

Supplementary Figure S1

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Sequence name	V3 loop Sequence																																			mAb		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	2219	447-52D	
Consensus A1	C	T	R	P	N	N	N	T	R	K	S	I	R	I	G	P	G	Q	A	F	Y	A	T	G	D	I	I	G	D	I	R	Q	A	H	C	0.029	0.58	
Consensus AE	C	T	R	P	S	N	N	T	R	T	S	I	T	I	G	P	G	Q	V	F	Y	R	T	G	D	I	I	G	D	I	R	K	A	Y	C	0.23	1.2	
Consensus B	C	T	R	P	N	N	N	T	R	K	S	I	H	I	G	P	G	R	A	F	Y	T	T	G	E	I	I	G	D	I	R	Q	A	H	C	0.0011	0.00061	
Consensus B-D29A	C	T	R	P	N	N	N	T	R	K	S	I	H	I	G	P	G	R	A	F	Y	T	T	G	E	I	I	G	A	I	R	Q	A	H	C	0.0012	0.00026	
Consensus B-D29N	C	T	R	P	N	N	N	T	R	K	S	I	H	I	G	P	G	R	A	F	Y	T	T	G	E	I	I	G	N	I	R	Q	A	H	C	0.00084	0.00027	
Consensus B-H13P	C	T	R	P	N	N	N	T	R	K	S	I	P	I	G	P	G	R	A	F	Y	T	T	G	E	I	I	G	D	I	R	Q	A	H	C	0.00016	0.00048	
Consensus B-H13P-I14M	C	T	R	P	N	N	N	T	R	K	S	I	P	M	G	P	G	R	A	F	Y	T	T	G	E	I	I	G	D	I	R	Q	A	H	C	0.021	0.00078	
Consensus B-H13R-T22A-E25D	C	T	R	P	N	N	N	T	R	K	S	I	R	I	G	P	G	R	A	F	Y	A	T	G	D	I	I	G	D	I	R	Q	A	H	C	0.001	0.0011	
Consensus B-H13T-R18Q-A19T-T22A-E25D	C	T	R	P	N	N	N	T	R	K	S	I	T	I	G	P	G	Q	T	F	Y	A	T	G	D	I	I	G	D	I	R	Q	A	H	C	6.6	>20	
Consensus B-H13T-T22A-E25D	C	T	R	P	N	N	N	T	R	K	S	I	T	I	G	P	G	R	A	F	Y	A	T	G	D	I	I	G	D	I	R	Q	A	H	C	0.0044	0.067	
Consensus B-I12M	C	T	R	P	N	N	N	T	R	K	S	M	H	I	G	P	G	R	A	F	Y	T	T	G	E	I	I	G	D	I	R	Q	A	H	C	0.012	0.00037	
Consensus B-I12M-H13R	C	T	R	P	N	N	N	T	R	K	S	M	R	I	G	P	G	R	A	F	Y	T	T	G	E	I	I	G	D	I	R	Q	A	H	C	0.0032	<0.000128	
Consensus B-I12V	C	T	R	P	N	N	N	T	R	K	S	V	H	I	G	P	G	R	A	F	Y	T	T	G	E	I	I	G	D	I	R	Q	A	H	C	0.0012	0.00021	
Consensus B-I12V-H13R-T22A-E25D	C	T	R	P	N	N	N	T	R	K	S	V	R	I	G	P	G	R	A	F	Y	A	T	G	D	I	I	G	D	I	R	Q	A	H	C	0.00052	0.00025	
Consensus B-I14L	C	T	R	P	N	N	N	T	R	K	S	I	H	L	G	P	G	R	A	F	Y	T	T	G	E	I	I	G	D	I	R	Q	A	H	C	0.00066	0.00026	
Consensus B-I14M	C	T	R	P	N	N	N	T	R	K	S	I	H	M	G	P	G	R	A	F	Y	T	T	G	E	I	I	G	D	I	R	Q	A	H	C	0.001	0.00026	
Consensus B-K10A	C	T	R	P	N	N	N	T	R	A	S	I	H	I	G	P	G	R	A	F	Y	T	T	G	E	I	I	G	D	I	R	Q	A	H	C	0.19	0.00038	
