Figure 1

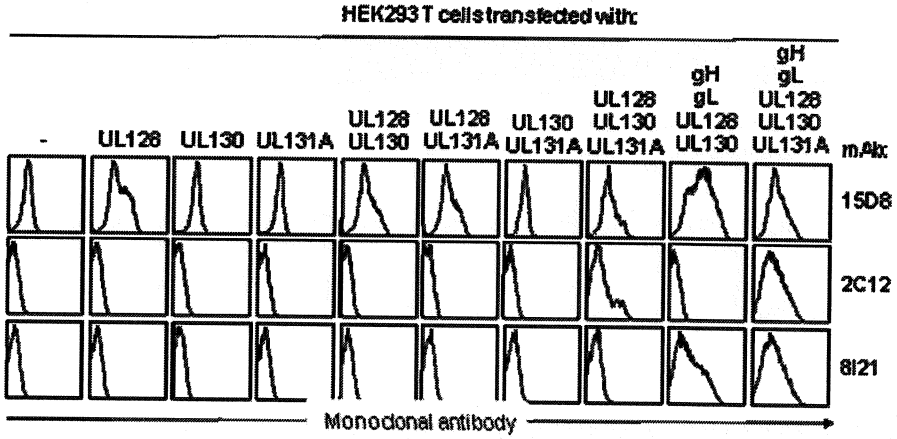

HEK293T cells transfected with:
-
UL128
UL130
UL131A
UL128 UL130
UL128 UL131A
UL130 UL131A
UL128 UL130 UL131A
gH gL UL128 UL130
gH gL UL128 UL130 UL131A
mAb:
15D8
2C12
8I21
Monoclonal antibody

Figure 2

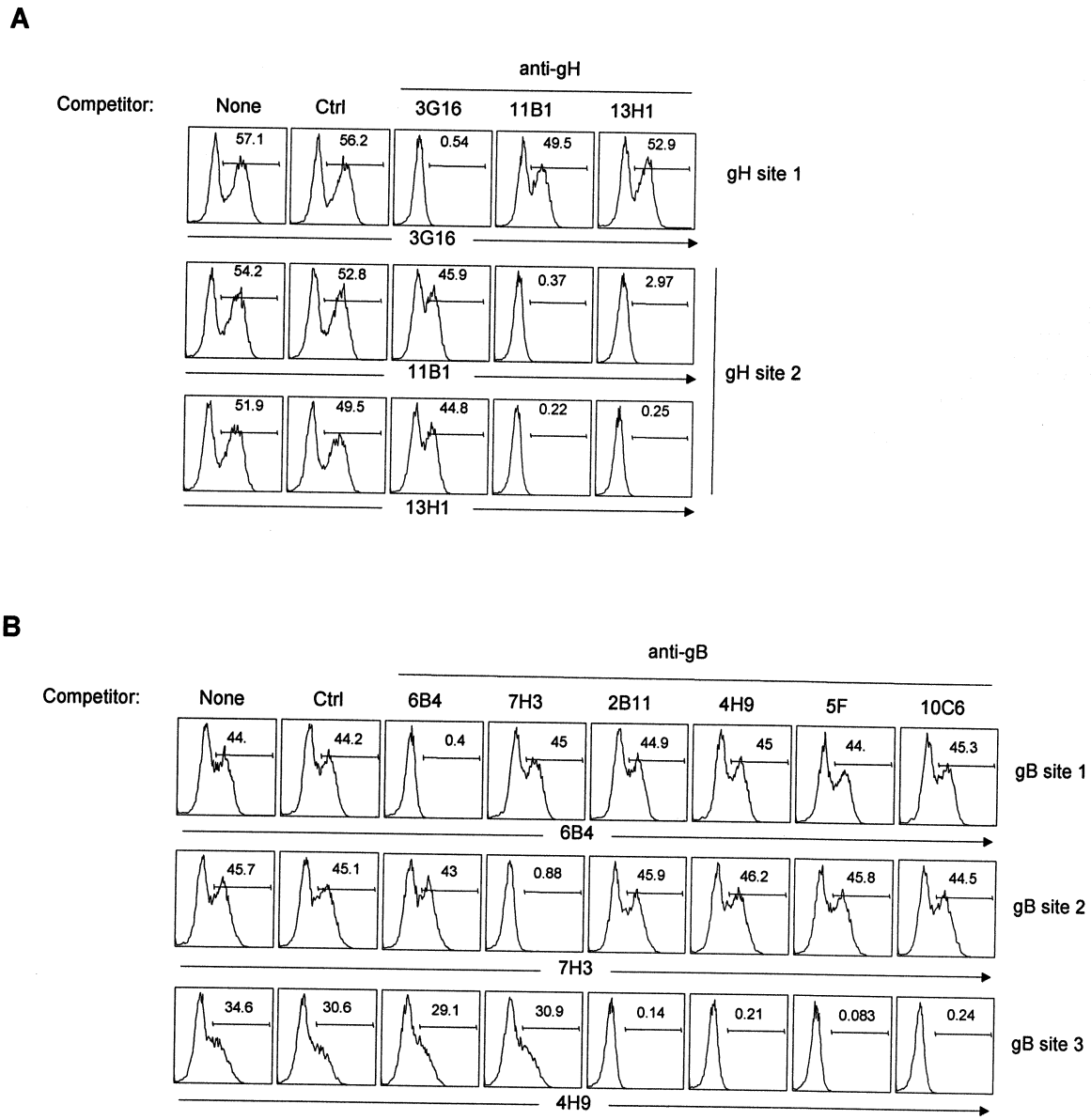
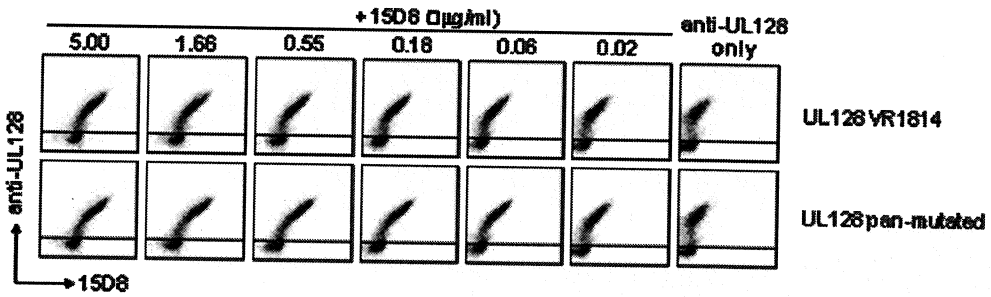

A
anti-gH
Competitor:
None
Ctrl
3G16
11B1
13H1
57.1
56.2
0.54
49.5
52.9
gH site 1
3G16
54.2
52.8
45.9
0.37
2.97
11B1
gH site 2
51.9
49.5
44.8
0.22
0.25
13H1
B
anti-gB
Competitor:
None
Ctrl
6B4
7H3
2B11
4H9
5F
10C6
44.
44.2
0.4
45
44.9
45
44.
45.3
gB site 1
6B4
45.7
45.1
43
0.88
45.9
46.2
45.8
44.5
gB site 2
7H3
34.6
30.6
29.1
30.9
0.14
0.21
0.083
0.24
gB site 3
4H9

Figure 3


+15D8 (µg/ml)
5.00
1.66
0.55
0.18
0.06
0.02
anti-UL128 only
UL128 VR1814
UL128 pan-mutated
anti-UL128
15D8

