Supplementary Figures

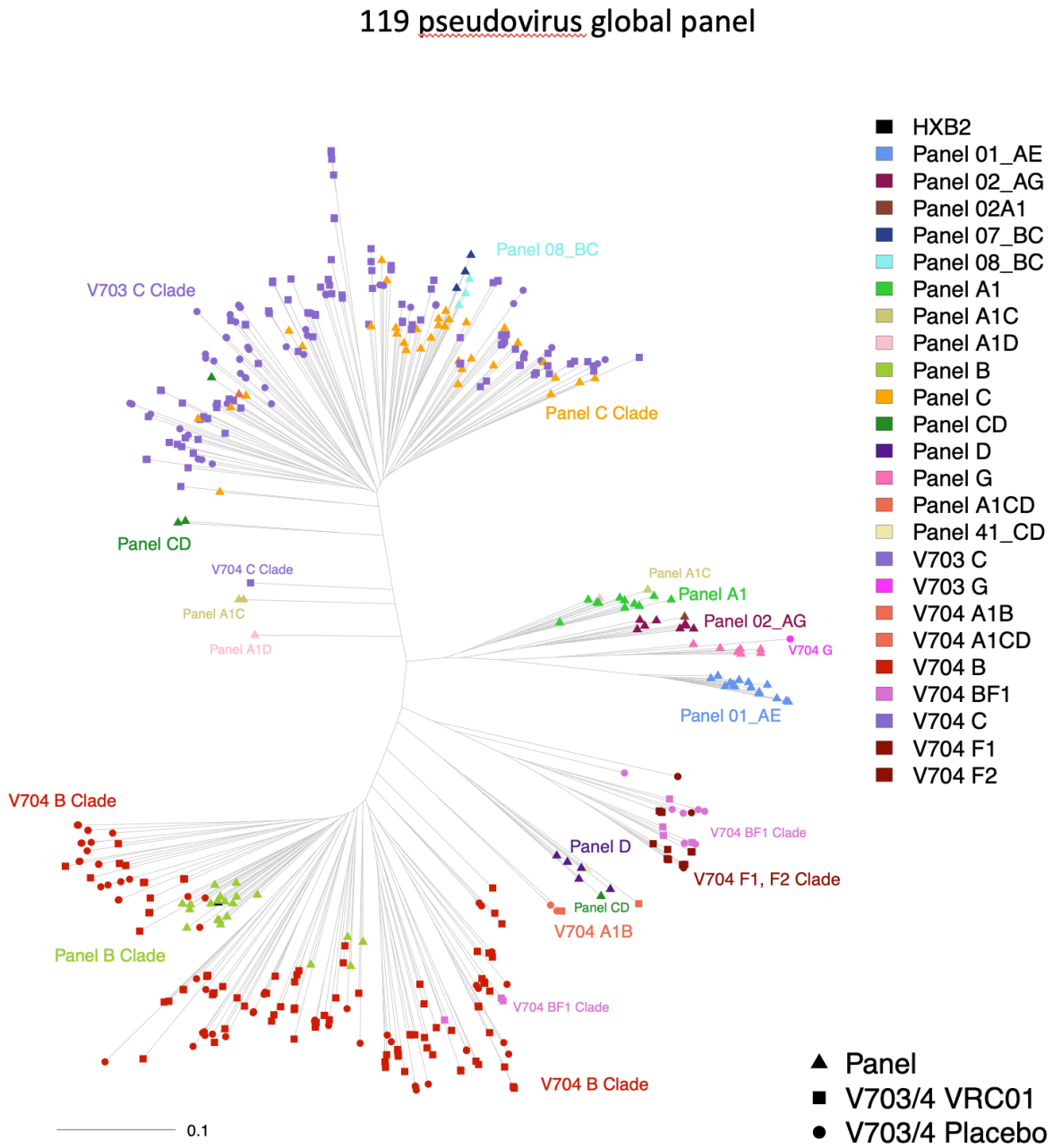

Fig. S1. Midpoint rooted phylogenetic tree comparing a global panel of 119 viruses used to assess bnAb breadth and potency (1-4) to 154 AMP V703 and 191 V704 trial sequences (5, 6). Phylogenetic analysis shows that within B and C clades the 119 viral panel sequences are not representative of the diversity sampled in the more contemporary AMP trial. Note that the exact composition of the panel can vary by a few viruses between studies. The phylogenetic tree was based on data from a version of the 119 virus panel that was downloaded using the CATNAP tool from the Los Alamos Database accessed on July 1, 2025 (7).

Fig. S2. Midpoint rooted phylogenetic tree comparing a global panel of 200 clade C viruses used to assess bnAb breadth and potency (1-4) to 154 AMP V703 and 191 V704 trial sequences (5, 6). Of all commonly used panels described in this paper, this exclusively clade C panel, while lacking representation for all other clades, was the closest to contemporary C clade viruses sampled from the AMP V703 participants. Notably though, within the clade C subtree, AMP sequences tend to have longer branch lengths than the clade C panel pseudoviruses and are more spread out in the tree. The phylogenetic tree was based on data from a version of the 200 virus panel that was downloaded using the CATNAP tool from the Los Alamos Database accessed on July 1, 2025 (7).

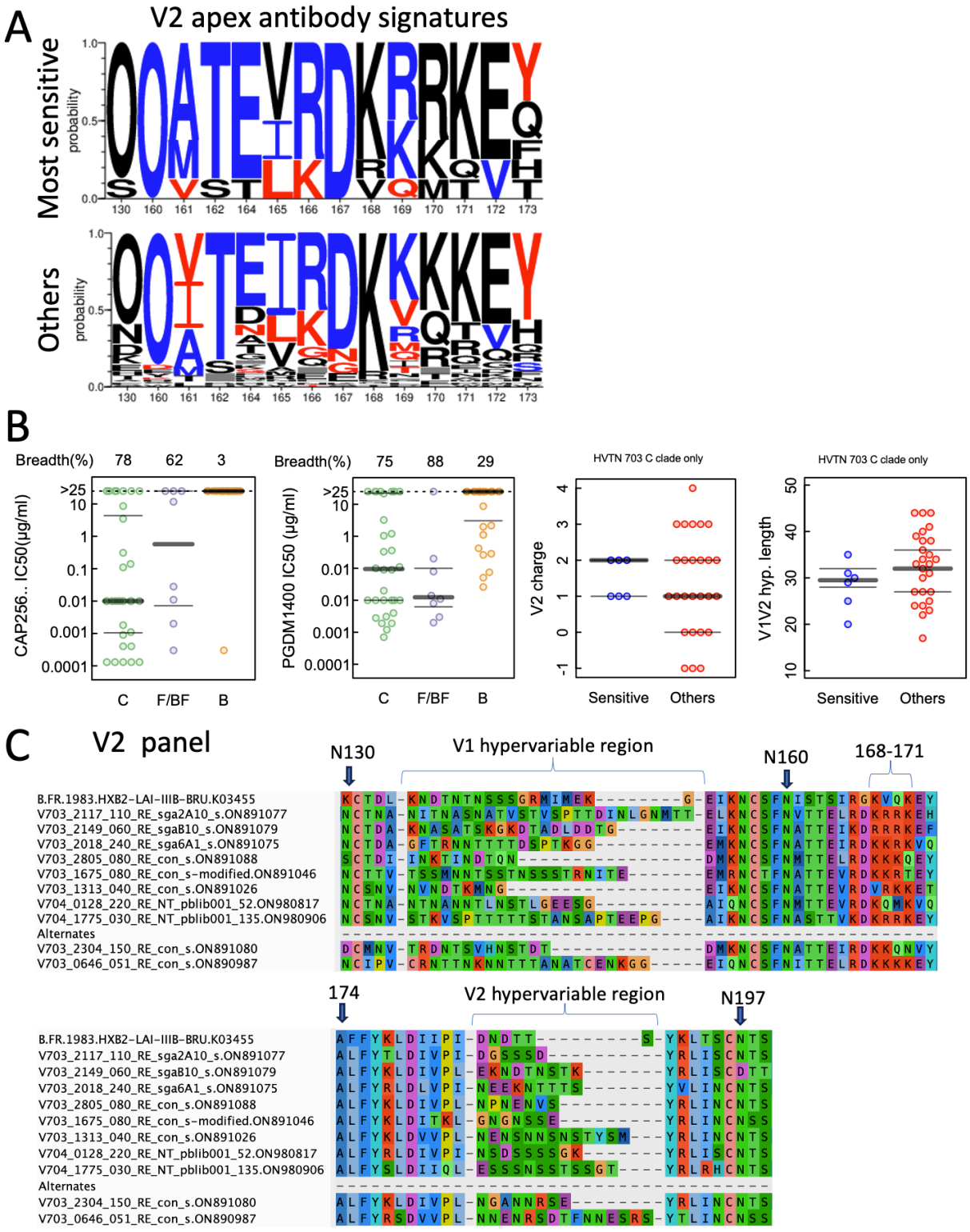

Fig. S3. Details regarding V2 apex bNab signatures within the V2 apex bnAb sensitive panel for detection of developing responses. A. The frequency of V2 apex bnAb sensitivity/resistance signatures as defined in Bricault et al. (8) in the class specific panel versus other AMP viruses. The height of the letter is indicative of the frequency of the amino acid in a given position in each group. An O indicates an N-linked glycosylation site. Blue are sensitivity signatures, red are resistance signatures, and black amino acids were not significantly associated with either one. **B.** On the left we illustrate (also see Table S5) the enhanced sensitivity of C

clade and F/BF viruses relative to B clade viruses among the AMP collection of viruses to neutralization by the V2 apex bNab CAP256 VRC26.25 LS (far left) and PGDM1400 (second to the left). On the right we show the distribution of hypervariable region characteristics that were associated with V2 apex bNab neutralization (8). As B clade viruses tend to be resistant regardless of loop characteristics, we restricted these comparisons to AMP C clade viruses. Positive V2 charge and shorter combined V1V2 hypervariable region lengths are signatures of sensitivity to V2 Apex antibodies (8), and V2 hypervariable loop positive charge and shorter hypervariable regions are slightly enriched in the sensitive panel. **C.** The sequence alignment for the V2 apex bNab sensitive panel across the epitope region.

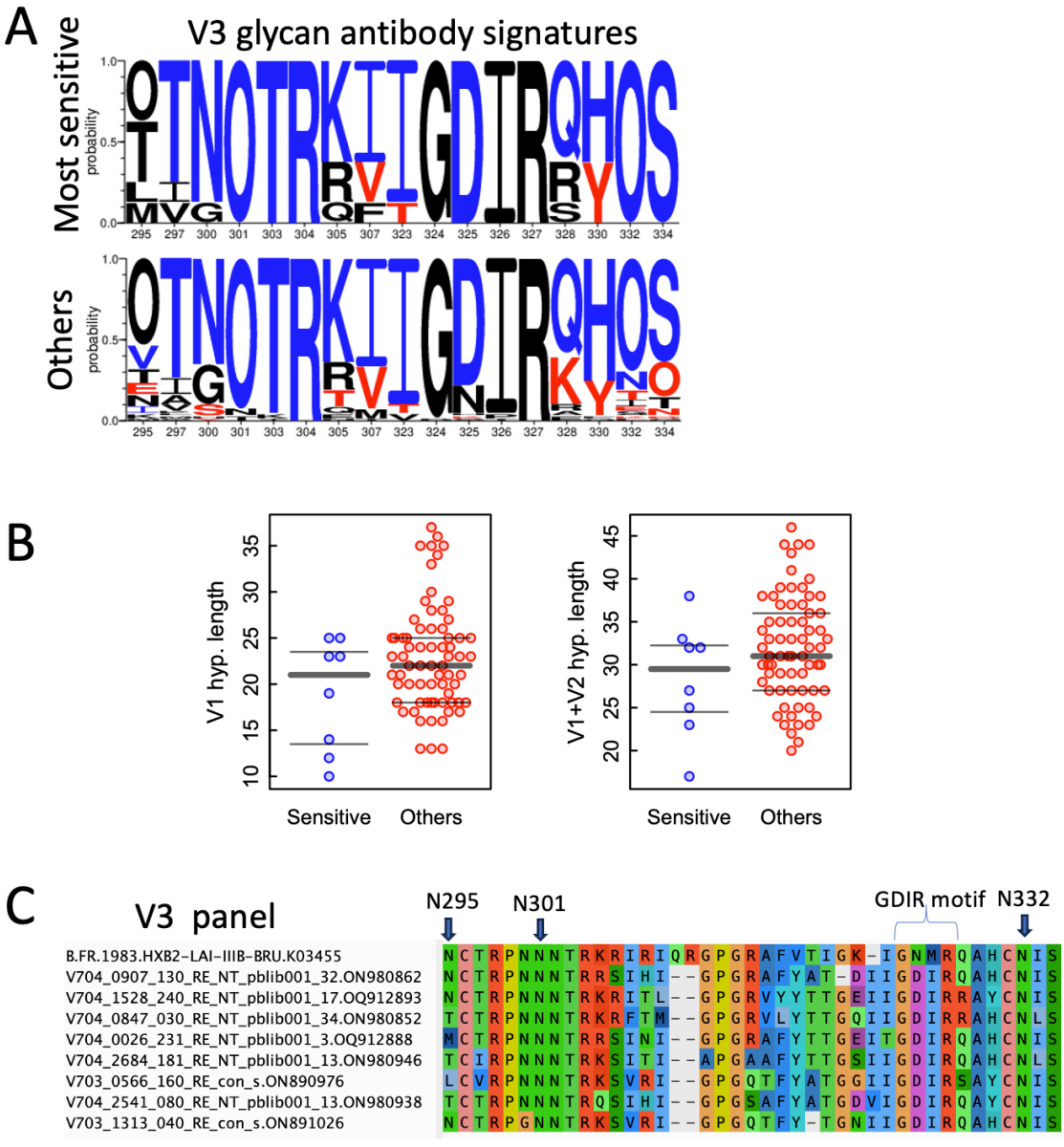

Fig. S4. Details regarding V3 glycan bNab signatures within the V3 glycan bNab sensitive panel for detection of developing responses. A. The frequency of V3 glycan bNab sensitivity/resistance signatures as defined in Bricault et al. (8) in the class specific panel versus other AMP viruses. The height of the letter is indicative of the frequency of the amino acid in a given position in each group. An O indicates an N-linked glycosylation site. Blue are sensitivity signatures, red are resistance signatures, and black amino acids were not significantly associated

with either one. **B.** Shorter V1 hypervariable length and shorter combined V1V2 hypervariable region lengths are associated with enhanced sensitivity to V3 glycan bNabs (8), and there is an enrichment for shorter V1 and V1+V2 hypervariable regions in the V3 glycan sensitivity panel. **C.** The sequence alignment for the V3 glycan bNab sensitive panel across the epitope region.

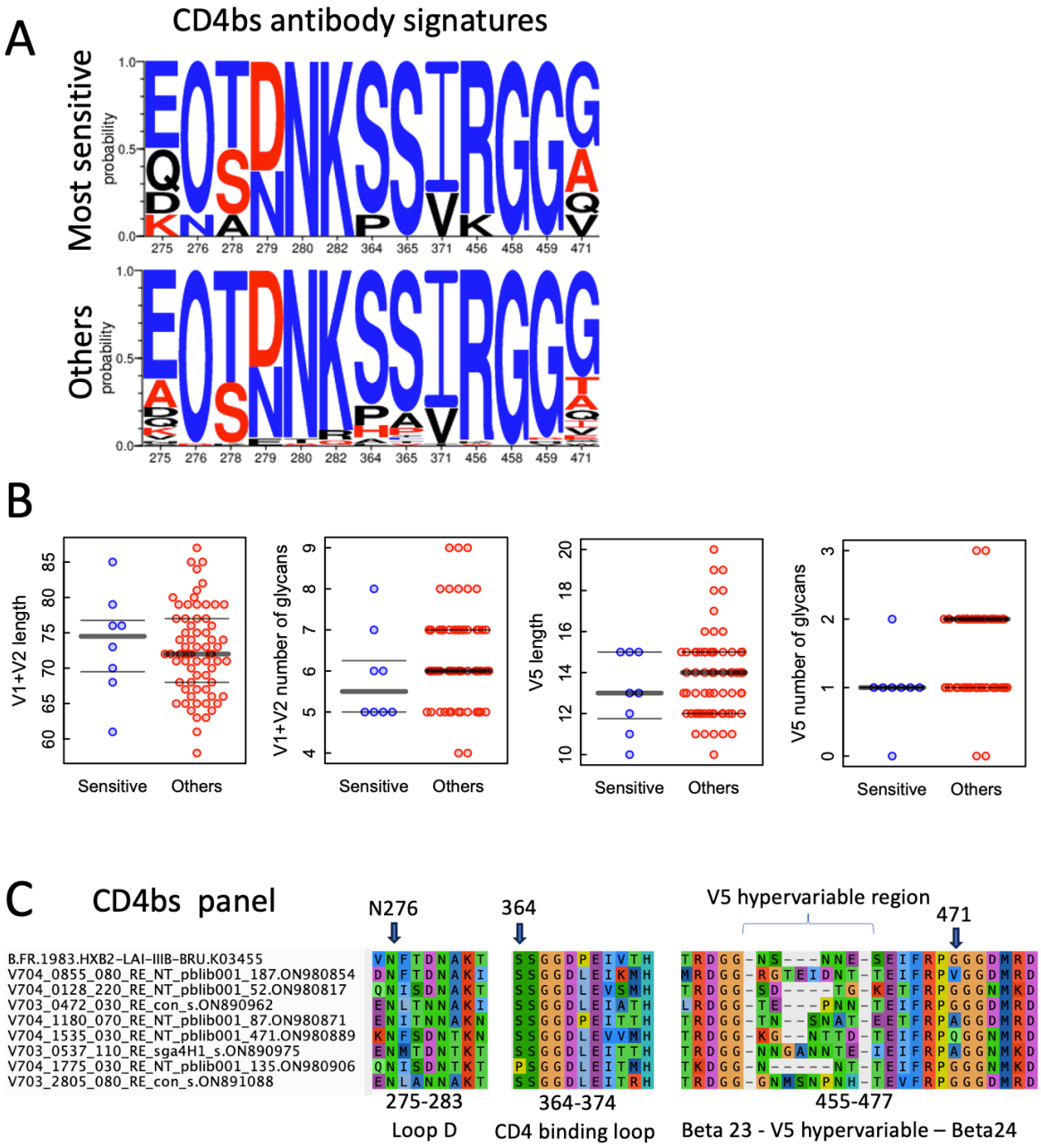

Fig. S5. Details regarding CD4bs bNab signatures within the CD4 bNab sensitive panel for detection of developing responses. A. The frequency of CD4bs bNab sensitivity/resistance signatures as defined in Bricault et al. (8) in the class specific panel versus other AMP viruses. The height of the letter is indicative of the frequency of the amino acid in a given position in each group. An O indicates an N-linked glycosylation site. Blue are sensitivity signatures, red are resistance signatures, and black amino acids were not significantly associated with either one. **B.** Shorter V1+V2 region lengths with fewer glycans were associated with CD4bs bNAb sensitivity (8), and while shorter combined V1V2 lengths were not enriched in the sensitive panel, fewer glycans in the V1V2 loop regions were. Shorter V5 loops with fewer glycans were also previously associated with enhanced CD4bs bNab sensitivity (8), and both of these

characteristics were enriched in the sensitive panel. **C.** The sequence alignment for the CD4bs bNab sensitive panel across the epitope region.

