Supplemental information

Long-term SARS-CoV-2-specific immune and

inflammatory responses in individuals recovering

from COVID-19 with and without post-acute symptoms

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Supplementary Table 1. Participants with Activation Induced Marker (AIM) and Intracellular Cytokine Staining (ICS) Assay Results Greater than Pre-COVID-19 Control Samples Across All Timepoints. <mark>Related to Figure 1.</mark>

| Assay	N[a]	N Above Upper Interquartile Range (%+ Cells) of Pre-COVID-19 Controls (% of N)
CD4 AIM or ICS (N or S)	69	69 (100)
CD8 AIM or ICS (N or S)	69	66 (95.7)
CD4 AIM N or S	68	67 (98.5)
CD4 AIM N	68	67 (98.5)
CD4 AIM S	68	65 (95.6)
CD8 AIM N or S	68	52 (76.5)
CD8 AIM N	68	46 (67.6)
CD8 AIM 2	68	41 (60.3)
CD4 ICS N or S (IFNγ+/TNFα+ or IFNγ+)	65	65 (100)
CD4 ICS N	64	64 (100)
CD4 ICS S	64	63 (98.4)
CD8 ICS N or S (IFNγ+/TNFα+ or IFNγ+)	65	53 (81.5)
CD8 ICSN	65	47 (72.3)
CD8 ICS S	63	46 (73.0)

[a] Number of participants from the total analysis cohort (N=70) with valid AIM or ICS assay results (*e.g.* sufficient numbers of cells for analysis, adequate staining)
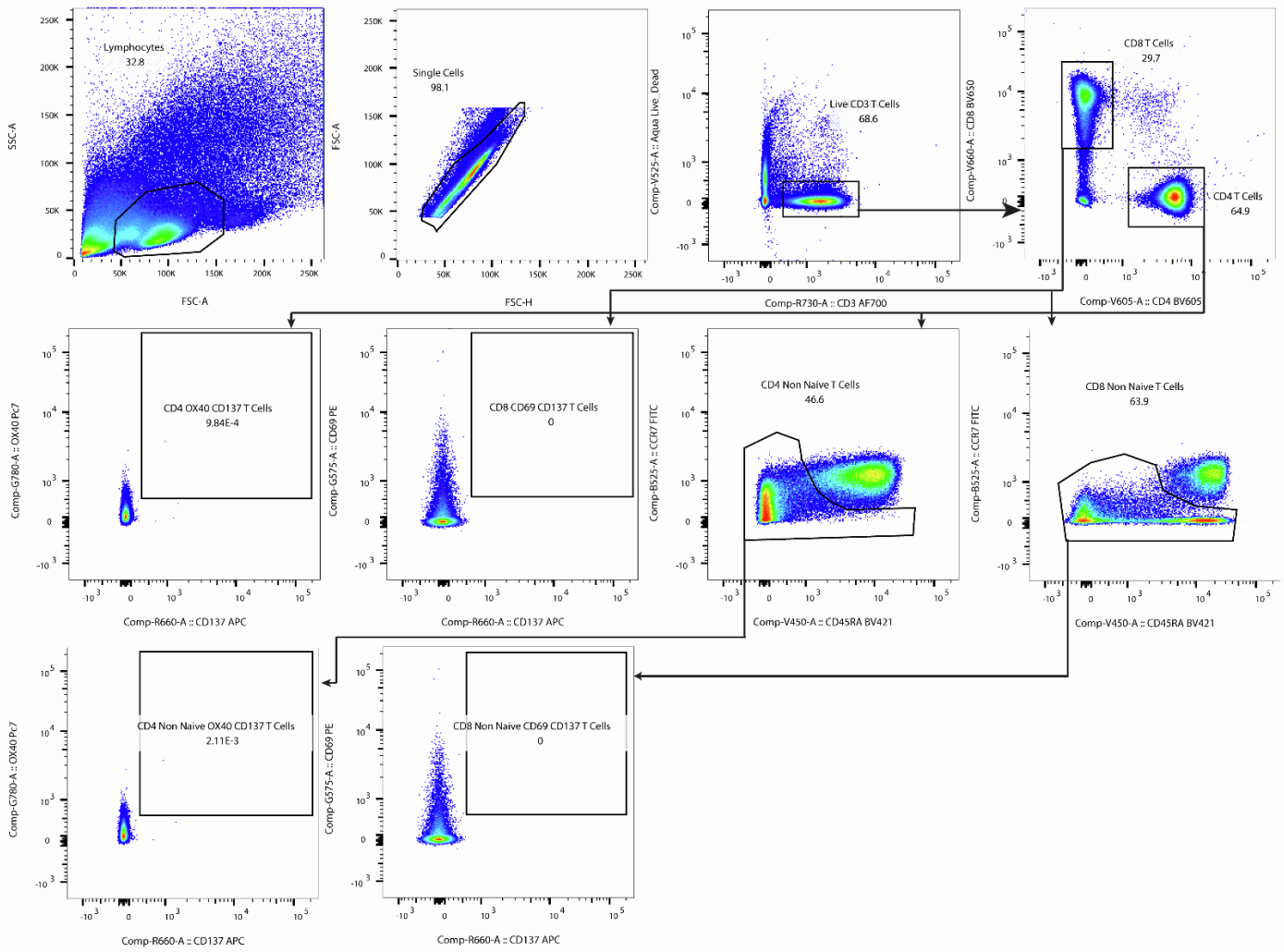
Supplementary Figure 1. <mark>Gating Strategy for the Activation Induced Marker (AIM) Assay, related to STAR methods section, "Activated Induced