDR3 Variants3E10-VL-CDR3m $QX_1SX_2X_3FPWT$, where: X_1 is K, R, or H, X_2 is K, R, or H, and X_3 is D or E (SEQ ID NO:63)

FIG. 20

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Humanized 3E10 Heavy Chain Variable Regions

>3E10-VH-h1

EVQLVESGGGLVQPGGSLRLSCAASGFTFSNYGMHWVRQAPGKGLEWVSYISSGSSTIYYADTVKGRFTI
SRDNAKNSLYLQMNSLRAEDTAVYYCARRGLLLDYWGQGTSLVTVSS (SEQ ID NO:65)

>3E10-VH-h2

EVQLVESGGGLVQPGGSLRLSCAASGFTFSNYGMHWVRQAPGKGLEWVAYISSGSSTIYYADTVKGRFTI
SRDNAKNSLYLQMNSLRAEDTAMYYCARRGLLLDYWGQGTSLVTVSS (SEQ ID NO:66)

>3E10-VH-h3

EVQLVESGGGLVQPGGSLRLSCAASGFTFSNYGMHWVRQAPGKGLEWVAYISSGSSTIYYADTVKGRFTI
SRDNAKNSLYLQMTSLRAEDTAMYYCARRGLLLDYWGQGTSLVTVSS (SEQ ID NO:67)

>3E10-VH-h4

EVQLVESGGGLVQPGGSLRLSCAASGFTFSNYGMHWVRQAPEKGLEWVAYISSGSSTIYYADTVKGRFTI
SRDNAKNSLYLQMTSLRAEDTAMYYCARRGLLLDYWGQGTSLVTVSS (SEQ ID NO:68)

>3E10-VH-h5

EVQLVESGGGLVQPGGSLRLSCAASGFTFSNYGMHWVRQAPGKGLEWVAYISSGSSTIYYADTVKGRFTI
SRDNAKNTLFLQMNSLRAEDTAVYYCARRGLLLDYWGQGTSLVTVSS (SEQ ID NO:69)

>3E10-VH-h6

EVQLVESGGGLVQPGGSRKLSCAASGFTFSNYGMHWVRQAPGKGLEWVAYISSGSSTIYYADTVKGRFTI
SRDNAKNTLFLQMNSLRAEDTAVYYCARRGLLLDYWGQGTSLVTVSS (SEQ ID NO:70)

>3E10-VH-h7

EVQLVESGGGLVQPGGSRKLSCAASGFTFSNYGMHWVRQAPEKGLEWVAYISSGSSTIYYADTVKGRFTI
SRDNAKNTLFLQMTSLRAEDTAVYYCARRGLLLDYWGQGTSLVTVSS (SEQ ID NO:71)

FIG. 21

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Humanized 3E10 Heavy Chain (without signal peptide)

>3E10-HC-h1m

EVQLVESGGGLVQPGGSLRLSCAASGFTFSNYGMHWVRQAPGKGLEWVSYISSGSSTIYYADTVKGRFTISRDNAKNSLYLQMN
SLRAEDTAVYYCARRGLLLDYWGQGTLLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSQVHT
FPAVLQSSGLYSLSSVTVTPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMI
SRTPEVTCVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTIS
KAKGQPREPQVYITLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTPPVLDSDGSFFLYSKLTVDKSRWQQGN
VFSCSVMEALHNHYTQKSLSLSPGK (SEQ ID NO:72)

>3E10-HC-h2m

EVQLVESGGGLVQPGGSLRLSCAASGFTFSNYGMHWVRQAPGKGLEWVYISSGSSTIYYADTVKGRFTISRDNAKNSLYLQMN
SLRAEDTAMYYCARRGLLLDYWGQGTLLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSQVHT
FPAVLQSSGLYSLSSVTVTPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMI
SRTPEVTCVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTIS
KAKGQPREPQVYITLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTPPVLDSDGSFFLYSKLTVDKSRWQQGN
VFSCSVMEALHNHYTQKSLSLSPGK (SEQ ID NO:73)

>3E10-HC-h3m

EVQLVESGGGLVQPGGSLRLSCAASGFTFSNYGMHWVRQAPGKGLEWVYISSGSSTIYYADTVKGRFTISRDNAKNSLYLQMT
SLRAEDTAMYYCARRGLLLDYWGQGTLLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSQVHT
FPAVLQSSGLYSLSSVTVTPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMI
SRTPEVTCVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTIS
KAKGQPREPQVYITLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTPPVLDSDGSFFLYSKLTVDKSRWQQGN
VFSCSVMEALHNHYTQKSLSLSPGK (SEQ ID NO:74)

>3E10-HC-h4m

EVQLVESGGGLVQPGGSLRLSCAASGFTFSNYGMHWVRQAPGKGLEWVYISSGSSTIYYADTVKGRFTISRDNAKNSLYLQMT
SLRAEDTAMYYCARRGLLLDYWGQGTLLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSQVHT
FPAVLQSSGLYSLSSVTVTPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMI
SRTPEVTCVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTIS
KAKGQPREPQVYITLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTPPVLDSDGSFFLYSKLTVDKSRWQQGN
VFSCSVMEALHNHYTQKSLSLSPGK (SEQ ID NO:75)

>3E10-HC-h5m

EVQLVESGGGLVQPGGSLRLSCAASGFTFSNYGMHWVRQAPGKGLEWVYISSGSSTIYYADTVKGRFTISRDNAKNTLFLQMN
SLRAEDTAVYYCARRGLLLDYWGQGTLLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSQVHT
FPAVLQSSGLYSLSSVTVTPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMI
SRTPEVTCVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTIS
KAKGQPREPQVYITLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTPPVLDSDGSFFLYSKLTVDKSRWQQGN
VFSCSVMEALHNHYTQKSLSLSPGK (SEQ ID NO:76)

>3E10-HC-h6m

EVQLVESGGGLVQPGGSRKLSAASGFTFSNYGMHWVRQAPGKGLEWVYISSGSSTIYYADTVKGRFTISRDNAKNTLFLQMN
SLRAEDTAVYYCARRGLLLDYWGQGTLLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSQVHT
FPAVLQSSGLYSLSSVTVTPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMI
SRTPEVTCVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTIS
KAKGQPREPQVYITLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTPPVLDSDGSFFLYSKLTVDKSRWQQGN
VFSCSVMEALHNHYTQKSLSLSPGK (SEQ ID NO:77)