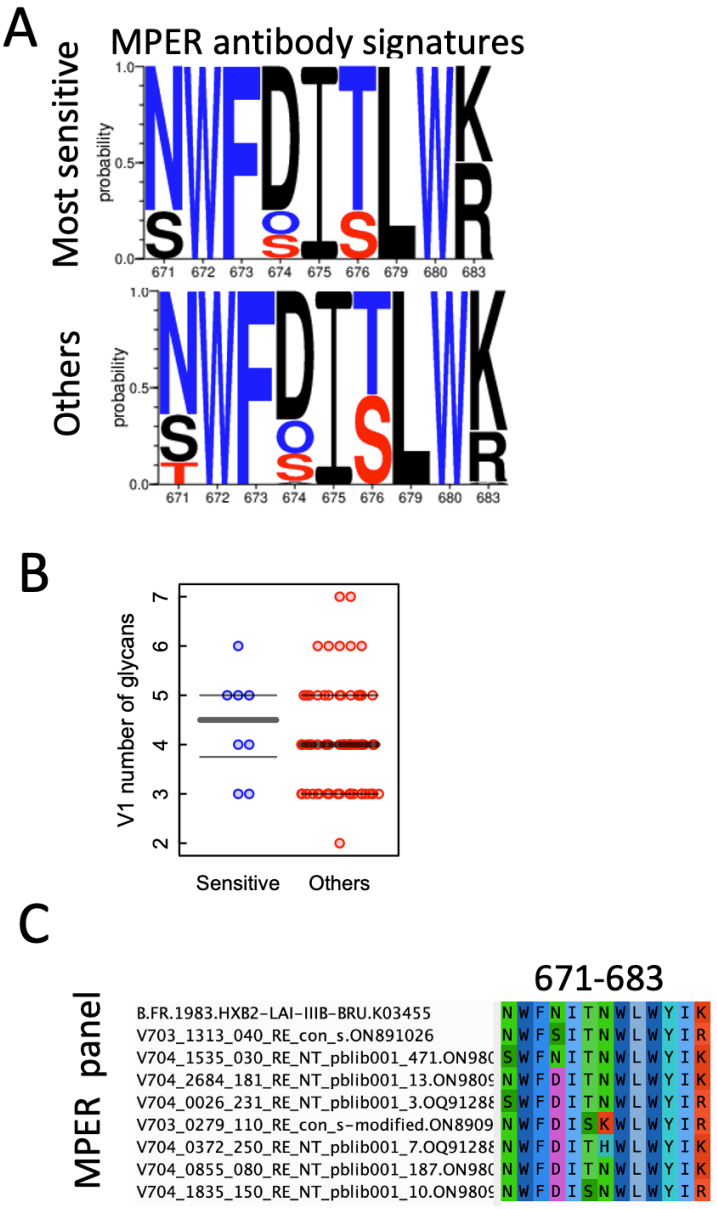

Fig. S6. Details regarding MPER bNab signatures within the MPER sensitive panel for detection of developing responses. A. The frequency of MPER sensitivity/resistance signatures as defined in Bricault et al. (8) in the class specific panel versus other AMP viruses. The height of the letter is indicative of the frequency of the amino acid in a given position in each group. An O indicates an N-linked glycosylation site. Blue are sensitivity signatures, red are resistance signatures, and black amino acids were not significantly associated with either one. **B.** Shorter V1 region lengths with fewer glycans were associated with MPER sensitivity (8), and these were not enriched in the MPER sensitive panel. **C.** The sequence alignment for the CD4bs bNab sensitive panel across the epitope region. This a highly conserved epitope.

Supplementary Tables

Table S1 A. AMP V703 IC50

Sequence Name HVTN 703	1-18	VRC07-523 LS	VRC01-23 LS	3BNC117-LS	VRC01	CH235.12	PGT121-414 LS	10-1074 LS	PGDM1400	CAP256 VRC26.25 LS	PGT151	VRC34.01	ACS202	10E8v4	CAP248-2B
V703_0013_090_RE_con_s	0.52	0.4200	0.49	>25	3.4725	>10	7.9700	18.4100	0.0100	0.0100	>10	>10	>10	1.6100	>10
V703_0203_081_RE_pblib002_s	0.38	0.4500	1.23	>25	3.8721	7.6	0.0400	0.0300	>25	>25	>10	>10	>10	0.6700	>10
V703_0203_081_RE_sga8A5_s	0.64	0.4100	0.91	>25	4.1508	>10	0.0300	0.0200	>25	>25	>10	>10	>10	0.1300	>10
V703_0217_050_RE_pblib002_s	0.0018	0.0700	0.06	>25	>25	0.15	>25	>25	0.0028	0.0011	0.0029	0.02	0.06	0.2400	0.01
V703_0217_050_RE_sga2A3_s	0.008	0.0300	0.04	>25	>25	0.29	>25	>25	0.0040	0.0020	0.01	0.0>253	2.21	0.1800	0.0247
V703_0279_110_RE_con_s-modified	0.08	0.2500	0.17	0.4400	1.3910	5.34	0.7700	0.4900	21.6100	>25	>10	>10	>10	0.0800	>10
V703_0279_110_RE_pblib002_s	0.17	0.1800	0.14	0.3300	1.5089	>10	0.9400	1.1900	>25	>25	>10	>10	>10	0.3400	>10
V703_0472_030_RE_con_s	0.0054	0.0100	0.005	>25	0.0210	0.05	>25	7.9400	0.1000	0.0100	0.028	5.67	>10	0.4200	>10
V703_0537_110_RE_sga4H1_s	0.01	0.0100	0.005	0.0200	0.0899	1.14	0.0100	0.0800	0.0900	0.0100	>10	>10	>10	0.6800	>10
V703_0537_110_RE_sga2B5_s	0.007	0.0300	0.005	0.0800	690443319	0.04	0.0200	0.1000	0.2200	0.0100	>10	>10	>10	0.6600	>10
V703_0537_110_RE_pblib003_s	0.0138	0.0200	0.005	0.0300	78>258823	0.19	0.0500	0.2100	1.0000	0.0100	>10	>10	>10	0.2600	>10
V703_0566_160_RE_con_s	0.04	0.0900	0.11	0.2000	1.3324	0.48	0.0100	0.0100	>25	>25	0.007	0.08	>10	0.9200	>10
V703_0566_160_RE_pblib002_s	0.06	0.1800	0.17	0.6600	3.5028	1.28	0.0300	0.0600	>25	>25	0.2	0.08	>10	4.2100	>10
V703_0629_150_RE_pblib002_s	0.08	0.0800	0.07	0.1100	1.4440	0.34	3.9000	3.1100	0.3600	0.1100	0.01	0.1	>10	0.7400	>10
V703_0629_150_RE_sga5A2_s	0.09	0.2200	0.0256	0.3900	0.7194	0.2	4.7200	4.4000	0.4200	0.0500	0.0032	0.16	>10	4.2700	>10
V703_0629_150_RE_pblib003_s	0.11	0.3300	0.06	0.7200	1.0759	1.5	9.8700	5.6100	1.5100	>25	0.06	>10	>10	6.4400	>10
V703_0629_150_RE_pblib004_s	0.12	0.2400	0.08	0.8000	1.0282	0.41	6.4100	4.1200	0.1100	0.2200	0.01	1.1	>10	2.4600	>10
V703_0646_051_RE_con_s	0.18	0.4500	0.63	1.5400	4.8972	>10	>25	>25	0.0100	0.0100	0.07	0.07	>10	1.5600	>10
V703_0739_110_RE_con_s-modified	0.025	0.0500	0.023	0.0700	0.1431	0.56	0.6700	0.1600	3.2300	0.0009	>10	4.86	0.09	1.9400	>10
V703_0842_200_RE_con_s	>10	1.4400	1.82	2.1300	20.8948	6.36	7.2300	1.5600	0.1100	0.0100	0.21	>10	>10	0.7300	>10
V703_0865_070_RE_con_s	0.09	0.0900	ND	ND	ND	12	ND	ND	ND	ND	>10	>10	>10	ND	ND
V703_0926_070_RE_sga2H2_s	2.02	0.8100	0.76	2.0400	7.8027	2.34	0.0400	0.1000	1.0400	>25	>10	>10	>10	0.5600	>10
V703_1060_080_RE_con_s	0.09	0.1300	0.28	0.8000	1.7123	1.17	>25	3.6300	>25	0.3100	0.05	>10	>10	0.0800	>10
V703_1104_100_RE_pblib001_s	0.18	1.8100	0.92	2.5700	4.0481	>10	>25	2.9800	0.3300	0.1400	>10	>10	0.19	0.9200	>10
V703_1104_100_RE_sga10A5_s	0.33	1.3200	1.69	1.8000	8.0808	>10	>25	3.5800	0.9200	0.1200	>10	>10	0.15	0.2800	>10
V703_1104_100_RE_sga10G5_s	0.28	1.6100	1.41	2.9900	6.4095	>10	>25	10.4800	0.4700	0.1200	>10	>10	4.23	0.8600	>10
V703_1298_080_RE_pblib002_s	0.15	1.2700	0.13	>25	>25	0.16	>25	>25	0.0900	0.0100	0.1	>10	>10	0.8400	>10
V703_1313_040_RE_con_s	0.046	0.0400	0.07	0.1100	0.6860	>10	0.0100	0.0600	0.0040	0.0018	>10	>10	>10	0.0100	>10
V703_1471_190_RE_con_s	0.05	0.0800	0.0235	0.0600	7782805>25	0.6	0.0100	0.1000	0.0200	0.0100	0.01	>10	>10	4.9200	0.011
V703_1675_080_RE_con_s-modified	0.02	0.0800	0.0414	0.0600	0.3446	0.15	0.9800	1.4200	0.0100	0.0001	0.59	>10	4.47	18.5300	>10
V703_1675_080_RE_con_s	0.0279	0.0500	0.0528	0.0400	79183384>2	0.23	0.2600	0.7900	0.0100	0.0100	>10	>10	1.49	14.6600	>10
V703_1750_140_RE_con_s	0.11	0.1800	0.13	0.2300	0.8813	1.35	0.0500	0.0800	>25	8.5900	0.05	0.34	>10	0.5000	>10
V703_1764_250_RE_con_s	0.03	0.1000	0.06	0.1000	0.2402	0.1	0.2000	0.1300	>25	>25	0.18	>10	>10	1.4100	>10
V703_1789_230_RE_sga3A3_s	0.09	0.9900	0.55	>25	17.8963	>10	0.8300	0.3400	>25	>25	>10	>10	>10	2.4300	>10
V703_1848_190_RE_pblib002_s	0.0517	0.1500	0.07	0.0600	1.0367	0.92	>25	6.7400	0.0100	0.0100	0.06	>10	>10	0.2800	>10
V703_1848_190_RE_sga6D1_s	0.09	0.3100	0.2	0.2400	1.0544	0.24	>25	>25	11.4600	>25	0.02	>10	>10	2.7600	>10
V703_1889_100_RE_con_s	0.09	2.3000	0.19	>25	>25	5.78	0.0900	0.2300	0.0100	0.0001	>10	>10	>10	>25	>10
V703_1915_250_RE_sgaA3_s	0.0841	0.3600	0.0406	1.6000	0.5291	5.6	0.3200	0.8400	>25	3.4800	0.04	>10	>10	3.8300	>10
V703_2018_240_RE_sga6A1_s	0.16	0.3000	0.09	1.1300	1.2489	6.38	0.0500	0.0700	0.0031	0.0001	>10	>10	>10	2.8500	>10
V703_2117_110_RE_sga2A10_s	0.17	0.0400	0.06	0.1100	0.2285	0.52	>25	>25	0.0007	0.0001	>10	0.81	>10	0.8800	>10
V703_2149_060_RE_sgaB10_s	0.0324	0.0700	0.0208	>25	0.2050	>10	0.1100	0.0700	0.0012	0.0001	9.17	>10	>10	0.9800	>10
V703_2304_150_RE_con_s	0.06	0.0200	0.0106	0.0600	0.1135	0.08	0.0700	0.0600	0.0100	0.0100	>10	0.03	>10	0.3600	>10
V703_2539_070_RE_sga6F6_s	0.74	0.3900	0.27	>25	1.7655	>10	0.0100	0.0400	>25	>25	4.57	>10	>10	0.2300	>10
V703_2631_150_RE_sga2F8_s	0.02	0.0800	0.09	0.0700	0.4631	1.02	>25	>25	0.0019	0.0004	>10	0.97	>10	1.2300	>10
V703_2788_030_RE_con_s	1.56	0.2400	4.11	0.0900	0.6812	4.9	0.3000	0.0900	1.2000	0.0100	1.84	>10	>10	5.3800	>10
V703_2805_080_RE_con_s	0.027	0.0100	0.0287	0.0200	0.2668	0.24	>25	>25	0.0019	0.0004	0.06	0.23	>10	1.2200	>10
V703_2805_080_RE_pblib002_s	>10	1.8700	>10	5.1700	>25	>10	>25	>25	>25	5.9000	>10	0.84	>10	2.3800	>10

Sequences from the same person are grouped.

Gray: Most sensitive TFL virus

Yellow: Most resistant TFL virus

IC50/IC80
HVTN 703: >10
HVTN 704: >25
HVTN 704: >10 - 25
>1 - 10
>0.1 - 1
>0.01 - 0.1
>0.001 - 0.01
<= 0.001

Table S1 B. AMP V704 IC50

	IC50														
	CD4bs						V3		V2		FP			MPER	
Sequence Name HVTN 704	1-18	VRC07-523 LS	VRC01-23 LS	3BNC117-LS	VRC01	CH235.12	PGT121-414 LS	10-1074 LS	PGDM1400	CAP256 VRC26.25 LS	PGT151	VRC34.01	ACS202	10E8v4	CAP248-2B
V704_0026_231_RE_NT_pblib001_3	0.097	0.081	0.088	0.103	0.46	>25	0.006	0.017	0.075	>25	>25	>25	>25	0.07	>25
V704_0128_220_RE_NT_pblib001_52	0.023	0.006	0.011	0.026	0.04	0.021	0.018	0.059	0.008	0.002	>25	0.194	22.918	1.221	ND
V704_0128_220_RE_NT_pblib002_40	0.044	0.026	0.034	0.025	0.16	0.089	0.047	0.171	0.031	0.0003	>25	2.044	>25	1.33	>25
V704_0445_180_RE_NT_pblib001_22	0.012	0.063	0.021	>25	82.985	0.205	0.291	0.086	0.285	>25	0.083	>25	0.08	1.49	>25
V704_0496_040_RE_NT_pblib001_37	0.037	0.242	0.601	>25	4.940	1.236	0.142	0.078	0.011	0.011	>25	>25	>25	0.289	>25
V704_0513_150_RE_NT_pblib007_2	0.413	0.263	0.354	0.29	1.08	17.817	>25	>25	>25	>25	0.047	1.468	>25	0.98	>25
V704_0513_150_RE_NT_pblib002_10	0.465	0.401	0.387	0.251	1.445	5.793	>25	>25	>25	>25	0.044	>25	>25	1.049	>25
V704_0513_150_RE_NT_pblib001_34	0.612	0.38	0.329	0.276	1.49	6.07	>25	>25	>25	>25	0.49	>25	>25	1.13	>25
V704_0575_060_RE_NT_pblib002_16	0.244	0.989	0.615	1.294	1.934	2.286	>25	>25	0.051	>25	>25	0.239	0.039	0.57	>25
V704_0575_060_RE_NT_pblib001_60	0.412	1.02	0.652	1.241	2.195	2.275	>25	>25	0.047	>25	>25	0.657	0.083	0.417	>25
V704_0575_060_RE_NT_con02_s	0.467	0.756	0.771	0.965	2.118	2.354	>25	>25	0.042	>25	>25	>25	0.157	0.494	>25
V704_0644_060_RE_NT_pblib001_216	0.084	0.155	0.279	0.29	1.02	3.275	6.348	0.454	>25	>25	>25	5.728	>25	0.297	>25
V704_0726_080_RE_NT_pblib001_26	0.199	1.020	0.466	0.537	5.636	3.445	0.36	0.734	0.421	>25	>25	>25	>25	2.473	>25
V704_0746_760_RE_NT_pblib001_37	0.19	0.397	0.15	0.255	0.87	5.201	0.015	0.014	>25	>25	>25	>25	>25	3.08	>25
V704_0746_760_RE_NT_pblib003_34	0.187	0.415	0.122	0.26	1.07	7.051	0.018	0.013	>25	>25	>25	>25	>25	2.56	>25
V704_0746_760_RE_NT_pblib002_36	0.224	0.447	0.189	0.282	1.25	6.796	0.02	0.015	>25	>25	>25	>25	>25	1.96	>25
V704_0847_030_RE_NT_pblib001_34	6.634	0.19	0.053	>25	2.048	>25	0.01	0.003	>25	>25	>25	>25	>25	0.221	0.041
V704_0847_030_RE_NT_pblib002_23	9.694	0.204	0.161	>25	3.118	>25	0.011	0.006	>25	>25	>25	>25	>25	0.27	1.448
V704_0855_080_RE_NT_pblib001_187	0.012	0.003	0.002	0.009	0.013	>25	0.05	0.061	>25	>25	0.007	>25	>25	0.134	>25
V704_0856_240_RE_NT_pblib001_9	0.095	0.063	0.055	0.06	0.524	0.503	0.011	0.016	>25	>25	1.04	7.845	>25	0.54	>25
V704_0886_250_RE_NT_pblib001_10	0.173	0.177	0.099	0.516	1.745	>25	0.338	0.185	>25	>25	>25	>25	0.498	0.171	>25
V704_0907_130_RE_NT_pblib001_32	0.016	0.193	0.019	0.199	0.364	15.857	0.002	0.006	>25	>25	0.017	0.25	0.236	0.655	>25
V704_0911_150_RE_NT_pblib001_58	0.437	0.538	1.525	0.622	1.391	10.111	0.013	0.018	>25	>25	3.99	>25	>25	0.869	>25
V704_0944_180_RE_NT_pblib001_76	0.023	0.02	0.007	0.061	0.074	>25	>25	>25	>25	>25	0.367	>25	>25	>25	>25
V704_1109_140_RE_NT_pblib001_191	>25	0.283	2.455	>25	3.36	>25	>25	>25	0.201	>25	>25	>25	>25	1.25	>25
V704_1180_070_RE_NT_pblib001_87	0.005	0.045	0.013	0.016	0.17	0.145	>25	>25	0.188	>25	0.009	0.283	0.273	0.32	0.114
V704_1180_070_RE_NT_pblib027_1	0.005	0.074	0.009	0.018	0.137	0.419	>25	>25	0.405	>25	0.009	0.683	0.388	0.16	>25
V704_1183_220_RE_NT_pblib001_70	0.041	0.347	0.038	0.065	0.39	1.185	0.032	0.051	>25	>25	3.666	>25	0.228	0.495	>25
V704_1429_090_RE_NT_pblib002_75	0.111	0.097	0.078	1.216	0.235	>25	>25	>25	0.079	11.679	4.01	>25	>25	0.537	>25
V704_1429_090_RE_NT_pblib001_111	0.119	0.112	0.122	1.806	0.307	>25	>25	>25	0.141	>25	4.52	>25	>25	0.45	>25
V704_1528_240_RE_NT_pblib001_17	0.06	0.439	0.114	0.092	2.39	7.107	0.003	0.004	>25	>25	1.418	0.04	0.041	0.243	1.15
V704_1535_030_RE_NT_pblib001_471	0.052	0.068	0.018	0.019	0.088	>25	0.011	0.071	1.109	>25	0.197	0.391	0.512	0.015	0.334
V704_1706_040_RE_NT_pblib001_26	0.2	0.058	0.058	0.164	0.489	0.186	0.457	0.301	1.986	>25	>25	>25	>25	0.488	>25
V704_1775_030_RE_NT_pblib001_135	0.014	0.029	0.031	0.109	0.09	0.05	>25	>25	0.002	0.028	0.112	>25	>25	0.291	>25
V704_1783_150_RE_NT_pblib001_144	0.006	0.064	0.009	0.036	0.135	>25	0.248	0.485	>25	>25	0.06	>25	0.353	0.388	>25
V704_1835_150_RE_NT_pblib001_10	0.027	21.596	0.041	>25	99	>25	3.127	0.095	>25	>25	0.112	0.412	0.113	0.147	>25
V704_1835_150_RE_NT_pblib002_9	0.026	24.845	0.078	>25	>100	>25	3.791	0.081	>25	>25	0.24	1.729	0.397	0.099	>25
V704_1930_170_RE_NT_pblib002_114	0.032	0.025	0.013	0.028	0.11	0.087	>25	>25	0.014	>25	>25	>25	>25	1	>25
V704_1930_170_RE_NT_pblib001_234	0.041	0.035	0.023	0.043	0.134	0.118	>25	>25	0.018	>25	>25	>25	>25	1.25	>25
V704_1991_230_RE_NT_pblib001_38	0.093	0.284	0.171	0.242	1.51	0.303	>25	>25	0.026	0.0003	0.373	>25	0.128	0.5	>25
V704_1991_230_RE_NT_pblib002_19	0.067	0.215	0.14	0.165	1.488	0.309	>25	>25	0.052	0.0003	>25	>25	0.12	0.317	>25
V704_2065_060_RE_NT_pblib001_47	0.069	0.146	0.028	0.047	0.22	0.052	>25	>25	>25	>25	>25	>25	>25	0.1	>25
V704_2065_060_RE_NT_pblib002_42	0.062	0.082	0.037	0.048	0.22	0.036	>25	>25	>25	>25	>25	>25	>25	0.161	>25
V704_2095_130_RE_NT_pblib001_136	0.079	0.096	0.031	0.053	0.312	0.283	2.167	0.085	>25	>25	0.147	>25	>25	0.51	>25
V704_2448_240_RE_NT_pblib001_288	0.133	0.108	0.01	0.058	0.14	0.146	>25	>25	>25	>25	>25	>25	7.416	>25	>25
V704_2541_080_RE_NT_pblib001_13	0.037	0.056	0.033	0.032	0.305	0.288	0.026	0.008	2.163	>25	0.033	0.755	>25	0.25	>25
V704_2541_080_RE_NT_pblib042_1	0.026	0.036	0.018	0.021	0.21	0.112	0.022	0.027	0.218	>25	0.168	2.872	>25	0.08	>25
V704_2541_080_RE_NT_pblib003_5	0.053	0.069	0.025	0.051	0.38	0.409	0.044	0.011	3.382	>25	0.048	0.477	>25	0.184	>25
V704_2544_140_RE_NT_pblib002_10	0.431	0.122	0.136	0.108	0.922	4.104	0.493	0.611	>25	>25	>25	>25	>25	0.4	>25
V704_2544_140_RE_NT_pblib001_11	0.99	0.431	0.494	0.82	5.76	8.648	16.44	0.421	13.864	>25	0.059	>25	>25	1.127	17.994
V704_2544_150_RE_NT_pblib001_33	0.262	0.2	0.18	0.35	1.84	3.257	0.03	0.063	0.101	>25	>25	>25	>25	0.29	>25
V704_2555_240_RE_NT_pblib001_231	0.092	0.052	0.033	0.075	0.424	>25	0.012	0.03	>25	>25	>25	2.808	0.151	>25	>25
V704_2684_181_RE_NT_pblib001_13	0.01	0.044	0.014	0.051	0.09	>25	0.006	0.019	>25	>25	>25	>25	0.913	0.03	>25
V704_2684_181_RE_NT_pblib006_3	0.007	0.057	0.012	0.43	0.092	>25	0.007	0.019	>25	>25	>25	>25	0.97	0.031	>25
V704_2767_070_RE_NT_pblib001_63	0.217	0.126	0.068	0.796	2.06	1.275	0.066	0.241	>25	>25	0.038	>25	>25	2.03	>25
V704_2788_060_RE_NT_pblib001_96	0.075	0.173	0.277	0.167	1.36	0.694	0.171	0.201	0.003	0.0003	2.78	>25	>25	0.43	>25
V704_2788_060_RE_NT_pblib002_20	0.192	0.260	0.284	0.223	1.409	1.144	0.134	0.144	0.011	0.011	16.77	>25	>25	0.082	>25
V704_2834_210_RE_NT_pblib002_26	0.056	0.199	0.088	0.059	2.039	>25	7.78	3.385	>25	>25	>25	1.179	>25	0.397	>25
V704_2834_210_RE_NT_pblib001_44	0.107	0.312	0.073	0.086	2.19	>25	19.219	4.297	>25	>25	>25	0.922	>25	0.12	>25
V704_2839_140_RE_NT_pblib001_208	0.116	0.183	0.346	1.426	1.58	>25	>25	>25	>25	>25	>25	1.771	1.486	0.63	>25
V704_2981_150_RE_NT_pblib004_2	0.392	0.414	0.102	0.129	2.43	0.279	1.271	0.702	0.262	>25	>25	9.095	>25	0.23	>25
V704_2981_150_RE_NT_pblib001_33	5.259	1.404	0.942	1.038	6.07	2.665	0.609	0.421	0.022	>25	>25	24.65	>25	2.89	>25
V704_2981_150_RE_NT_pblib002_11	0.809	0.443	0.304	0.248	1.89	0.734	>25	>25	>25	>25	>25	16.439	>25	1.09	>25
V704_2981_150_RE_NT_pblib003_4	1.058	0.39	0.178	0.155	1.84	0.333	>25	>25	>25	>25	>25	>25	>25	0.28	>25
V704_3000_240_RE_NT_pblib001_8	0.037	0.11	0.392	0.156	0.523	>25	>25	>25	8.698	>25	>25	0.281	>25	0.111	>25
V704_3000_240_RE_NT_pblib019_1	0.062	0.201	0.562	0.271	1.92	>25	>25	>25	16.221	>25	>25	0.145	>25	0.14	>25
V704_3008_040_RE_NT_pblib001_113	0.067	0.431	0.025	0.163	3.02	>25	0.017	0.178	>25	>25	>25	>25	>25	0.184	>25
V704_0372_250_RE_NT_pblib001_7	0.03	0.167	0.062	0.199	0.415	0.191	>25	>25	>25	>25	>25	>25	>25	0.087	>25
V704_0372_250_RE_NT_pblib002_6	0.023	0.217	ND	0.151	0.326	2.426	>25	>25	>25	2.114	ND	ND	ND	0.09	ND

