Supplementary Information:

In the initial cohort, 63% of patients received the BNT162b2 vaccine, 33% received mRNA-1273, and 4% received Ad26.COV2.S. In the booster cohort, 67% of patients had received BNT162b2 for their initial vaccines, 28% mRNA-1273, and 5% Ad26.COV2.S. Of the 76 patients who received BNT162b2 initially, 75 received BNT162b2 as a booster and 1 received Ad26.COV2.S. Of the 32 patients who received mRNA-1273 initially, 29 received mRNA-1273 as a booster and 3 received BNT162b2. Of the 6 patients who received Ad26.COV2.S initially, 3 received Ad26.COV2.S as a booster and 3 received BNT162b2.

Six patients in the booster cohort underwent heterologous vaccinations and had pre- and post-booster serologic values. Of the 3 patients who initially received Ad26.COV2.S and subsequently received BNT162b2, 1 maintained a strong serologic response (2660 AU/mL) whereas the other 2 did not respond to either vaccine. Of the 3 patients who originally received mRNA-1273 and then received BNT162b2, 1 maintained a moderate serologic response (529.7 AU/mL) and 1 did not respond to either vaccine. The third patient had no response to mRNA-1273 and a very weak response to BNT162b2 (1.63 AU/mL).

Supplementary Table 1: Correlation of anti-S levels and neutralization antibody levels

Subject	anti-S (AU/mL)	anti-S Interpretation	ND50 heat (cutoff: 20)	ND80 heat (cutoff: 20)	ND Interpretation
1	< 0.4	NEG	0	0	NEG
2	12.7	POS	0	0	NEG
3	1474	POS	2212	958	POS
4	22.9	POS	0	0	NEG
5	0.5	NEG	0	0	NEG
6	7429	POS	1357	534	POS
7	< 0.4	NEG	0	0	NEG
8	11882	POS	2472	1146	POS
9	2784	POS	2730	758	POS
10	< 0.4	NEG	0	0	NEG
11	< 0.4	NEG	0	0	NEG
12	< 0.4	NEG	0	0	NEG
13	< 0.4	NEG	0	0	NEG
14	0.4	NEG	47	0	POS
15	16950	POS	10000	6933	POS
16	< 0.4	NEG	0	0	NEG
17	< 0.4	NEG	0	0	NEG
18	3162	POS	1210	478	POS
19	636.8	POS	728	218	POS
20	84.7	POS	77	26	POS

NEG – negative   POS – positive

Supplementary Table 2: Multivariable analysis for CD8 response to SARS-CoV-2 Variants

T-cell, variant, vaccine	Variable	Direction of association, p-value
CD8, Wuhan, initial	Years since diagnosis Age	Negative, p=0.007 Negative, p=0.02
CD8, Omicron, initial	Age Female vs. Male	Negative, p=0.09 Female higher response, p=0.09
CD8, Wuhan, booster	Age Absolute lymphocyte count	Negative, p=0.02 Positive, p=0.08