>3E10-HC-h7m

EVQLVESGGGLVQPGGSRKLSAASGFTFSNYGMHWVRQAPGKGLEWVYISSGSSTIYYADTVKGRFTISRDNAKNTLFLQMT
SLRAEDTAVYYCARRGLLLDYWGQGTLLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSQVHT
FPAVLQSSGLYSLSSVTVTPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMI
SRTPEVTCVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTIS
KAKGQPREPQVYITLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTPPVLDSDGSFFLYSKLTVDKSRWQQGN
VFSCSVMEALHNHYTQKSLSLSPGK (SEQ ID NO:78)

FIG. 22

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Humanized 3E10 Heavy Chain (with signal peptide)

>3E10-HC-h1

MGWSCIILFLVATATGVHSEVQLVESGGGLVQPGGSLRLSCAASGFTFSNYGMHWVRQAPGKGLEWVSYISSGSSTIYYADTVK
GRFTISRDNKNSLYLQMNSLRAEDTAVYYCARRGLLLDYWGQGLTLVTSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYF
PEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPEL
LGGPSVFLFPPKPKDITLMISRTPETCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKE
YKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDG
SFFLYSKLTVDKSRWQQGNVFPSCVMHEALHNHYTQKSLSLSPGK (SEQ ID NO:79)

>3E10-HC-h2

MGWSCIILFLVATATGVHSEVQLVESGGGLVQPGGSLRLSCAASGFTFSNYGMHWVRQAPGKGLEWVYISSGSSTIYYADTVK
GRFTISRDNKNSLYLQMNSLRAEDTAMYYCARRGLLLDYWGQGLTLVTSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYF
PEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPEL
LGGPSVFLFPPKPKDITLMISRTPETCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKE
YKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDG
SFFLYSKLTVDKSRWQQGNVFPSCVMHEALHNHYTQKSLSLSPGK (SEQ ID NO:80)

>3E10-HC-h3

MGWSCIILFLVATATGVHSEVQLVESGGGLVQPGGSLRLSCAASGFTFSNYGMHWVRQAPGKGLEWVYISSGSSTIYYADTVK
GRFTISRDNKNSLYLQMNSLRAEDTAMYYCARRGLLLDYWGQGLTLVTSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYF
PEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPEL
LGGPSVFLFPPKPKDITLMISRTPETCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKE
YKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDG
SFFLYSKLTVDKSRWQQGNVFPSCVMHEALHNHYTQKSLSLSPGK (SEQ ID NO:81)

>3E10-HC-h4

MGWSCIILFLVATATGVHSEVQLVESGGGLVQPGGSLRLSCAASGFTFSNYGMHWVRQAPGKGLEWVYISSGSSTIYYADTVK
GRFTISRDNKNSLYLQMNSLRAEDTAMYYCARRGLLLDYWGQGLTLVTSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYF
PEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPEL
LGGPSVFLFPPKPKDITLMISRTPETCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKE
YKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDG
SFFLYSKLTVDKSRWQQGNVFPSCVMHEALHNHYTQKSLSLSPGK (SEQ ID NO:82)

>3E10-HC-h5

MGWSCIILFLVATATGVHSEVQLVESGGGLVQPGGSLRLSCAASGFTFSNYGMHWVRQAPGKGLEWVYISSGSSTIYYADTVK
GRFTISRDNKNTLFLQMNSLRAEDTAVYYCARRGLLLDYWGQGLTLVTSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYF
PEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPEL
LGGPSVFLFPPKPKDITLMISRTPETCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKE
YKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDG
SFFLYSKLTVDKSRWQQGNVFPSCVMHEALHNHYTQKSLSLSPGK (SEQ ID NO:83)

>3E10-HC-h6

MGWSCIILFLVATATGVHSEVQLVESGGGLVQPGGSRKLSAASGFTFSNYGMHWVRQAPGKGLEWVYISSGSSTIYYADTVK
GRFTISRDNKNTLFLQMNSLRAEDTAVYYCARRGLLLDYWGQGLTLVTSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYF
PEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPEL
LGGPSVFLFPPKPKDITLMISRTPETCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKE
YKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDG
SFFLYSKLTVDKSRWQQGNVFPSCVMHEALHNHYTQKSLSLSPGK (SEQ ID NO:84)

>3E10-HC-h7

MGWSCIILFLVATATGVHSEVQLVESGGGLVQPGGSRKLSAASGFTFSNYGMHWVRQAPGKGLEWVYISSGSSTIYYADTVK
GRFTISRDNKNTLFLQMNSLRAEDTAVYYCARRGLLLDYWGQGLTLVTSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYF
PEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPEL
LGGPSVFLFPPKPKDITLMISRTPETCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKE
YKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDG
SFFLYSKLTVDKSRWQQGNVFPSCVMHEALHNHYTQKSLSLSPGK (SEQ ID NO:85)

FIG. 23

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Humanized 3E10 Light Chain Variable Regions

>V_L1-C

DIVLTQSPASLAVSPGQRATITCRASKSVSTSSYSYMHWYQQKPGQPPKLLIYYASYLESQVPAHFSGSG
SGTDFTLTINPVEANDTANYYCQHSREFPWTFGGGTKVEIK (SEQ ID NO:86)

>V_L2-C

DIVLTQSPASLAVSPGQRATITCRASKSVSTSSYSYMHWYQQKPGQPPKLLIKYASYLESQVPAHFSGSG
SGTDFTLTINPVEAEDTATYYCQHSREFPWTFGGGTKVEIK (SEQ ID NO:87)

>V_L3-C

DIVLTQSPASLAVSPGQRATITCRASKSVSTSSYSYMHWYQQKPGQPPKLLIKYASYLESQVPAHFSGSG
SGTDFTLTINPVEAEDTANYYCQHSREFPWTFGGGTKVEIK (SEQ ID NO:88)

>V_L4-C

DIVLTQSPASLAVSPGQRATITCRASKSVSTSSYSYMHWYQQKPGQPPKLLIKYASYLESQVPAHFSGSG
SGTDFTLTINPVEAEDAATYYCQHSREFPWTFGGGTKVEIK (SEQ ID NO:89)

>V_L5-C

DIVLTQSPASLAVSPGQRATITCRASKSVSTSSYSYMHWYQQKPGQPPKLLIKYASYLESQVPAHFSGSG
SGTDFTLTINHPVEAEDTANYYCQHSREFPWTFGGGTKVEIK (SEQ ID NO:90)