Table S1 C. AMP V703 IC80

Sequence Name HVTN 703	1-18	VRC07-523 LS	VRC01-23 LS	3BNC117-LS	VRC01	CH235.12	PGT121-414 LS	10-1074 LS	PGDM1400	CAP256 VRC26.25 LS	PGT151	VRC34.01	ACS202	10E8v4	CAP248-2B
V703_0013_090_RE_con_s	1.93	1.1200	1.07	>25	9.2118	>10	>25	>25	0.0200	0.0300	>10	>10	>10	16.9200	>10
V703_0203_081_RE_pblib002_s	1.91	1.6100	5.69	>25	15.2818	>10	0.1100	0.1000	>25	>25	>10	>10	>10	2.4500	>10
V703_0203_081_RE_sga8A5_s	2.26	1.5400	3.27	>25	>25	>10	0.0800	0.0600	>25	>25	>10	>10	>10	0.6200	>10
V703_0217_050_RE_pblib002_s	0.01	0.1700	0.24	>25	>25	0.79	>25	>25	0.0100	0.0100	0.0162	0.06	>10	0.8100	0.04
V703_0217_050_RE_sga2A3_s	0.08	0.1100	0.22	>25	>25	1.16	>25	>25	0.0100	0.0020	0.04	0.09	>10	1.0000	>10
V703_0279_110_RE_con_s-modified	0.36	1.0900	0.51	1.3500	3.9365	>10	5.6000	3.5300	>25	>25	>10	>10	>10	0.6100	>10
V703_0279_110_RE_pblib002_s	0.64	0.5800	0.35	1.5100	4.6208	>10	3.4600	5.9200	>25	>25	>10	>10	>10	1.3000	>10
V703_0472_030_RE_con_s	0.0115	0.0100	<0,005	>25	0.0735	0.18	>25	>25	2.9900	0.0400	0.13	>10	>10	2.7200	>10
V703_0537_110_RE_sga4H1_s	0.06	0.0400	0.01	0.0500	>25	2.63	0.0500	>25	0.4500	0.1900	>10	>10	>10	4.3200	>10
V703_0537_110_RE_sga2B5_s	0.02	0.0900	0.0072	0.2800	0.0695	0.13	0.1200	0.4400	0.8100	0.6000	>10	>10	>10	3.8200	>10
V703_0537_110_RE_pblib003_s	0.0411	0.0600	0.01	0.0800	0.1947	0.56	0.1500	0.5600	5.7800	11.0400	>10	>10	>10	1.7700	>10
V703_0566_160_RE_con_s	0.2	0.3100	0.65	0.9400	5.2121	1.33	0.0300	0.0300	>25	>25	>10	0.3	>10	5.3200	>10
V703_0566_160_RE_pblib002_s	0.21	0.4900	0.64	4.5100	10.6147	3.6	0.0600	0.1300	>25	>25	>10	0.27	>10	21.2100	>10
V703_0629_150_RE_pblib002_s	0.31	0.2300	0.28	0.5000	4.3929	2.3	>25	10.4000	4.2400	>25	0.04	0.87	>10	3.6200	>10
V703_0629_150_RE_sga5A2_s	0.23	0.6800	0.0775	1.2300	2.5153	0.73	>25	20.1100	13.4300	5.2800	0.02	>10	>10	19.5800	>10
V703_0629_150_RE_pblib003_s	0.29	1.1600	0.19	2.2300	3.7899	4.66	>25	22.4500	>25	>25	0.19	>10	>10	20.8200	>10
V703_0629_150_RE_pblib004_s	0.31	0.5800	0.24	4.4000	3.3096	1.51	>25	11.6400	0.6400	>25	0.04	>10	>10	7.9700	>10
V703_0646_051_RE_con_s	1.85	1.2900	3	4.2900	15.7791	>10	>25	>25	0.0500	0.0300	>10	0.32	>10	8.7100	>10
V703_0739_110_RE_con_s-modified	0.1	0.1400	0.07	0.1900	0.4577	1.11	2.3000	0.5800	3.2300	0.0100	>10	>10	>10	7.5400	>10
V703_0842_200_RE_con_s	>10	5.3600	6.75	8.9200	>25	>10	>25	14.4900	0.3000	0.0700	>10	>10	>10	5.1500	>10
V703_0865_070_RE_con_s	0.39	4.8300	ND	ND	ND	4.15	ND	ND	ND	ND	>10	>10	>10	ND	ND
V703_0926_070_RE_sga2H2_s	7.85	2.4000	2.36	>25	>25	9.8	0.1300	0.3200	4.0700	>25	>10	>10	>10	2.7100	>10
V703_1060_080_RE_con_s	0.76	0.5600	1	3.5300	6.2655	4.39	>25	19.0600	>25	1.6700	>10	>10	>10	0.3900	>10
V703_1104_100_RE_pblib001_s	0.63	9.7000	3.69	14.4000	>25	>10	>25	>25	0.9500	3.5400	>10	>10	>10	5.2000	>10
V703_1104_100_RE_sga10A5_s	0.93	5.8200	4.4	8.7200	>25	>10	>25	12.3000	3.0000	4.2800	>10	>10	>10	1.5200	>10
V703_1104_100_RE_sga10G5_s	0.85	7.2800	4.31	15.4100	22.0665	>10	>25	>25	2.4300	>25	>10	>10	>10	2.8500	>10
V703_1298_080_RE_pblib002_s	0.77	25.0000	0.38	>25	>25	0.59	>25	>25	0.8400	0.0700	9.49	>10	>10	4.3500	>10
V703_1313_040_RE_con_s	0.26	0.1200	0.24	0.4200	2.4732	>10	0.0500	0.2300	0.0157	0.0200	>10	>10	>10	0.4300	>10
V703_1471_190_RE_con_s	0.15	0.6100	0.07	0.2200	0.5218	1.89	0.0200	0.2600	0.1400	0.0200	0.02	>10	>10	25.0000	>10
V703_1675_080_RE_con_s-modified	0.09	0.1600	0.19	0.1600	1.3422	0.55	5.5000	10.6700	0.0400	0.0100	4.81	>10	>10	>25	>10
V703_1675_080_RE_con_s	0.11	0.1500	0.17	0.1200	1.3686	0.7	1.1800	3.8500	0.0200	0.0100	>10	>10	>10	>25	>10
V703_1750_140_RE_con_s	0.69	0.2100	0.52	0.7200	2.8549	3.32	0.2000	0.2700	>25	>25	0.3	8.3	>10	2.9100	>10
V703_1764_250_RE_con_s	0.09	0.2300	0.2	0.2600	0.8038	0.57	0.5700	0.2900	>25	>25	>10	>10	>10	4.0300	>10
V703_1789_230_RE_sga3A3_s	0.43	4.2100	1.75	>25	>25	>10	2.8300	1.1300	>25	>25	>10	>10	>10	14.8400	>10
V703_1848_190_RE_pblib002_s	**0.29**	**0.5100**	**0.24**	**0.1900**	**4.2223**	**3.7**	>25	>25	**0.1100**	**2.3400**	**>10**	**>10**	**>10**	**1.4100**	**>10**
V703_1848_190_RE_sga6D1_s	**0.36**	**0.9000**	**0.65**	**0.6900**	**4.1500**	**0.92**	>25	>25	>25	>25	**0.14**	**>10**	**>10**	**8.3000**	**>10**
V703_1889_100_RE_con_s	0.33	20.0400	0.9	>25	>25	9.48	0.3500	0.6800	0.0200	0.0047	>10	>10	>10	25.0000	>10
V703_1915_250_RE_sgaA3_s	0.28	0.6300	0.18	2.7700	>25	>10	1.1000	2.3500	>25	15.7800	5.62	>10	>10	12.4700	>10
V703_2018_240_RE_sga6A1_s	0.68	0.8800	0.31	12.6600	2.8441	>10	0.1100	0.1600	0.0031	0.0003	>10	>10	>10	11.3200	>10
V703_2117_110_RE_sga2A10_s	0.37	0.0800	0.11	0.3500	0.6427	1.33	>25	>25	0.0028	0.0016	>10	>10	>10	3.6900	>10
V703_2149_060_RE_sgaB10_s	0.1	0.1700	0.07	>25	0.6489	>10	0.2700	0.1400	0.0040	0.0050	>10	>10	>10	4.0000	>10
V703_2304_150_RE_con_s	0.24	0.0400	0.0413	0.8600	0.5357	0.22	0.2900	0.1700	0.1200	0.0100	>10	0.11	>10	3.8700	>10
V703_2539_070_RE_sga6F6_s	>10	1.0600	>10	>25	>25	>10	0.0400	0.1200	>25	>25	>10	>10	>10	0.9400	>10
V703_2631_150_RE_sga2F8_s	0.12	0.2600	0.26	0.1900	1.8281	2.8	>25	>25	0.0100	0.0021	>10	3.9	>10	6.7200	>10
V703_2788_030_RE_con_s	2.55	0.5900	7.44	0.2300	2.7234	7.8	0.8400	0.1600	>25	0.6900	>10	>10	>10	19.7300	>10
V703_2805_080_RE_con_s	0.1	0.0300	0.0985	0.0900	1.2914	0.85	>25	>25	>25	0.0009	0.5	0.81	>10	6.1900	>10
V703_2805_080_RE_pblib002_s	>10	11.0700	>10	>25	>25	>10	>25	>25	>25	>25	>10	9.05	>10	16.2600	>10