SEQ ID List

SEQ ID	mAb	Description	Sequence
1	4N10	CDRH1 aa	GGTFSSYV
2		CDRH2 aa	VIPIFDTV
3		CDRH3 aa	ARGILAYCGGDCYNTPYGMDV
4		CDRL1 aa	QSISSW
5		CDRL2 aa	KAS
6		CDRL3 aa	QQYNSSWT
7		CDRH1 nuc	ggaggcaccttcagcagctatgtt
8		CDRH2 nuc	gtcatccctatctttgatacagta
9		CDRH3 nuc	gcgagaggaattctagcatattgtggtggtgattgctataataccccttacggtatggacgtc
10		CDRL1 nuc	cagagtattagtagctgg
11		CDRL2 nuc	aaggcgtct
12		CDRL3 nuc	caacagtataatagttcgtggacg
13		heavy ch aa	QVQLVQSGAEVKKPGSSVRVSCKASGGTFSSYVIIWVRQAPGQGLEWMGG VIPIFDTVNYAQKFQGRVTITADESTSTAYMELSSLKSEDTAVYYCARGILAYC GGDCYNTPYGMDVWGQGTTVTVSS
14		light ch aa	DIQMTQSPSILSASVGDRVTITCRASQSISSWLAWYQQKPGKAPKLLIYKASS LEIGVPSRISGSGSGTEFTLTISSLQPDDFATYYCQQYNSSWTFGQGTKVEIK
15		heavy ch nuc	caggtgcagctggtgcagtctggggctgaggtgaagaagcctgggtcctcggtgagggtctcct gcaaggcttctggaggcaccttcagcagctatgttatcatctgggtgcgacaggcccctggacaa ggtcttgagtggatgggggggggtcatccctatctttgatacagtaaattacgcacagaagttcca gggcagagtcacgattaccgcggacgaatccacgagtactgcctacatggagctgagcagcct gaaatctgaggacacggccgtatattactgtgcgagaggaattctagcatattgtggtggtgatt gctataataccccttacggtatggacgtctggggccaagggaccacggtcaccgtctcctcag
16		light ch nuc	gacatccagatgacccagtctccttccatcctgtctgcatctgtaggagacagagtcaccatcact tgccgggccagtcagagtattagtagctggttggcctggtatcagcagaaaccagggaaagccc caaaactcctaatctataaggcgtctagtttagaaattggggtcccatcaaggatcagcggcagt ggatctgggacagaattcactctcaccatcagcagcctgcagcctgatgattttgcaacttattac tgccaacagtataatagttcgtggacgttcggccaagggacgaaggtggaaatcaaac
17	10F7	CDRH1 aa	GFTFGDYA
18		CDRH2 aa	IRSKAYGGTT
19		CDRH3 aa	TRASSLLWLLNPQPNFDY
20		CDRL1 aa	NIGSNN
21		CDRL2 aa	DDS
22		CDRL3 aa	QVWDSSSDHPV
23		CDRH1 nuc	ggattcacctttggtgattatgct
24		CDRH2 nuc	attagaagcaaagcttatggtgggacaaca
25		CDRH3 nuc	actagagcatcttcattactatggttactaaaccctcaacccaactttgactac
26		CDRL1 nuc	aacattggaagtaacaat
27		CDRL2 nuc	gatgatagc
28		CDRL3 nuc	caggtgtgggatagtagtagtgatcatccggta

29		heavy ch aa	EVQLVESGGGLVQPGRSLRLSCTASGFTFGDYAMSWFRQAPGKGLEWVGF IRSKAYGGTTEYAASVKGRFTISRDDSKSIAYLQMNSLKTEDTAVYYCTRASSL LWLLNPQPNFDYWGQGTLVTVSS
30		light ch aa	SYVLTQPPSVSVAPGQTARITCGGNNIGSNNVHWYQQKPGQAPVLVVYDD SDRPSGIPERFSGSNSGNTATLTISRVEAGDEADYYCQVWDSSSDHPVFGGG TKLTVL
31		heavy ch nuc	gaggtgcagctggtggagtctgggggaggcttggtacagccagggcggtccctgagactctcct gtacagcttctggattcacctttggtgattatgctatgagctggttccgccaggctccagggaagg ggctggagtgggtaggtttcattagaagcaaagcttatggtgggacaacagaatacgccgcgtc tgtgaaaggcagattcaccatctcaagagatgattccaaaagcatcgcctatctgcaaatgaac agcctgaaaaccgaggacacagccgtgtattactgtactagagcatcttcattactatggttact aaaccctcaacccaactttgactactggggccagggaaccctggtcaccgtctcctcag
32		light ch nuc	tcctatgtgctgactcagccaccctcggtgtcagtggccccaggacagacggccaggattacctg tgggggaaacaacattggaagtaacaatgtgcactggtaccagcagaagccaggccaggcccc tgtgctggtcgtctatgatgatagcgaccggccctcagggatccctgagcgattctctggctccaa ctctgggaacacggccaccctgaccatcagcagggtcgaagccggggatgaggccgactatta ctgtcaggtgtgggatagtagtagtgatcatccggtattcggcggagggaccaagctgaccgtcc tag
33	10P3	CDRH1 aa	GFTFHNYR
34		CDRH2 aa	IKQDGSEK
35		CDRH3 aa	ARGEGYTYGVVYSYSAMDV
36		CDRL1 aa	VLPNQY
37		CDRL2 aa	KDT
38		CDRL3 aa	QSADSSGADYV
39		CDRH1 nuc	ggattcacctttcataactatcgc
40		CDRH2 nuc	ataaagcaagatggaagtgagaaa
41		CDRH3 nuc	gcgaggggtgaagggtacacctatggtgtcgtctactcctattccgctatggacgtc
42		CDRL1 nuc	gtattgccaaaccaatat
43		CDRL2 nuc	aaagacact
44		CDRL3 nuc	caatcagcagacagcagtggtgccgattatgtc
45		heavy ch aa	EVQLVESGGGLVRPGGSLRLSCAASGFTFHNYRMNWVRQAPGKGLEWVA NIKQDGSEKSYVDSVRGRFTTSRDNSKNSLYLQINSLRAEDTAVYYCARGEGY TYGVVYSYSAMDVWGQGTTVIVSS
46		light ch aa	SYELTQPPSVSVSPGQTARITCSGNVLPNQYASWYQQKPGQAPVLVIYKDTE RPSGIPGRFSGSSSGTTVTLTISGVQAEDEADYYCQSADSSGADYVFGTGTKV TVL
47		heavy ch nuc	gaggtgcagctggtagagtctgggggaggcttggtccggcctgggggtccctgagactctcat gtgcagcctctggattcacctttcataactatcgcatgaactgggtccgccaggctccagggaag gggctggagtgggtggccaacataaagcaagatggaagtgagaaatcctatgtggactctgtg aggggccgattcaccacctccagagacaactccaagaattcactctatctgcaaattaacagcct gcgagccgaggacacggctgtctattactgtgcgaggggtgaagggtacacctatggtgtcgtct actcctattccgctatggacgtctggggccaagggaccacagtcatcgtctcctcag
48		light ch nuc	tcctatgagctgacacagccaccctcggtgtcagtgtccccaggacagacggccaggatcacct gctctggaaatgtattgccaaaccaatatgcttcttggtaccagcagaagccaggccaggcccct gtattggtgatatataaagacactgagaggccctcagggatccctgggcgattctctggctccag ctcagggacgacagtcacgttgaccatcagtggagtccaggcagaggacgaggctgactatta ctgtcaatcagcagacagcagtggtgccgattatgtcttcggaactgggaccaaggtcaccgtcc tag

49	4I22	CDRH1 aa	GFTFSSYA
50		CDRH2 aa	ISYDGDNK
51		CDRH3 aa	AREELVGLMPPYYNYGLDV
52		CDRL1 aa	NSNIGNNY
53		CDRL2 aa	DND
54		CDRL3 aa	ETWDTSLSAAVV
55		CDRH1 nuc	ggattcaccttcagttcctatgct
56		CDRH2 nuc	atttcatatgatggcgacaacaaa
57		CDRH3 nuc	gcgagagaagagttagtcgggttgatgcctccctattacaactacggattggacgtc
58		CDRL1 nuc	aactccaacatcgggaataattat
59		CDRL2 nuc	gacaatgat
60		CDRL3 nuc	gaaacatgggataccagcctgagtgctgctgttgtc
61		heavy ch aa	QVQLVESGGGVVQPGRSLRLSCVASGFTFSSYAMHWVRQAPGKGLEWVA VISYDGDNKFYADSVKGRFRISRDTSKNTLYLEMNSLRAADTAIYYCAREELV GLMPPYYNYGLDVWGQGTTVTVSS
62		light ch aa	QSVLTQPPSVSAAPGQKVTISCSGSNSNIGNNYVSWYQQLPGRAPKLLIYDN DHRPSGIPDRFSGSKSGTSATLVITGLQTGDEADYYCETWDTSLSAAVVFGG GTKLTVL
63		heavy ch nuc	caggtgcagctggtggagtctgggggaggggtggtccagcctgggaggtccctgagactctcct gtgtagcctctggattcaccttcagttcctatgctatgcactgggtccgccaggctccaggcaagg gactggagtgggtggcagttatttcatatgatggcgacaacaaattctacgcagactccgtgaag ggccgattcaggatctccagagacacatccaagaatacactgtatctggaaatgaacagcctga gagctgcggacacggctatatattactgtgcgagagaagagttagtcgggttgatgcctccctat tacaactacggattggacgtctggggccaaggaaccacggtcaccgtctcgtcag
64		light ch nuc	cagtctgtgttgactcagccgccctcagtgtctgcggccccaggacagaaggtcaccatctcctg ctctggaagcaactccaacatcgggaataattatgtatcgtggtaccagcagctcccaggaaga gcccccaaactcctcatttatgacaatgatcaccgaccctcagggattcctgaccgattctctggc tccaagtctggcacgtcagccaccctggtcatcaccggactccagactggggacgaggccgatt attactgcgaaacatgggataccagcctgagtgctgctgttgtcttcggcggagggaccaagctg accgtcctac
65	2C12	CDRH1 aa	GFSLNTNGVG
66		CDRH2 aa	IYWNGNE
67		CDRH3 aa	VHWPQGLTTVTRLAFDI
68		CDRL1 aa	TSDVGRYNF
69		CDRL2 aa	DVS
70		CDRL3 aa	CSYAGGNFFSYV
71		CDRH1 nuc	ggcttctcactcaacactaatggagtgggt
72		CDRH2 nuc	atttactggaatggtaatgag
73		CDRH3 nuc	gtacactggccccaagggttgactacggtgacaagacttgcttttgatatc
74		CDRL1 nuc	accagtgatgttggtcgttataacttt
75		CDRL2 nuc	gatgtcagt
76		CDRL3 nuc	tgctcatatgcaggcggcaatttttttctcttatgtc
77		heavy ch aa	QITLRESGPTLVKPTQTLTLTCTFSGFSLNTNGVGVGWIRQPPGKALEWLALI YWNGNEGYSPSLKSRLTITKDTSKNQVVLTMTNMDPVDTATYYCVHWPQ GLTTVTRLAFDIWGQGTMVTVSS
78		light ch aa	QSALTQPRSVSGSPGQSVTISCTGTTSDVGRYNFVSWYQQHPGKAPKLLMY DVSQRPSGVPSRFSGSKSGNTASLTISGLQAEDEAVFYCCSYAGGNFFSYVFG TGTKVTVL