>V_L6-C

DIVLTQSPASLAVSPGQRATISCRASKSVSTSSYSYMHWYQQKPGQPPKLLIKYASYLESQVPAHFSGSG
SGTDFTLTINHPVEEEDTANYYCQHSREFPWTFGGGTKVEIK (SEQ ID NO:91)

FIG. 24

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Humanized 3E10 Light Chain (without signal peptide)

>3E10-LC-h1m

DIVLTQSPASLAVSPGQRATITCRASKSVSTSSYSYMHWYQQKPGQPPKLLIYYASYLESQVGPARGSGSG
SGTDFTLTINPVEANDTANYYCQHSREFPWTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLL
NNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDYSLSSSTLTLSKADYEKHKVYACEVTHQGLSSPVT
KSFNRGEC (SEQ ID NO:92)

>3E10-LC-h2m

DIVLTQSPASLAVSPGQRATITCRASKSVSTSSYSYMHWYQQKPGQPPKLLIKYASYLESQVGPARGSGSG
SGTDFTLTINPVEAEDTANYYCQHSREFPWTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLL
NNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDYSLSSSTLTLSKADYEKHKVYACEVTHQGLSSPVT
KSFNRGEC (SEQ ID NO:93)

>3E10-LC-h3m

DIVLTQSPASLAVSPGQRATITCRASKSVSTSSYSYMHWYQQKPGQPPKLLIKYASYLESQVGPARGSGSG
SGTDFTLTINPVEAEDTANYYCQHSREFPWTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLL
NNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDYSLSSSTLTLSKADYEKHKVYACEVTHQGLSSPVT
KSFNRGEC (SEQ ID NO:94)

>3E10-LC-h4m

DIVLTQSPASLAVSPGQRATITCRASKSVSTSSYSYMHWYQQKPGQPPKLLIKYASYLESQVGPARGSGSG
SGTDFTLTINPVEAEDAATYYCQHSREFPWTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLL
NNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDYSLSSSTLTLSKADYEKHKVYACEVTHQGLSSPVT
KSFNRGEC (SEQ ID NO:95)

>3E10-LC-h5m

DIVLTQSPASLAVSPGQRATITCRASKSVSTSSYSYMHWYQQKPGQPPKLLIKYASYLESQVGPARGSGSG
SGTDFTLTINPVEAEDTANYYCQHSREFPWTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLL
NNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDYSLSSSTLTLSKADYEKHKVYACEVTHQGLSSPVT
KSFNRGEC (SEQ ID NO:96)

>3E10-LC-h6m

DIVLTQSPASLAVSPGQRATITCRASKSVSTSSYSYMHWYQQKPGQPPKLLIKYASYLESQVGPARGSGSG
SGTDFTLTINPVEEEDTANYYCQHSREFPWTFGCGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLL
NNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDYSLSSSTLTLSKADYEKHKVYACEVTHQGLSSPVT
KSFNRGEC (SEQ ID NO:97)

FIG. 25

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Humanized 3E10 Light Chain (with signal peptide)

>3E10-LC-h1

MGWSCIILFLVATATGVHSDIVLTQSPASLAVSPGQRATITCRASKSVSTSSYSYMHWYQQKPGQPPKLL
IKYASYLESQVGFARFSGSGSGTDFTLTINPVEANDTANYYCQHSREFPWTFGGGTKVEIKRTVAAPSVFI
FPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDDSTYLSSTLTLSKADYE
KHKVYACEVTHQGLSSPVTKSFNRGEC (SEQ ID NO:98)

>3E10-LC-h2

MGWSCIILFLVATATGVHSDIVLTQSPASLAVSPGQRATITCRASKSVSTSSYSYMHWYQQKPGQPPKLL
IKYASYLESQVGFARFSGSGSGTDFTLTINPVEAEDTANYYCQHSREFPWTFGGGTKVEIKRTVAAPSVFI
FPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDDSTYLSSTLTLSKADYE
KHKVYACEVTHQGLSSPVTKSFNRGEC (SEQ ID NO:99)

>3E10-LC-h3

MGWSCIILFLVATATGVHSDIVLTQSPASLAVSPGQRATITCRASKSVSTSSYSYMHWYQQKPGQPPKLL
IKYASYLESQVGFARFSGSGSGTDFTLTINPVEAEDTANYYCQHSREFPWTFGGGTKVEIKRTVAAPSVFI
FPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDDSTYLSSTLTLSKADYE
KHKVYACEVTHQGLSSPVTKSFNRGEC (SEQ ID NO:100)

>3E10-LC-h4

MGWSCIILFLVATATGVHSDIVLTQSPASLAVSPGQRATITCRASKSVSTSSYSYMHWYQQKPGQPPKLL
IKYASYLESQVGFARFSGSGSGTDFTLTINPVEAEDAATYYCQHSREFPWTFGGGTKVEIKRTVAAPSVFI
FPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDDSTYLSSTLTLSKADYE
KHKVYACEVTHQGLSSPVTKSFNRGEC (SEQ ID NO:101)

>3E10-LC-h5

MGWSCIILFLVATATGVHSDIVLTQSPASLAVSPGQRATITCRASKSVSTSSYSYMHWYQQKPGQPPKLL
IKYASYLESQVGFARFSGSGSGTDFTLTINPVEAEDTANYYCQHSREFPWTFGGGTKVEIKRTVAAPSVFI
FPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDDSTYLSSTLTLSKADYE
KHKVYACEVTHQGLSSPVTKSFNRGEC (SEQ ID NO:102)

>3E10-LC-h6

MGWSCIILFLVATATGVHSDIVLTQSPASLAVSPGQRATITCRASKSVSTSSYSYMHWYQQKPGQPPKLL
IKYASYLESQVGFARFSGSGSGTDFTLTINHPVEEEDTANYYCQHSREFPWTFGGCTKVEIKRTVAAPSVFI
FPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDDSTYLSSTLTLSKADYE
KHKVYACEVTHQGLSSPVTKSFNRGEC (SEQ ID NO:103)

