

Supplementary Appendix

This appendix has been provided by the authors to give readers additional information about their work.

Supplement to: Hacısuleyman E, Hale C, Saito Y, et al. Vaccine breakthrough infections with SARS-CoV-2 variants. *N Engl J Med*. DOI: 10.1056/NEJMoa2105000

Appendix

Figure S1: Standard curve for the chemically inactivated SARS-CoV-2

Table S1: Demographics on vaccinated and unvaccinated cohorts tested at the Rockefeller University between 1/21/2021 and 3/17/2021

Table S2: Multiplex primers for the SARS-CoV-2 RT-PCR assay

Table S3: Viral loads in Patient 1 and 2

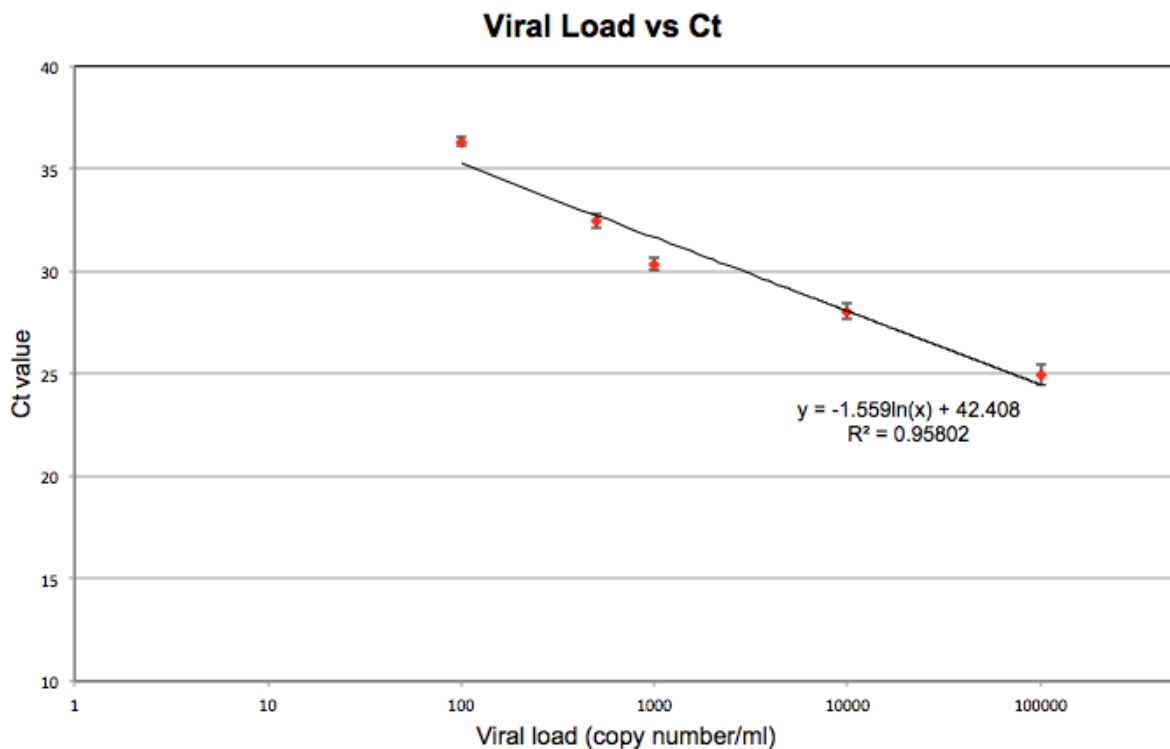


Figure S1: Standard curve for the chemically inactivated SARS-CoV-2. Standard curve calculated using the chemically inactivated SARS-CoV-2 in DRUL buffer and extracted with SPRI magnetic beads. Patient 1's viral load at diagnosis corresponds to 134,000 and 255,000 copies per ml for N1 and N2, respectively. Patient 2's viral load at diagnosis corresponds to 400 and 450 copies per ml for N1 and N2, respectively.

