

## Supplemental information

### Reduced neutralization of SARS-CoV-2

#### B.1.1.7 variant by convalescent and vaccine sera

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**Table S1** X-ray data collection and refinement statistics. Related to STAR Methods X-ray data collection, structure determination and refinement

<b>Data collection</b>		
Data set	RBD/Fab269	RBD <sub>N501Y</sub> /Fab269
Space group	C222 <sub>1</sub>	C2
Cell dimensions (Å)		
a, b, c (Å)	82.8, 149.7, 145.9	195.1, 85.0, 57.9
a, b, g (°)	90, 90, 90	90, 100.6, 90
Resolution (Å)	75–1.77 (1.80–1.77)	96–2.19 (2.23–2.19)
Unique reflections	88349 (4395)	48007 (2371)
R <sub>merge</sub>	0.091 (---)	0.177 (---)
R <sub>pim</sub>	0.025 (0.980)	0.050 (0.988)
CC <sub>1/2</sub>	1.00 (0.333)	0.997 (0.468)
<I> / <σI>	14.0 (0.3)	8.4 (0.2)
Completeness (%)	100 (95.5)	99.9 (98.5)
Redundancy	13.5 (13.9)	13.0 (9.1)
<b>Refinement</b>		
Resolution (Å)	42.7–1.77	56.9–2.19
No. reflections	83704/4325	41325/2137
R <sub>work</sub> / R <sub>free</sub>	0.182/0.198	0.197/0.222
No. atoms	5454	4948
Average B-factors (Å <sup>2</sup> )	50	68
R.m.s. deviations		
Bond lengths (Å)	0.009	0.003
Bond angles (°)	1.0	0.6
Ramachandran plot (%)		
Favoured	96.9	96.2
Allowed	3.1	3.8
Outliers	0	0

Numbers in brackets refer to the highest resolution shell of data.

**Table S2.** Neutralization and RDB binding of selected antibodies against SARS-CoV-2 strains Victoria and B.1.1.7. Related to STAR Methods Bio-Layer Interferometry and Focus Reduction Neutralization Assay, and Figures 2 and 4.

mAb	IC50 (ug/ml) <sup>#</sup>			KD (nM) <sup>€</sup>		Immunoglobulin gene usage <sup>Δ</sup>		
	B.1.1.7	Victoria	B.1.1.7/Victoria ratio <sup>§</sup>	RBD-N501Y	Native RBD	IGHV	K/λ	IGLV
40	0.035 ± 0.008	0.026 ± 0.007	1.36	0.97±0.006	0.55±0.003	3-66	K	1-33 or 1D-33
55	0.348 ± 0.044	0.095 ± 0.015	3.68	4.55±0.19	3.61±0.15	1-58	K	3-20
58	0.116 ± 0.029	0.041 ± 0.003	2.81	0.55±0.004	0.30±0.003	3-9	λ	3-21
88	0.058 ± 0.008	0.033 ± 0.001	1.78	0.65±0.005	0.64±0.004	4-61	λ	1-36
132	0.337 ± 0.048	0.048 ± 0.000	7.03	43.7±0.43	16.0±0.09	4-34	λ	7-46
150	0.139 ± 0.019	0.012 ± 0.000	11.96	0.72±0.004	0.19±0.002	3-53	K	1-9
158	0.254 ± 0.109	0.031 ± 0.004	8.33	1.57±0.01	0.53±0.0003	3-53	K	1-9
159	0.061 ± 0.020	0.011 ± 0.000	5.71	N/A	N/A	3-30	K	3-20
165	0.212 ± 0.004	0.034 ± 0.004	6.31	3.64±0.14	3.49±0.15	1-58	K	3-20
170	0.105 ± 0.050	0.025 ± 0.004	4.22	8.71±0.13	5.75±0.07	5-51	K	2D-29
175	0.575 ± 0.280	0.026 ± 0.000	22.51	2.54±0.02	0.97±0.005	3-53	K	1-33 or 1D-33
222	0.014 ± 0.002	0.019 ± 0.000	0.74	0.39±0.005	0.29±0.003	3-53	K	3-20
253	0.126 ± 0.018	0.055 ± 0.008	2.28	19.5±0.20	13.9±0.48	1-58	K	3-20
269	>10	0.030 ± 0.000	N/A	45.4±1.42	1.59±0.009	3-53	K	1-9
278	0.307 ± 0.149	0.014 ± 0.007	22.46	8.45±0.06	5.11±0.03	1-18	K	1-39 or 1D-39
281	0.012 ± 0.000	0.005 ± 0.001	2.50	4.05±0.02	3.20±0.01	3-7	K	2-24
316	0.024 ± 0.005	0.018 ± 0.007	1.37	2.81±0.03	1.50±0.01	1-2	λ	2-8
318	0.185 ± 0.037	0.029 ± 0.008	6.30	1.99±0.02	2.23±0.02	1-58	K	3-20
384	0.005 ± 0.002	0.004 ± 0.001	1.13	0.71±0.006	0.51±0.004	3-11	K	1-27
398	0.180 ± 0.001	0.091 ± 0.004	1.98	1.18±0.009	1.02±0.007	3-66	λ	2-8
REGN10933	0.014 ± 0.002	0.004 ± 0.002	3.31	2.75±0.04	1.82±0.03			
REGN10987	0.028 ± 0.003	0.032 ± 0.007	0.86	3.09±0.06	3.85±0.08			
AZD1061	0.012 ± 0.002	0.013 ± 0.003	0.93	1.41±0.02	1.04±0.01			
AZD8895	0.011 ± 0.002	0.005 ± 0.001	2.17	2.44±0.04	1.49±0.02			

# Neutralization activity of selected antibodies against SARS-CoV-2 strain Victoria and B.1.1.7 were determined by FRNT. Data are from 2 independent experiments, each with duplicate wells and the data are shown as mean ± s.e.m.

§ IC50 ratio between strains B.1.1.7 and Victoria.

€ KD values for Fab association with N501-RBD and Y501-RBD measured by BLI are shown mAb 159 binds to the NTD and was not tested.

Δ VH and VL gene usage for monoclonal antibodies.

**Table S3** RBD/Fab complexes analysed for N501 contact. Related to Figures 2 and 3.

<b>Fabs contact N501 (<math>\leq 4</math> Å)</b>		<b>Fabs that do not contact N501 (<math>&gt;4</math> Å)</b>	
<b>Name</b>	<b>PDB ID</b>	<b>Name</b>	<b>PDB ID</b>
B38	7BZ5	CV07-270	6XKP
CC12.1	6XC3	P2B-2F6	7BWJ
CC12.3	6XC4	P2C-1A3	7CDJ
BD604	7CH4	BD368	7CHE
BD629	7CH5	P17	7CWO
BD236	7CHB	COVA2	7JMP
COVA2-04	7JMO	COVA1	7JMW
C102	7K8M	52	7KZ9
C1A-B12	7KfV	298	7KZ9
C1A-B3	7KfW	CR3022	6YLA
C1A-C2	7KfX	REGN10933	6XDG
C1A-F10	7KfY	REGN10987	6XDG
STE90-C11	7B3O	CV30	6XE1
Fab-7CJF	7CJF	CB6	7C01
40	7ND3	P2C-1F11	7CDI
150	7ND5	EY6A	6ZCZ
158	7ND6	S309	7BEP
269	7NEH	88	7BEL
		253	7BEN
		384	7BEP