79		heavy ch nuc	cagatcaccttgagggagtctggtcctacgctggtgaaacccacacagaccctcacgctgacct gcaccttctctggcttctcactcaacactaatggagtgggtgtgggctggatccgtcagcccccag gaaaggccctggagtggcttgcactcatttactggaatggtaatgagggctacagcccctctctg aaaagcagactcaccatcaccaaggacacctccaaaaaccaggtggtcctgacaatgaccaac atggaccctgtggacacagccacatattactgtgtacactggccccaagggttgactacggtgac aagacttgcttttgatatctggggccaagggactatggtcaccgtctcttcag
80		light ch nuc	cagtctgccctgactcagcctcgctcagtgtccgggtctcctggacagtcagtcaccatctcctgc actggaaccaccagtgatgttggtcgttataactttgtctcctggtaccaacaacacccaggcaa agcccccaaactcctgatgtatgatgtcagtcagcggccctcaggggtccctagtcgcttctctgg ctccaagtctggcaacacggcctccctgaccatctctgggctccaggctgaggatgaggctgtttt ttactgctgctcatatgcaggcggcaatttttctcttatgtcttcggaactgggaccaaggtcacc gtcctag
81	8C15	CDRH1 aa	GGSIRSYY
82		CDRH2 aa	IYYSGNT
83		CDRH3 aa	ARHDVIVVRGVFDV
84		CDRL1 aa	SSDIGTYNL
85		CDRL2 aa	DGS
86		CDRL3 aa	CSYAGTSDFFVV
87		CDRH1 nuc	ggtggctccatccggagttactac
88		CDRH2 nuc	atctattacagtgggaacacc
89		CDRH3 nuc	gcgagacatgatgtgatagtagtccgcggtgtctttgatgtc
90		CDRL1 nuc	agcagtgatattggaacttataacctt
91		CDRL2 nuc	gatggcagt
92		CDRL3 nuc	tgctcatatgctggtactagcgatttctttgtggtt
93		heavy ch aa	QVQLQESGPGLVKPSETLSLTCTVSGGSIRSYYWSWIRQPPGKGLEWIGHIY YSGNTNYSPSLQSRVTISLDTPKNQFSLRLSSVTAADTAVYYCARHDVIVVRG VFDVWGQGTVVTVSS
94		light ch aa	QSALTQPASVSGSPGQSITISCTGTSSDIGTYNLVSWYQQHPGKAPKVLIYDG SKRPSGVSSRFSASKSGNTASLTISGLQAEDETDYYCCSYAGTSDFFVVFGGG TKLTVL
95		heavy ch nuc	caggtgcagctgcaggagtcgggcccaggtctggtgaagccttcggagaccctgtccctcacct gcactgtctctggtggctccatccggagttactactggagctggatccggcagcccccagggaag ggactggagtggattgggcacatctattacagtgggaacaccaactacagcccctccctccaga gtcgagtcaccatatcattagacacgcccaagaaccaattctccctgcggctgagctctgtgacc gccgcagacacggccgtctattactgtgcgagacatgatgtgatagtagtccgcggtgtctttga tgtctggggccaagggacagtggtcaccgtctcttcag
96		light ch nuc	cagtctgccctgactcagcctgcctccgtgtctgggtcacctggacagtcgatcaccatctcctgc actggaaccagcagtgatattggaacttataaccttgtctcctggtaccaacaacacccaggca aagcccccaaagtcctaatttatgatggcagtaagcggccctcaggggtttctagtcgcttctctg cctccaagtctggcaacacggcctccctgacaatctctgggctccaggctgaggacgagactga ttattactgctgctcatatgctggtactagcgatttctttgtggttttcggcggagggaccaagctg accgtcctgg
97	9I6	CDRH1 aa	GDTFPAYW
98		CDRH2 aa	IYPIDSET
99		CDRH3 aa	ARGTSTGLREAFHI
100		CDRL1 aa	QSLGYSDGNTY
101		CDRL2 aa	EVS
102		CDRL3 aa	MQGTHWPPMCS

103		CDRH1 nuc	ggagacacttttcccgcctactgg
104		CDRH2 nuc	atctatcctattgactctgagacc
105		CDRH3 nuc	gcccgggggacaagtactggcctcagagaggcttttcatatc
106		CDRL1 nuc	caaagcctcggatacagtgatggaaacacctat
107		CDRL2 nuc	gaggtttct
108		CDRL3 nuc	atgcaaggtacacactggcctcccatgtgcagt
109		heavy ch aa	EVQLVQSGAEVKKPGESLKISCRESGDTFPAYWIAWVRQMPGKGLEWMGI IYPIDSETTYSPSFQGQVTISADKSINTAYLQWSSLKASDSAIYYCARGTSTGLR EAFHIWGQGTMVTVSS
110		light ch aa	DVVMTQSPLSLAVTLGQPAYISCRSSQSLGYSDGNTYLNWFQQRPGQSPRR LIYEVSNRDSGVPDRFSGSGSGTDFTLKISRVEAEDVGTYYCMQGTHWPPM CSFGQGTKLEIK
111		heavy ch nuc	gaggtgcagctggtgcagtctggagcagaggtgaaaaagcccggggagtctctgaagatctcct gtagggaatctggagacactttcccgcctactggatcgcctgggtgcgccagatgcccgggaa aggcctggagtggatgggaattatctatcctattgactctgagaccacatatagcccgtccttcca aggccaggtcaccatttcagccgacaagtccatcaacaccgcctacctgcagtggagcagcctg aaggcctcggactccgccatttattactgtgcccgggggacaagtactggcctcagagaggcttt tcatatctggggccaagggacaatggtcaccgtctcttcag
112		light ch nuc	gatgttgtgatgactcagtctccactctccctggccgtcacccttggacagccggcctacatctcct gcaggtcaagtcaaagcctcggatacagtgatggaaacacctatttgaattggtttcagcagag accaggccaatctcccaggcgcctaatttatgaggtttctaaccgggactctggggtcccagaca gattcagcggcagtgggtcgggcactgatttcacactgaaaatcagcagggtggaggctgagg atgttgggacttattactgcatgcaaggtacacactggcctcccatgtgcagttttggccagggg accaagttggagatcaaac
113	8L13	CDRH1 aa	GFTFSNYG
114		CDRH2 aa	IWNDGSKK
115		CDRH3 aa	ARDEGVQMVFAMPDYGMDV
116		CDRL1 aa	KLGDKF
117		CDRL2 aa	QDS
118		CDRL3 aa	QAWDSSTAHYV
119		CDRH1 nuc	ggattcaccttcagtaattatggc
120		CDRH2 nuc	atatggaatgatggaagtaagaaa
121		CDRH3 nuc	gcgagagatgaaggtgtacaaatggtgttcgccatgcctgactacggtatggacgtc
122		CDRL1 nuc	aaattgggggataaattc
123		CDRL2 nuc	caagattcc
124		CDRL3 nuc	caggcgtgggacagcagcactgcccattatgtc
125		heavy ch aa	QVQLLESGGGVVQPGRSLRLSCAASGFTFSNYGMHWVRQAPGKGLEWVA VIWNDGSKKYYAESVKGRFTISRDNSKNTVYLQMNSLRAEDTAVYYCARDE GVQMVFAMPDYGMDVWGQGTTVTVSS
126		light ch aa	SYELTQPPSVSVSPGQTASITCSGDKLGDKFACWYQQRPGQSPILVIYQDSK RPSGIPERFSGSNSGNTATLTIRGTQAMDEADYYCQAWDSSTAHYVFGTGT KVTVL
127		heavy ch nuc	caggtgcagttgctggagtctgggggaggcgtggtccagcctgggaggtccctgagactctcctg tgcagcgtctggattcaccttcagtaattatggcatgcactgggtccgccaggctccaggcaagg ggctggagtgggtggcagttatatggaatgatggaagtaagaaatattatgcagagtccgtgaa gggccggttcaccatctccagagacaattccaagaacacagtatatctacaaatgaacagcctg agagccgaggacacggctgtgtattactgtgcgagagatgaaggtgtacaaatggtgttcgcca tgcctgactacggtatggacgtctggggccaggggaccacggtcaccgtctcctcag