Marker Assay"</mark>. Data from memory (non naïve) CD4 and CD8 T cells were used in the primary analyses.
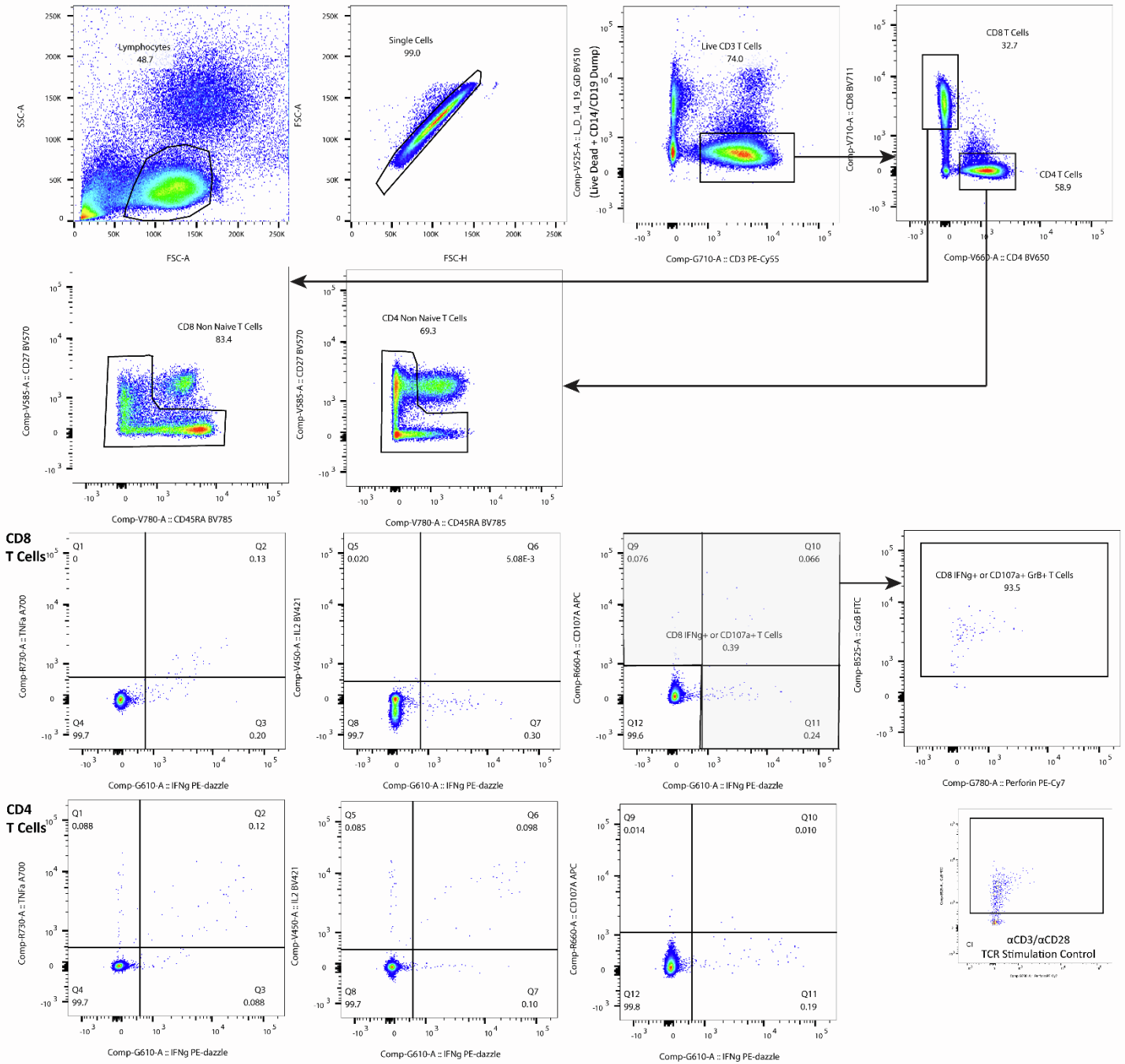
Supplementary Figure 2. Gating Strategy for the Intracellular Cytokine Staining (ICS) Assay, related to STAR methods section, "Intracellular Cytokine Assay". Data from memory (non naïve) CD4 and CD8 T cells were used in the analyses.
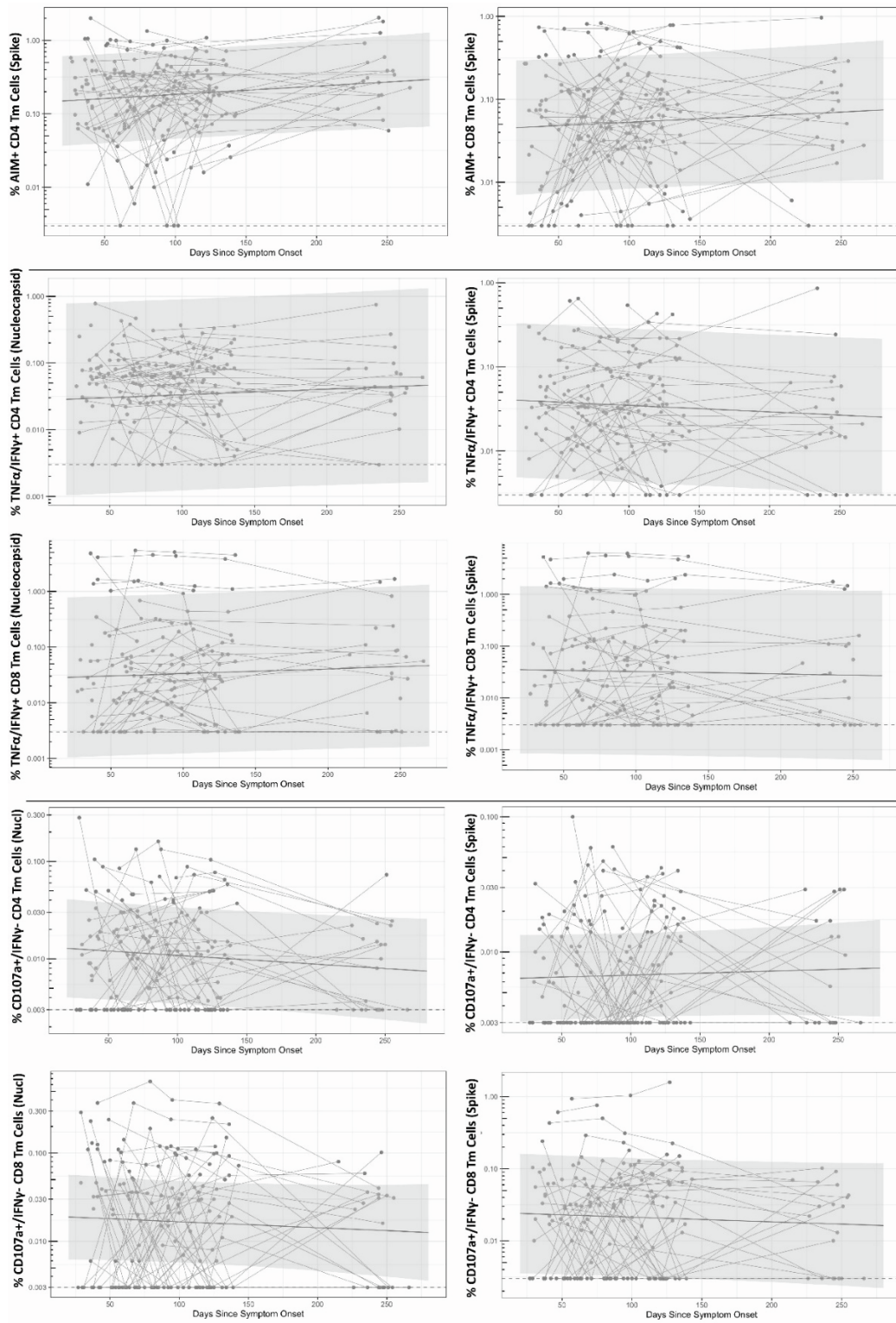
Supplementary Figure 3. <mark>Longitudinal T Cell Responses, Related to Figure 1.</mark> as Longitudinal T cell responses measured by AIM SARS-CoV-2 Spike assay (**A**), dual expression of IFNγ+ and TNFα CD8+ and CD4+ T cells by ICS (**B**), and expression of CD107a (IFNγ negative) CD4+ and CD8+ T cells (**C**). Solid line and shaded region represent the median model prediction and 95% prediction interval from linear mixed effects modeling. Dashed lines represent assay limits of detection.
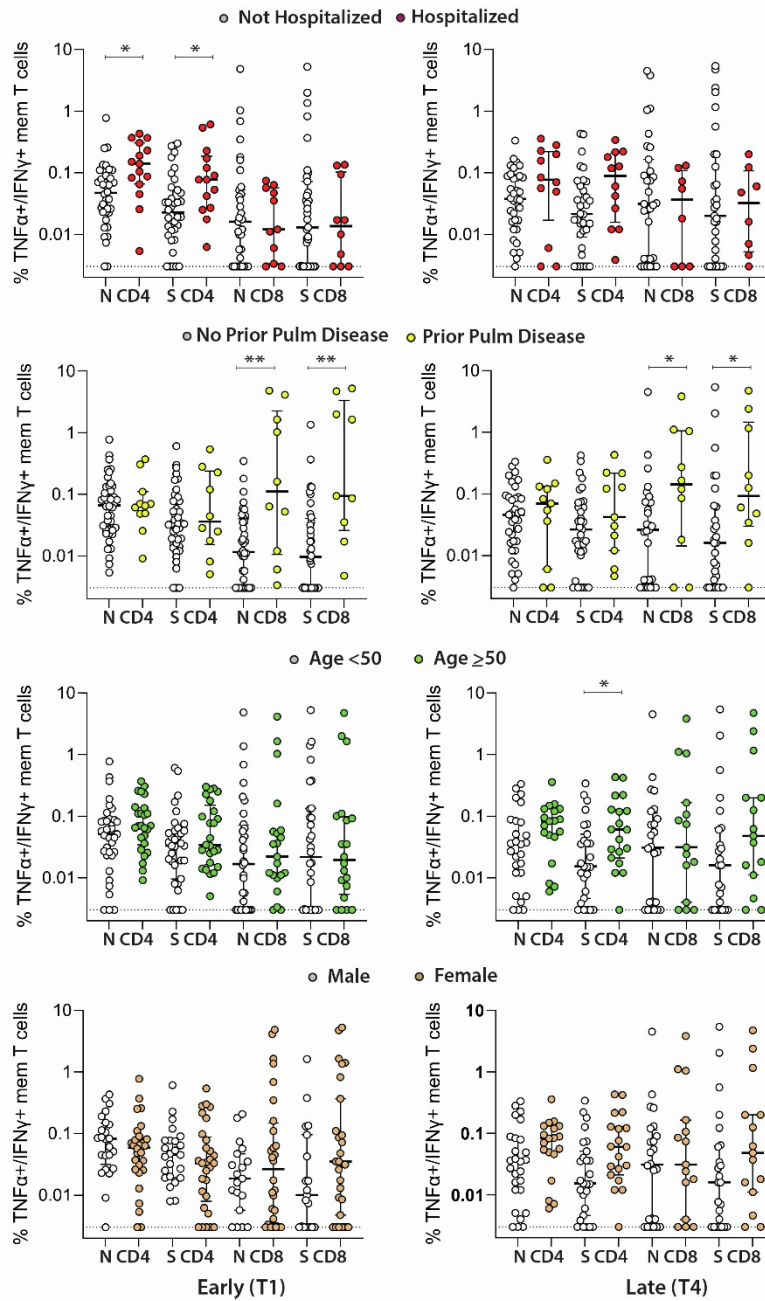
Supplementary Figure 4. Frequency of SARS-CoV-2-Specific TNFα+/IFNγ+ T cell CD4+ T Cells as Measured by the ICS Assay in Study Participants, Related to Figure 2. ICS results are shown for various clinical and demographic factors at T1 (left panels, median 53 days after onset of symptoms) versus T4 (right panels, median 123 days from onset of symptoms) cross-sectional