Table S1 D. AMP V704 IC80

	IC80														
	CD4bs						V3		V2		FP			MPER	
Sequence Name HVTN 704	**1-18**	**VRC07-523 LS**	**VRC01-23 LS**	**3BNC117-LS**	**VRC01**	**CH235.12**	**PGT121-414 LS**	**10-1074 LS**	**PGDM1400**	**CAP256 VRC26.25 LS**	**PGT151**	**VRC34.01**	**ACS202**	**10E8v4**	**CAP248-2B**
V704_0026_231_RE_NT_pblib001_3	0.34	0.221	0.321	0.348	1.3	>25	0.018	0.057	1.186	>25	>25	>25	>25	0.66	>25
V704_0128_220_RE_NT_pblib001_52	0.076	0.017	0.032	0.202	2.35	0.068	0.061	0.161	0.024	0.184	>25	10.094	>25	5.112	ND
V704_0128_220_RE_NT_pblib002_40	0.134	0.07	0.12	0.092	0.37	0.329	0.131	0.464	0.108	0.253	>25	>25	>25	0.38	>25
V704_0445_180_RE_NT_pblib001_22	0.035	0.694	0.09	>25	>25	0.948	1.497	0.255	1.096	>25	0.557	>25	0.79	4.358	>25
V704_0496_040_RE_NT_pblib001_37	0.142	0.565	2.091	>25	12.57	4.89	0.457	0.238	0.021	2.61	>25	>25	>25	1.207	>25
V704_0513_150_RE_NT_pblib007_2	1.477	0.706	0.732	0.673	2.47	>25	>25	>25	>25	>25	1.89	>25	>25	4.3	>25
V704_0513_150_RE_NT_pblib002_10	1.315	0.887	1.007	0.687	3.64	19.266	>25	>25	>25	>25	1.084	>25	>25	4.13	>25
V704_0513_150_RE_NT_pblib001_34	1.71	1.037	0.892	0.785	3.2	22.674	>25	>25	>25	>25	>25	>25	>25	4.04	>25
V704_0575_060_RE_NT_pblib002_16	1.278	3.279	2.171	4.895	6.12	6.285	>25	>25	0.188	>25	>25	0.849	0.193	2.06	>25
V704_0575_060_RE_NT_pblib001_60	1.926	4.692	2.289	6.593	6.718	8.447	>25	>25	0.23	>25	>25	2.715	0.287	1.53	>25
V704_0575_060_RE_NT_con02_s	2.119	2.68	2.44	5.349	6.46	8.191	>25	>25	0.164	>25	>25	>25	0.557	1.74	>25
V704_0644_060_RE_NT_pblib001_216	0.358	0.513	0.816	1.025	2.49	11.908	>25	1.551	>25	>25	>25	>25	>25	1.427	>25
V704_0726_080_RE_NT_pblib001_26	0.571	3.3	1.177	1.568	18.649	14.337	1.31	1.913	1.668	>25	>25	>25	>25	11.4	>25
V704_0746_760_RE_NT_pblib001_37	0.629	1.056	0.502	0.716	2.27	>25	0.034	0.032	>25	>25	>25	>25	>25	8.99	>25
V704_0746_760_RE_NT_pblib003_34	0.625	1.095	0.442	0.909	2.87	>25	0.049	0.032	>25	>25	>25	>25	>25	7.78	>25
V704_0746_760_RE_NT_pblib002_36	0.775	1.184	0.868	1.025	3.08	>25	0.053	0.035	>25	>25	>25	>25	>25	5.37	>25
V704_0847_030_RE_NT_pblib001_34	>25	0.663	0.269	>25	6.537	>25	0.028	0.008	>25	>25	>25	>25	>25	1.129	>25
V704_0847_030_RE_NT_pblib002_23	>25	1.022	0.397	>25	8.502	>25	0.026	0.02	>25	>25	>25	>25	>25	1.602	>25
V704_0855_080_RE_NT_pblib001_187	0.028	0.01	0.01	0.025	0.044	>25	0.259	0.235	>25	>25	0.028	>25	>25	0.836	>25
V704_0856_240_RE_NT_pblib001_9	0.379	0.184	0.164	0.24	1.32	1.98	0.037	0.042	>25	>25	>25	>25	>25	2.44	>25
V704_0886_250_RE_NT_pblib001_10	0.742	0.745	0.354	2.225	4.601	>25	3.693	0.789	>25	>25	>25	>25	>25	1.04	>25
V704_0907_130_RE_NT_pblib001_32	0.049	0.522	0.053	2.65	0.816	>25	0.009	0.011	>25	>25	0.05	0.99	3.53	2.397	>25
V704_0911_150_RE_NT_pblib001_58	1.545	1.77	3.313	1.814	3.503	>25	0.032	0.04	>25	>25	>25	>25	>25	4.326	>25
V704_0944_180_RE_NT_pblib001_76	0.077	0.068	0.021	0.221	0.24	>25	>25	>25	>25	>25	>25	>25	>25	20	>25
V704_1109_140_RE_NT_pblib001_191	>25	0.774	6.788	>25	8.7	>25	>25	>25	0.449	>25	>25	>25	>25	4.7	>25
V704_1180_070_RE_NT_pblib001_87	0.017	0.155	0.031	0.062	0.47	0.487	>25	>25	1.031	>25	0.027	2.325	6.402	2.06	>25
V704_1180_070_RE_NT_pblib027_1	0.021	0.193	0.026	0.062	0.419	1.701	>25	>25	2.394	>25	0.027	3.647	6.066	0.88	>25
V704_1183_220_RE_NT_pblib001_70	0.115	0.73	0.086	0.23	0.91	3.05	0.09	0.134	>25	>25	>25	>25	5.842	1.77	>25
V704_1429_090_RE_NT_pblib002_75	0.421	0.25	0.212	6.731	0.618	>25	>25	>25	0.339	>25	>25	>25	>25	2.683	>25
V704_1429_090_RE_NT_pblib001_111	0.322	0.287	0.318	9.705	0.727	>25	>25	>25	0.892	>25	>25	>25	>25	1.737	>25
V704_1528_240_RE_NT_pblib001_17	0.238	1.509	0.114	0.464	7.13	24.662	0.012	0.012	>25	>25	>25	0.385	0.181	0.949	>25
V704_1535_030_RE_NT_pblib001_471	0.129	0.183	0.054	0.061	0.281	>25	0.041	0.241	4.061	>25	>25	1.36	5.17	0.143	>25
V704_1706_040_RE_NT_pblib001_26	1.103	0.203	0.161	0.924	1.25	0.641	1.784	1.126	13.413	>25	>25	>25	>25	1.95	>25
V704_1775_030_RE_NT_pblib001_135	0.014	0.077	0.073	6.421	0.487	0.166	>25	>25	0.007	>25	1.767	>25	>25	1.811	>25
V704_1783_150_RE_NT_pblib001_144	0.02	0.15	0.027	0.09	0.28	>25	1.474	1.766	>25	>25	>25	>25	>25	1.49	>25
V704_1835_150_RE_NT_pblib001_10	0.079	>25	0.187	>25	>25	>25	>25	0.312	>25	>25	1.176	>25	1.291	0.982	>25
V704_1835_150_RE_NT_pblib002_9	0.107	>25	0.179	>25	>25	>25	>25	0.346	>25	>25	5.51	>25	6.834	0.88	>25
V704_1930_170_RE_NT_pblib002_114	0.115	0.086	0.04	0.1	0.297	0.394	>25	>25	0.063	>25	>25	>25	>25	6.298	>25
V704_1930_170_RE_NT_pblib001_234	0.148	0.121	0.079	0.121	0.376	0.424	>25	>25	0.063	>25	>25	>25	>25	20	>25
V704_1991_230_RE_NT_pblib001_38	0.329	0.951	0.606	0.839	4.22	1.374	>25	>25	0.109	0.0001	>25	>25	1.054	2.54	>25
V704_1991_230_RE_NT_pblib002_19	0.23	0.753	0.523	0.581	4.21	1.059	>25	>25	0.173	0.057	>25	>25	0.589	1.433	>25
V704_2065_060_RE_NT_pblib001_47	0.405	0.691	0.076	0.316	0.603	0.572	>25	>25	>25	>25	>25	>25	>25	0.729	>25
V704_2065_060_RE_NT_pblib002_42	0.335	0.854	0.121	0.292	0.67	0.378	>25	>25	>25	>25	>25	>25	>25	1.33	>25
V704_2095_130_RE_NT_pblib001_136	0.234	0.256	0.084	0.124	0.82	1.004	>25	0.239	>25	>25	>25	>25	>25	2.82	>25
V704_2448_240_RE_NT_pblib001_288	0.489	0.297	0.03	0.211	0.412	0.393	>25	>25	>25	>25	>25	>25	>25	20	>25
V704_2541_080_RE_NT_pblib001_13	0.109	0.152	0.088	0.093	0.74	0.763	0.136	0.026	9.447	>25	0.161	2.733	>25	1.12	>25
V704_2541_080_RE_NT_pblib042_1	0.058	0.118	0.05	0.071	0.58	0.391	0.074	0.088	1.459	>25	>25	>25	>25	0.73	>25
V704_2541_080_RE_NT_pblib003_5	0.152	0.246	0.071	0.148	1.02	1.417	0.264	0.042	18.004	>25	0.215	1.791	>25	0.82	>25
V704_2544_140_RE_NT_pblib002_10	0.493	0.424	0.346	0.298	2.24	>25	2.283	2.125	>25	>25	>25	>25	>25	1.567	>25
V704_2544_140_RE_NT_pblib001_11	3.149	1.12	1.339	2.977	14.88	>25	>25	1.314	>25	>25	0.232	>25	>25	4.195	>25
V704_2544_150_RE_NT_pblib001_33	0.871	0.549	0.687	1.181	5.31	16.051	0.106	0.171	0.28	>25	>25	>25	>25	1.12	>25
V704_2555_240_RE_NT_pblib001_231	0.38	0.148	0.087	0.258	1.061	>25	0.052	0.057	>25	>25	>25	>25	>25	20	>25
V704_2684_181_RE_NT_pblib001_13	0.029	0.117	0.044	0.139	0.31	>25	0.018	0.05	>25	>25	>25	>25	>25	0.12	>25
V704_2684_181_RE_NT_pblib006_3	0.033	0.158	0.043	0.131	0.275	>25	0.019	0.057	>25	>25	>25	>25	>25	0.13	>25
V704_2767_070_RE_NT_pblib001_63	0.476	0.252	0.184	2.979	8.32	3.189	0.195	0.63	>25	>25	0.854	>25	>25	7.16	>25
V704_2788_060_RE_NT_pblib001_96	0.221	0.45	0.714	0.609	3.171	2.516	0.571	0.536	0.008	0.0001	>25	>25	>25	2.06	>25
V704_2788_060_RE_NT_pblib002_20	0.502	0.596	0.735	0.708	3.5	3.104	0.356	0.381	0.01	0.01	>25	>25	>25	0.434	>25
V704_2834_210_RE_NT_pblib002_26	0.229	0.727	0.3	0.23	5.79	>25	>25	18.87	>25	>25	>25	5.353	>25	1.84	>25
V704_2834_210_RE_NT_pblib001_44	0.328	1.11	0.211	0.253	5.62	>25	>25	15.601	>25	>25	>25	3.189	>25	0.415	>25
V704_2839_140_RE_NT_pblib001_208	0.318	0.5	0.731	5.705	3.96	>25	>25	>25	>25	>25	>25	8.989	>25	2.355	>25
V704_2981_150_RE_NT_pblib004_2	1.826	1.134	0.288	0.351	6.36	0.929	8.173	2.389	0.704	>25	>25	>25	>25	0.922	>25
V704_2981_150_RE_NT_pblib001_33	>25	3.909	3.159	3.012	16.5	7.835	3.613	1.139	0.06	>25	>25	>25	>25	9.84	>25
V704_2981_150_RE_NT_pblib002_11	4.473	1.502	0.649	0.917	4.94	2.453	>25	>25	>25	>25	>25	>25	>25	4.03	>25
V704_2981_150_RE_NT_pblib003_4	4.22	1.355	0.497	0.53	5.58	0.886	>25	>25	>25	>25	>25	>25	>25	1.17	>25
V704_3000_240_RE_NT_pblib001_8	0.175	0.287	1.724	0.527	1.79	>25	>25	>25	>25	>25	>25	3.358	>25	ND	>25
V704_3000_240_RE_NT_pblib019_1	0.178	0.461	1.597	1.445	5.22	>25	>25	>25	>25	>25	>25	8.711	>25	0.745	>25
V704_3008_040_RE_NT_pblib001_113	0.402	1.972	0.092	0.704	9.935	>25	0.22	4.87	>25	>25	>25	>25	>25	1.11	>25
V704_0372_250_RE_NT_pblib001_7	0.165	1.52	0.284	1.47	1.32	3.16	>25	>25	>25	>25	>25	>25	>25	0.427	>25
V704_0372_250_RE_NT_pblib002_6	0.125	0.529	ND	0.986	0.868	>25	>25	>25	>25	>25	ND	ND	ND	ND	ND

Table S1. IC50 and IC80 scores for the AMP V703 and V704 study sequences. A. IC50 AMP V703. **B.** IC50 AMP V704. **C.** IC80 AMP V703. **D.** IC80 AMP V704.When more than one transmitted founder lineage was found in an individual, the set of TFLs are grouped in these tables. For designing SHEP-T2 and class specific sensitive panels, we used the most sensitive variant overall to represent an individual, and those are marked in grey on the left. For the REP-

T2 the least sensitive from an individual was used, are these are marked in yellow. “ND” means that the assay was not done.

Table S2 A. AMP V704 nomenclature key

Accession number	Isolate name in Genbank, sequence name	NIH repository name	Plasmid_name	Subtype	Country	Sampling Year	Footnotes
OQ912888	V704_0026_231_RE_NT_pblib001_3	AMP1-P136	H704_0026_231_RE_pbsga001_s	B	PERU	2019	
ON980817	V704_0128_220_RE_NT_pblib001_52	AMP1-P101.1	H704_0128_220_RE_pb001_s	BF1	PERU	2019	
ON980818	V704_0128_220_RE_NT_pblib002_40	AMP1-P101.2	V704_0128_220_RE_pblib002_s	BF1	PERU	2019	
OQ912889	V704_0372_250_RE_NT_pblib001_7	AMP1-P137.1	V704_0372_250_RE_pblib001_s	B	PERU	2019	
OQ912890	V704_0372_250_RE_NT_pblib002_6	AMP1-P137.2	V704_0372_250_RE_pblib002_s	B	PERU	2019	
ON980823	V704_0445_180_RE_NT_pblib001_22	AMP1-P102	H704_0445_180_RE_con_s	B	PERU	2019	
ON980826	V704_0496_040_RE_NT_pblib001_37	AMP1-P103	H704_0496_040sN	F1	BRAZIL	2017	
ON980827	V704_0513_150_RE_NT_pblib001_34	AMP1-P104.1	H704_0513_150_eN01T	B	PERU	2018	
ON980828	V704_0513_150_RE_NT_pblib002_10	AMP1-P104.2	H704_0513_150_eN02C	B	PERU	2018	
ON980829	V704_0513_150_RE_NT_pblib007_2	AMP1-P104.3	H704_0513_150_RE_pblib003_s	B	PERU	2018	
ON980835	V704_0575_060_RE_NT_con02_s	AMP1-P105.2	V704_0575_060_RE_NT_con02_s	B	PERU	2018	2
ON980834	V704_0575_060_RE_NT_pblib001_60	AMP1-P105.1	H704_0575_060_EsN1A	B	PERU	2018	
ON980836	V704_0575_060_RE_NT_pblib002_16	AMP1-P105.3	H704_0575_060_RE_p002s	B	PERU	2018	
ON980839	V704_0644_060_RE_NT_pblib001_216	AMP1-P106	H704_0644_060sN_prelimSeq	B	PERU	2018	
ON980844	V704_0726_080_RE_NT_pblib001_26	AMP1-P107	H704_0726_080sN	B	UNITED STATES	2017	
ON980846	V704_0746_760_RE_NT_pblib001_37	AMP1-P108.2	H704_0746_760_RE_p002s	B	PERU	2018	
ON980847	V704_0746_760_RE_NT_pblib002_36	AMP1-P108.3	H704_0746_760_RE_p003s	B	PERU	2018	
ON980845	V704_0746_760_RE_NT_pblib003_34	AMP1-P108.1	H704_0746_760_RE_p001s	B	PERU	2018	
ON980852	V704_0847_030_RE_NT_pblib001_34	AMP1-P109.1	H704_0847_030_EsN_01T	B	PERU	2018	
ON980853	V704_0847_030_RE_NT_pblib002_23	AMP1-P109.2	H704_0847_030_EsN_02C	B	PERU	2018	
ON980854	V704_0855_080_RE_NT_pblib001_187	AMP1-P110	H704_0855_080_EsN	B	PERU	2018	
OQ912891	V704_0856_240_RE_NT_pblib001_9	AMP1-P138	H704_0856_240_RE_pb001_s	B	UNITED STATES	2019	
OQ912892	V704_0886_250_RE_NT_pblib001_10	AMP1-P139	H704_0886_250_RE_p001s	B	PERU	2019	
ON980862	V704_0907_130_RE_NT_pblib001_32	AMP1-P111	H704_0907_130sN	B	UNITED STATES	2017	
ON980863	V704_0911_150_RE_NT_pblib001_58	AMP1-P112	H704_0911_150sN	B	UNITED STATES	2017	
ON980866	V704_0944_180_RE_NT_pblib001_76	AMP1-P113	H704_0944_180_RE_cs	B	PERU	2019	
ON980868	V704_1109_140_RE_NT_pblib001_191	AMP1-P114	H704_1109_140_RE_cs	BF1	PERU	2019	
ON980872	V704_1180_070_RE_NT_pblib001_87	AMP1-P115.2	H704_1180_070EsN	A1B	PERU	2018	
ON980871	V704_1180_070_RE_NT_pblib027_1	AMP1-P115.1	H704_1180_070_RE_pblib027_s	A1B	PERU	2018	
ON980873	V704_1183_220_RE_NT_pblib001_70	AMP1-P116	H704_1183_220EsN	B	UNITED STATES	2018	
ON980885	V704_1429_090_RE_NT_pblib001_111	AMP1-P117.2	H704_1429_090_eN2G	F2	SWITZERLAND	2017	
ON980884	V704_1429_090_RE_NT_pblib002_75	AMP1-P117.1	H704_1429_090_eN1A	F2	SWITZERLAND	2017	
OQ912893	V704_1528_240_RE_NT_pblib001_17	AMP1-P140	H704_1528_240_RE_pblib_001_s	B	PERU	2019	
ON980889	V704_1535_030_RE_NT_pblib001_471	AMP1-P118	H704_1535_030sN	B	UNITED STATES	2017	
ON980897	V704_1706_040_RE_NT_pblib001_26	AMP1-P119	H704_1706_050sN	B	PERU	2018	
ON980906	V704_1775_030_RE_NT_pblib001_135	AMP1-P120	H704_1775_030cN_SynGtoA_567	F1	PERU	2018	
ON980907	V704_1783_150_RE_NT_pblib001_144	AMP1-P121	H704_1783_150_RE_cs	B	PERU	2019	
ON980910	V704_1835_150_RE_NT_pblib001_10	AMP1-P122.1	H704_1835_150_RE_p001s_2484A	B	PERU	2018	
ON980911	V704_1835_150_RE_NT_pblib002_9	AMP1-P122.2	H704_1835_150_RE_p002s_2484A	B	PERU	2018	
ON980913	V704_1930_170_RE_NT_pblib001_234	AMP1-P123.2	H704_1930_170_RE_c02s_1523G	BF1	PERU	2019	
ON980912	V704_1930_170_RE_NT_pblib002_114	AMP1-P123.1	H704_1930_170_RE_c01s_1523A	BF1	PERU	2019	
ON980917	V704_1991_230_RE_NT_pblib001_38	AMP1-P124.1	H704_1991_230_RE_p001s_1194T	B	PERU	2018	
ON980918	V704_1991_230_RE_NT_pblib002_19	AMP1-P124.2	H704_1991_230_RE_p002s_1194T	B	PERU	2018	
ON980920	V704_2065_060_RE_NT_pblib001_47	AMP1-P125.1	H704_2065_060_RE_p001s	B	PERU	2018	
ON980921	V704_2065_060_RE_NT_pblib002_42	AMP1-P125.2	H704_2065_060_RE_p002s	B	PERU	2018	
ON980922	V704_2095_130_RE_NT_pblib001_136	AMP1-P126	H704_2095_130_RE_cs	B	PERU	2019	
OQ912894	V704_2448_240_RE_NT_pblib001_288	AMP1-P141	H704_2448_240_RE_cs	B	PERU	2018	
ON980937	V704_2541_080_RE_NT_pblib003_5	AMP1-P127.3	H704_2541_080EsN	B	UNITED STATES	2018	3
ON980939	V704_2541_080_RE_NT_pblib042_1	AMP1-P127.2	H704_2541_080_RE_p003s	B	UNITED STATES	2018	3
ON980938	V704_2541_080_RE_NT_pblib001_13	AMP1-P127.1	H704_2541_080_RE_p001s	B	UNITED STATES	2018	3
ON980941	V704_2544_140_RE_NT_pblib001_11	AMP1-P128.2	H704_2544_140eN02	B	UNITED STATES	2018	4
ON980940	V704_2544_140_RE_NT_pblib002_10	AMP1-P128.1	H704_2544_140eN01	B	UNITED STATES	2018	4
ON980942	V704_2544_150_RE_NT_pblib001_33	AMP1-P128.3	H704_2544_150_RE_p001s	B	UNITED STATES	2018	4
OQ912895	V704_2555_240_RE_NT_pblib001_231	AMP1-P142	H704_2555_240_RE_con_s_vpuG	B	PERU	2019	5
ON980946	V704_2684_181_RE_NT_pblib001_13	AMP1-P129.1	H704_2684_181_RE_p001s	B	PERU	2018	
ON980947	V704_2684_181_RE_NT_pblib006_3	AMP1-P129.2	H704_2684_181_RE_pblib006_s	B	PERU	2018	
ON980949	V704_2767_070_RE_NT_pblib001_63	AMP1-P130	H704_2767_070sN	B	PERU	2017	
ON980952	V704_2788_060_RE_NT_pblib001_96	AMP1-P131.1	H704_2788_060eN_04	BF1	PERU	2017	
ON980953	V704_2788_060_RE_NT_pblib002_20	AMP1-P131.2	H704_2788_060eN_12	BF1	PERU	2017	
ON980954	V704_2834_210_RE_NT_pblib001_44	AMP1-P132.1	H704_2834_210_RE_pb001_s	B	BRAZIL	2019	
ON980955	V704_2834_210_RE_NT_pblib002_26	AMP1-P132.2	H704_2834_210_RE_pb002_s	B	BRAZIL	2019	
ON980956	V704_2839_140_RE_NT_pblib001_208	AMP1-P133	H704_2839_140_RE_cs	B	PERU	2019	
ON980961	V704_2981_150_RE_NT_pblib001_33	AMP1-P134.1	H704_2981_150_RE_p001s_2559A	B	UNITED STATES	2018	
ON980962	V704_2981_150_RE_NT_pblib002_11	AMP1-P134.2	H704_2981_150_RE_p002s_2559A	B	UNITED STATES	2018	
ON980963	V704_2981_150_RE_NT_pblib003_4	AMP1-P134.3	H704_2981_150_RE_pblib003_s	B	UNITED STATES	2018	
ON980964	V704_2981_150_RE_NT_pblib004_2	AMP1-P134.4	H704_2981_150_RE_pblib005_s	B	UNITED STATES	2018	
OQ912896	V704_3000_240_RE_NT_pblib001_8	AMP1-P143.1	H704_3000_240_RE_pbsga001_s	B	PERU	2018	
OQ912897	V704_3000_240_RE_NT_pblib019_1	AMP1-P143.2	H704_3000_240_RE_pbsga002_s	B	PERU	2018	
ON980965	V704_3008_040_RE_NT_pblib001_113	AMP1-P135	H704_3008_040EsN	B	PERU	2018	