FIG. 26

Examples of Humanized 3E10 Light Chain Variable Regions

DIVLTSQSPASLAVSPGQRATITCRASKSVSTSSYSYMHNYQQKPGQPPKLLIYYASYLES	60
DIQMTQSPSSLSASVGDRTVITCRASKSVSTSSYSYMHNYQQKPGKAPKLLIKYASYLES	60
DIQMTQSPSSLSASVGDRTVITCRASKTVSTSSYSYMHNYQQKPGKAPKLLIKYASYLES	60
DIQMTQSPSSLSASLGDRATITCRASKSVSTSSYSYMHNYQQKPGQPPKLLIKYASYLES	60
DIQMTQSPSSLSASLGDRATITCRASKTVSTSSYSYMHNYQQKPGQPPKLLIKYASYLES	60
DIQMTQSPSSLSASLGDRATITCRASKSVSTSSYSYMHNYQQKPGQAPKLLIKYASYLES	60
DIQMTQSPSSLSASLGDRATITCRASKTVSTSSYSYMHNYQQKPGQAPKLLIKYASYLES	60
DIQMTQSPSSLSASVGDRTVITCRASKSVSTSSYSYLAHYQQKPEKAPKLLIKYASYLQS	60
DIQMTQSPSSLSASVGDRTVITCRASKSVSTSSYSYMHNYQQKPEKAPKLLIKYASYLQS	60
** :****:**. * * :*. ** :****:**.***** : ***** : ***** :***** :*	
CDR1	
CDR2	
Putative NLS1	
Putative NLS2	
GVPARFSGSGSCTDFTLTINPVEANDTANYCQHSREFFPWTFGQGTKEIK	111 (SEQ ID NO:114)
GVPFRFSGSGSCTDFTLTISLQPEDFATYYCQHSREFFPWTFGQGTKEIK	111 (SEQ ID NO:115)
GVPFRFSGSGSCTDFTLTISLQPEDFATYYCQHSREFFPWTFGQGTKEIK	111 (SEQ ID NO:116)
GVPFRFSGSGSCTDFTLTISLQPEDAATYYCQHSREFFPWTFGQGTKEIK	111 (SEQ ID NO:117)
GVPFRFSGSGSCTDFTLTISLQPEDAATYYCQHSREFFPWTFGQGTKEIK	111 (SEQ ID NO:118)
GVPFRFSGSGSCTDFTLTISLQPEDFATYYCQHSREFFPWTFGQGTKEIK	111 (SEQ ID NO:119)
GVPFRFSGSGSCTDFTLTISLQPEDFATYYCQHSREFFPWTFGQGTKEIK	111 (SEQ ID NO:120)
GVPFRFSGSGSCTDFTLTISLQPEDFATYYCQHSREFFPWTFGAGTKLEIK	111 (SEQ ID NO:121)
GVPFRFSGSGSCTDFTLTISLQPEDVATYYCQHSREFFPWTFGAGTKLEIK	111 (SEQ ID NO:122)
:**. : : * *.***** ***** ****:*.*	
CDR3	

FIG. 28

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Examples of di-scFv 3E10 Constructs