Table S1: Demographics on vaccinated and unvaccinated cohorts tested at the Rockefeller University between 1/21/2021 and 3/17/2021. Vaccinated refers to participants who were at least 2 weeks beyond the second dose of either Pfizer/BioNTech or Moderna vaccines by 3/17/2021.

| | Vaccinated Cohort (n=417) | | Unvaccinated Cohort (n=1491) | |
|----------------------------|----------------------------------|--------|-------------------------------------|--------|
| Gender | | | | |
| Female | 186 | 44.60% | 698 | 46.81% |
| Male | 226 | 54.20% | 780 | 52.31% |
| Other | 5 | 1.20% | 13 | 0.87% |
| Average age (years) | 47.2 | | 34.9 | |
| | | | | |
| Ethnicity | | | | |
| Not hispanic | 324 | 77.70% | 299 | 20.05% |
| Hispanic | 65 | 15.59% | 1063 | 71.29% |
| Not reported | 28 | 6.71% | 129 | 8.65% |
| | | | | |
| Race | | | | |
| White | 253 | 60.67% | 708 | 47.48% |
| Black | 36 | 8.63% | 153 | 10.26% |
| Asian | 59 | 14.15% | 332 | 22.27% |
| More than one | 22 | 5.28% | 88 | 5.90% |
| Unknown/unreported | 45 | 10.79% | 203 | 13.62% |
| Native American | 2 | 0.48% | 4 | 0.27% |
| Pacific Islander | 0 | 0.00% | 3 | 0.20% |
| | | | | |

| | | | | |
|----------------------------------|-----|--------|------|--------|
| Education | | | | |
| College Grad | 346 | 82.97% | 1059 | 71.03% |
| Some College | 27 | 6.47% | 131 | 8.79% |
| High School Graduate | 36 | 8.63% | 149 | 9.99% |
| Some High School | 5 | 1.20% | 27 | 1.81% |
| Under 18 years old | 0 | 0.00% | 125 | 8.38% |
| Unreported | 3 | 0.72% | 0 | 0.00% |
| | | | | |
| Health Care worker | | | | |
| No | 352 | 84.41% | 1484 | 99.53% |
| Yes | 65 | 15.59% | 7 | 0.47% |
| | | | | |
| First responder | | | | |
| No | 406 | 97.36% | 1480 | 99.26% |
| Yes | 11 | 2.64% | 11 | 0.74% |
| | | | | |
| Use public Transportation | | | | |
| No | 336 | 80.58% | 1139 | 76.39% |
| Yes | 81 | 19.42% | 352 | 23.61% |
| | | | | |
| Net PCR Test Results | | | | |
| Positive | 2 | 0.48% | 32 | 2.15% |

Table S2: Multiplex primers for the SARS-CoV-2 RT-PCR assay

| Custom Primer / Probes | Manufacturer | Storage |
|--|----------------------------|----------------|
| SARS-CoV-2 forward primer for N1 target (nCoV_NF1) | LGC Biosearch Technologies | Room temp |
| SARS-CoV-2 reverse primer for N1 target (nCoV_NR1) | LGC Biosearch Technologies | Room temp |
| SARS-CoV-2 FAM probe for N1 target (nCoV_NP1) | LGC Biosearch Technologies | Room temp |
| SARS-CoV-2 forward primer for N2 target (nCoV_NF2) | LGC Biosearch Technologies | Room temp |
| SARS-CoV-2 reverse primer for N2 target (nCoV_NR2) | LGC Biosearch Technologies | Room temp |
| SARS-CoV-2 Quasar 670 probe for N2 target (nCoV_NP2) | LGC Biosearch Technologies | Room temp |
| RNAse P forward primer (RP_F) | LGC Biosearch Technologies | Room temp |
| RNAse P reverse primer (RP_R) | LGC Biosearch Technologies | Room temp |
| RNAse P CAL Fluor Orange 560 probe (RP_P) | LGC Biosearch Technologies | Room temp |

Table S3: Viral loads in Patient 1 and 2

| | Patient 1 | | | | Patient 2 | |
|----|-----------|-----------|-----------|-----------|-----------|------|
| Ct | Date: | 3/10/2021 | 3/11/2021 | 3/12/2021 | 3/16/2021 | 3/18 |
| N1 | | 24.2 | 26.3 | 22.9 | 35.8 | 33.3 |
| N2 | | 23.5 | 25.9 | 22.4 | 35.9 | 33.1 |
| RP | | 21.7 | 22.9 | 20.8 | 22.5 | 24.4 |