Table S2 B. AMP V703 nomenclature key

Accession number	Isolate name in Genbank, sequence name	NIH repository name	Plasmid_name	Subtype	Country	Sampling Year	Footnotes
ON890939	V703_0013_090_RE_con_s	AMP1-P001	H703_0013_090Es	C	SOUTH AFRICA	2019	
ON890946	V703_0203_081_RE_pblib002_s	AMP1-P002.1	V703_0203_081_RE_pblib002_s	C	MALAWI	2019	
ON890947	V703_0203_081_RE_sga8A5_s	AMP1-P002.2	H703_0203_081_RE_e8A5s	C	MALAWI	2019	
ON890948	V703_0217_050_RE_pblib002_s	AMP1-P003.1	V703_0217_050_RE_pblib002_s	C	ZAMBIA	2017	
ON890949	V703_0217_050_RE_sga2A3_s	AMP1-P003.2	H703_0217_050e_2A3	C	ZAMBIA	2017	
ON890950	V703_0279_110_RE_con_s-modified	AMP1-P004.1	H703_0279_110s	C	SOUTH AFRICA	2018	
ON890951	V703_0279_110_RE_pblib002_s	AMP1-P004.2	V703_0279_110_RE_pblib002_s	C	SOUTH AFRICA	2018	
ON890962	V703_0472_030_RE_con_s	AMP1-P005	H703_0472_030s	C	MALAWI	2017	
ON890973	V703_0537_110_RE_pblib003_s	AMP1-P006.1	V703_0537_110_RE_pblib003_s	C	SOUTH AFRICA	2017	
ON890974	V703_0537_110_RE_sga2B5_s	AMP1-P006.2	H703_0537_110s_2B5	C	SOUTH AFRICA	2017	
ON890975	V703_0537_110_RE_sga4H1_s	AMP1-P006.3	H703_0537_110s_4H1	C	SOUTH AFRICA	2017	
ON890976	V703_0566_160_RE_con_s	AMP1-P007.1	H703_0566_160s	C	SOUTH AFRICA	2017	
ON890977	V703_0566_160_RE_pblib002_s	AMP1-P007.2	V703_0566_160_RE_pblib002_s	C	SOUTH AFRICA	2017	
ON890982	V703_0629_150_RE_pblib002_s	AMP1-P008.1	V703_0629_150_RE_pblib002_s	C	BOTSWANA	2018	
ON890983	V703_0629_150_RE_pblib003_s	AMP1-P008.2	V703_0629_150_RE_pblib003_s	C	BOTSWANA	2018	
ON890984	V703_0629_150_RE_pblib004_s	AMP1-P008.3	V703_0629_150_RE_pblib004_s	C	BOTSWANA	2018	
ON890985	V703_0629_150_RE_sga5A2_s	AMP1-P008.4	H703_0629_150_RE_e5A2s	C	BOTSWANA	2018	
ON890987	V703_0646_051_RE_con_s	AMP1-P009	H703_0646_051sN	C	SOUTH AFRICA	2017	
ON890990	V703_0739_110_RE_con_s-modified	AMP1-P010	H703_0739_110s	C	SOUTH AFRICA	2017	
ON890997	V703_0842_200_RE_con_s	AMP1-P011	H703_0842_200Es	C	ZAMBIA	2018	
ON890999	V703_0865_070_RE_con_s	AMP1-P012	H703_0865_070s	G	KENYA	2017	
ON891001	V703_0926_070_RE_sga2H2_s	AMP1-P013	H703_0926_070s_2H2	C	SOUTH AFRICA	2017	
ON891010	V703_1060_080_RE_con_s	AMP1-P014	H703_1060_080s	C	SOUTH AFRICA	2017	
ON891011	V703_1104_100_RE_pblib001_s	AMP1-P015.1	V703_1104_100_RE_pblib001_s	C	ZAMBIA	2017	
ON891012	V703_1104_100_RE_sga10A5_s	AMP1-P015.2	H703_1104_100_RE_e10A5s	C	ZAMBIA	2017	
ON891013	V703_1104_100_RE_sga10G5_s	AMP1-P015.3	H703_1104_100_RE_e10G5s	C	ZAMBIA	2017	
ON891026	V703_1313_040_RE_con_s	AMP1-P016	H703_1313_040s	C	SOUTH AFRICA	2017	
ON891037	V703_1471_190_RE_con_s	AMP1-P017	H703_1471_190s	C	SOUTH AFRICA	2017	
ON891047	V703_1675_080_RE_con_s	AMP1-P018.2	H703_1675_080s	C	SOUTH AFRICA	2017	
ON891046	V703_1675_080_RE_con_s-modified	AMP1-P018.1	H703_1675_080s_G613S	C	SOUTH AFRICA	2017	
ON891053	V703_1750_140_RE_con_s	AMP1-P019	H703_1750_140Es	C	SOUTH AFRICA	2018	
ON891055	V703_1764_250_RE_con_s	AMP1-P020.1	H703_1764_250_RE_cs	C	SOUTH AFRICA	2019	
ON891056	V703_1764_250_RE_pblib002_s	AMP1-P020.2	V703_1764_250_RE_pblib002_s	C	SOUTH AFRICA	2019	
ON891058	V703_1789_230_RE_sga3A3_s	AMP1-P021	H703_1789_230_RE_e3A3s	C	MALAWI	2018	
ON891062	V703_1848_190_RE_pblib002_s	AMP1-P022.1	V703_1848_190_RE_pblib002_s	C	MALAWI	2019	
ON891063	V703_1848_190_RE_sga6D1_s	AMP1-P022.2	H703_1848_190_RE_e6D1s	C	MALAWI	2019	
ON891068	V703_1889_100_RE_con_s	AMP1-P023	H703_1889_100Es	C	SOUTH AFRICA	2018	
ON891069	V703_1915_250_RE_sgaA3_s	AMP1-P024.1	V703_1915_250_RE_sgaA3_s	C	SOUTH AFRICA	2019	
ON891070	V703_1915_250_RE_sgaC2a_s	AMP1-P024.2	V703_1915_250_RE_sgaC2a_s	C	SOUTH AFRICA	2019	
ON891075	V703_2018_240_RE_sga6A1_s	AMP1-P025	H703_2018_240_RE_e6A1s	C	SOUTH AFRICA	2019	
ON891077	V703_2117_110_RE_sga2A10_s	AMP1-P026	H703_2117_110_RE_e2A10s	C	SOUTH AFRICA	2019	
ON891079	V703_2149_060_RE_sgaB10_s	AMP1-P027	H703_2149_060_RE_eB10s	C	MALAWI	2018	
ON891080	V703_2304_150_RE_con_s	AMP1-P028	H703_2304_150_RE_cs	C	SOUTH AFRICA	2019	
ON891082	V703_2539_070_RE_pblib002_s	AMP1-P029.1	V703_2539_070_RE_pblib002_s	C	SOUTH AFRICA	2018	1
ON891083	V703_2539_070_RE_sga6F6_s	AMP1-P029.2	H703_2539_070_RE_e6F6s	C	SOUTH AFRICA	2018	1
ON891084	V703_2631_150_RE_sga2F8_s	AMP1-P030	H703_2631_150_RE_e2F8s	C	MALAWI	2019	
ON891087	V703_2788_030_RE_con_s	AMP1-P031	H703_2788_030Es_B1	C	MALAWI	2018	
ON891088	V703_2805_080_RE_con_s	AMP1-P032.1	H703_2805_080Es	C	MOZAMBIQUE	2018	
ON891089	V703_2805_080_RE_pblib002_s	AMP1-P032.2	V703_2805_080_RE_pblib002_s	C	MOZAMBIQUE	2018	

Footnotes:

1. V703_2539 also called V703_1039
2. Synthesized gene, no exact match in vivo
3. V704_2541 also called V704_1041
4. V704_2544 also called V704_1044
5. V704_2555 also called V704_1055

Table S2. Nomenclature key and critical sequence metadata. A. V704 study sequences. **B.** V703 study sequences.

Table S3

				IC50												
				CD4bs					V3		V2		FP			MPER
	Sequence Name	IC50 Rank Mean Rank	IC50 Mean Rank	1-18	VRC07-523 LS	3BNC117-LS	VRC01	CH235.12	PGT121.414 LS	10-1074 LS	PGDM1400	CAP256-VRC26.25 LS	PGT151	VRC34.01	ACS202	10E8v4
1	V704_0128_220_RE_NT_pblib001_52	10.21	1	0.023	0.006	0.026	0.04	0.021	0.018	0.059	0.008	0.002	25	0.19	22.918	1.221
2	V704_0855_080_RE_NT_pblib001_187	11.47	2	0.012	0.003	0.009	0.013	25	0.05	0.061	25	25	0.007	25	25	0.134
3	V704_1180_070_RE_NT_pblib001_87	12.59	3	0.005	0.045	0.016	0.17	0.145	25	25	0.188	25	0.009	0.28	0.273	0.32
4	V703_0472_030_RE_con_s	13.75	4	0.005	0.01	25	0.021	0.05	25	7.94	0.1	0.01	0.028	5.67	10	0.42
5	V703_2304_150_RE_con_s	13.77	5	0.06	0.02	0.06	0.1135	0.08	0.07	0.06	0.01	0.01	10	0.03	10	0.36
6	V703_2805_080_RE_con_s	15.12	6	0.027	0.01	0.02	0.2668	0.24	25	25	0.0019	0.0004	0.06	0.23	10	1.22
7	V704_1535_030_RE_NT_pblib001_471	15.30	7	0.052	0.068	0.019	0.088	25	0.011	0.071	1.109	25	0.197	0.39	0.512	0.015
8	V704_1528_240_RE_NT_pblib001_17	15.69	9	0.06	0.439	0.092	2.39	7.107	0.003	0.004	25	25	1.418	0.04	0.041	0.243
9	V704_0907_130_RE_NT_pblib001_32	16.01	10	0.016	0.193	0.199	0.364	15.857	0.002	0.006	25	25	0.017	0.25	0.236	0.655
10	V703_1313_040_RE_con_s	17.08	12	0.046	0.04	0.11	0.686	10	0.01	0.06	0.004	0.0018	10	10	10	0.01
11	V703_2117_110_RE_sga2A10_s	20.38	17	0.17	0.04	0.11	0.2285	0.52	25	25	0.0007	0.0001	10	0.81	10	0.88
12	V704_0445_180_RE_NT_pblib001_22	26.09	25	0.012	0.063	25	82.985	0.205	0.291	0.086	0.285	25	0.083	25	0.08	1.49
replaced	V703_0537_110_RE_sga4H1_s	15.32	8	0.01	0.01	0.02	0.0899	1.14	0.01	0.08	0.09	0.01	10	10	10	0.68
replaced	V704_2684_181_RE_NT_pblib001_13	16.32	11	0.01	0.044	0.051	0.09	25	0.006	0.019	25	25	25	25	0.913	0.03
	V704_2541_080_RE_NT_pblib001_13	18.13	13	0.037	0.056	0.032	0.305	0.288	0.026	0.008	2.163	25	0.033	0.76	25	0.25
	V704_1775_030_RE_NT_pblib001_135	18.69	14	0.014	0.029	0.109	0.09	0.05	25	25	0.002	0.028	0.112	25	25	0.291
	V703_0566_160_RE_con_s	19.12	15	0.04	0.09	0.2	1.3324	0.48	0.01	0.01	25	25	0.007	0.08	10	0.92
	V703_1675_080_RE_con_s-modified	20.36	16	0.02	0.08	0.06	0.3446	0.15	0.98	1.42	0.01	0.0001	0.59	10	4.47	18.53
	V703_1471_190_RE_con_s	20.58	18	0.05	0.08	0.06	0.1608	0.6	0.01	0.1	0.02	0.01	0.01	10	10	4.92
	V703_0739_110_RE_con_s-modified	21.21	19	0.025	0.05	0.07	0.1431	0.56	0.67	0.16	3.23	0.0009	10	4.86	0.09	1.94
	V703_2149_060_RE_sgaB10_s	21.51	20	0.0324	0.07	25	0.205	10	0.11	0.07	0.0012	0.0001	9.17	10	10	0.98
	V704_1783_150_RE_NT_pblib001_144	22.92	21	0.006	0.064	0.036	0.135	25	0.248	0.485	25	25	0.06	25	0.353	0.388
	V703_2631_150_RE_sga2F8_s	23.90	22	0.02	0.08	0.07	0.4631	1.02	25	25	0.0019	0.0004	10	0.97	10	1.23
	V703_0629_150_RE_pblib002_s	24.36	23	0.09	0.22	0.39	0.7194	0.2	4.72	4.4	0.42	0.05	0.0032	0.16	10	4.27
	V704_0026_231_RE_NT_pblib001_3	25.62	24	0.097	0.081	0.103	0.46	25	0.006	0.017	0.075	25	25	25	25	0.07
	V704_1930_170_RE_NT_pblib002_114	26.24	26	0.032	0.025	0.028	0.11	0.087	25	25	0.014	25	25	25	25	1
	V704_0856_240_RE_NT_pblib001_9	27.10	27	0.095	0.063	0.06	0.524	0.503	0.011	0.016	25	25	1.04	7.85	25	0.54
	V703_1848_190_RE_pblib002_s	27.57	28	0.0517	0.15	0.06	1.0367	0.92	25	6.74	0.01	0.01	0.06	10	10	0.28
	V704_2788_060_RE_NT_pblib001_96	28.86	29	0.075	0.173	0.167	1.36	0.694	0.171	0.201	0.003	0.0003	2.78	25	25	0.43
	V704_2555_240_RE_NT_pblib001_231	28.95	30	0.092	0.052	0.075	0.424	25	0.012	0.03	25	25	25	2.81	0.151	25
	V703_1764_250_RE_con_s	28.99	31	0.03	0.1	0.1	0.2402	0.1	0.2	0.13	25	25	0.18	10	10	1.41
	V703_2018_240_RE_sga6A1_s	29.25	32	0.16	0.3	1.13	1.2489	6.38	0.05	0.07	0.0031	0.0001	10	10	10	2.85
	V704_1183_220_RE_NT_pblib001_70	29.30	33	0.041	0.347	0.065	0.39	1.185	0.032	0.051	25	25	3.666	25	0.228	0.495
	V704_1991_230_RE_NT_pblib001_38	30.11	34	0.093	0.284	0.242	1.51	0.303	25	25	0.026	0.0003	0.373	25	0.128	0.5
	V703_1750_140_RE_con_s	30.23	35	0.11	0.18	0.23	0.8813	1.35	0.05	0.08	25	8.59	0.05	0.34	10	0.5
	V704_2065_060_RE_NT_pblib001_47	30.69	36	0.069	0.146	0.047	0.22	0.052	25	25	25	25	25	25	25	0.1
	V704_1835_150_RE_NT_pblib001_10	31.23	37	0.027	21.596	25	99	25	3.127	0.095	25	25	0.112	0.41	0.113	0.147
	V704_0575_060_RE_NT_pblib002_16	32.08	38	0.244	0.989	1.294	1.934	2.286	25	25	0.051	25	25	0.24	0.039	0.57
	V704_0944_180_RE_NT_pblib001_76	32.33	39	0.023	0.02	0.061	0.074	25	25	25	25	25	0.367	25	25	25
	V703_1060_080_RE_con_s	32.84	40	0.09	0.13	0.8	1.7123	1.17	25	3.63	25	0.31	0.05	10	10	0.08
	V704_2095_130_RE_NT_pblib001_136	32.92	41	0.079	0.096	0.053	0.312	0.283	2.167	0.085	25	25	0.147	25	25	0.51
	V703_0646_051_RE_con_s	33.47	42	0.18	0.45	1.54	4.8972	10	25	25	0.01	0.01	0.07	0.07	10	1.56
	V704_0847_030_RE_NT_pblib001_34	33.49	43	6.634	0.19	25	2.048	25	0.01	0.003	25	25	25	25	25	0.221
	V703_1889_100_RE_con_s	34.72	44	0.09	2.3	25	25	5.78	0.09	0.23	0.01	0.0001	10	10	10	25
	V704_2448_240_RE_NT_pblib001_288	35.69	45	0.133	0.108	0.058	0.14	0.146	25	25	25	25	25	25	7.416	25
	V703_2539_070_RE_sga6F6_s	36.03	46	0.74	0.39	25	1.7655	10	0.01	0.04	25	25	4.57	10	10	0.23
	V704_3000_240_RE_NT_pblib001_8	36.05	47	0.037	0.11	0.156	0.523	25	25	25	8.698	25	25	0.28	25	0.111
	V703_2788_030_RE_con_s	36.41	48	1.56	0.24	0.09	0.6812	4.9	0.3	0.09	1.2	0.01	1.84	10	10	5.38
	V704_0496_040_RE_NT_pblib001_37	36.41	49	0.037	0.242	25	4.94	1.236	0.142	0.078	0.011	0.011	25	25	25	0.289
	V704_0372_250_RE_NT_pblib001_7	36.55	50	0.03	0.167	0.199	0.415	0.191	25	25	25	25	25	25	25	0.087
	V703_0279_110_RE_con_s-modified	36.56	51	0.08	0.25	0.44	1.391	5.34	0.77	0.49	21.61	25	10	10	10	0.08
	V704_1706_040_RE_NT_pblib001_26	37.60	52	0.2	0.058	0.164	0.489	0.186	0.457	0.301	1.986	25	25	25	25	0.488
	V703_1298_080_RE_pblib002_s	38.21	53	0.15	1.27	25	25	0.16	25	25	0.09	0.01	0.1	10	10	0.84
	V703_1915_250_RE_sgaA3_s	38.62	54	0.0841	0.36	1.6	0.5291	5.6	0.32	0.84	25	3.48	0.04	10	10	3.83
	V704_2981_150_RE_NT_pblib004_2	39.81	55	0.392	0.414	0.129	2.43	0.279	1.271	0.702	0.262	25	25	9.1	25	0.23
	V704_0886_250_RE_NT_pblib001_10	41.06	56	0.173	0.177	0.516	1.745	25	0.338	0.185	25	25	25	25	0.498	0.171
	V704_0746_760_RE_NT_pblib001_37	41.31	57	0.19	0.397	0.255	0.87	5.201	0.015	0.014	25	25	25	25	25	3.08
	V704_2834_210_RE_NT_pblib002_26	41.47	58	0.056	0.199	0.059	2.039	25	7.78	3.385	25	25	25	1.18	25	0.397
	V704_0644_060_RE_NT_pblib001_216	42.02	59	0.084	0.155	0.29	1.02	3.275	6.348	0.454	25	25	25	5.73	25	0.297
	V704_1429_090_RE_NT_pblib002_75	42.07	60	0.111	0.097	1.216	0.235	25	25	25	0.079	11.679	4.01	25	25	0.537
	V704_2767_070_RE_NT_pblib001_63	42.11	61	0.217	0.126	0.796	2.06	1.275	0.066	0.241	25	25	0.038	25	25	2.03
	V704_0911_150_RE_NT_pblib001_58	42.39	62	0.437	0.538	0.622	1.391	10.111	0.013	0.018	25	25	3.99	25	25	0.869
	V703_1104_100_RE_pblib001_s	42.47	63	0.18	1.81	2.57	4.0481	10	25	2.98	0.33	0.14	10	10	0.19	0.92
	V704_3008_040_RE_NT_pblib001_113	42.64	64	0.067	0.431	0.163	3.02	25	0.017	0.178	25	25	25	25	25	0.184
	V703_0203_081_RE_pblib002_s	42.66	65.5	0.38	0.45	25	3.8721	7.6	0.04	0.03	25	25	10	10	10	0.67
	V703_0217_050_RE_pblib002_s	42.66	65.5	0.38	0.45	25	3.8721	7.6	0.04	0.03	25	25	10	10	10	0.67
	V703_0842_200_RE_con_s	42.66	67	10	1.44	2.13	20.8948	6.36	7.23	1.56	0.11	0.01	0.21	10	10	0.73
	V703_0926_070_RE_sga2H2_s	42.93	68	2.02	0.81	2.04	7.8027	2.34	0.04	0.1	1.04	25	10	10	10	0.56
	V703_0013_090_RE_con_s	43.48	69	0.52	0.42	25	3.4725	10	7.97	18.41	0.01	0.01	10	10	10	1.61
	V704_0513_150_RE_NT_pblib007_2	45.17	70	0.413	0.263	0.29	1.08	17.817	25	25	25	25	0.047	1.47	25	0.98
	V704_2544_140_RE_NT_pblib002_10	45.54	71	0.431	0.122	0.108	0.922	4.104	0.493	0.611	25	25	25	25	25	0.4
	V704_2839_140_RE_NT_pblib001_208	46.10	72	0.116	0.183	1.426	1.58	25	25	25	25	25	25	1.77	1.486	0.63
	V703_1789_230_RE_sga3A3_s	50.42	73	0.09	0.99	25	17.8963	10	0.83	0.34	25	25	10	10	10	2.43
	V704_0726_080_RE_NT_pblib001_26	52.86	74	0.199	1.02	0.537	5.636	3.445	0.36	0.734	0.421	25	25	25	25	2.473
	V704_1109_140_RE_NT_pblib001_191	58.55	75	25	0.283	25	3.36	25	25	25	0.201	25	25	25	25	1.25

Table S3. Ranking of the AMP viruses for creating the SHEP-T2 bNab sensitive screening panel. Note that only 13 of the 15 antibodies tested (see Table S1) were included here. This is because the full neutralization data for the antibody VRC01-23 LS was not available at the time this panel was first designed and pseudovirus evaluation was initiated, and CAP248-2B AMP data indicated that it was not a broadly neutralizing antibody, so both were excluded it from consideration. We began the work to characterize this panel and to share the panel reagents prior to the complete VRC01-23 LS data being obtained, but its data is included in the SHEP-T2 panel data and is shown in Fig. 3. Fortunately, and as expected, the 12 viruses selected for the panel were also very sensitive to VRC01-23 LS, and the two viruses most sensitive to VRC01-23 LS viruses were already included in the panel. The color key for the neutralizing antibody responses is provided in Table S1 and Fig. 3. The IC50 mean rank orders the viruses according to their overall sensitivity to this panel of antibodies. In addition, the 3 lowest antibody scores for each antibody are written in white and underlined, and we required that at least 2 of these 3 were included the SHEP-T2 panel, which is why two of the lower ranked viruses (ranks 8 and 11) were replaced with viruses that were ranked higher and less sensitive overall (ranks 17 and 25), as these viruses were particularly sensitive to the V2 apex antibodies and to FP antibody ACS202.