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DIQMTQSPSSLSASLGDRATITCRASKSVSTSSYSYMHWYQQKPGQPPKLLIKYASYLES 60
DIQMTQSPSSLSASVGDRTITCRASKSVSTSSYSYMHWYQQKPGKAPKLLIKYASYLES 60
DIQMTQSPSSLSASLGDRATITCRASKSVSTSSYSYMHWYQQKPGQAPKLLIKYASYLES 60
DIQMTQSPSSLSASLGDRATITCRASKSVSTSSYSYMHWYQQKPGQPPKLLIKYASYLES 60
DIQMTQSPSSLSASVGDRTITCRASKSVSTSSYSYMHWYQQKPGKAPKLLIKYASYLES 60
DIQMTQSPSSLSASVGDRTITCRASKSVSTSSYSYMHWYQQKPGKAPKLLIKYASYLES 60
DIQMTQSPSSLSASVGDRTITCRASKSVSTSSYSYMHWYQQKPGQAPKLLIKYASYLES 60
DIQMTQSPSSLSASLGDRATITCRASKSVSTSSYSYMHWYQQKPGQPPKLLIKYASYLES 60
DIQMTQSPSSLSASLGDRATITCRASKSVSTSSYSYMHWYQQKPGQAPKLLIKYASYLES 60
DIQMTQSPSSLSASLGDRATITCRASKSVSTSSYSYMHWYQQKPGQAPKLLIKYASYLES 60
DIQMTQSPSSLSASLGDRATITCRASKTVSTSSYSYMHWYQQKPGQPPKLLIKYASYLES 60
DIQMTQSPSSLSASVGDRTITCRASKTVSTSSYSYMHWYQQKPGKAPKLLIKYASYLES 60
DIQMTQSPSSLSASLGDRATITCRASKTVSTSSYSYMHWYQQKPGQPPKLLIKYASYLES 60
DIQMTQSPSSLSASVGDRTITCRASKTVSTSSYSYMHWYQQKPGKAPKLLIKYASYLES 60
DIQMTQSPSSLSASVGDRTITCRASKTVSTSSYSYMHWYQQKPGKAPKLLIKYASYLES 60
DIQMTQSPSSLSASLGDRATITCRASKTVSTSSYSYMHWYQQKPGQAPKLLIKYASYLES 60
DIQMTQSPSSLSASLGDRATITCRASKTVSTSSYSYMHWYQQKPGQPPKLLIKYASYLES 60
DIQMTQSPSSLSASVGDRTITCRASKTVSTSSYSYMHWYQQKPGKAPKLLIKYASYLES 60
*****:***.*****:*****:*****
GVPSRFGSGSGTDFTLTISSLQPEDAATYYCQHSREFPWTFGGGTKVEIKRADAAPGGG 120
GVPSRFGSGSGTDFTLTISSLQPEDFATYYCQHSREFPWTFGGGTKVEIKRADAAPGGG 120
GVPSRFGSGSGTDFTLTISSLQPEDFATYYCQHSREFPWTFGGGTKVEIKRADAAPGGG 120
GVPSRFGSGSGTDFTLTISSLQPEDAATYYCQHSREFPWTFGGGTKVEIKRADAAPGGG 120
GVPSRFGSGSGTDFTLTISSLQPEDFATYYCQHSREFPWTFGGGTKVEIKRADAAPGGG 120
GVPSRFGSGSGTDFTLTISSLQPEDFATYYCQHSREFPWTFGGGTKVEIKRADAAPGGG 120
GVPSRFGSGSGTDFTLTISSLQPEDFATYYCQHSREFPWTFGGGTKVEIKRADAAPGGG 120
GVPSRFGSGSGTDFTLTISSLQPEDFATYYCQHSREFPWTFGGGTKVEIKRADAAPGGG 120
GVPSRFGSGSGTDFTLTISSLQPEDFATYYCQHSREFPWTFGGGTKVEIKRADAAPGGG 120
GVPSRFGSGSGTDFTLTISSLQPEDFATYYCQHSREFPWTFGGGTKVEIKRADAAPGGG 120
GVPSRFGSGSGTDFTLTISSLQPEDFATYYCQHSREFPWTFGGGTKVEIKRADAAPGGG 120
GVPSRFGSGSGTDFTLTISSLQPEDFATYYCQHSREFPWTFGGGTKVEIKRADAAPGGG 120
GVPSRFGSGSGTDFTLTISSLQPEDFATYYCQHSREFPWTFGGGTKVEIKRADAAPGGG 120
GVPSRFGSGSGTDFTLTISSLQPEDFATYYCQHSREFPWTFGGGTKVEIKRADAAPGGG 120
GVPSRFGSGSGTDFTLTISSLQPEDAATYYCQHSREFPWTFGGGTKVEIKRADAAPGGG 120
GVPSRFGSGSGTDFTLTISSLQPEDFATYYCQHSREFPWTFGGGTKVEIKRADAAPGGG 120
***** ***** *****
```

(Continued)

FIG. 29A

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Examples of di-scFv 3E10 Constructs

GSGGGGSGGGGSEVQLVESGGGLVQPGGSLRLSCAASGFTFSNYGMHWVRQAPGKGLEWV 180
GSGGGGSGGGGSEVQLVESGGGLVQPGGSLRLSCAASGFTFSNYGMHWVRQAPGKGLEWV 180
GSGGGGSGGGGSEVQLVESGGGLVQPGGSLRLSCAASGFTFSNYGMHWVRQAPGKGLEWV 180
GSGGGGSGGGGSEVQLVESGGGDVQPGGSLRLSCAASGFTFSNYGMHWVRQAPGKGLEWV 180
GSGGGGSGGGGSEVQLVESGGGDVQPGGSLRLSCAASGFTFSNYGMHWVRQAPGKGLEWV 180
GSGGGGSGGGGSEVQLVESGGGVVQPGGSLRLSCAASGFTFSNYGMHWVRQAPGKGLEWV 180
GSGGGGSGGGGSEVQLVESGGGVVQPGGSLRLSCAASGFTFSNYGMHWVRQAPGKGLEWV 180
GSGGGGSGGGGSEVQLVESGGGVVQPGGSLRLSCAASGFTFSNYGMHWVRQAPGKGLEWV 180
GSGGGGSGGGGSEVQLVESGGGDVQPGGSLRLSCAASGFTFSNYGMHWVRQAPGKGLEWV 180
GSGGGGSGGGGSEVQLVESGGGLVQPGGSLRLSCAASGFTFSNYGMHWVRQAPGKGLEWV 180
GSGGGGSGGGGSEVQLVESGGGLVQPGGSLRLSCAASGFTFSNYGMHWVRQAPGKGLEWV 180
GSGGGGSGGGGSEVQLVESGGGDVQPGGSLRLSCAASGFTFSNYGMHWVRQAPGKGLEWV 180
GSGGGGSGGGGSEVQLVESGGGDVQPGGSLRLSCAASGFTFSNYGMHWVRQAPGKGLEWV 180
GSGGGGSGGGGSEVQLVESGGGVVQPGGSLRLSCAASGFTFSNYGMHWVRQAPGKGLEWV 180
GSGGGGSGGGGSEVQLVESGGGVVQPGGSLRLSCAASGFTFSNYGMHWVRQAPGKGLEWV 180
***** *:***** *****

SYISSSSSTIYYADSVKGRFTISRDNKNSLYLQMNSLRAEDTAVYYCARRGLLLDYWGQ 240
SYISSSSSTIYYADSVKGRFTISRDNKNSLYLQMNSLRAEDTAVYYCARRGLLLDYWGQ 240
SYISSSSSTIYYADSVKGRFTISRDNKNSLYLQMNSLRAEDTAVYYCARRGLLLDYWGQ 240
SYISSSSSTIYYADSVKGRFTISRDNKNTLYLQMNSLRAEDTAVYYCARRGLLLDYWGQ 240
SYISSSSSTIYYADSVKGRFTISRDNKNTLYLQMNSLRAEDTAVYYCARRGLLLDYWGQ 240
SYISSSSSTIYYADSVKGRFTISRDNKNTLYLQMNSLRAEDTAVYYCARRGLLLDYWGQ 240
SYISSSSSTIYYADSVKGRFTISRDNKNTLYLQMNSLRAEDTAVYYCARRGLLLDYWGQ 240
SYISSSSSTIYYADSVKGRFTISRDNKNTLYLQMNSLRAEDTAVYYCARRGLLLDYWGQ 240
SYISSSSSTIYYADSVKGRFTISRDNKNTLYLQMNSLRAEDTAVYYCARRGLLLDYWGQ 240
SYISSSSSTIYYADSVKGRFTISRDNKNTLYLQMNSLRAEDTAVYYCARRGLLLDYWGQ 240
SYISSSSSTIYYADSVKGRFTISRDNKNTLYLQMNSLRAEDTAVYYCARRGLLLDYWGQ 240
SYISSSSSTIYYADSVKGRFTISRDNKNTLYLQMNSLRAEDTAVYYCARRGLLLDYWGQ 240
SYISSSSSTIYYADSVKGRFTISRDNKNTLYLQMNSLRAEDTAVYYCARRGLLLDYWGQ 240
SYISSSSSTIYYADSVKGRFTISRDNKNTLYLQMNSLRAEDTAVYYCARRGLLLDYWGQ 240
SYISSSSSTIYYADSVKGRFTISRDNKNTLYLQMNSLRAEDTAVYYCARRGLLLDYWGQ 240
SYISSSSSTIYYADSVKGRFTISRDNKNTLYLQMNSLRAEDTAVYYCARRGLLLDYWGQ 240
*****:*****:*****

(Continued)

FIG. 29B

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Examples of di-scFv 3E10 Constructs