Consensus B-K10E	C	T	R	P	N	N	N	T	R	E	S	I	H	I	G	P	G	R	A	F	Y	T	T	G	E	I	I	G	D	I	R	Q	A	H	C	>20	0.00033	
Consensus B-P16A	C	T	R	P	N	N	N	T	R	K	S	I	H	I	G	A	G	R	A	F	Y	T	T	G	E	I	I	G	D	I	R	Q	A	H	C	0.00056	0.0011	
Consensus B-R18K	C	T	R	P	N	N	N	T	R	K	S	I	H	I	G	P	G	K	A	F	Y	T	T	G	E	I	I	G	D	I	R	Q	A	H	C	0.00076	0.0068	
Consensus B-R18Q	C	T	R	P	N	N	N	T	R	K	S	I	H	I	G	P	G	Q	A	F	Y	T	T	G	E	I	I	G	D	I	R	Q	A	H	C	0.0012	0.4	
Consensus B-R3A	C	T	A	P	N	N	N	T	R	K	S	I	H	I	G	P	G	R	A	F	Y	T	T	G	E	I	I	G	D	I	R	Q	A	H	C	0.00053	0.00027	
Consensus B-R3Q	C	T	Q	P	N	N	N	T	R	K	S	I	H	I	G	P	G	R	A	F	Y	T	T	G	E	I	I	G	D	I	R	Q	A	H	C	0.00053	0.00037	
Consensus B-R9A	C	T	R	P	N	N	N	T	A	K	S	I	H	I	G	P	G	R	A	F	Y	T	T	G	E	I	I	G	D	I	R	Q	A	H	C	0.0007	0.0005	
Consensus B-R9E	C	T	R	P	N	N	N	T	E	K	S	I	H	I	G	P	G	R	A	F	Y	T	T	G	E	I	I	G	D	I	R	Q	A	H	C	0.004	0.0031	
Consensus B-T22A	C	T	R	P	N	N	N	T	R	K	S	I	H	I	G	P	G	R	A	F	Y	A	T	G	E	I	I	G	D	I	R	Q	A	H	C	0.0023	0.0013	
Consensus B-T22A-E25D	C	T	R	P	N	N	N	T	R	K	S	I	H	I	G	P	G	R	A	F	Y	A	T	G	D	I	I	G	D	I	R	Q	A	H	C	0.0041	0.0024	
Consensus B-T22A-Q32K	C	T	R	P	N	N	N	T	R	K	S	I	H	I	G	P	G	R	A	F	Y	A	T	G	E	I	I	G	D	I	R	K	A	H	C	0.00061	0.00049	
Consensus B-T8I	C	T	R	P	N	N	N	T	I	R	K	S	I	H	I	G	P	G	R	A	F	Y	T	T	G	E	I	I	G	D	I	R	Q	A	H	C	0.00042	0.00027
Consensus C	C	T	R	P	N	N	N	T	R	K	S	I	R	I	G	P	G	Q	T	F	Y	A	T	G	D	I	I	G	D	I	R	Q	A	H	C	0.15	>20	
Consensus C-D25E	C	T	R	P	N	N	N	T	R	K	S	I	R	I	G	P	G	Q	T	F	Y	A	T	G	E	I	I	G	D	I	R	Q	A	H	C	0.35	>20	
Consensus C-I12M-D25E	C	T	R	P	N	N	N	T	R	K	S	M	R	I	G	P	G	Q	T	F	Y	A	T	G	E	I	I	G	D	I	R	Q	A	H	C	0.23	0.55	
Consensus C-I12M-R13P-T19A-D25E	C	T	R	P	N	N	N	T	R	K	S	M	P	I	G	P	G	Q	A	F	Y	A	T	G	E	I	I	G	D	I	R	Q	A	H	C	>20	>20	
Consensus C-I12M-R13S-T19A-D25E	C	T	R	P	N	N	N	T	R	K	S	M	S	I	G	P	G	Q	A	F	Y	A	T	G	E	I	I	G	D	I	R	Q	A	H	C	>20	>20	
Consensus C-I12V	C	T	R	P	N	N	N	T	R	K	S	V	R	I	G	P	G	Q	T	F	Y	A	T	G	D	I	I	G	D	I	R	Q	A	H	C	0.054	0.76	
Consensus C-I14F-D25E	C	T	R	P	N	N	N	T	R	K	S	I	R	F	G	P	G	Q	T	F	Y	A	T	G	E	I	I	G	D	I	R	Q	A	H	C	0.1	0.96	