128		light ch nuc	tcctatgaactgactcagccaccctcagtgtccgtgtccccaggacagacagccagcatcacttg ctctggagataaattgggggataaattcgcttgctggtatcagcagaggccaggccagtctccta tactggtcatctatcaagattccaagcggccctcagggatccctgagcgattctctggctccaact ctgggaacacagccactctgaccatccgcgggacccaggctatggatgaggctgactattactg tcaggcgtgggacagcagcactgcccattatgtcttcggaactgggaccaaggtcaccgtccttg
129	7B13	CDRH1 aa	GFSFSNYG
130		CDRH2 aa	IPSDGNYQ
131		CDRH3 aa	AHLGGGLFDF
132		CDRL1 aa	SSDVGGYEF
133		CDRL2 aa	DVD
134		CDRL3 aa	YSSADTWV
135		CDRH1 nuc	ggattctccttcagtaattatggc
136		CDRH2 nuc	ataccgtctgatggaaattatcaa
137		CDRH3 nuc	gcccacctcgggggggtttatttgacttc
138		CDRL1 nuc	agcagtgatgttggtggttatgagttt
139		CDRL2 nuc	gatgtcgat
140		CDRL3 nuc	tactcatctgcagacacctgggtc
141		heavy ch aa	QVQLVESGGGVVQPGGSLRLSCAASGFSFSNYGMHWVRQAPGKGLEWVA LIPSDGNYQYYTDSVKGRFTVSRDNSRNTLYLQMKSLRAEDTARYHCAHLG GGLFDFWGQGTLVTVSS
142		light ch aa	QSALNQPRSVSGSPGQSVSISCTGSSSDVGGYEFVSWYQHHPGKAPKLIIYD VDKRPSGVPDRFSGSRSGDTASLTISGLQAEDEADYYCYSSADTWVFGGGTK LTVL
143		heavy ch nuc	caggtgcagctggtggagtctgggggaggcgtggtccagcctgggggtccctgagattgtcct gtgcagcgtctggattctccttcagtaattatggcatgcactgggtccgccaggctccaggcaag gggctggagtgggtggcacttataccgtctgatggaaattatcaatactatacagactccgtgaa gggccgattcaccgtctccagagacaattccaggaacacgttgtatctgcaaatgaagagcctg agagctgaggacacggctagatatcattgtgcccacctcgggggggtttatttgacttctgggg ccagggcaccctggtcaccgtctcctcag
144		light ch nuc	cagtctgccctgaatcagcctcgctcagtgtccgggtctcctggacagtcagtctccatctcctgc actggctccagcagtgatgttggtggttatgagtttgtctcctggtaccaacaccacccaggcaa agcccccaaactcataatttatgatgtcgataagcggccctcaggggtccctgatcgcttctctgg ctccaggtctggcgacacggcctccctgaccatctctgggctccaggctgaggatgaggctgatt attactgctactcatctgcagacacctgggtcttcggcggagggaccaagctcactgtcctag
145	8J16	CDRH1 aa	GGFTSSYY
146		CDRH2 aa	VYYGEST
147		CDRH3 aa	AREVDKRGFDY
148		CDRL1 aa	QSVSGGY
149		CDRL2 aa	GAS
150		CDRL3 aa	QQYGRTPLT
151		CDRH1 nuc	ggtggcttcaccagtagttattat
152		CDRH2 nuc	gtgtattacggtgaaagtacc
153		CDRH3 nuc	gcgagagaagtggataaacggggctttgactac
154		CDRL1 nuc	cagagtgttagcggcggttac
155		CDRL2 nuc	ggtgcatcc
156		CDRL3 nuc	cagcagtatggtaggacaccgctcact

157		heavy ch aa	QVQLQESGPGLVKPSETLSLTCSVSGGFTSSYYWSWIRQAPGKGLEWIGYVY YGESTDYNPSLKSRATISIDTSKNQFSLKLSSVTAADTAVYYCAREVDKRGFDY WGQGALVTVSS
158		light ch aa	EIVLTQSPGTLSLSPGERATLSCRASQSVSGGYLAWYQQEPGQAPRLVIYGAS SRATGIPDRFSASGSGTDFTLTITRLEPEDFAVYYCQQYGRTPLTFGGGTKVEI K
159		heavy ch nuc	caggtgcagctgcaggagtcgggcccaggactggtgaagccttcggagaccctgtccctcacct gcagtgtctctggtggcttcaccagtagttattattggagttggatccggcaggcccccgggaag ggactggagtggattggctatgtgtattacggtgaaagtaccgattacaacccctccctcaagag tcgagccaccatatcaatagacacgtccaagaaccaattctccctgaagctgagctctgtgaccg ctgcggacacggccgtctattattgtgcgagagaagtggataaacggggctttgactactgggg ccagggagccctggtcaccgtctcctcag
160		light ch nuc	gaaattgtgttgacgcagtctccaggcaccctatctttgtctccaggggaaagagccaccctctc ctgcagggccagtcagagtgttagcggcggttacttagcctggtaccagcaggaacctggccag gctcccaggctcgtcatctatggtgcatccagcagggccactggcatcccagacaggttcagtgc cagtgggtctgggacagacttcactctcaccatcaccagactggagccagaagattttgcagtgt attactgtcagcagtatggtaggacaccgctcactttcggcggagggaccaaggtggagatcaa ac
161	7I13	CDRH2 aa	ISYDASSK
162		CDRH3 aa	AKALRYLDWFLSDPFDY
163		CDRL1 aa	QSVSSDF
164		CDRL3 aa	QQYAASPP
165		CDRH1 nuc	ggattcaccttcagtaactatggc
166		CDRH2 nuc	atatcttatgatgcaagtagtaaa
167		CDRH3 nuc	gcgaaagccctacgatatcttgactggttcctctcggacccccttcgactac
168		CDRL1 nuc	cagagtgttagtagcgacttc
169		CDRL3 nuc	cagcagtatgctgcctcaccgccc
170		heavy ch aa	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMHWVRQGPGKGLEWVA VISYDASSKYYTDSVQGRFTISRDNSKNTLFLQMNSLRGEDTAVYYCAKALRY LDWFLSDPFDYWGQGTLVTVSS
171		light ch aa	EIVLTQSPGTLSLSPGERATLSCRASQSVSSDFLAWYQQKPGQAPRLLIYGAS SRATGIPDRFSGSGSGTDFTLTISRLEPEDFAVYYCQQYAASPPFGQGTRLEIK
172		heavy ch nuc	caggtgcaactggtggagtctgggggaggcgtggtccagcctgggaggtccctcagactctcct gtgcagcctctggattcaccttcagtaactatggcatgcactgggtccgccagggtccaggcaag gggctggagtgggtggcagttatatcttatgatgcaagtagtaaatactatacagactccgtgca gggccgattcaccatctccagagacaattccaagaacacactgtttctgcaaatgaacagcctg agaggtgaagacacggctgtgtattactgtgcgaaagccctacgatatcttgactggttcctctc ggacccccttcgactactggggccagggaaccctggtcaccgtctcctcag
173		light ch nuc	gaaattgtgttgacgcagtctccaggcaccctgtctttgtctccaggggaaagagccaccctctcc tgcagggccagtcagagtgttagtagcgacttcttagcctggtaccagcagaaacctggccagg ctcccaggctcctcatctatggtgcatccagcagggccactggcatcccagacaggttcagtggc agtgggtctgggacagacttcactctcaccatcagccgactggagcctgaagattttgcagtcta ttactgtcagcagtatgctgcctcaccgcccttcggccaagggacacgactggagattaaac
174	8I21	CDRH1 aa	GFTFSSDG
175		CDRH2 aa	ISSDGSTP
176		CDRH3 aa	AKDWALFRWLRTFDH
177		CDRL1 aa	QSVGIN
178		CDRL3 aa	QQYNDWPPWT