```

GTTVTVSSASTKGPSVFPLAPLESSGSDIQMTQSPSSLSASLGDRATITCRASKSVSTSS 300
GTTVTVSSASTKGPSVFPLAPLESSGSDIQMTQSPSSLSASVGDRTITCRASKSVSTSS 300
GTTVTVSSASTKGPSVFPLAPLESSGSDIQMTQSPSSLSASLGDRATITCRASKSVSTSS 300
GTTVTVSSASTKGPSVFPLAPLESSGSDIQMTQSPSSLSASLGDRATITCRASKSVSTSS 300
GTTVTVSSASTKGPSVFPLAPLESSGSDIQMTQSPSSLSASVGDRTITCRASKSVSTSS 300
GTTVTVSSASTKGPSVFPLAPLESSGSDIQMTQSPSSLSASVGDRTITCRASKSVSTSS 300
GTTVTVSSASTKGPSVFPLAPLESSGSDIQMTQSPSSLSASLGDRATITCRASKSVSTSS 300
GTTVTVSSASTKGPSVFPLAPLESSGSDIQMTQSPSSLSASLGDRATITCRASKSVSTSS 300
GTTVTVSSASTKGPSVFPLAPLESSGSDIQMTQSPSSLSASLGDRATITCRASKSVSTSS 300
GTTVTVSSASTKGPSVFPLAPLESSGSDIQMTQSPSSLSASLGDRATITCRASKTVSTSS 300
GTTVTVSSASTKGPSVFPLAPLESSGSDIQMTQSPSSLSASVGDRTITCRASKTVSTSS 300
GTTVTVSSASTKGPSVFPLAPLESSGSDIQMTQSPSSLSASLGDRATITCRASKTVSTSS 300
GTTVTVSSASTKGPSVFPLAPLESSGSDIQMTQSPSSLSASLGDRATITCRASKTVSTSS 300
GTTVTVSSASTKGPSVFPLAPLESSGSDIQMTQSPSSLSASLGDRATITCRASKTVSTSS 300
GTTVTVSSASTKGPSVFPLAPLESSGSDIQMTQSPSSLSASVGDRTITCRASKTVSTSS 300
GTTVTVSSASTKGPSVFPLAPLESSGSDIQMTQSPSSLSASVGDRTITCRASKTVSTSS 300
*****:***.*****:*****

YSYMHWYQQKPGQPPKLLIKYASYLESQVPSRFGSGSGTDFTLTISSLQPEDAATYYCQ 360
YSYMHWYQQKPGKAPKLLIKYASYLESQVPSRFGSGSGTDFTLTISSLQPEDFATYYCQ 360
YSYMHWYQQKPGQAPKLLIKYASYLESQVPSRFGSGSGTDFTLTISSLQPEDFATYYCQ 360
YSYMHWYQQKPGQPPKLLIKYASYLESQVPSRFGSGSGTDFTLTISSLQPEDAATYYCQ 360
YSYMHWYQQKPGKAPKLLIKYASYLESQVPSRFGSGSGTDFTLTISSLQPEDFATYYCQ 360
YSYMHWYQQKPGKAPKLLIKYASYLESQVPSRFGSGSGTDFTLTISSLQPEDFATYYCQ 360
YSYMHWYQQKPGQAPKLLIKYASYLESQVPSRFGSGSGTDFTLTISSLQPEDAATYYCQ 360
YSYMHWYQQKPGQPPKLLIKYASYLESQVPSRFGSGSGTDFTLTISSLQPEDAATYYCQ 360
YSYMHWYQQKPGKAPKLLIKYASYLESQVPSRFGSGSGTDFTLTISSLQPEDFATYYCQ 360
YSYMHWYQQKPGQAPKLLIKYASYLESQVPSRFGSGSGTDFTLTISSLQPEDFATYYCQ 360
YSYMHWYQQKPGQPPKLLIKYASYLESQVPSRFGSGSGTDFTLTISSLQPEDAATYYCQ 360
YSYMHWYQQKPGKAPKLLIKYASYLESQVPSRFGSGSGTDFTLTISSLQPEDFATYYCQ 360
YSYMHWYQQKPGQAPKLLIKYASYLESQVPSRFGSGSGTDFTLTISSLQPEDAATYYCQ 360
YSYMHWYQQKPGQPPKLLIKYASYLESQVPSRFGSGSGTDFTLTISSLQPEDAATYYCQ 360
YSYMHWYQQKPGKAPKLLIKYASYLESQVPSRFGSGSGTDFTLTISSLQPEDFATYYCQ 360
*****:*****

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(Continued)