Consensus C-I14L-D25E	C	T	R	P	N	N	N	T	R	K	S	I	R	L	G	P	G	Q	T	F	Y	A	T	G	E	I	I	G	D	I	R	Q	A	H	C	2.3	>20	
Consensus C-I14M-D25E	C	T	R	P	N	N	N	T	R	K	S	I	R	M	G	P	G	Q	T	F	Y	A	T	G	E	I	I	G	D	I	R	Q	A	H	C	0.034	12.1	
Consensus C-I14V-D25E	C	T	R	P	N	N	N	T	R	K	S	I	R	V	G	P	G	Q	T	F	Y	A	T	G	E	I	I	G	D	I	R	Q	A	H	C	0.01	0.45	
Consensus C-K10A-D25E	C	T	R	P	N	N	N	T	R	A	S	I	R	I	G	P	G	Q	T	F	Y	A	T	G	E	I	I	G	D	I	R	Q	A	H	C	>20	0.025	
Consensus C-K10A-I14M-D25E	C	T	R	P	N	N	N	T	R	A	S	I	R	M	G	P	G	Q	T	F	Y	A	T	G	E	I	I	G	D	I	R	Q	A	H	C	>20	6.5	
Consensus C-K10E-D25E	C	T	R	P	N	N	N	T	R	E	S	I	R	I	G	P	G	Q	T	F	Y	A	T	G	E	I	I	G	D	I	R	Q	A	H	C	>20	1	
Consensus C-K10R-R13P-I14V-D25E	C	T	R	P	N	N	N	T	R	S	I	P	V	G	P	G	Q	T	F	Y	A	T	G	E	I	I	G	D	I	R	Q	A	H	C	>20	>20		
Consensus C-R13N-I14F-T19A	C	T	R	P	N	N	N	T	R	K	S	I	N	F	G	P	G	Q	A	F	Y	A	T	G	D	I	I	G	D	I	R	Q	A	H	C	0.036	>20	
Consensus C-R13P-T19A-D25E	C	T	R	P	N	N	N	T	R	K	S	I	P	I	G	P	G	Q	A	F	Y	A	T	G	E	I	I	G	D	I	R	Q	A	H	C	5	>20	
Consensus C-R13S-T19A-D25E	C	T	R	P	N	N	N	T	R	K	S	I	S	I	G	P	G	Q	A	F	Y	A	T	G	E	I	I	G	D	I	R	Q	A	H	C	1.1	>20	
Consensus C-R13T-I14F-T19A-D25E	C	T	R	P	N	N	N	T	R	K	S	I	T	F	G	P	G	Q	A	F	Y	A	T	G	E	I	I	G	D	I	R	Q	A	H	C	0.075	>20	
Consensus C-R13T-I14L-T19A-D25E	C	T	R	P	N	N	N	T	R	K	S	I	T	L	G	P	G	Q	A	F	Y	A	T	G	E	I	I	G	D	I	R	Q	A	H	C	12	>20	
Consensus C-R9A-D25E	C	T	R	P	N	N	N	T	A	K	S	I	R	I	G	P	G	Q	T	F	Y	A	T	G	E	I	I	G	D	I	R	Q	A	H	C	3.5	>20	
Consensus C-R9A-I14V-D25E	C	T	R	P	N	N	N	T	A	K	S	I	R	V	G	P	G	Q	T	F	Y	A	T	G	E	I	I	G	D	I	R	Q	A	H	C	0.082	>20	
Consensus C-R9A-R13G-D25E	C	T	R	P	N	N	N	T	A	K	S	I	G	I	G	P	G	Q	T	F	Y	A	T	G	E	I	I	G	D	I	R	Q	A	H	C	>20	>20	
Consensus C-R9E-D25E	C	T	R	P	N	N	N	T	E	K	S	I	R	I	G	P	G	Q	T	F	Y	A	T	G	E	I	I	G	D	I	R	Q	A	H	C	3.6	>20	
Consensus C-R9I-I12M-R13G-D25E	C	T	R	P	N	N	N	T	I	K	S	M	G	I	G	P	G	Q	T	F	Y	A	T	G	E	I	I	G	D	I	R	Q	A	H	C	>20	>20	
Consensus C-R9I-K10Q-I12M-R13G-D25E	C	T	R	P	N	N	N	T	I	Q	S	M	G	I	G	P	G	Q	T	F	Y	A	T	G	E	I	I	G	D	I	R	Q	A	H	C	>20	>20	
Consensus C-R9Q-I14V-D25E	C	T	R	P	N	N	N	T	Q	K	S	I	R	V	G	P	G	Q	T	F	Y	A	T	G	E	I	I</											