Table S4 A.

Virus Name	Backbone	Host Cell	Tier	Clade	Virus ID#	Panel	SHEP-T2 panel	MPER sensitive	V3 sensitive	V2 sensitive	FP sensitive	CD4bs sensitive
V704_1535_030_RE_NT_pblib001_471	SG3 Δenv	293T/17	2	B	AMP322	SHEP-T2	Y	Y	N	N	N	Y
V704_0128_220_RE_NT_pblib001_52	SG3 Δenv	293T/17	2	F1/B	AMP228	SHEP-T2	Y	N	N	Y	N	Y
V704_0907_130_RE_NT_pblib001_32	SG3 Δenv	293T/17	2	B	AMP17	SHEP-T2	Y	N	Y	N	Y	N
V704_1528_240_RE_NT_pblib001_17	SG3 Δenv	293T/17	2	B	AMP253	SHEP-T2	Y	N	Y	N	Y	N
V704_0855_080_RE_NT_pblib001_187	SG3 Δenv	293T/17	2	B	AMP98	SHEP-T2	Y	Y	N	N	N	Y
V704_1180_070_RE_NT_pblib001_87	SG3 Δenv	293T/17	2	A1/B	11050	SHEP-T2	Y	N	N	N	Y	Y
V704_0445_180_RE_NT_pblib001_22	SG3 Δenv	293T/17	2	B	AMP218	SHEP-T2	Y	N	N	N	Y	N
V703_2117_110_RE_sga2A10_s	SG3 Δenv	293T/17	2	C	AMP333	SHEP-T2	Y	N	N	Y	N	N
V703_2117_110_RE_sga2A10_s	SG3 Δenv	293T/17	2	C	11105	SHEP-T2	Y	N	N	Y	Y	Y
V703_1313_040_RE_con_s	SG3 Δenv	293T/17	2	C	11065	SHEP-T2	Y	Y	Y	Y	N	N
V703_2304_150_RE_con_s	SG3 Δenv	293T/17	2	C	AMP328	SHEP-T2	Y	N	N	N	Y	N
V703_0472_030_RE_con_s	SG3 Δenv	293T/17	2	C	11072	SHEP-T2	Y	N	N	N	N	Y
V704_2684_181_RE_NT_pblib001_13	SG3 Δenv	293T/17	2	B	AMP205	V3 MPER	N	Y	Y	N	N	N
V704_0026_231_RE_NT_pblib001_3	SG3 Δenv	293T/17	2	B	AMP245	V3 MPER	N	Y	Y	N	N	N
V703_1060_080_RE_con_s	SG3 Δenv	293T/17	2	C	AMP38	MPER	N	Y	N	N	N	N
V703_0279_110_RE_con_s-modified	SG3 Δenv	293T/17	2	C	AMP339	MPER	N	Y	N	N	N	N
V704_0372_250_RE_NT_pblib001_7	SG3 Δenv	293T/17	2	B	AMP312	MPER	N	Y	N	N	N	N
V704_0847_030_RE_NT_pblib001_34	SG3 Δenv	293T/17	2	B	11132	V3	N	N	Y	N	N	N
V703_0566_160_RE_con_s	SG3 Δenv	293T/17	2	C	AMP337	V3 FP	N	N	Y	N	Y	N
V704_2541_080_RE_NT_pblib001_13	SG3 Δenv	293T/17	2	B	AMP201	V3	N	N	Y	N	N	N
V703_0629_150_RE_pblib002_s	SG3 Δenv	293T/17	2	C	AMP345	FP	N	N	N	N	Y	N
V704_0575_060_RE_NT_pblib002_16	SG3 Δenv	293T/17	2	B	AMP181	FP	N	N	N	N	Y	N
V703_0646_051_RE_con_s	SG3 Δenv	293T/17	2	C	AMP350	FP	N	N	N	N	Y	N
V704_1835_150_RE_NT_pblib001_10	SG3 Δenv	293T/17	2	B	AMP192	FP	N	N	N	N	Y	N
V703_0739_110_RE_con_s-modified	SG3 Δenv	293T/17	2	C	AMP357	FP	N	N	N	N	Y	N
V703_2149_060_RE_sgaB10_s	SG3 Δenv	293T/17	2	C	11149	V2	N	N	N	Y	N	N
V703_2018_240_RE_sga6A1_s	SG3 Δenv	293T/17	2	C	AMP341	V2	N	N	N	Y	N	N
V703_2631_150_RE_sga2F8_s	SG3 Δenv	293T/17	IB	C	AMP343	V2	N	N	N	N	N	N
V703_1675_080_RE_con_s-modified	SG3 Δenv	293T/17	2	C	11112	V2	N	N	N	Y	N	N
V703_0537_110_RE_sga4H1_s	SG3 Δenv	293T/17	2	C	AMP348	CD4bs	N	N	N	N	N	Y
V704_1775_030_RE_NT_pblib001_135	SG3 Δenv	293T/17	2	F1	AMP93	CD4bs V2	N	N	N	Y	N	Y
V704_1783_150_RE_NT_pblib001_144	SG3 Δenv	293T/17	2	B	AMP167	CD4bs	N	N	N	N	N	Y

Table S4 B.

	VRC26UCA_4A/293I		AbPG9_RUA/293I		AbPG16_RUA/293I		gIPGT145/293I		PGT121tkUCA.V2/293I		DH270UCA3_G1.4A/293I		Antibody
	191022PPF		200221PPF		200224PPF		19121PPF		200225PPF		191107PPF		Lot
	V2-apex		V2-apex		V2-apex		Apex		V3-glycan		V3-glycan		Epitope
Virus Name	ID50	ID80	ID50	ID80	ID50	ID80	ID50	ID80	ID50	ID80	ID50	ID80	Measure
V704_1535_030_RE_NT_pblib001_471	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_0128_220_RE_NT_pblib001_52	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_0907_130_RE_NT_pblib001_32	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_1528_240_RE_NT_pblib001_17	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_0855_080_RE_NT_pblib001_187	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_1180_070_RE_NT_pblib001_87	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_0445_180_RE_NT_pblib001_22	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_2117_110_RE_sga2A10_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_2117_110_RE_sga2A10_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_1313_040_RE_con_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_2304_150_RE_con_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_0472_030_RE_con_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_2684_181_RE_NT_pblib001_13	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_0026_231_RE_NT_pblib001_3	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_1060_080_RE_con_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_0279_110_RE_con_s-modified	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_0372_250_RE_NT_pblib001_7	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_0847_030_RE_NT_pblib001_34	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_0566_160_RE_con_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_2541_080_RE_NT_pblib001_13	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_0629_150_RE_pblib002_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_0575_060_RE_NT_pblib002_16	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_0646_051_RE_con_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_1835_150_RE_NT_pblib001_10	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_0739_110_RE_con_s-modified	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_2149_060_RE_sgaB10_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_2018_240_RE_sga6A1_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_2631_150_RE_sga2F8_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_1675_080_RE_con_s-modified	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_0537_110_RE_sga4H1_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_1775_030_RE_NT_pblib001_135	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_1783_150_RE_NT_pblib001_144	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	

Table S4 B, continued.

	PGT128_gl/293I		VRC03gHvgLv/293I		VRC04gHvgLv/293I		VRC07gHvgLv/293I		VRC18bgHvgLv		VRC20gHvgLv		Antibody
	200226PPF		191106PPF		191023PPF		191024PPF		191114PPF		191029PPF		Lot
	V3-glycan		CD4bs		CD4bs		CD4bs		CD4bs		CD4bs		Epitope
Virus Name	ID50	ID80	ID50	ID80	ID50	ID80	ID50	ID80	ID50	ID80	ID50	ID80	Measure
V704_1535_030_RE_NT_pblib001_471	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_0128_220_RE_NT_pblib001_52	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_0907_130_RE_NT_pblib001_32	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_1528_240_RE_NT_pblib001_17	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_0855_080_RE_NT_pblib001_187	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_1180_070_RE_NT_pblib001_87	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_0445_180_RE_NT_pblib001_22	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_2117_110_RE_sga2A10_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_2117_110_RE_sga2A10_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_1313_040_RE_con_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_2304_150_RE_con_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_0472_030_RE_con_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_2684_181_RE_NT_pblib001_13	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_0026_231_RE_NT_pblib001_3	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_1060_080_RE_con_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_0279_110_RE_con_s-modified	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_0372_250_RE_NT_pblib001_7	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_0847_030_RE_NT_pblib001_34	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_0566_160_RE_con_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_2541_080_RE_NT_pblib001_13	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_0629_150_RE_pblib002_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_0575_060_RE_NT_pblib002_16	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_0646_051_RE_con_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_1835_150_RE_NT_pblib001_10	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_0739_110_RE_con_s-modified	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_2149_060_RE_sgaB10_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_2018_240_RE_sga6A1_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_2631_150_RE_sga2F8_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_1675_080_RE_con_s-modified	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_0537_110_RE_sga4H1_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_1775_030_RE_NT_pblib001_135	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_1783_150_RE_NT_pblib001_144	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	

	VRC23.gl/293I		RC01_UCAtk_4A/293		bCH3X_UCAl (gl-CH3		CH103_UCA_4A/293I		12A12gl/293I		glPGV04/293I		Antibody
	191031PPF		191120PPF-1		191112PPF		191101PPF		191030PPF		191119PPF		Lot
	CD4bs		CD4bs		CD4bs		CD4bs		CD4bs		CD4bs		Epitope
Virus Name	ID50	ID80	ID50	ID80	ID50	ID80	ID50	ID80	ID50	ID80	ID50	ID80	Measure
V704_1535_030_RE_NT_pblib001_471	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_0128_220_RE_NT_pblib001_52	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_0907_130_RE_NT_pblib001_32	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_1528_240_RE_NT_pblib001_17	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_0855_080_RE_NT_pblib001_187	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_1180_070_RE_NT_pblib001_87	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_0445_180_RE_NT_pblib001_22	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_2117_110_RE_sga2A10_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_2117_110_RE_sga2A10_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_1313_040_RE_con_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_2304_150_RE_con_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_0472_030_RE_con_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_2684_181_RE_NT_pblib001_13	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_0026_231_RE_NT_pblib001_3	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_1060_080_RE_con_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_0279_110_RE_con_s-modified	>50	>50	>50	>50	*failed*	*failed*	>50	>50	>50	>50	>50	>50	
V704_0372_250_RE_NT_pblib001_7	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_0847_030_RE_NT_pblib001_34	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_0566_160_RE_con_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_2541_080_RE_NT_pblib001_13	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_0629_150_RE_pblib002_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_0575_060_RE_NT_pblib002_16	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_0646_051_RE_con_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_1835_150_RE_NT_pblib001_10	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_0739_110_RE_con_s-modified	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_2149_060_RE_sgaB10_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_2018_240_RE_sga6A1_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_2631_150_RE_sga2F8_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_1675_080_RE_con_s-modified	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_0537_110_RE_sga4H1_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_1775_030_RE_NT_pblib001_135	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_1783_150_RE_NT_pblib001_144	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	

Table S4 B, continued.

	gl1NC9/293I		gl3BNC60/293I		glNIH45-46/293I		glIOMA/293I		VRC01gHvgLv/293I		DH235UCAtK_v3_4A/293I		Antibody
	200227PPF		200115PPF		200228PPF		5Mar202PPFJCA-1		191105PPF		200114PPF		Lot
	CD4bs		CD4bs		CD4bs		CD4bs		CD4bs		CD4bs		Epitope
Virus Name	ID50	ID80	ID50	ID80	ID50	ID80	ID50	ID80	ID50	ID80	ID50	ID80	Measure
V704_1535_030_RE_NT_pblib001_471	>50	>50	>50	>50	>50	>50	**32**	>50	>50	>50	>50	>50	
V704_0128_220_RE_NT_pblib001_52	>50	>50	>50	>50	>50	>50	**34**	>50	>50	>50	>50	>50	
V704_0907_130_RE_NT_pblib001_32	>50	>50	>50	>50	>50	>50	**33**	>50	>50	>50	>50	>50	
V704_1528_240_RE_NT_pblib001_17	>50	>50	>50	>50	>50	>50	**22**	>50	>50	>50	>50	>50	
V704_0855_080_RE_NT_pblib001_187	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_1180_070_RE_NT_pblib001_87	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_0445_180_RE_NT_pblib001_22	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_2117_110_RE_sga2A10_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_2117_110_RE_sga2A10_s	>50	>50	>50	>50	>50	>50	**27**	>50	>50	>50	>50	>50	
V703_1313_040_RE_con_s	>50	>50	>50	>50	>50	>50	**37**	>50	>50	>50	>50	>50	
V703_2304_150_RE_con_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_0472_030_RE_con_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_2684_181_RE_NT_pblib001_13	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_0026_231_RE_NT_pblib001_3	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_1060_080_RE_con_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_0279_110_RE_con_s-modified	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_0372_250_RE_NT_pblib001_7	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_0847_030_RE_NT_pblib001_34	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_0566_160_RE_con_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_2541_080_RE_NT_pblib001_13	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_0629_150_RE_pblib002_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_0575_060_RE_NT_pblib002_16	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_0646_051_RE_con_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_1835_150_RE_NT_pblib001_10	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_0739_110_RE_con_s-modified	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_2149_060_RE_sgaB10_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_2018_240_RE_sga6A1_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_2631_150_RE_sga2F8_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_1675_080_RE_con_s-modified	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V703_0537_110_RE_sga4H1_s	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_1775_030_RE_NT_pblib001_135	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	
V704_1783_150_RE_NT_pblib001_144	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	>50	

	CH01-RUA3_4A/293I		gIPGV19		Antibody
	200305PPF				Lot
	V1/V2		CD4bs		Epitope
Virus Name	ID50	ID80	ID50	ID80	Measure
V704_1535_030_RE_NT_pblib001_471	>50	>50	>50	>50	
V704_0128_220_RE_NT_pblib001_52	>50	>50	>50	>50	
V704_0907_130_RE_NT_pblib001_32	>50	>50	>50	>50	
V704_1528_240_RE_NT_pblib001_17	>50	>50	>50	>50	
V704_0855_080_RE_NT_pblib001_187	>50	>50	>50	>50	
V704_1180_070_RE_NT_pblib001_87	>50	>50	>50	>50	
V704_0445_180_RE_NT_pblib001_22	>50	>50	>50	>50	
V703_2117_110_RE_sga2A10_s	>50	>50	>50	>50	
V703_2117_110_RE_sga2A10_s	>50	>50	>50	>50	
V703_1313_040_RE_con_s	>50	>50	>50	>50	
V703_2304_150_RE_con_s	>50	>50	>50	>50	
V703_0472_030_RE_con_s	>50	>50	>50	>50	
V704_2684_181_RE_NT_pblib001_13	>50	>50	>50	>50	
V704_0026_231_RE_NT_pblib001_3	>50	>50	>50	>50	
V703_1060_080_RE_con_s	>50	>50	>50	>50	
V703_0279_110_RE_con_s-modified	>50	>50	>50	>50	
V704_0372_250_RE_NT_pblib001_7	>50	>50	>50	>50	
V704_0847_030_RE_NT_pblib001_34	>50	>50	>50	>50	
V703_0566_160_RE_con_s	>50	>50	>50	>50	
V704_2541_080_RE_NT_pblib001_13	>50	>50	>50	>50	
V703_0629_150_RE_pblib002_s	>50	>50	>50	>50	
V704_0575_060_RE_NT_pblib002_16	>50	>50	>50	>50	
V703_0646_051_RE_con_s	>50	>50	>50	>50	
V704_1835_150_RE_NT_pblib001_10	>50	>50	>50	>50	
V703_0739_110_RE_con_s-modified	>50	>50	>50	>50	
V703_2149_060_RE_sgaB10_s	>50	>50	>50	>50	
V703_2018_240_RE_sga6A1_s	>50	>50	>50	>50	
V703_2631_150_RE_sga2F8_s	>50	>50	>50	>50	
V703_1675_080_RE_con_s-modified	>50	>50	>50	>50	
V703_0537_110_RE_sga4H1_s	>50	>50	*failed*	*failed*	
V704_1775_030_RE_NT_pblib001_135	>50	>50	>50	>50	
V704_1783_150_RE_NT_pblib001_144	>50	>50	>50	>50	

Table S4. Twenty six germline precursors antibodies that ultimately give rise to bnAbs show no IC50 against any of the 40 viruses included in the SHEP-T2 and class-specific antibody panels. **A.** Virus details and panel inclusion. **B.** IC50 and IC80 responses for each of the 26 antibodies tested; there was no detectable activity against any of the AMP viruses.

Table S5 A and B

Table S5 A.

Sequence Name HVTN 704	HIV-1 M Env subtype	PGDM1400	CAP256-VRC26.25 LS
V704_1991_230_RE_NT_pblib001_38	B	0.026	0.0003
V704_1991_230_RE_NT_pblib002_19	B	0.052	0.0003
V704_0372_250_RE_NT_pblib002_6	B	>25	2.114
V704_2981_150_RE_NT_pblib001_33	B	0.022	>25
V704_0026_231_RE_NT_pblib001_3	B	0.075	>25
V704_2544_150_RE_NT_pblib001_33	B	0.101	>25
V704_2541_080_RE_NT_pblib042_1	B	0.218	>25
V704_2981_150_RE_NT_pblib004_2	B	0.262	>25
V704_0445_180_RE_NT_pblib001_22	B	0.285	>25
V704_0726_080_RE_NT_pblib001_26	B	0.421	>25
V704_1535_030_RE_NT_pblib001_471	B	1.109	>25
V704_1706_040_RE_NT_pblib001_26	B	1.986	>25
V704_2541_080_RE_NT_pblib001_13	B	2.163	>25
V704_2541_080_RE_NT_pblib003_5	B	3.382	>25
V704_3000_240_RE_NT_pblib001_8	B	8.698	>25
V704_2544_140_RE_NT_pblib001_11	B	13.864	>25
V704_3000_240_RE_NT_pblib019_1	B	16.221	>25
V704_0513_150_RE_NT_pblib007_2	B	>25	>25
V704_0513_150_RE_NT_pblib002_10	B	>25	>25
V704_0513_150_RE_NT_pblib001_34	B	>25	>25
V704_0746_760_RE_NT_pblib001_37	B	>25	>25
V704_0746_760_RE_NT_pblib003_34	B	>25	>25
V704_0746_760_RE_NT_pblib002_36	B	>25	>25
V704_0847_030_RE_NT_pblib001_34	B	>25	>25
V704_0847_030_RE_NT_pblib002_23	B	>25	>25
V704_0855_080_RE_NT_pblib001_187	B	>25	>25
V704_0856_240_RE_NT_pblib001_9	B	>25	>25
V704_0886_250_RE_NT_pblib001_10	B	>25	>25
V704_0907_130_RE_NT_pblib001_32	B	>25	>25
V704_0911_150_RE_NT_pblib001_58	B	>25	>25
V704_0944_180_RE_NT_pblib001_76	B	>25	>25
V704_1528_240_RE_NT_pblib001_17	B	>25	>25
V704_1783_150_RE_NT_pblib001_144	B	>25	>25
V704_1835_150_RE_NT_pblib001_10	B	>25	>25
V704_1835_150_RE_NT_pblib002_9	B	>25	>25
V704_2065_060_RE_NT_pblib001_47	B	>25	>25
V704_2065_060_RE_NT_pblib002_42	B	>25	>25
V704_2095_130_RE_NT_pblib001_136	B	>25	>25
V704_2448_240_RE_NT_pblib001_288	B	>25	>25
V704_2544_140_RE_NT_pblib002_10	B	>25	>25
V704_2555_240_RE_NT_pblib001_231	B	>25	>25
V704_2684_181_RE_NT_pblib001_13	B	>25	>25
V704_2684_181_RE_NT_pblib006_3	B	>25	>25
V704_2767_070_RE_NT_pblib001_63	B	>25	>25
V704_2834_210_RE_NT_pblib002_26	B	>25	>25
V704_2834_210_RE_NT_pblib001_44	B	>25	>25
V704_2839_140_RE_NT_pblib001_208	B	>25	>25
V704_2981_150_RE_NT_pblib002_11	B	>25	>25
V704_2981_150_RE_NT_pblib003_4	B	>25	>25
V704_3008_040_RE_NT_pblib001_113	B	>25	>25
V704_0372_250_RE_NT_pblib001_7	B	>25	>25

Table S5 B.