FIG. 29C

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Examples of di-scFv 3E10 Constructs

```
HSREFPWTFGGQTKVEIKRADAAPGGGGSGGGSGGGSEVQLVESGGGLVQPGGSLRLS 420
HSREFPWTFGGQTKVEIKRADAAPGGGGSGGGSGGGSEVQLVESGGGLVQPGGSLRLS 420
HSREFPWTFGGQTKVEIKRADAAPGGGGSGGGSGGGSEVQLVESGGGLVQPGGSLRLS 420
HSREFPWTFGGQTKVEIKRADAAPGGGGSGGGSGGGSEVQLVESGGGDVQPGGSLRLS 420
HSREFPWTFGGQTKVEIKRADAAPGGGGSGGGSGGGSEVQLVESGGGDVQPGGSLRLS 420
HSREFPWTFGGQTKVEIKRADAAPGGGGSGGGSGGGSEVQLVESGGGVVQPGGSLRLS 420
HSREFPWTFGGQTKVEIKRADAAPGGGGSGGGSGGGSEVQLVESGGGVVQPGGSLRLS 420
HSREFPWTFGGQTKVEIKRADAAPGGGGSGGGSGGGSEVQLVESGGGVVQPGGSLRLS 420
HSREFPWTFGGQTKVEIKRADAAPGGGGSGGGSGGGSEVQLVESGGGVVQPGGSLRLS 420
HSREFPWTFGGQTKVEIKRADAAPGGGGSGGGSGGGSEVQLVESGGGVVQPGGSLRLS 420
HSREFPWTFGGQTKVEIKRADAAPGGGGSGGGSGGGSEVQLVESGGGVVQPGGSLRLS 420
HSREFPWTFGGQTKVEIKRADAAPGGGGSGGGSGGGSEVQLVESGGGVVQPGGSLRLS 420
HSREFPWTFGGQTKVEIKRADAAPGGGGSGGGSGGGSEVQLVESGGGVVQPGGSLRLS 420
HSREFPWTFGGQTKVEIKRADAAPGGGGSGGGSGGGSEVQLVESGGGVVQPGGSLRLS 420
HSREFPWTFGGQTKVEIKRADAAPGGGGSGGGSGGGSEVQLVESGGGVVQPGGSLRLS 420
***** *;*****

CAASGFTFSNYGMHWVRQAPGKGLEWVSYISSSSTIYYADSVKGRFTISRDNKNSLYL 480
CAASGFTFSNYGMHWVRQAPGKGLEWVSYISSSSTIYYADSVKGRFTISRDNKNSLYL 480
CAASGFTFSNYGMHWVRQAPGKGLEWVSYISSSSTIYYADSVKGRFTISRDNKNSLYL 480
CAASGFTFSNYGMHWVRQAPEKGLEWVSYISSSSTIYYADSVKGRFTISRDNKNTLYL 480
CAASGFTFSNYGMHWVRQAPEKGLEWVSYISSSSTIYYADSVKGRFTISRDNKNTLYL 480
CAASGFTFSNYGMHWVRQAPEKGLEWVSYISSSSTIYYADSVKGRFTISRDNKNTLYL 480
CAASGFTFSNYGMHWVRQAPEKGLEWVSYISSSSTIYYADSVKGRFTISRDNKNTLYL 480
CAASGFTFSNYGMHWVRQAPEKGLEWVSYISSSSTIYYADSVKGRFTISRDNKNTLYL 480
CAASGFTFSNYGMHWVRQAPEKGLEWVSYISSSSTIYYADSVKGRFTISRDNKNTLYL 480
CAASGFTFSNYGMHWVRQAPGKGLEWVSYISSGSSTIYYADSVKGRFTISRDNKNSLYL 480