analysis time points. All data points are shown as individual points. Bars and lines in cross sectional data represent median values and interquartile ranges; (*) P<0.05, (**) P<0.01, (***) P<0.001 by non-parametric analyses.
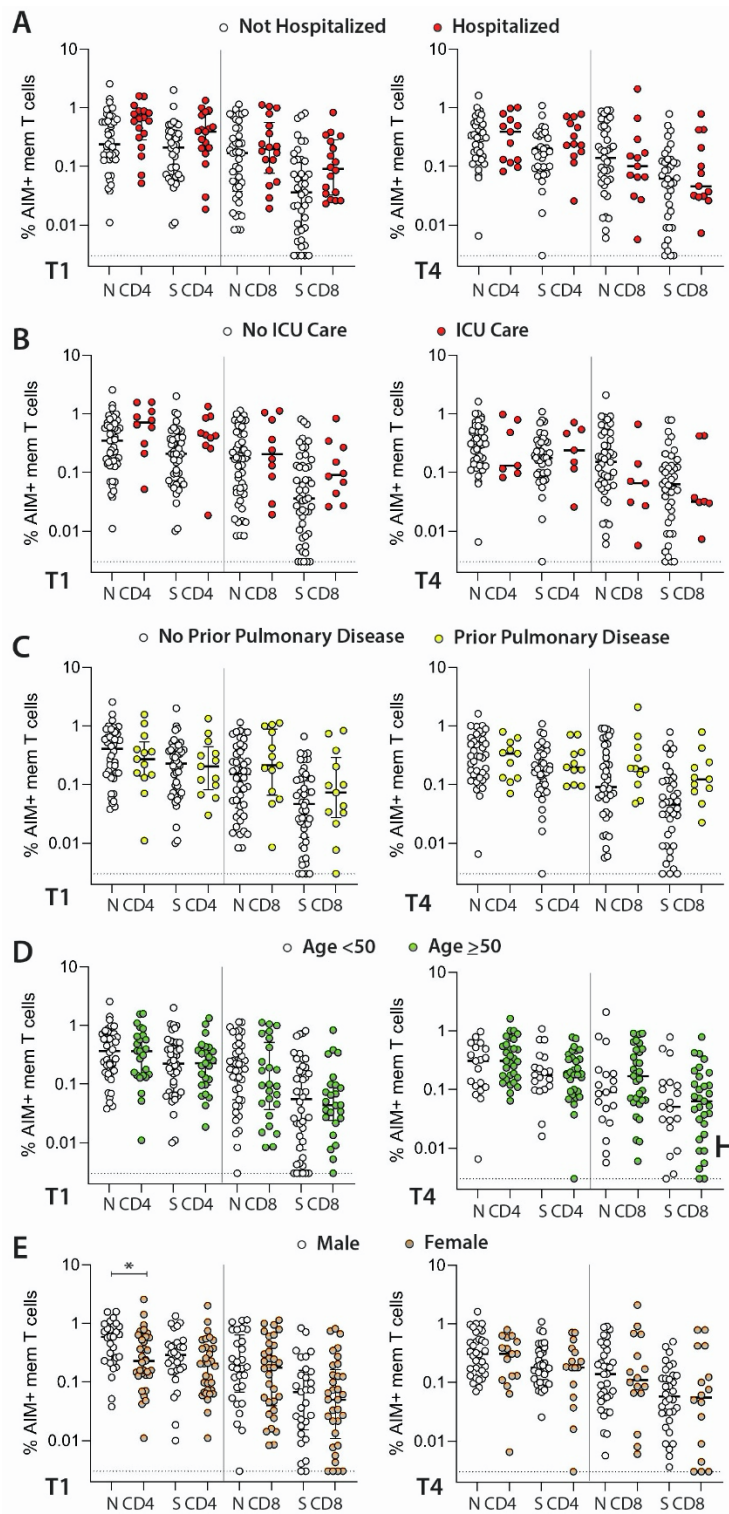
Supplementary Figure 5. <mark>Frequency of SARS-CoV-2-Specific CD4 an CD8 T Cells as Measured by the AIM Assay, Related to Figure 2.</mark> Frequency of AIM+ cells from study participants for various clinical and demographic factors are shown at T1 (left panels, median 53 days after onset of symptoms) versus T4 (right panels, median 123 days from onset of symptoms) cross-sectional