Sequence Name HVTN 704	HIV-1 M Env subtype	PGDM1400	CAP256-VRC26.25 LS
V703_2117_110_RE_sga2A10_s	C	0.0007	0.0001
V703_2149_060_RE_sgaB10_s	C	0.0012	0.0001
V703_2018_240_RE_sga6A1_s	C	0.0031	0.0001
V703_1675_080_RE_con_s-modified	C	0.0100	0.0001
V703_1889_100_RE_con_s	C	0.0100	0.0001
V703_2631_150_RE_sga2F8_s	C	0.0019	0.0004
V703_2805_080_RE_con_s	C	0.0019	0.0004
V703_0739_110_RE_con_s-modified	C	3.2300	0.0009
V703_0217_050_RE_pblib002_s	C	0.0028	0.0011
V703_1313_040_RE_con_s	C	0.0040	0.0018
V703_0217_050_RE_sga2A3_s	C	0.0040	0.0020
V703_0013_090_RE_con_s	C	0.0100	0.0100
V703_0646_051_RE_con_s	C	0.0100	0.0100
V703_1675_080_RE_con_s	C	0.0100	0.0100
V703_1848_190_RE_pblib002_s	C	0.0100	0.0100
V703_2304_150_RE_con_s	C	0.0100	0.0100
V703_1471_190_RE_con_s	C	0.0200	0.0100
V703_0537_110_RE_sga4H1_s	C	0.0900	0.0100
V703_1298_080_RE_pblib002_s	C	0.0900	0.0100
V703_0472_030_RE_con_s	C	0.1000	0.0100
V703_0842_200_RE_con_s	C	0.1100	0.0100
V703_0537_110_RE_sga2B5_s	C	0.2200	0.0100
V703_0537_110_RE_pblib003_s	C	1.0000	0.0100
V703_2788_030_RE_con_s	C	1.2000	0.0100
V703_0629_150_RE_sga5A2_s	C	0.4200	0.0500
V703_0629_150_RE_pblib002_s	C	0.3600	0.1100
V703_1104_100_RE_sga10G5_s	C	0.4700	0.1200
V703_1104_100_RE_sga10A5_s	C	0.9200	0.1200
V703_1104_100_RE_pblib001_s	C	0.3300	0.1400
V703_0629_150_RE_pblib004_s	C	0.1100	0.2200
V703_1060_080_RE_con_s	C	>25	0.3100
V703_1915_250_RE_sgaA3_s	C	>25	3.4800
V703_2805_080_RE_pblib002_s	C	>25	5.9000
V703_1750_140_RE_con_s	C	>25	8.5900
V703_0926_070_RE_sga2H2_s	C	1.0400	>25
V703_0629_150_RE_pblib003_s	C	1.5100	>25
V703_1848_190_RE_sga6D1_s	C	11.4600	>25
V703_0279_110_RE_con_s-modified	C	21.6100	>25
V703_0203_081_RE_pblib002_s	C	>25	>25
V703_0203_081_RE_sga8A5_s	C	>25	>25
V703_0279_110_RE_pblib002_s	C	>25	>25
V703_0566_160_RE_con_s	C	>25	>25
V703_0566_160_RE_pblib002_s	C	>25	>25
V703_1764_250_RE_con_s	C	>25	>25
V703_1789_230_RE_sga3A3_s	C	>25	>25
V703_2539_070_RE_sga6F6_s	C	>25	>25

Table S5 C

Table S5 C.

Sequence Name HVTN 704	HIV-1 M Env subtype	PGDM1400	CAP256-VRC26.25LS
V704_0575_060_RE_NT_pblib002_16	Atypical B	0.051	>25
V704_0575_060_RE_NT_pblib001_60	Atypical B	0.047	>25
V704_0575_060_RE_NT_con02_s	Atypical B	0.042	>25
V704_0644_060_RE_NT_pblib001_216	Atypical B	>25	>25
V704_1183_220_RE_NT_pblib001_70	B/F	>25	>25
V704_2788_060_RE_NT_pblib001_96	B/F	0.003	0.0003
V704_2788_060_RE_NT_pblib002_20	B/F	0.011	0.011
V704_1930_170_RE_NT_pblib002_114	12_BF/F1	0.014	>25
V704_1930_170_RE_NT_pblib001_234	12_BF/F1	0.018	>25
V704_1180_070_RE_NT_pblib001_87	A1/B	0.188	>25
V704_1180_070_RE_NT_pblib027_1	A1/B	0.405	>25
V704_0496_040_RE_NT_pblib001_37	F	0.011	0.011
V704_1775_030_RE_NT_pblib001_135	F1	0.002	0.028
V704_0128_220_RE_NT_pblib001_52	F1/B	0.008	0.002
V704_0128_220_RE_NT_pblib002_40	F1/B	0.031	0.0003
V704_1109_140_RE_NT_pblib001_191	F1/B	0.201	>25
V704_1429_090_RE_NT_pblib002_75	F2	0.079	11.679
V704_1429_090_RE_NT_pblib001_111	F2	0.141	>25
V703_0865_070_RE_con_s	G	ND	ND

Table S5. Clade specificity of V2 apex antibodies. A. IC50s of V2 apex antibodies against B clade AMP viruses. **B.** C clade AMP viruses. **C.** Other subtypes and recombinant viruses found among the AMP placebo HIV-1 infections. The V2 apex bNab CAP256 VRC26.25 LS has substantial breadth and great potency among C clade viruses but has almost no neutralizing activity against B clade viruses. PGDM1400 shares this pattern but is less extreme, with a few modest B clade responses and less potent but still strong neutralization of C clade viruses. F clade viruses (in Table C) can be sensitivity to both antibodies and are generally more like C clade viruses than B clade. B/F recombinants, indicated by the forward slash, were each checked for recombination breakpoints, and all were found to be F-like in the relevant V2 apex epitope region.

Table S6

	CD4bs						V3		V2		FP			MPER		
Sequence Name	1-18	VRC07-	VRC01-23	3BNC117-	VRC01	CH235.12	PGT121-	10-1074	PGDM1400	CAP256	PGT151	VRC34.01	ACS202	10E8v4	CAP248-	Subtype
V703_2805_080_RE_pblib002_s	>10	1.87	>10	5.17	>25	>10	>25	>25	>25	5.9	>10	0.84	>10	2.38	>10	C
V704_1109_140_RE_NT_pblib001_191	>25	0.283	2.455	>25	3.360	>25	>25	>25	0.201	>25	>25	>25	>25	1.25	>25	F1B
V703_0279_110_RE_pblib002_s	0.17	0.18	0.14	0.33	1.509	>10	0.94	1.19	>25	>25	>10	>10	>10	0.34	>10	C
V704_0513_150_RE_NT_pblib001_34	0.612	0.38	0.329	0.276	1.490	6.07	>25	>25	>25	>25	0.49	>25	>25	1.13	>25	B
V704_0575_060_RE_NT_con02_s	0.467	0.756	0.771	0.965	2.118	2.354	>25	>25	0.042	>25	>25	>25	0.157	0.494	>25	B
V704_0644_060_RE_NT_pblib001_216	0.084	0.155	0.279	0.29	1.020	3.275	6.348	0.454	>25	>25	>25	5.728	>25	0.297	>25	B
V704_0726_080_RE_NT_pblib001_26	0.199	1.02	0.466	0.537	5.636	3.445	0.36	0.734	0.421	>25	>25	>25	>25	2.473	>25	B
V704_1429_090_RE_NT_pblib001_111	0.119	0.112	0.122	1.806	0.307	>25	>25	>25	0.141	>25	4.52	>25	>25	0.45	>25	F2
V704_1835_150_RE_NT_pblib002_9	0.026	24.845	0.078	>25	>100	>25	3.791	0.081	>25	>25	0.24	1.729	0.397	0.099	>25	B
V704_1044_140_RE_NT_pblib001_11	0.99	0.431	0.494	0.82	5.76	8.648	>25	0.421	>25	>25	0.059	>25	>25	1.127	10	B
V704_2834_210_RE_NT_pblib001_44	0.107	0.312	0.073	0.086	2.190	>25	19.219	4.297	>25	>25	>25	0.922	>25	0.12	>25	B
V704_2839_140_RE_NT_pblib001_208	0.116	0.183	0.346	1.426	1.580	>25	>25	>25	>25	>25	>25	1.771	1.486	0.63	>25	B
V704_2981_150_RE_NT_pblib003_4	1.058	0.39	0.178	0.155	1.840	0.333	>25	>25	>25	>25	>25	>25	>25	0.28	>25	B
V704_3000_240_RE_NT_pblib019_1	0.062	0.201	0.562	0.271	1.920	>25	>25	>25	16.221	>25	>25	0.145	>25	0.14	>25	B
V703_1789_230_RE_sga3A3_s	0.09	0.99	0.55	>25	17.896	>10	0.83	0.34	>25	>25	>10	>10	>10	2.43	>10	C
V703_1675_080_RE_con_s	0.0279	0.05	0.0528	0.04	0.378	0.23	0.26	0.79	0.01	0.01	>10	>10	1.49	14.66	>10	C
V704_0128_220_RE_NT_pblib002_40	0.044	0.026	0.034	0.025	0.160	0.089	0.047	0.171	0.031	0.0003	>25	2.044	>25	1.33	>25	F1B
V704_0496_040_RE_NT_pblib001_37	0.037	0.242	0.601	>25	4.940	1.236	0.142	0.078	0.011	0.011	>25	>25	>25	0.289	>25	B
V704_1775_030_RE_NT_pblib001_135	0.014	0.029	0.031	0.109	0.090	0.05	>25	>25	0.002	0.028	0.112	>25	>25	0.291	>25	F1
V704_2788_060_RE_NT_pblib002_20	0.192	0.26	0.284	0.223	1.409	1.144	0.134	0.144	0.011	0.011	>10	>10	>10	0.082	>10	BF
V703_0472_030_RE_con_s	0.0054	0.01	0.005	>25	0.021	0.05	>25	7.94	0.1	0.01	0.028	5.67	>10	0.42	>10	C
V703_0537_110_RE_pblib003_s	0.0138	0.02	0.005	0.03	0.097	0.19	0.05	0.21	1	0.01	>10	>10	>10	0.26	>10	C
V703_0739_110_RE_con_s-modified	0.025	0.05	0.023	0.07	0.143	0.56	0.67	0.16	3.23	0.0009	>10	4.86	0.09	1.94	>10	C
V703_1313_040_RE_con_s	0.046	0.04	0.07	0.11	0.686	>10	0.01	0.06	0.004	0.0018	>10	>10	>10	0.01	>10	C
V703_2304_150_RE_con_s	0.06	0.02	0.0106	0.06	0.114	0.08	0.07	0.06	0.01	0.01	>10	0.03	>10	0.36	>10	C
V703_0842_200_RE_con_s	>10	1.44	1.82	2.13	20.895	6.36	7.23	1.56	0.11	0.01	0.21	>10	>10	0.73	>10	C
V703_0013_090_RE_con_s	0.52	0.42	0.49	>25	3.472	>10	7.97	18.41	0.01	0.01	>10	>10	>10	1.61	>10	C
V703_0646_051_RE_con_s	0.18	0.45	0.63	1.54	4.897	>10	>25	>25	0.01	0.01	0.07	0.07	>10	1.56	>10	C
V703_1104_100_RE_sga10G5_s	0.28	1.61	1.41	2.99	6.410	>10	>25	10.48	0.47	0.12	>10	>10	4.23	0.86	>10	C
V703_1298_080_RE_pblib002_s	0.15	1.27	0.13	>25	>25	0.16	>25	>25	0.09	0.01	0.1	>10	>10	0.84	>10	C
V703_2788_030_RE_con_s	1.56	0.24	4.11	0.09	0.6812	4.9	0.3	0.09	1.2	0.01	1.84	>10	>10	5.38	>10	C
V704_1783_150_RE_NT_pblib001_144	0.006	0.064	0.009	0.036	0.135	>25	0.248	0.485	>25	>25	0.06	>25	0.353	0.388	>25	B
V704_0855_080_RE_NT_pblib001_187	0.012	0.003	0.002	0.009	0.013	>25	0.05	0.061	>25	>25	0.007	>25	>25	0.134	>25	B
V704_1180_070_RE_NT_pblib027_1	0.005	0.074	0.009	0.018	0.137	0.419	>25	>25	0.405	>25	0.009	0.683	0.388	0.16	>25	A1B
V704_1535_030_RE_NT_pblib001_471	0.052	0.068	0.018	0.019	0.088	>25	0.011	0.071	1.109	>25	0.197	0.391	0.512	0.015	0.334	B
V704_1041_080_RE_NT_pblib042_1	0.026	0.036	0.018	0.021	0.21	0.112	0.022	0.027	0.218	>25	0.168	2.872	>25	0.08	>10	B
V704_2767_070_RE_NT_pblib001_63	0.217	0.126	0.068	0.796	2.060	1.275	0.066	0.241	>25	>25	0.038	>25	>25	2.03	>25	B
V704_0445_180_RE_NT_pblib001_22	0.012	0.063	0.021	>25	>25	0.205	0.291	0.086	0.285	>25	0.083	>25	0.08	1.49	>25	B
V703_0566_160_RE_pblib002_s	0.06	0.18	0.17	0.66	3.503	1.28	0.03	0.06	>25	>25	0.2	0.08	>10	4.21	>10	C
V703_1750_140_RE_con_s	0.11	0.18	0.13	0.23	0.881	1.35	0.05	0.08	>25	8.59	0.05	0.34	>10	0.5	>10	C
V703_1915_250_RE_sgaA3_s	0.0841	0.36	0.0406	1.6	0.529	5.6	0.32	0.84	>25	3.48	0.04	>10	>10	3.83	>10	C
V703_0217_050_RE_sga2A3_s	0.008	0.03	0.04	>25	>25	0.29	>25	>25	0.004	0.002	0.01	0.0253	2.21	0.18	0.0247	C
V704_0746_760_RE_NT_pblib002_36	0.224	0.447	0.189	0.282	1.250	6.796	0.02	0.015	>25	>25	>25	>25	>25	1.96	>25	B
V704_0026_231_RE_NT_pblib001_3	0.097	0.081	0.088	0.103	0.460	>25	0.006	0.017	0.075	>25	>25	>25	>25	0.07	>25	B
V704_0847_030_RE_NT_pblib002_23	9.694	0.204	0.161	>25	3.118	>25	0.011	0.006	>25	>25	>25	>25	>25	0.27	1.448	B
V704_0856_240_RE_NT_pblib001_9	0.095	0.063	0.055	0.06	0.524	0.503	0.011	0.016	>25	>25	1.04	7.845	>25	0.54	>25	B
V704_0886_250_RE_NT_pblib001_10	0.173	0.177	0.099	0.516	1.745	>25	0.338	0.185	>25	>25	>25	>25	0.498	0.171	>25	B
V704_0911_150_RE_NT_pblib001_58	0.437	0.538	1.525	0.622	1.391	10.111	0.013	0.018	>25	>25	3.99	>25	>25	0.869	>25	B
V704_1183_220_RE_NT_pblib001_70	0.041	0.347	0.038	0.065	0.390	1.185	0.032	0.051	>25	>25	3.666	>25	0.228	0.495	>25	BF
V704_1055_240_RE_NT_pblib001_231	0.092	0.052	0.033	0.075	0.424	10	0.012	0.03	>25	>25	>25	2.808	0.151	>25	>25	B
V704_2684_181_RE_NT_pblib006_3	0.007	0.057	0.012	0.43	0.092	>25	0.007	0.019	>25	>25	>25	>25	0.97	0.031	>25	B
V704_3008_040_RE_NT_pblib001_113	0.067	0.431	0.025	0.163	3.020	>25	0.017	0.178	>25	>25	>25	>25	>25	0.184	>25	B
V703_0203_081_RE_sga8A5_s	0.64	0.41	0.91	>10	4.151	>10	0.03	0.02	>10	>10	>10	>10	>10	0.13	>10	C
V703_0926_070_RE_sga2H2_s	2.02	0.81	0.76	2.04	7.803	2.34	0.04	0.1	1.04	>25	>10	>10	>10	0.56	>10	C
V703_1039_070_RE_sga6F6_s	0.74	0.39	0.27	>10	1.7655	>10	0.01	0.04	>10	>10	4.57	>10	>10	0.23	>10	C
V703_1471_190_RE_con_s	0.05	0.08	0.0235	0.06	0.161	0.6	0.01	0.1	0.02	0.01	0.01	>10	>10	4.92	0.011	C
V704_2095_130_RE_NT_pblib001_136	0.079	0.096	0.031	0.053	0.312	0.283	2.167	0.085	>25	>25	0.147	>25	>25	0.51	>25	B
V704_0944_180_RE_NT_pblib001_76	0.023	0.02	0.007	0.061	0.074	>25	>25	>25	>25	>25	0.367	>25	>25	>25	>25	B
V704_1706_040_RE_NT_pblib001_26	0.2	0.058	0.058	0.164	0.489	0.186	0.457	0.301	1.986	>25	>25	>25	>25	0.488	>25	B
V704_1930_170_RE_NT_pblib001_234	0.041	0.035	0.023	0.043	0.134	0.118	>25	>25	0.018	>25	>25	>25	>25	1.25	>25	12.BF
V704_2065_060_RE_NT_pblib002_42	0.062	0.082	0.037	0.048	0.220	0.036	>25	>25	>25	>25	>25	>25	>25	0.161	>25	B
V704_2448_240_RE_NT_pblib001_288	0.133	0.108	0.01	0.058	0.140	0.146	>25	>25	>25	>25	>25	>25	7.416	>25	>25	B
V703_0629_150_RE_pblib003_s	0.11	0.33	0.06	0.72	1.076	1.5	9.87	5.61	1.51	>25	0.06	>10	>10	6.44	>10	C
V703_1060_080_RE_con_s	0.09	0.13	0.28	0.8	1.712	1.17	>25	3.63	>25	0.31	0.05	>10	>10	0.08	>10	C
V703_1764_250_RE_con_s	0.03	0.1	0.06	0.1	0.240	0.1	0.2	0.13	>25	>25	0.18	>10	>10	1.41	>10	C
V703_1848_190_RE_sga6D1_s	0.09	0.31	0.2	0.24	1.054	0.24	>25	>25	11.46	>25	0.02	>10	>10	2.76	>10	C
V703_2018_240_RE_sga6A1_s	0.16	0.3	0.09	1.13	1.249	6.38	0.05	0.07	0.0031	0.00013	>10	>10	>10	2.85	>10	C
V704_1991_230_RE_NT_pblib002_19	0.067	0.215	0.14	0.165	1.488	0.309	>25	>25	0.052	0.0003	>25	>25	0.12	0.317	>25	B
V703_1889_100_RE_con_s	0.09	2.3	0.19	>25	>25	5.78	0.09	0.23	0.01	0.00013	>10	>10	>10	>25	>10	C
V703_2117_110_RE_sga2A10_s	0.17	0.04	0.06	0.11	0.228	0.52	>25	>25	0.0007	0.00013	>10	0.81	>10	0.88	>10	C
V703_2149_060_RE_sgaB10_s	0.0324	0.07	0.0208	>25	0.205	>10	0.11	0.07	0.0012	0.00013	9.17	>10	>10	0.98	>10	C
V703_2631_150_RE_sga2F8_s	0.02	0.08	0.09	0.07	0.463	1.02	>25	>25	0.0019	0.0004	>10	0.97	>10	1.23	>10	C
V704_0907_130_RE_NT_pblib001_32	0.016	0.193	0.019	0.199	0.364	15.857	0.002	0.006	>25	>25	0.017	0.25	0.236	0.655	>25	B
V704_1528_240_RE_NT_pblib001_17	0.06	0.439	0.114	0.092	2.390	7.107	0.003	0.004	>25	>25	1.418	0.04	0.041	0.243	1.15	B

Table S6. K-means clusters used to define the REP-T2 panel, the centroids of each cluster were used as panel members and are marked in pink.