CAASGFTFSNYGMHWVRQAPEKGLEWVSYISSGSSTIYYADSVKGRFTISRDNKNTLYL 480
CAASGFTFSNYGMHWVRQAPEKGLEWVSYISSGSSTIYYADSVKGRFTISRDNKNTLYL 480
CAASGFTFSNYGMHWVRQAPEKGLEWVSYISSGSSTIYYADSVKGRFTISRDNKNTLYL 480
CAASGFTFSNYGMHWVRQAPGKGLEWVSYISSGSSTIYYADSVKGRFTISRDNKNSLYL 480
CAASGFTFSNYGMHWVRQAPEKGLEWVSYISSGSSTIYYADSVKGRFTISRDNKNTLYL 480
CAASGFTFSNYGMHWVRQAPEKGLEWVSYISSGSSTIYYADSVKGRFTISRDNKNTLYL 480
***** .*****;*.***
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(Continued)

FIG. 29D

Examples of di-scFv 3E10 Constructs

QMNSLRAEDTAVYYCARRGLLLDYWGQGT'TVTVSS 515 (SEQ ID NO:123)
QMNSLRAEDTAVYYCARRGLLLDYWGQGT'TVTVSS 515 (SEQ ID NO:124)
QMNSLRAEDTAVYYCARRGLLLDYWGQGT'TVTVSS 515 (SEQ ID NO:125)
QMNSLRAEDTAVYYCARRGLLLDYWGQGT'TVTVSS 515 (SEQ ID NO:126)
QMNSLRAEDTAVYYCARRGLLLDYWGQGT'TVTVSS 515 (SEQ ID NO:127)
QMNSLRAEDTAVYYCARRGLLLDYWGQGT'TVTVSS 515 (SEQ ID NO:128)
QMNSLRAEDTAVYYCARRGLLLDYWGQGT'TVTVSS 515 (SEQ ID NO:129)
QMNSLRAEDTAVYYCARRGLLLDYWGQGT'TVTVSS 515 (SEQ ID NO:130)
QMNSLRAEDTAVYYCARRGLLLDYWGQGT'TVTVSS 515 (SEQ ID NO:131)
QMNSLRAEDTAVYYCARRGLLLDYWGQGT'TVTVSS 515 (SEQ ID NO:132)
QMNSLRAEDTAVYYCARRGLLLDYWGQGT'TVTVSS 515 (SEQ ID NO:133)
QMNSLRAEDTAVYYCARRGLLLDYWGQGT'TVTVSS 515 (SEQ ID NO:134)
QMNSLRAEDTAVYYCARRGLLLDYWGQGT'TVTVSS 515 (SEQ ID NO:135)
QMNSLRAEDTAVYYCARRGLLLDYWGQGT'TVTVSS 515 (SEQ ID NO:136)
QMNSLRAEDTAVYYCARRGLLLDYWGQGT'TVTVSS 515 (SEQ ID NO:137)
QMNSLRAEDTAVYYCARRGLLLDYWGQGT'TVTVSS 515 (SEQ ID NO:138)

FIG. 29E

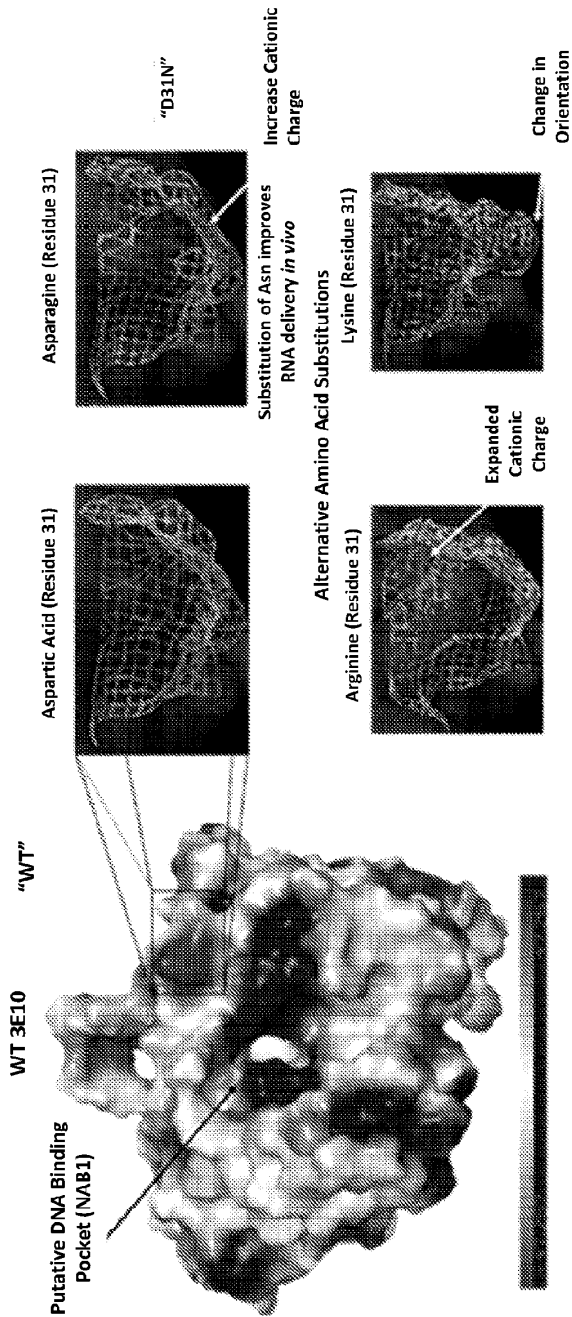


FIG. 30A

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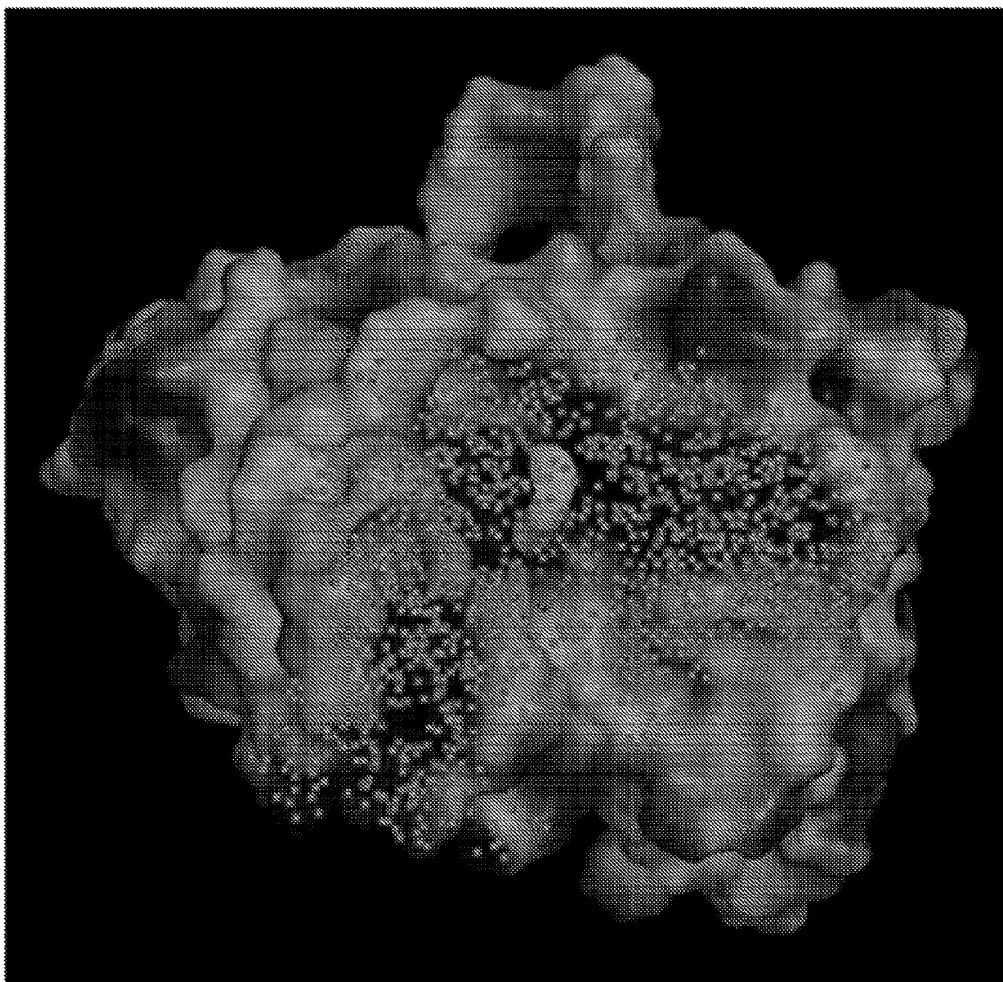


FIG. 30B

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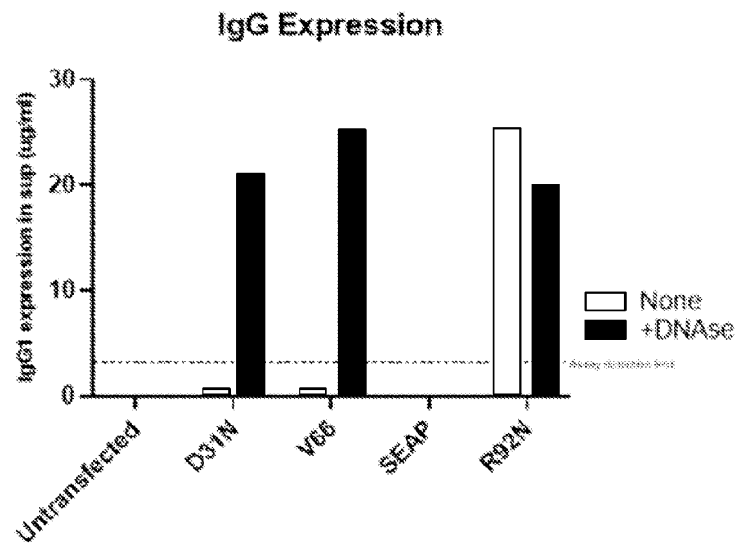


FIG. 31A

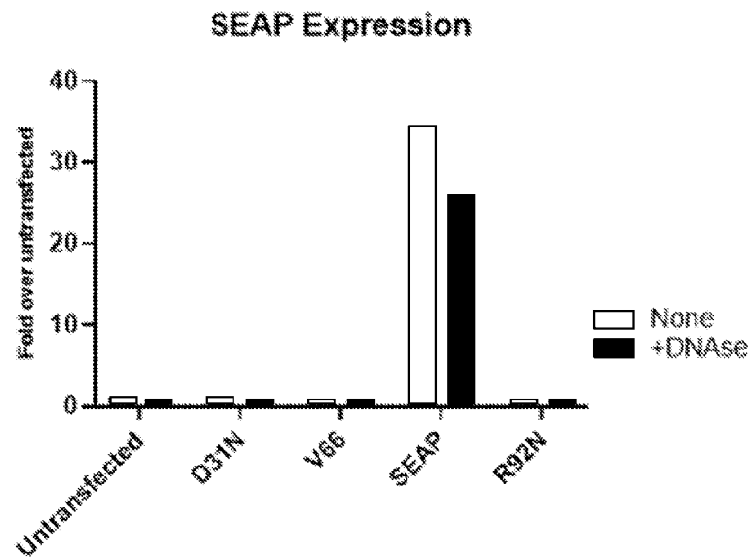


FIG. 31B