179		CDRH1 nuc	ggattcaccttcagtagcgacggc
180		CDRH2 nuc	atatcatctgacggaagtactcca
181		CDRH3 nuc	gccaaagattgggcattatttcggtggctacgaacctttgatcat
182		CDRL1 nuc	cagagtgttggcatcaat
183		CDRL3 nuc	caacaatataatgactggcctccgtggacg
184		heavy ch aa	LVELVESGGGVVQPGRSLRLSCAASGFTFSSDGMHWVRQSPGRGLEWVAF ISSDGSTPYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAMYFCAKDWAL FRWLRTFDHWGQGTLVTVSS
185		light ch aa	ETVMTQSPATLSVSPGGRATLSCRASQSVGINLAWYQQKPGQAPRLLIYGA STRASGFPARFSGSGSGTEFTLTITSLQSEDFAVYYCQQYNDWPPWTFGQG TKVEIK
186		heavy ch nuc	ctggtggaactggtggagtctgggggaggcgtggtccagcctgggaggtccctgagactctcct gtgcagcctctggattcaccttcagtagcgacggcatgcactgggtccgccagagtccaggcag ggggctggaatgggtggcctttatatcatctgacggaagtactccatactatgctgactccgtga agggccgattcaccatctccagagacaattccaagaacacactgtatctgcaaatgaacagcct cagagctgaggacacggctatgtacttctgtgccaaagattgggcattatttcggtggctacgaa cctttgatcattggggccagggaaccctggtcaccgtctcctcag
187		light ch nuc	gaaacggtgatgacgcagtctccagccaccctgtctgtgtctcctgggggaagagccaccctctc ctgcagggccagtcagagtgttggcatcaatttagcctggtaccagcagaaacctggccaggct cccaggctcctcatctatggtgcatccaccagggcctctggtttcccagccaggttcagtggcagt gggtctgggacagagttcactctcaccatcaccagcctgcagtctgaagattttgcagtctattac tgtcaacaatataatgactggcctccgtggacgttcggccaagggaccaaggtggagatcaaac
188	15D8	CDRH1 aa	GYSFTNYW
189		CDRH2 aa	IYPGDSDI
190		CDRH3 aa	ARHAIRGDGFDY
191		CDRL1 aa	KLGEKY
192		CDRL2 aa	QDT
193		CDRL3 aa	QAWDTNTVI
194		CDRH1 nuc	ggatacagctttaccaactactgg
195		CDRH2 nuc	atctatcctggtgactctgatatc
196		CDRH3 nuc	gcgagacatgcaatacgaggagatgggtttgactac
197		CDRL1 nuc	aaattgggggaaaaatac
198		CDRL2 nuc	caagatacg
199		CDRL3 nuc	caggcgtgggacaccaacactgtgata
200		heavy ch aa	EVQLVQSGAEVKKPGESLKISCQASGYSFTNYWIAWVRQMPGKGLEWMGI IYPGDSDIKYSPSFRGQVTISADKSISNAFLQWRSLRASDTAMYYCARHAIRG DGFDYWGQGTLVTVSS
201		light ch aa	SYELTQPPSVSVSPGQTATITCSGDKLGEKYACWYQQKPGQSPVLVMYQDT KRPSGIPERFSGSNSGNTATLTISGTRAMDEADYYCQAWDTNTVIFGGGTKL TVL
202		heavy ch nuc	gaggtgcagctggtgcagtctggagcagaagtgaaaaagcccggggagtctctgaagatctcc tgtcaggcttctggatacagctttaccaactactggatcgcctgggtgcgccagatgcccgggaa aggcctggagtggatgggcatcatctatcctggtgactctgatatcaaatacagcccgtccttcc gaggccaggtcaccatctcagccgacaagtccatcagtaatgccttcctccagtggcgaagcct gagggcctcggacaccgccatgtattactgtgcgagacatgcaatacgaggagatgggtttgac tactggggccagggaaccctggtcaccgtctcctcag

203		light ch nuc	tcctatgagctgactcagccaccctcagtgtccgtgtccccaggacagacagccaccatcacctg ctctggagataaattgggggaaaaatacgcttgctggtatcagcagaagccaggccagtcccct gttttggtcatgtatcaagatacgaagcggccctcagggatccctgagcgattctctggctccaa ctctgggaacacagccactctgaccatcagcgggacccgggctatggatgaagctgactattac tgtcaggcgtgggacaccaacactgtgatattcggcggagggaccaagctgaccgtcctag
204		CDRH2 aa var1	IYPGDSDT
205		CDRH3 aa var 1	GRHAIRGDGFDY
206		CDRH2 nuc var 1	atctatcctggtgactctgatacc
207		CDRH3 nuc var 2	gggagacatgcaatacgaggagatgggtttgactac
208		heavy ch aa var 1	EVQLVQSGAEVKKPGESLKISCQASGYSFTNYWIAWVRQMPGKGLEWMGI IYPGDSDTKYSPSFRGQVTISADKSISTAFLQWRSLRASDTAMYYCGRHAIRG DGFDYWGQGTLVTVSS
209		heavy ch nuc var 1	gaggtgcagctggtgcagtctggagcagaagtgaaaaagcccggggagtctctgaagatctcc tgtcaggcttctggatacagctttaccaactactggatcgcctgggtgcgccagatgcccgggaa aggcctggagtggatgggcatcatctatcctggtgactctgataccaaatacagcccgtccttcc gaggccaggtcaccatctcagccgacaagtccatcagtactgccttcctccagtggcgaagcctg agggcctcggacaccgccatgtattactgtgggagacatgcaatacgaggagatgggtttgact actggggccagggaaccctggtcaccgtctcctcag
210		CDRH3 aa var 2	ERHAIRGDGFDY
211		CDRH3 nuc var 2	gagagacatgcaatacgaggagatgggtttgactac
212		heavy ch aa var 2	EVQLVQSGAEVKKPGESLKISCQASGYSFTNYWIAWVRQMPGKGLEWMGI IYPGDSDTKYSPSFRGQVTISADKSISTAFLQWRSLRASDTAMYYCERHAIRG DGFDYWGQGTLVTVSS
213		light ch aa var 2	SYVLTQPPSVSVSPGQTATITCSGDKLGEKYACWYQQKPGQSPVLVMYQDT KRPSGIPERFSGSNSGNTATLTISGTRAMDEADYYCQAWDTNTVIFGGGTKL TVL
214		heavy ch nuc var 2	gaggtgcagctggtgcagtctggagcagaagtgaaaaagcccggggagtctctgaagatctcc tgtcaggcttctggatacagctttaccaactactggatcgcctgggtgcgccagatgcccgggaa aggcctggagtggatgggcatcatctatcctggtgactctgataccaaatacagcccgtccttcc gaggccaggtcaccatctcagccgacaagtccatcagtactgccttcctccagtggcgaagcctg agggcctcggacaccgccatgtattactgtgagagacatgcaatacgaggagatgggtttgact actggggccagggaaccctggtcaccgtctcctcag
215		light ch nuc var 2	tcctatgtcctgactcagccaccctcagtgtccgtgtccccaggacagacagccaccatcacctg ctctggagataaattgggggaaaaatacgcttgctggtatcagcagaagccaggccagtcccct gttttggtcatgtatcaagatacgaagcggccctcagggatccctgagcgattctctggctccaa ctctgggaacacagccactctgaccatcagcgggacccgggctatggatgaagctgactattac tgtcaggcgtgggacaccaacactgtgatattcggcggagggaccaagctgaccgtcctag
216	13H11	CDRH1 aa	GYTFTNYY
217		CDRH2 aa	IHPSSGGT
218		CDRH3 aa	GRAFRILGLSDVFVND
219		CDRL1 aa	QGINNY
220		CDRL2 aa	AAS
221		CDRL3 aa	QKYNSAPFT
222		CDRH1 nuc	ggatacaccttcaccaactactat
223		CDRH2 nuc	atccaccctagtagtggtggcaca
224		CDRH3 nuc	gggagagcctttcggatcttgggactttcggatgtctttgttaatgac
225		CDRL1 nuc	cagggcattaacaattat
226		CDRL2 nuc	gctgcatcc