Table S7

SHEP-T2 panel phenotyping

	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2
	H703_1313_040s	H704_1535_030sN	H704_0855_080_EsN	H704_0907_130sN	H704_1528_240_RE_pblib_001_s	H704_1180_070EsN	H704_0445_180_RE_con_s	H703_2304_150_RE_cs	H703_2805_080Es	H703_2117_110_RE_e2A10s	H704_0128_220_RE_pb001_s	H703_0472_030s
Specimen ID	Clade C	Clade B	Clade B	Clade B	Clade B	Clade A1/B	Clade B	Clade C	Clade C	Clade C	Clade F1/B	Clade C
SA-C10	**1623**	**468**	**789**	**795**	**505**	**588**	>1666.67	>1666.67	>1666.67	>1666.67	>1666.67	>1666.67
SA-C48	**421**	**136**	**919**	**1088**	**652**	**587**	>1666.67	>1666.67	>1666.67	>1666.67	>1666.67	>1666.67
SA-C72	**461**	**168**	>1666.67	>1666.67	**186**	**821**	**753**	>1666.67	**629**	**1381**	>1666.67	**534**
SA-C74	>1666.67	**84**	>1666.67	**367**	**152**	**783**	>1666.67	**1403**	**1028**	**489**	>1666.67	>1666.67
SA-C90	**1653**	**782**	**1150**	**375**	**145**	>1666.67	**738**	**1192**	**822**	**1181**	**1508**	>1666.67
2219	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667
2557	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667
3074	>16.667	**13**	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667
3869	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667
447-52D	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667
838-12D	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667
654-30D	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667
1008-30D	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667
729-30D	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667
F105	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667	>16.667
VRC01	**1.25**	**0.21**	**0.09**	**0.96**	**3.31**	**0.28**	>6.667	**1.89**	>6.667	**0.3**	**0.2**	**0.308**

REP-T2 panel phenotyping

	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2
	H703_0217_050e_2A3	H703_0842_200Es	H703_1471_190s	H703_1675_080s	H703_2805_080_RE_pblib002_s	H703_2018_240_RE_e6A1s	H704_0746_760_RE_p001s	H704_2095_130_RE_cs	H704_2767_070sN	H704_0907_130sN	H704_1783_150_RE_cs	V703_0279_110_RE_pblib002_s
	Clade C	Clade C	Clade C	Clade C	Clade C	Clade C	Clade B	Clade B	Clade B	Clade B	Clade B	Clade B
Specimen ID	IC50	IC50	IC50	IC50	IC50	IC50	IC50	IC50	IC50	IC50	IC50	IC50
SA-C10	**639.317**	>2500.0	**1160.687**	**210.727**	>2500.0	>1666.67	**2286.262**	>2500.0	>2500.0	**795**	>1666.67	**315.597**
SA-C48	**277.999**	>2500.0	**399.278**	> 2500	>2500.0	**1017.621**	**2371.204**	**1385.695**	>2500.0	**1088**	>1666.67	**444.906**
SA-C72	**113.266**	**1477.2**	**291.491**	**1025.910**	>2500.0	>1666.67	>2500.0	**1406.991**	>2500.0	>1666.67	>1666.67	**313.508**
SA-C74	**711.452**	>2500.0	**671.339**	**1185.753**	>2500.0	**1256.247**	>2500.0	>2500.0	>2500.0	**367**	>1666.67	**1715.938**
SA-C90	**260.549**	**1609.68**	**575.145**	> 2500	>2500.0	>1666.67	>2500.0	>2500.0	>2500.0	**375**	**1277**	**740.313**
2219	>25.0	>25.0	>25.0	>25.0	>25.0	>16.67	>25.0	**5.502**	>25.0	>16.667	>16.67	>25.0
2557	>25.0	>25.0	>25.0	>25.0	>25.0	>16.67	>25.0	**16.476**	>25.0	>16.667	>16.67	>25.0
3074	**21.435**	>25.0	>25.0	>25.0	>25.0	>16.67	>25.0	>25.0	>25.0	>16.667	>16.67	>25.0
3869	>25.0	>25.0	>25.0	>25.0	>25.0	>16.67	>25.0	>25.0	>25.0	>16.667	>16.67	>25.0
447-52D	>25.0	>25.0	>25.0	>25.0	>25.0	>16.67	>25.0	>25.0	>25.0	>16.667	>16.67	>25.0
838-12D	>25.0	>25.0	>25.0	>25.0	>25.0	>16.67	>25.0	>25.0	>25.0	>16.667	>16.67	>25.0
654-30D	>25.0	>25.0	>25.0	>25.0	>25.0	>16.67	>25.0	>25.0	>25.0	>16.667	>16.67	>25.0
1008-30D	>25.0	>25.0	>25.0	>25.0	>25.0	>16.67	>25.0	>25.0	>25.0	>16.667	>16.67	>25.0
729-30D	>25.0	>25.0	>25.0	>25.0	>25.0	>16.67	>25.0	>25.0	>25.0	>16.667	>16.67	>25.0
F105	>25.0	>25.0	>25.0	>25.0	>25.0	>16.67	>25.0	>25.0	>25.0	>16.667	>16.67	>25.0
VRC01	>25.0	>25.0	**0.392**	**1.037**	>25.0	**2.870**	**1.418**	**0.624**	>25.0	**0.96**	**0.22**	**1.484**

Table S7, continued

MPER Sensitive

	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2*	Tier 2	Tier 2	Tier 2	Tier 2**
	H703_1313_040s	H704_1535_030sN	H704_2684_181_RE_p001s	H704_0026_231_RE_pbsga001_s	H703_1060_080s	H703_0279_110s	V704_0372_250_RE_pblib001_s	H704_0855_080_EsN	H704_1835_150_RE_p001s_2484A
Specimen ID	Clade C	Clade B	Clade B	Clade B	Clade C	Clade C	Clade B	Clade B	Clade B
SA-C10	1623	468	90	1116	1182.447	528.4	388	789	874
SA-C48	421	136	511	1075	1455.479	410.213	623	919	421
SA-C72	461	168	301	>1666.67	1429.193	400.006	>1666.67	>1666.67	177
SA-C74	>1666.67	84	215	>1666.67	716.276	1646.61	>1666.67	>1666.67	265
SA-C90	1653	782	1243	644	766.31	1298.502	>1666.67	1150	499
2219	>16.667	>16.667	>16.667	>16.667	>16.67	>16.67	>16.67	>16.667	0.9
2557	>16.667	>16.667	>16.667	>16.667	>16.67	>16.67	>16.67	>16.667	1.98
3074	>16.667	13	>16.667	>16.667	>16.67	>16.67	>16.67	>16.667	>16.67
3869	>16.667	>16.667	>16.667	>16.667	>16.67	>16.67	>16.67	>16.667	14.28
447-52D	>16.667	>16.667	>16.667	>16.667	>16.67	>16.67	>16.67	>16.667	>16.67
838-12D	>16.667	>16.667	>16.667	>16.667	>16.67	>16.67	>16.67	>16.667	5.82
654-30D	>16.667	>16.667	>16.667	>16.667	>16.67	>16.67	>16.67	>16.667	>16.67
1008-30D	>16.667	>16.667	>16.667	>16.667	>16.67	>16.67	>16.67	>16.667	>16.67
729-30D	>16.667	>16.667	>16.667	>16.667	>16.67	>16.67	>16.67	>16.667	>16.67
F105	>16.667	>16.667	>16.667	>16.667	>16.67	>16.67	>16.67	>16.667	>16.67
VRC01	1.25	0.21	0.24	1.16	2.856	1.537	0.64	0.09	>6.67

V3 glycan sensitive

	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2
	H704_0907130sN	H704_1528240_RE_p	H704_0847030_EsN_	H704_0026231_RE_p	H704_2684181_RE_p	H703_0566160s	H704_2541080_RE_p	H703_1313040s
Specimen ID	Clade B	Clade B	Clade B	Clade B	Clade B	Clade C	Clade B	Clade C
SA-C10	795	505	226	1116	90	580.509	729	1623
SA-C48	1088	652	770	1075	511	1527.773	364	421
SA-C72	>1666.67	186	>1666.67	>1666.67	301	380.616	589	461
SA-C74	367	152	>1666.67	>1666.67	215	741.785	552	>1666.67
SA-C90	375	145	239	644	1243	51.964	420	1653
2219	>16.667	>16.667	>16.667	>16.667	>16.667	>16.67	>16.667	>16.667
2557	>16.667	>16.667	>16.667	>16.667	>16.667	>16.67	>16.667	>16.667
3074	>16.667	>16.667	>16.667	>16.667	>16.667	>16.67	>16.667	>16.667
3869	>16.667	>16.667	>16.667	>16.667	>16.667	>16.67	>16.667	>16.667
447-52D	>16.667	>16.667	>16.667	>16.667	>16.667	>16.67	>16.667	>16.667
838-12D	>16.667	>16.667	>16.667	>16.667	>16.667	>16.67	>16.667	>16.667
654-30D	>16.667	>16.667	>16.667	>16.667	>16.667	>16.67	>16.667	>16.667
1008-30D	>16.667	>16.667	>16.667	>16.667	>16.667	>16.67	>16.667	>16.667
729-30D	>16.667	>16.667	>16.667	>16.667	>16.667	>16.67	>16.667	>16.667
F105	>16.667	>16.667	>16.667	>16.667	>16.667	>16.67	>16.667	>16.667
VRC01	0.96	3.31	>6.667	1.16	0.24	>6.67	1.02	1.25

FP sensitive

	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 3
	H704_1528_240_RE_pblib_001_s	H703_0629_150_RE_e5A2s	H703_0566_160s	H704_1180_070EsN	H704_0445_180_RE_con_s	H704_0575_060_RE_p002s	H703_2304_150_RE_cs	H703_0646_051sN
Specimen ID	Clade B	Clade C	Clade C	Clade A1/B	Clade B	Clade B	Clade C	Clade C
SA-C10	505	>1666.67	580.509	588	>1666.67	928	>1666.67	>1666.67
SA-C48	652	>1666.67	1527.773	587	>1666.67	781	>1666.67	>1666.67
SA-C72	186	1073.293	380.616	821	753	1569	>1666.67	>1666.67
SA-C74	152	>1666.67	741.785	783	>1666.67	501	1403	>1666.67
SA-C90	145	139.3	51.964	>1666.67	738	1336	1192	>1666.67
2219	>16.667	>16.67	>16.67	>16.667	>16.667	>16.67	>16.667	>16.67
2557	>16.667	>16.67	>16.67	>16.667	>16.667	>16.67	>16.667	>16.67
3074	>16.667	>16.67	>16.67	>16.667	>16.667	>16.67	>16.667	>16.67
3869	>16.667	>16.67	>16.67	>16.667	>16.667	>16.67	>16.667	>16.67
447-52D	>16.667	>16.67	>16.67	>16.667	>16.667	>16.67	>16.667	>16.67
838-12D	>16.667	>16.67	>16.67	>16.667	>16.667	>16.67	>16.667	>16.67
654-30D	>16.667	>16.67	>16.67	>16.667	>16.667	>16.67	>16.667	>16.67
1008-30D	>16.667	>16.67	>16.67	>16.667	>16.667	>16.67	>16.667	>16.67
729-30D	>16.667	>16.67	>16.67	>16.667	>16.667	>16.67	>16.667	>16.67
F105	>16.667	>16.67	>16.67	>16.667	>16.667	>16.67	>16.667	>16.67
VRC01	3.31	1.164	>6.67	0.28	>6.667	3.11	1.89	>6.67

Table S7, continued

V2 apex

	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier 3
	H703_2117_110_RE_e2A10s	H703_2149_060_RE_eB10s	H703_2018_240_RE_e6A1s	H703_2805_080Es	H703_1675_G613s	H703_1313_040s	H704_0128_220_RE_pb001_s	H704_1775_030cN_SynGtoA_567	H703_2304_150_RE_cs	H703_0646_051sN
Specimen ID	Clade: C	Clade: C	Clade: C	Clade: C	Clade: C	Clade: C	Clade: F1/B	Clade: F1	Clade C	Clade C
SA-C10	>1666.67	**1417.451**	>1666.67	>1666.67	**173.596**	**1623**	>1666.67	>1666.67	>1666.67	>1666.67
SA-C48	>1666.67	>1666.67	**1017.621**	>1666.67	>1666.67	**421**	>1666.67	**478**	>1666.67	>1666.67
SA-C72	**1381**	**605.54**	>1666.67	**629**	**1090.774**	**461**	>1666.67	**748**	>1666.67	>1666.67
SA-C74	**489**	**894.9**	**1256.247**	**1028**	**563.956**	>1666.67	>1666.67	**890**	**1403**	>1666.67
SA-C90	**1181**	**486.581**	>1666.67	**822**	**1433.617**	**1653**	**1508**	>1666.67	**1192**	>1666.67
2219	>16.667	>16.67	>16.67	>16.667	>16.67	>16.667	>16.667	>16.667	>16.667	>16.67
2557	>16.667	>16.67	>16.67	>16.667	>16.67	>16.667	>16.667	>16.667	>16.667	>16.67
3074	>16.667	>16.67	>16.67	>16.667	>16.67	>16.667	>16.667	>16.667	>16.667	>16.67
3869	>16.667	>16.67	>16.67	>16.667	>16.67	>16.667	>16.667	>16.667	>16.667	>16.67
447-52D	>16.667	>16.67	>16.67	>16.667	>16.67	>16.667	>16.667	>16.667	>16.667	>16.67
838-12D	>16.667	>16.67	>16.67	>16.667	>16.67	>16.667	>16.667	>16.667	>16.667	>16.67
654-30D	>16.667	>16.67	>16.67	>16.667	>16.67	>16.667	>16.667	>16.667	>16.667	>16.67
1008-30D	>16.667	>16.67	>16.67	>16.667	>16.67	>16.667	>16.667	>16.667	>16.667	>16.67
729-30D	>16.667	>16.67	>16.67	>16.667	>16.67	>16.667	>16.667	>16.667	>16.667	>16.67
F105	>16.667	>16.67	>16.67	>16.667	>16.67	>16.667	>16.667	>16.667	>16.667	>16.67
VRC01	**0.3**	**0.555**	**2.87**	>6.667	**0.549**	**1.25**	**0.2**	**0.44**	**1.89**	>6.67

CD4bs

	Tier 2	Tier 2	Tier 2	Tier 2	Tier 2	Tier ?*	Tier 2	Tier 2	Tier 2**
	H704_0855_080_EsN	H704_0128_220_RE_pb001_s	H703_0472_030s	H704_1180_070EsN	H704_1535_030sN	H703_0537_011s_4H1*	H704_1775_030cN_SynGtoA_567	H703_2805_080Es	H704_1783_150_RE_cs
Specimen ID	Clade B	Clade F1/B	Clade C	Clade A1/B	Clade B	Clade C	Clade F1	Clade C	Clade B
SA-C10	**789**	>1666.67	>1666.67	**588**	**468**		>1666.67	>1666.67	>1666.67
SA-C48	**919**	>1666.67	>1666.67	**587**	**136**		**478**	>1666.67	>1666.67
SA-C72	>1666.67	>1666.67	**534**	**821**	**168**		**748**	**629**	>1666.67
SA-C74	>1666.67	>1666.67	>1666.67	**783**	**84**		**890**	**1028**	>1666.67
SA-C90	**1150**	**1508**	>1666.67	>1666.67	**782**		>1666.67	**822**	**1277**
2219	>16.667	>16.667	>16.667	>16.667	>16.667		>16.667	>16.667	>16.67
2557	>16.667	>16.667	>16.667	>16.667	>16.667		>16.667	>16.667	>16.67
3074	>16.667	>16.667	>16.667	>16.667	**13**		>16.667	>16.667	>16.67
3869	>16.667	>16.667	>16.667	>16.667	>16.667		>16.667	>16.667	>16.67
447-52D	>16.667	>16.667	>16.667	>16.667	>16.667		>16.667	>16.667	>16.67
838-12D	>16.667	>16.667	>16.667	>16.667	>16.667		>16.667	>16.667	>16.67
654-30D	>16.667	>16.667	>16.667	>16.667	>16.667		>16.667	>16.667	>16.67
1008-30D	>16.667	>16.667	>16.667	>16.667	>16.667		>16.667	>16.667	>16.67
729-30D	>16.667	>16.667	>16.667	>16.667	>16.667		>16.667	>16.667	>16.67
F105	>16.667	>16.667	>16.667	>16.667	>16.667		>16.667	>16.667	>16.67
VRC01	**0.09**	**0.2**	**0.308**	**0.28**	**0.21**		**0.44**	>6.667	**0.22**

Tier	IC50 Range
Tier 1A	<64
Tier 1B	64- 310
Tier 2	296-1603
Tier 3	>1603

Table S7. Establishing the Tier status by using 5 standardized sera and a set of monoclonals that are typically only exposed on Tier 1 viruses in open conformation. The standardized sera are called SA-C10, SA-C48, SA-C72, SA-C74, and SA-C90. Members of the SHEP-T2 panel were sometimes included in the sensitive panels for a particular class. *The two viruses with a single asterisk did not grow well, so were replaced with the viruses with the marked with ** so reagent stocks could be generated and shared.

References

1. Diskin R, Klein F, Horwitz JA, Halper-Stromberg A, Sather DN, Marcovecchio PM, et al. Restricting HIV-1 pathways for escape using rationally designed anti-HIV-1 antibodies. J Exp Med. 2013;210(6):1235-49.
2. Huang Y, Yu J, Lanzi A, Yao X, Andrews CD, Tsai L, et al. Engineered Bispecific Antibodies with Exquisite HIV-1-Neutralizing Activity. Cell. 2016;165(7):1621-31.
3. Mouquet H, Scharf L, Euler Z, Liu Y, Eden C, Scheid JF, et al. Complex-type N-glycan recognition by potent broadly neutralizing HIV antibodies. Proc Natl Acad Sci U S A. 2012;109(47):E3268-77.

4. Schoofs T, Barnes CO, Suh-Toma N, Golijanin J, Schommers P, Gruell H, et al. Broad and Potent Neutralizing Antibodies Recognize the Silent Face of the HIV Envelope. Immunity. 2019;50(6):1513-29 e9.
5. Mkhize NN, Yssel AEJ, Kaldine H, van Dorsten RT, Woodward Davis AS, Beaume N, et al. Neutralization profiles of HIV-1 viruses from the VRC01 Antibody Mediated Prevention (AMP) trials. PLoS Pathog. 2023;19(6):e1011469.
6. Salazar-Gonzalez JF, Bailes E, Pham KT, Salazar MG, Guffey MB, Keele BF, et al. Deciphering human immunodeficiency virus type 1 transmission and early envelope diversification by single-genome amplification and sequencing. J Virol. 2008;82(8):3952-70.
7. Yoon H, Macke J, West AP, Jr., Foley B, Bjorkman PJ, Korber B, et al. CATNAP: a tool to compile, analyze and tally neutralizing antibody panels. Nucleic Acids Res. 2015;43(W1):W213-9.
8. Bricault CA, Yusim K, Seaman MS, Yoon H, Theiler J, Giorgi EE, et al. HIV-1 Neutralizing Antibody Signatures and Application to Epitope-Targeted Vaccine Design. Cell Host Microbe. 2019;26(2):296.