analysis time points.. All data points are shown as individual points. Bars and lines in cross sectional data represent median values and interquartile ranges; (*) P<0.05, by non-parametric analyses.
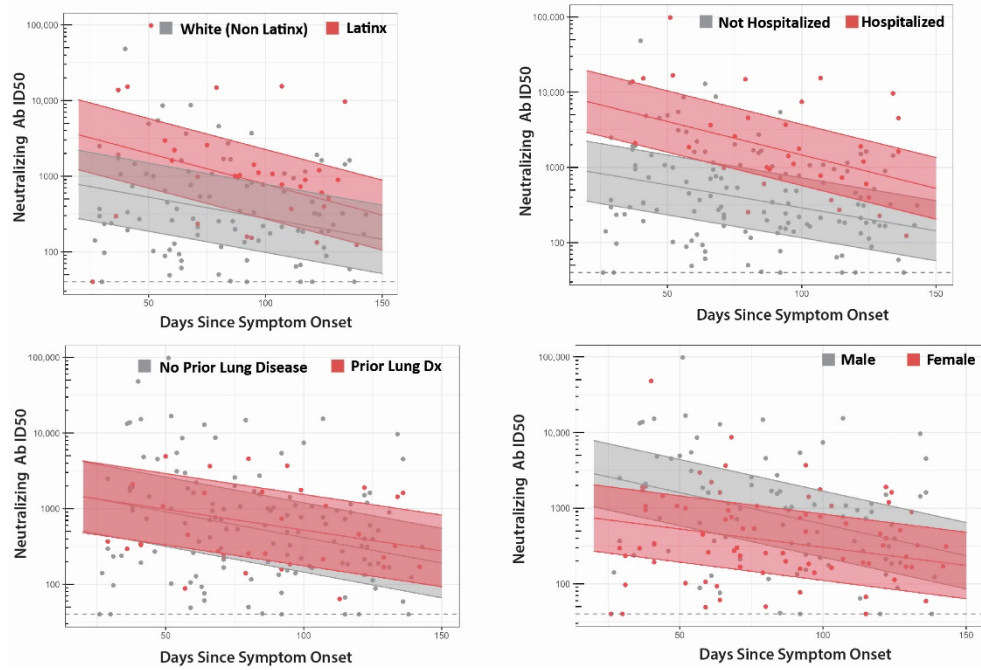
Supplementary Figure 6. <mark>Neutralizing Capacity (Infectious Dose, 50% [ID50] of Spike Pseudovirus in Presence of Participant Serum) for all Participants and by Various Clinical and Demographic Factors, Related to Figure 4</mark>. Solid line and shaded region represent the median model prediction and 50% prediction interval from linear mixed effects modeling. Dashed lines represent assay limits of detection.