227		CDRL3 nuc	caaaagtataacagtgccccccttcact
228		heavy ch aa	QVQLVQSGAEVKKPGASVKVSCKASGYTFTNYYIHWVRQAPGQGLEWMG IIHPSSGGTSYAQKFQGRVTMTRDTSTSTVSMDLSSLRSEDTAVYYCGRAFRI LGLSDVFVNDWGQGTVVTVSS
229		light ch aa	DIQMTQSPSSLSASVGDRVTITCRASQGINNYLAWYQQKPGKVPKLLIYAAS TLQSGVPSRFSGSGSGTAFTLTILSLQPEDVATYYCQKYNSAPFTFGPGTKVDI K
230		heavy ch nuc	caggtgcagttggtgcagtctggggctgaggtgaagaagcctggggcctcagtgaaggtttcct gcaaggcatctggatacaccttcaccaactactatatacactgggtgcgacaggcccctggaca aggacttgagtggatgggaataatccaccctagtagtggtggcacaagctacgcacagaagttc cagggcagagtcaccatgaccagggacacgtccacgagcacagtttccatggacctgagcagc ctgagatctgaagacacggccgtatattactgtgggagagcctttcggatcttgggactttcggat gtctttgttaatgactggggccagggaactgtggtcaccgtctcctcag
231		light ch nuc	gacatccagatgacccagtctccatcctccctgtctgcatctgtaggagacagagtcaccatcac ttgccgggcgagtcagggcattaacaattatttagcctggtatcagcagaaaccagggaaagtt cctaagctcctgatctatgctgcatccacattgcaatcaggggtcccatctcggttcagtggcagt ggatctgggacagctttcaccctcaccatcctcagcctgcagcctgaagatgttgcaacttattac tgtcaaaagtataacagtgccccccttcactttcggccctgggaccaaagtggacatcaaac
232	11B12	CDRH1 aa	GFTFTSSA
233		CDRH2 aa	IVLGSGNT
234		CDRH3 aa	AADRGRGGYNVYTY
235		CDRL1 aa	QTISNTY
236		CDRL3 aa	QQNGQSPWT
237		CDRH1 nuc	ggattcacctttactagctctgct
238		CDRH2 nuc	atcgtccttggcagcggtaacaca
239		CDRH3 nuc	gcggcagataggggtagaggtggatacaatgtatacacttac
240		CDRL1 nuc	cagactattagtaacacctac
241		CDRL3 nuc	cagcagaatggtcagtcaccttggacg
242		heavy ch aa	QMQLVQSGPQVKKPGTSVKVSCKASGFTFTSSAMQWVRQARGQRPEWI GWIVLGSGNTNYAQKFQERVTLTRDMSTATAYMELSSLRSEDTAVYYCAAD RGRGGYNVYTYWGQGTLVAVSS
243		light ch aa	EIVMTQSPGTLSLSPGERATLSCRASQTISNTYVAWYQQKPGQAPRLLIYGAS SRATGIPDRFSGSGSGTDFTLTIRRLEPEDFAVYYCQQNGQSPWTFGQGTN VEIK
244		heavy ch nuc	caaatgcagctggtgcagtctgggcctcaagtgaagaagcctgggacctcagtgaaggtctcct gcaaggcttctggattcacctttactagctctgctatgcagtgggtgcggcaggctcgtggacag cgccctgagtggataggatggatcgtccttggcagcggtaacacaaactacgcacagaagttcc aggaaagagtcacccttaccagggacatgtccactgctacagcctacatggaactgagcagcct gagatccgaggacacggccgtgtattactgtgcggcagataggggtagaggtggatacaatgt atacacttactggggccaggggaccctggtcgccgtctcctcag
245		light ch nuc	gaaattgtgatgacgcagtctccaggcaccctgtctttgtctccaggggaaagagccaccctctc ctgcagggccagtcagactattagtaacacctacgtggcctggtaccagcagaaacctggccag gctcccaggctcctcatctatggtgcatccagcagggccactggcatcccagacaggttcagtgg cagtgggtctgggacagacttcactctcaccatccgcagactggagcctgaagattttgcagtgt attactgtcagcagaatggtcagtcaccttggacgttcggccaagggaccaacgtggaaatcaa ac
246	3G16	CDRH1 aa	GYTFTGYY
247		CDRH2 aa	INPMTGAT

248		CDRH3 aa	ARGGPTSTRITGKRHFDL
249		CDRL1 aa	ISDVGAYNS
250		CDRL2 aa	DVT
251		CDRL3 aa	SSYTTSDTYV
252		CDRH1 nuc	ggatacaccttcaccggctactat
253		CDRH2 nuc	atcaaccctatgactggagccaca
254		CDRH3 nuc	gcgagaggaggtcctaccagtacccgaataacagggaaacggcacttcgatctc
255		CDRL1 nuc	atcagtgacgttggtgcttataactct
256		CDRL2 nuc	gacgtcact
257		CDRL3 nuc	agctcatatacaaccagtgacacttatgtc
258		heavy ch aa	RAQLVQSAAEMKNPGASVKVSCEASGYTFTGYYVHWMRQAPGQGLEWM GWINPMTGATKSPQKFQGRVTMTRDTSTTATHIELTRLRSDDSAVFFCARG GPTSTRITGKRHFDLWGRGTLITVAS
259		light ch aa	QSALTQPASVSGSPGESITISCTGTISDVGAYNSVSWYQQHSGTAPELIIYDVT NRPAGVSSRFSGSKSGNTASLTISWLQSEDEAEYYCSSYTTSDTYVFGSGTQV TVL
260		heavy ch nuc	cgggcgcagttggtgcagtctgcggctgagatgaagaaccctggggcctcagtgaaggtctcct gcgaggcttctggatacaccttcaccggctactatgtacactggatgcgacaggcccccggaca aggactagagtggatgggatggatcaaccctatgactggagccacaaagtctccacagaagttt cagggcagggtcaccatgaccagggacacttccaccaccgcaacccacatagaactgactagg ctgagatctgacgacagtgccgtctttttctgtgcgagaggaggtcctaccagtacccgaataac agggaaacggcacttcgatctctggggccgcggcaccctgatcactgtcgcctcag
261		light ch nuc	cagtctgccctgactcagcctgcctccgtgtctgggtctcctggagagtcgatcaccatctcctgc actggaaccatcagtgacgttggtgcttataactctgtctcctggtaccaacaacactcaggcac agcccccgaactcatcatttatgacgtcactaatcggcccgcaggggtttcgagtcgcttctctgg ctccaagtctggcaacacggcctccctgaccatctcttggctccagtctgaggacgaggctgaat attattgcagctcatatacaaccagtgacacttatgtcttcggaagtgggacccaagtcaccgtc ctaa
262	6L3	CDRH1 aa	GFTVSTTY
263		CDRH2 aa	IHTGGIFGVGGT
264		CDRH3 aa	AREHRGTIDAFDA
265		CDRL1 aa	QNIRNY
266		CDRL2 aa	TTS
267		CDRL3 aa	QQSYDGWT
268		CDRH1 nuc	ggattcaccgtcagtaccacctac
269		CDRH2 nuc	attcataccggtggcatttttggcgttggcggtaca
270		CDRH3 nuc	gcgagggaacatcggggaactatcgatgcttttgatgcc
271		CDRL1 nuc	cagaacattcgaaattat
272		CDRL2 nuc	actacatcc
273		CDRL3 nuc	caacagagttacgatgggtggacg
274		heavy ch aa	EVRLEESGGGLVQPGGSLRLSCAASGFTVSTTYMAWVRQAPGKGLEWVSLI HTGGIFGVGGTSYADSVKGRFTISRDTSKNTVSLQMSSLRVEDTAIYFCAREH RGTIDAFDAWGQGTVVIVSS
275		light ch aa	DIHMTQSPSSLSASVGDRVTITCRASQNIRNYLNWYQHKPGKAPKLLIYTTSR LQSGVPSRFSGSGSGTDFTLTVNSLQPEDFASYYCQQSYDGWTFGQGTKVE MK

