**Table S2. Reversion of affinity maturation patches on VRC01 and MinVRC01 reveal redundancies in affinity maturation residues that contribute to neutralization.** Variants in which affinity maturation patches on VRC01 and MinVRC01 were reverted to germline were tested on a cross-clade panel of viruses. While there was loss of neutralization breadth for L-FW3 and H-CDR2 reversions for MinVRC01, neutralization activity remained for VRC01. The data also show that the disulfide is not necessary for potency and breadth of MinVRC01. Presented values are neutralization $IC_{50}$ in µg/ml and colored according to the listed legend.

| CLADE | VIRUS | VRC01 | VRC01 LΔCDR1 | VRC01 LΔFW3 | VRC01 HΔCDR1 | VRC01 HΔCDR2 | VRC01 HΔFW3 | VRC01 HΔdisulf |
|---|---|---|---|---|---|---|---|---|
| A | Q769 | 0.02 | 0.06 | 0.05 | 0.03 | 3.13 | 0.06 | 0.029 |
| | 0330.v4.c3 | 0.11 | > 50 | 2.51 | 1.43 | 8.50 | 0.29 | 0.076 |
| | Q461.e2 | 0.26 | > 50 | > 50 | 50 | 12.9 | 0.77 | 0.239 |
| B | REJO4541.67 | 0.05 | 0.11 | 0.08 | 0.07 | 1.35 | 0.07 | 0.036 |
| | JR-FL | 0.03 | > 50 | 0.24 | > 50 | > 50 | 0.10 | 0.033 |
| | TRO.11 | 0.33 | > 50 | > 50 | 50 | > 50 | 0.78 | 0.300 |
| C | ZM197M.PB7 | 0.10 | 0.19 | 0.12 | 0.19 | 0.30 | 0.14 | 0.059 |
| | 6240_08_TA5_4622 | 0.61 | > 50 | 1.37 | 0.62 | 10.6 | 1.23 | 0.495 |
| | ZM109F.PF4 | 0.18 | > 50 | 4.53 | 2.33 | 2.08 | 0.36 | 0.194 |
| C (T/F) | Ce2010_F5 | 0.28 | > 50 | 0.83 | 0.33 | 3.47 | 0.53 | 0.166 |
| | Ce2060_G9 | 0.23 | > 50 | > 50 | > 50 | > 50 | 0.83 | 0.262 |
| BC | CNE52 | 0.34 | > 50 | 2.00 | 0.83 | 3.17 | 1.30 | 0.206 |
| | CNE30 | 0.50 | > 50 | > 50 | 2.47 | > 50 | 1.17 | 0.433 |
| CRF02_AG | C3347.c11 | 0.08 | 0.07 | 0.12 | 3.26 | > 50 | 0.16 | 0.073 |
| | R2184.c04 | 0.09 | 0.37 | 0.10 | 0.35 | 0.28 | 0.20 | 0.061 |
| G | X2131 | 0.29 | 20 | 0.69 | 2.40 | 1.99 | 1.43 | 0.467 |

| CLADE | VIRUS | MinVRC01 | MinVRC01 LΔCDR1 | MinVRC01 LΔFW3 | MinVRC01 HΔCDR1 | MinVRC01 HΔCDR2 | MinVRC01 HΔFW3 | MinVRC01 HΔdisulf |
|---|---|---|---|---|---|---|---|---|
| A | Q769 | 0.02 | 11.0 | > 10 | 0.41 | > 50 | 0.03 | 0.031 |
| | 0330.v4.c3 | 0.17 | > 50 | > 50 | > 50 | > 50 | 4.76 | 0.510 |
| | Q461.e2 | 0.28 | > 50 | > 50 | > 50 | > 50 | 5.89 | 0.522 |
| B | REJO4541.67 | 0.01 | > 50 | > 10 | > 50 | > 50 | 0.03 | 0.025 |
| | JR-FL | 1.19 | > 50 | > 50 | > 50 | > 50 | > 50 | 3.030 |
| | TRO.11 | 0.44 | > 50 | > 50 | > 50 | > 50 | 5.07 | 1.551 |
| C | ZM197M.PB7 | 0.03 | > 50 | 0.17 | 8.90 | > 50 | 0.06 | 0.066 |
| | 6240_08_TA5_4622 | 0.92 | > 50 | > 50 | > 50 | > 50 | 6.96 | 1.061 |
| | ZM109F.PF4 | 0.52 | > 50 | > 50 | > 50 | > 50 | 11.4 | 0.418 |
| C (T/F) | Ce2010_F5 | 0.15 | > 50 | > 50 | 1.81 | > 50 | 1.39 | 0.153 |
| | Ce2060_G9 | 0.09 | > 50 | > 50 | > 50 | > 50 | 0.69 | 0.153 |
| BC | CNE52 | 0.09 | > 50 | > 10 | 0.72 | > 50 | 1.79 | 0.141 |
| | CNE30 | 0.40 | > 50 | > 50 | > 50 | > 50 | 4.92 | 0.936 |
| CRF02_AG | C3347.c11 | 0.02 | 0.02 | 0.17 | 0.25 | > 50 | 0.03 | 0.055 |
| | R2184.c04 | 0.04 | > 50 | > 10 | 3.09 | > 50 | 0.14 | 0.071 |
| G | X2131 | 0.18 | > 50 | > 50 | > 50 | > 50 | 2.44 | 0.145 |

| Neutralization $IC_{50}$ (µg/mL) |
|---|
| 50 |
| 10 |
| 1 |
| 0.10 |
| 0.01 |
| 0.001 |