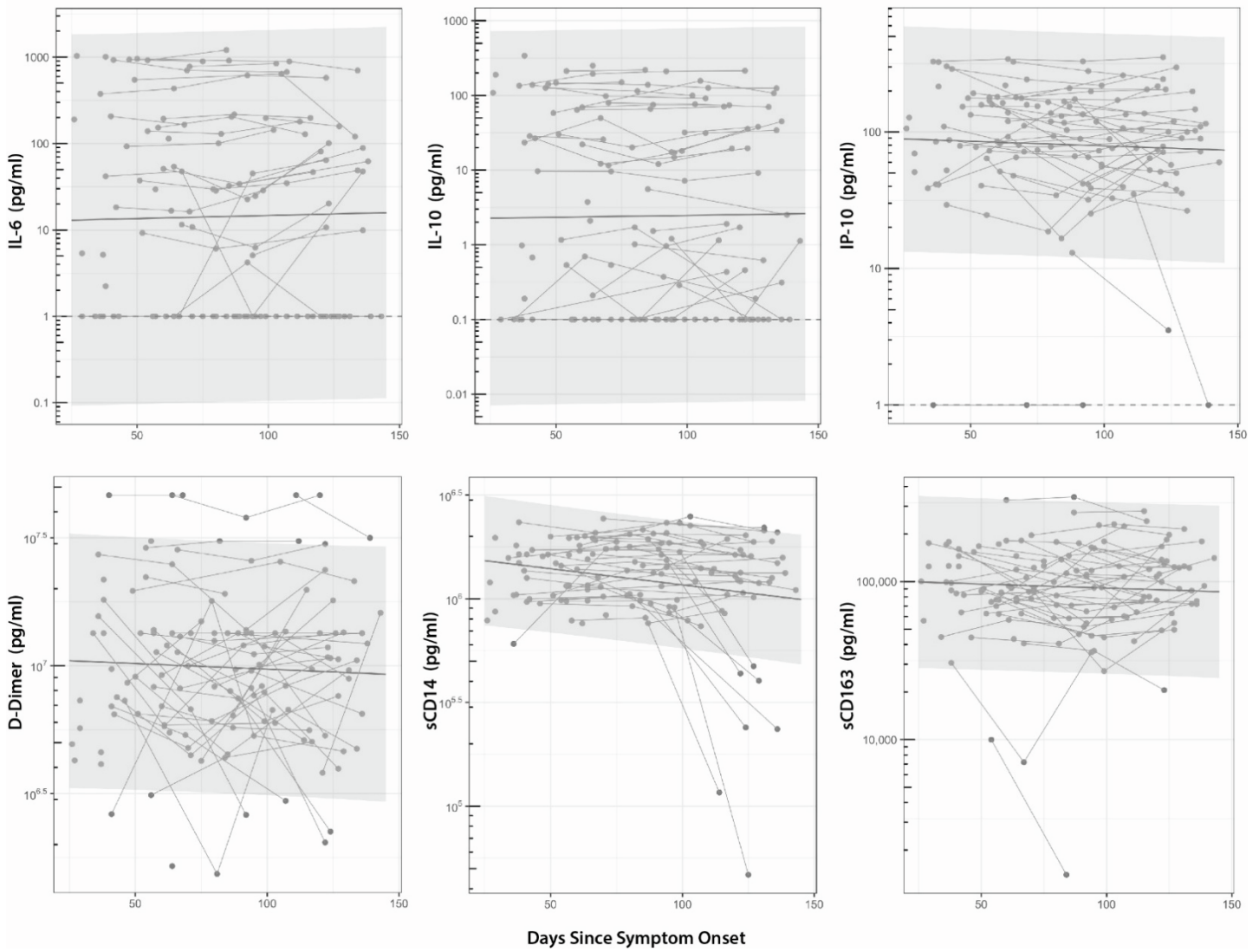
Supplementary Figure 7. <mark>Circulating Markers of Cytokines and Markers of Inflammation Over Time, Related to Figure 5.</mark> With the exception of a modest decrease in sCD14 over time (1pg/ml per day (P=0.006), levels remained constant over 4 months following onset of COVID-19 symptoms. Solid line and shaded region represent the median model prediction and 95% prediction interval from linear mixed effects modeling