276		heavy ch nuc	gaggtgcgactggaggagtctgggggaggcttggtccagcctgggggtccctgagactctcct gtgcagcctctggattcaccgtcagtaccacctacatggcctgggtccgccaggctccagggaa ggggctggaatgggtctcacttattcataccggtggcatttttggcgttggcggtacatcctacgc agactccgtgaagggcagattcaccatctccagagacacttccaagaacacagtgtctcttcaa atgagcagcctgagagtcgaggacacggccatctatttctgtgcgagggaacatcggggaacta tcgatgcttttgatgcctggggccaagggacagtggtcatcgtctcttcag
277		light ch nuc	gacatccacatgacccagtctccatcctccctgtctgcatctgttggagacagagtcaccatcact tgccgggcaagtcagaacattcgaaattatttaaattggtatcaacataaaccagggaaagccc ctaaactcctgatctatactacatcccgtctgcaaagtggggtcccatcaaggttcagtggcagt ggatctgggacagatttcactctcaccgtcaacagcctgcaaccagaagactttgcaagttacta ctgtcaacagagttacgatgggtggacgttcggccaggggaccaaggtggaaatgaaac
278	5F1	CDRH1 aa	GFTFSSYE
279		CDRH2 aa	IDFTGSTI
280		CDRH3 aa	VRDAGRWGTSWYYFDY
281		CDRL1 aa	SSNIGAGYD
282		CDRL2 aa	GNN
283		CDRL3 aa	QSYDSSLNGWV
284		CDRH1 nuc	ggattcactttcagtagctatgag
285		CDRH2 nuc	attgattttactggctcaaccatc
286		CDRH3 nuc	gtgagagatgcgggccgttggggcaccagttggtactactttgactat
287		CDRL1 nuc	agctccaacatcggggcaggttatgat
288		CDRL2 nuc	ggtaacaac
289		CDRL3 nuc	cagtcgtatgacagcagcctgaatggttgggtg
290		heavy ch aa	AVQLVESGGGLAQPGRSLRLSCKVSGFTFSSYEMNWVRQAPGKGLEWIAYI DFTGSTIYYADSVKGRFTISRDTARNSLYLQMNKLRVEDTAVYYCVRDAGRW GTSWYYFDYWGQGTLVTVSS
291		light ch aa	QSVLTQPPSVSGAPGQRVTISCTGLSSNIGAGYDIHWYQQIPGKAPKLLIYGN NNRPSGVPDRFSGSKSGTSVSLAITGLQAEDEADYYCQSYDSSLNGWVFGG GTRLTVL
292		heavy ch nuc	gcggtgcagctggtggagtctgggggcggcttggcacagcctggacggtccctgaggctctcgt gtaaagtgtctggattcactttcagtagctatgagatgaactgggtccgccaggctccagggaag gggctggagtggattgcatacattgattttactggctcaaccatctactacgcagactctgtgaag ggacgattcaccatttccagagacaccgccaggaactcactctatctgcagatgaacaaattga gagtcgaggacacggctgtttattactgtgtgagagatgcgggccgttggggcaccagttggtac tactttgactattggggccagggaaccctggtcaccgtctcctcag
293		light ch nuc	cagtctgtgctgacgcagccgccctcagtgtctggggccccagggcagagggtcaccatctcctg cactgggctcagctccaacatcggggcaggttatgatatacactggtatcagcagattccagga aaagcccccaaactcctcatctatggtaacaacaatcggccctcaggggtccctgaccgattctc tggctctaagtctggcacctcagtctccctggccatcactgggctccaggctgaggatgaggctg attattactgccagtcgtatgacagcagcctgaatggttgggtgttcggcggagggaccaggttg accgtcctaa
294		heavy ch aa var 1	AVQLVESGGDLAQPGRSLRLSCKVSGFTFSSYEMNWVRQAPGKGLEWIAYI DFTGSTIYYADSVKGRFTISRDTARNSLYLQMNKLRVEDTAVYYCVRDAGRW GTSWYYFDYWGQGTLVTVSS

295		heavy ch nuc var 1	gcggtgcagctggtggagtctgggggcgacttggcacagcctggacggtccctgaggctctcgt gtaaagtgtctggattcactttcagtagctatgagatgaactgggtccgccaggctccagggaag gggctggagtggattgcatacattgattttactggctcaaccatctactacgcagactctgtgaag ggacgattcaccatttccagagacaccgccaggaactcactctatctgcagatgaacaaattga gagtcgaggacacggctgtttattactgtgtgagagatgcgggccgttggggcaccagttggtac tactttgactattggggccagggaaccctggtcaccgtctcctcag
296	4H9.6	CDRH1 aa	GFTFSSHE
297		CDRH2 aa	IDFTGSII
298		CDRH3 aa	ARDGGRWGTSWYYFDY
299		CDRL1 aa	SSNFGAGYD
300		CDRL2 aa	GS
301		CDRL3 aa	QSYDSSLSAWV
302		CDRH1 nuc	ggattcaccttcagttctcatgag
303		CDRH2 nuc	attgattttactggcagtattata
304		CDRH3 nuc	gcgagagatgggggtcgttggggcaccagttggtactactttgactac
305		CDRL1 nuc	agttccaacttcggggcaggttatgat
306		CDRL2 nuc	ggtagc
307		CDRL3 nuc	cagtcctatgacagcagcctgagcgcttgggtg
308		heavy ch aa	AVQLVESGGGLVRPGGSLRLSCAASGFTFSSHEMHWVRQAPGKGLEWLSYI DFTGSIIYYADSVRGRFTISRDNTKKSLFLQMNSLRDEDTALYYCARDGGRW GTSWYYFDYWGQGVLVTVSS
309		light ch aa	QSVLTQPPSVSGAPGQRVTITCTGSSSNFGAGYDGHWYQQLPGTAPKLLIY GSNRPSGVPDRFSGSKSGTSVSLAITGLQADDEADYYCQSYDSSLSAWVFGG GTKLTVL
310		heavy ch nuc	gcggtgcagctggtggagtctgggggaggcttggtacggcctggagggtccctgagactctcct gtgcagcctctggattcaccttcagttctcatgagatgcactgggtccgccaggctccagggaag gggctggaatggctttcatacattgattttactggcagtattatatactacgcagactctgtgagg ggtcggttcaccatctccagagacaacaccaaaaagtcactgtttctgcaaatgaacagcctga gagacgaggatacggctctttattactgtgcgagagatgggggtcgttggggcaccagttggta ctactttgactactggggccagggagtcctggtcaccgtctcctcag
311		light ch nuc	cagtctgtgctgacgcagccgccctcagtgtctggggccccagggcagagggtcaccataacct gcactgggagcagttccaacttcggggcaggttatgatggacactggtaccagcaacttccagg aacagcccccaaactcctcatctatggtagcaatcggccctcaggggtccctgaccgattctctg gctccaagtctggcacctcagtctccctggccatcactgggctccaggctgacgatgaggctgat tattactgccagtcctatgacagcagcctgagcgcttgggtgttcggcggagggaccaagctgac cgtcctac
312		CDRH2aa var 1	IDFTGSSI
313		CDRH2 nuc var 1	attgattttactggcagtagtata
314		Heavy ch aa var 1	AVQLVESGGGLVRPGGSLRLSCAASGFTFSSHEMHWVRQAPGKGLEWLSYI DFTGSSIYYADSVRGRFTISRDNTKKSLFLQMNSLRDEDTALYYCARDGGRW GTSWYYFDYWGQGVLVTVSS
315		Heavy ch nuc var 1	gcggtgcagctggtggagtctgggggaggcttggtacggcctggagggtccctgagactctcct gtgcagcctctggattcaccttcagttctcatgagatgcactgggtccgccaggctccagggaag gggctggaatggctttcatacattgattttactggcagtagtatatactacgcagactctgtgagg ggtcggttcaccatctccagagacaataccaaaaagtcactgtttctgcaaatgaacagcctga gagacgaggatacggctctttattactgtgcgagagatgggggtcgttggggcaccagttggta ctactttgactactggggccagggagtcctggtcaccgtctcctcag
316	7H3	CDRH1 aa	GYTFTDYY

