

Table S1. Minimally mutated variants of VRC01 (MinVRC01) and 12A21 (Min12A21) show high retention of neutralization breadth and potency compared to affinity-mature antibodies. VRC01, MinVRC01, 12A21, and Min12A21 were tested on a cross-clade 80-virus panel. Presented values are neutralization IC₅₀ in µg/ml and colored according to the listed legend.

VIRUS	CLADE	VRC01	MinVRC01	12A21	Min12A21	Neutralization IC ₅₀ (µg/mL)
Q23.17	A	0.083	0.128	0.036	0.105	50
Q461.e2	A	0.425	0.642	0.077	0.267	10.0
Q769.d22	A	0.052	0.015	0.021	0.060	1.00
0330.v4.c3	A	0.069	0.089	0.023	0.054	0.100
0260.v5.c36	A	0.252	0.319	0.141	0.480	0.010
191084 B7-19	A	0.054	0.030	0.033	4.049	0.001
QH0692.42	B	1.46	1.33	0.799	1.857	
SC422661.8	B	0.097	0.014	0.338	> 50	
PVO.4	B	0.648	0.328	0.262	0.886	
TRO.11	B	0.329	0.332	0.070	0.203	
AC10.0.29	B	1.98	1.45	0.710	4.51	
RHPA4259.7	B	0.043	0.016	0.005	> 50	
REJO4541.67	B	0.034	0.020	0.097	> 50	
WITO4160.33	B	0.129	0.516	0.025	0.280	
CAAN5342.A2	B	2.42	0.750	0.083	1.24	
WEAU_d15_410_5017	B (T/F)	0.125	0.012	0.269	> 50	
1006_11_C3_1601	B (T/F)	0.189	3.43	0.010	2.76	
1054_07_TC4_1499	B (T/F)	0.001	0.934	0.049	0.256	
1056_10_TA11_1826	B (T/F)	1.71	0.764	0.466	> 50	
6240_08_TA5_4622	B (T/F)	1.54	1.57	0.034	> 50	
6244_13_B5_4576	B (T/F)	0.160	0.055	0.480	0.987	
62357_14_D3_4589	B (T/F)	0.475	0.169	0.070	0.267	
SC05_8C11_2344	B (T/F)	0.543	0.253	0.120	0.778	
Du156.12	C	0.105	0.012	0.011	2.24	
Du422.1	C	>50	>50	0.665	> 50	
ZM214M.PL15	C	0.748	0.686	0.049	0.197	
ZM249M.PL1	C	0.041	0.025	0.028	> 50	
ZM53M.PB12	C	1.07	0.780	0.131	0.447	
ZM109F.PB4	C	0.084	0.044	0.094	> 50	
CAP45.2.00.G3	C	1.20	>50	0.026	> 50	
CAP210.2.00.E8	C	>50	>50	> 50	> 50	
HIV-001428-2.42	C	0.017	0.002	0.010	2.22	
HIV-16055-2.3	C	0.051	0.030	0.014	0.071	
HIV-16845-2.22	C	3.08	1.11	2.99	> 50	
Ce1176_A3	C (T/F)	1.06	0.750	0.211	0.739	
Ce2010_F5	C (T/F)	0.231	0.101	0.061	0.184	
Ce2060_G9	C (T/F)	0.230	0.123	0.053	0.163	
Ce703010054_2A2	C (T/F)	0.431	0.292	0.170	> 50	
246F C1G	C (T/F)	1.55	>50	0.059	> 50	
249M B10	C (T/F)	0.079	0.024	0.053	0.178	
ZM247v1(Rev-)	C (T/F)	0.279	>50	0.022	> 50	
7030102001E5(Rev-)	C (T/F)	0.541	0.098	0.008	3.69	
1394C9G1(Rev-)	C (T/F)	0.329	0.811	0.008	0.019	
Ce704809221_1B3	C (T/F)	0.464	0.073	0.047	0.119	
X2131_C1_B5	G	0.477	0.263	0.925	> 50	
P1981_C5_3	G	0.189	0.091	0.086	3.10	
X1632_S2_B10	G	0.055	0.022	0.109	> 50	
3016.v5.c45	D	0.066	0.460	0.010	0.099	
231965.c01	D	0.133	0.042	> 50	> 50	

Table S1 (Continued)

VIRUS	CLADE	VRC01	MinVRC01	12A21	Min12A21	Neutralization IC ₅₀ (µg/mL)
3301.v1.c24	AC	0.080	0.019	0.011	> 50	50
6041.v3.c23	AC	0.009	0.250	0.002	0.007	10.0
6540.v4.c1	AC	>50	>50	0.022	1.10	1.00
6545.v4.c1	AC	>50	>50	> 50	> 50	0.100
CNE19	BC	0.191	0.026	0.023	> 50	0.010
CNE21	BC	0.398	3.78	0.027	1.30	0.001
CNE17	BC	1.42	0.543	2.379	> 50	
CNE30	BC	0.827	0.915	0.170	0.438	
CNE52	BC	0.084	0.022	0.026	0.120	
CNE53	BC	0.121	0.024	0.028	0.047	
CNE58	BC	0.186	0.634	0.032	50	
6480.v4.c25	CD	0.030	0.040	0.023	0.069	
6952.v1.c20	CD	0.031	0.047	> 50	> 50	
6811.v7.c18	CD	0.122	0.039	0.035	0.169	
89-F1_2_25	CD	>50	>50	> 50	> 50	
0815.v3.c3	ACD	0.012	0.005	0.013	0.044	
T257-31	CRF02_AG	0.706	0.599	0.041	0.034	
928-28	CRF02_AG	0.173	0.103	0.161	0.476	
T250-4	CRF02_AG	>50	>50	> 50	> 50	
T251-18	CRF02_AG	1.97	1.17	1.03	> 50	
T278-50	CRF02_AG	>50	>50	> 50	> 50	
T255-34	CRF02_AG	0.260	0.303	0.048	0.132	
211-9	CRF02_AG	11.0	>50	0.048	7.44	
C1080.c03	CRF01_AE	1.48	>50	0.036	0.120	
R2184.c04	CRF01_AE	0.061	0.038	0.034	1.49	
R3265.c06	CRF01_AE	0.326	1.09	0.084	0.180	
C3347.c11	CRF01_AE	0.069	0.015	0.010	0.021	
BJOX009000.02.4	CRF01_AE	1.34	1.89	> 50	> 50	
BJOX015000.11.5	CRF01_AE (T/F)	0.081	0.566	0.199	0.870	
BJOX025000.01.1	CRF01_AE (T/F)	0.601	1.06	0.051	0.144	
BJOX028000.10.3	CRF01_AE (T/F)	>50	>50	0.042	0.017	