317		CDRH2 aa	FNPNSGGT
318		CDRH3 aa	AKDSAKTASAYYGLNFFYYGMDV
319		CDRL1 aa	SSNIGKNY
320		CDRL2 aa	KNN
321		CDRL3 aa	SAWDGSLSRPL
322		CDRH1 nuc	ggatacaccttcaccgactactat
323		CDRH2 nuc	ttcaaccctaacagtggtggcaca
324		CDRH3 nuc	gcgaaagattccgcgaaaactgcgagtgcttattatggactgaacttcttctactacggtatggacgtc
325		CDRL1 nuc	agttccaacatcggaaagaattat
326		CDRL2 nuc	aagaataat
327		CDRL3 nuc	tcagcgtgggatggcagcctgagtcgtccacta
328		heavy ch aa	QVQLVQSGAEVKNPGASVKVSCKASGYTFTDYYIHWVRQAPGQGLEWMGWFNPNSGGTNFVQNFQGRVTMTRDTSISTAYMELSRLRSDDTAMYYCAKDSAKTASAYYGLNFFYYGMDVWGQGTTVTVSS
329		light ch aa	QSVLSQPPSASGTPGQRVTISCSGSSSNIGKNYVYWYQQVPGTAPKLLMFKNNQRPSGVPDRFSGSKSGTSASLAISGLRSEDEADYYCSAWDGSLSRPLFGGGTKVTVL
330		heavy ch nuc	caggtgcagctggtgcagtctggggctgaagtgaagaaccctggggcctcagtgaaggtctcctgcaaggcttctggatacaccttcaccgactactatatacactgggtgcgacaggcccctggacaaggacttgagtggatgggctggttcaaccctaacagtggtggcacaaactttgtacagaactttcagggcagggtcaccatgaccagggacacgtccatcagcacagcctacatggagctcagcaggctgagatctgacgacacggccatgtattactgtgcgaaagattccgcgaaaactgcgagtgcttattatggactgaacttcttctactacggtatggacgtctggggccaagggaccacggtcaccgtctcctcag
331		light ch nuc	cagtctgtactgagtcagccaccctcagcatctgggacccccgggcagagggtcaccatctcttgttctggaagcagttccaacatcggaaagaattatgtatattggtaccagcaggtcccaggaacggcccccaaactcctcatgtttaagaataatcagcgaccctcaggggtccctgaccgattctctggctccaagtctggcacctctgcctccctggccatcagtgggctccggtccgaggatgaggctgattattattgttcagcgtgggatggcagcctgagtcgtccactattcggcggagggaccaaggtgaccgtcctag
332		CDRH3 aa var 1	ARDSAKTASAYYGLNFFYYGMDV
333		CDRH3 nuc var 1	gcgagagattccgcgaaaactgcgagtgcttattatggactgaacttcttctactacggtatggacgtc
334		heavy ch aa var 1	QVQLVQSGAEVKNPGASVKVSCKASGYTFTDYYIHWVRQAPGQGLEWMGWFNPNSGGTNFVQNFQGRVTMTRDTSISTAYMELSRLRSDDTAMYYCARDSAKTASAYYGLNFFYYGMDVWGQGTTVTVSS
335		heavy ch nuc var 1	caggtgcagctggtgcagtctggggctgaagtgaagaaccctggggcctcagtgaaggtctcctgcaaggcttctggatacaccttcaccgactactatatacactgggtgcgacaggcccctggacaaggacttgagtggatgggctggttcaaccctaacagtggtggcacaaactttgtacagaactttcagggcagggtcaccatgaccagggacacgtccatcagcacagcctacatggagctcagcaggctgagatctgacgacacggccatgtattactgtgcgagagattccgcgaaaactgcgagtgcttattatggactgaacttcttctactacggtatggacgtctggggccaagggaccacggtcaccgtctcctcag
336	6B4	CDRH1 aa	GFRFNEFN
337		CDRH2 aa	ISIDGRHK
338		CDRH3 aa	VTDGKAVDGFSGILEF
339		CDRL1 aa	QSVGGY

340		CDRL2 aa	DAS
341		CDRL3 aa	QQRNNWPPLT
342		CDRH1 nuc	ggattcaggttcaatgaatttaat
343		CDRH2 nuc	atctcaattgatgggagacacaaa
344		CDRH3 nuc	gtgacagatgggaaagcagtggatgggttttccggaattttagagttc
345		CDRL1 nuc	cagagtgttggcggctac
346		CDRL2 nuc	gatgcatcc
347		CDRL3 nuc	cagcagcgtaacaactggccaccactcact
348		heavy ch aa	QVQLVESGGGVVQPGRSLRLSCAASGFRFNEFNMHWVRQAPGKGLEWVA VISIDGRHKYNADSVEGRFTISRDNSRNTLYLQMNSLRVEDTALYYCVTDGK AVDGFSGILEFWGQGTPVTVST
349		light ch aa	EIVLTQSPATLSLSPGERATLSCWASQSVGGYLAWYQQKPGQAPRLLIYDASI RATGIPARFSGSGSGTHFTLTINSLEPEDFAVYYCQQRNNWPPLTFGGGTKV EIK
350		heavy ch nuc	caggtgcaactggtggagtctgggggaggcgtggtccagcctgggaggtccctgagactctcct gtgcagcctctggattcaggttcaatgaatttaatatgcactgggtccgccaggctccaggcaag ggcctggagtgggtggcagttatctcaattgatgggagacacaaatacaacgcagactccgtgg agggccgattcaccatctccagagacaattccagaaacactctttatctgcaaatgaacagcctg agagttgaggacacggctctttattactgtgtgacagatgggaaagcagtggatgggttttccgg aattttagagttctggggccagggaaccccagtcaccgtctccacag
351		light ch nuc	gaaattgtgttgacacagtctccggccaccctgtctttgtctccaggggagagagccaccctctcc tgctgggccagtcagagtgttggcggctacttagcctggtaccaacaaaaacctggccaggctc ccaggctcctcatctatgatgcatccatcagggccactggcatcccagccaggttcagtggcagt gggtctgggacacacttcactctcaccatcaatagcctcgagcctgaagattttgccgtttattac tgtcagcagcgtaacaactggccaccactcactttcggcggagggaccaaggtggagatcaaa c
352	10C6	CDRH1 aa	GFSFSNFE
353		CDRH1 nuc	ggattcagtttcagtaactttgag
354		CDRH2 nuc	attgattttactggctctaccatc
355		CDRH3 nuc	gtgagagatgcgggccgttggggcaccagttggtactattttgactat
356		CDRL3 nuc	cagtcatatgacagcagcctgaatggttgggtg
357		heavy ch aa	AVQLVESGGGLAQPGRSLRLSCKVSGFSFSNFEMNWVRQAPGKGLEWIAYI DFTGSTIYYSDSVKGRFTISRDTARNSLYLQMNKLRVEDTAVYYCVRDAGRW GTSWYYFDYWGQGTLVTVSS
358		heavy ch nuc	gcggtgcagctggtggaatccgggggcggcttggcacagcctggacggtccctgaggctctcgt gtaaagtgtccggattcagtttcagtaactttgagatgaactgggtccgccaggctccagggaag gggctggagtggattgcatatattgattttactggctctaccatctactactcagactctgtgaag ggacggtttaccatttccagagacaccgccaggaactcactctatctgcagatgaacaaattga gagtcgaggacacggctgtttattactgtgtgagagatgcgggccgttggggcaccagttggtac tattttgactattggggccagggcaccctggtcaccgtctcctcag
359		light ch nuc	Cagtctgtgctgacgcagccgccctcagtgtctggggccccagggcagagggtcaccatctcct gcactgggctcagctccaacatcggggcaggttatgatatacactggtatcagcagattccagg aaaagcccccaaactcctcatctatggtaacaacaatcggccctcaggggtccctgaccgattct ctggctctaagtctggcacctcagtctccctggccatcactgggctccaggctgaggatgaggct gattattactgccagtcatatgacagcagcctgaatggttgggtgttcggcggagggaccaggtt gaccgtcctaa
360	2B11	CDRH1 aa	GFTFGSYE
361		CDRL3 aa	QSYDNSLNGWV

362	CDRH1 nuc	ggattcaccttcggaagctatgaa
363	CDRH2 nuc	attgactttactggttcaaccatc
364	CDRH3 nuc	gtgagagatgcgggccgctggggcaccagttggtattactttgactat
365	CDRL2 nuc	ggcaacaac
366	CDRL3 nuc	cagtcctatgacaacagcctgaatggttgggtg
367	heavy ch aa	AVRLVESGGGLAQPGRSLRLSCQVSGFTFGSYEMNWVRQAPGKGLEWIAYI DFTGSTIYYADSVKGRFTISRNTARNSLYLQMNSLRVEDTAVYYCVRDAGRW GTSWYYFDYWGQGTRVTVSP
368	light ch aa	QSVLTQPPSVSGAPGQRVTISCTGISSNIGAGYDIHWYQQIPGKAPKLLVYG NNNRPSGVPDRFSGSKSGTSVSLAITGLQVEDEADYYCQSYDNSLNGWVFG GGTRLTVL
369	heavy ch nuc	gcggtgcggctggtggagtctgggggaggcttggcacagcctggacggtccctgagactctcgt gtcaagtgtctggattcaccttcggaagctatgaaatgaactgggtccgccaggctcccggcaa gggactggagtggattgcctacattgactttactggttcaaccatctactacgcagactctgtgaa gggccgattcaccatatccagaaacaccgccaggaactcactctatctgcagatgaacagcctg agagtcgaggacacggctgtttattactgtgtgagagatgcgggccgctggggcaccagttggt attactttgactattggggccaaggaacccgggtcaccgtctccccag
370	light ch nuc	cagtctgtgctgacgcagccgccctcagtgtctggggccccagggcagagggtcaccatctcctg cactgggatcagctccaacatcggggcaggttatgatatacactggtatcagcagattccagga aaagcccccaaactcctcgtctatggcaacaacaatcggccctcaggagtccctgaccgattctc tggctctaagtctggcacctcagtctccctggccatcactgggctccaggttgaggatgaggctg attattactgccagtcctatgacaacagcctgaatggttgggtgttcggcggagggaccaggttg accgtcctaa