T cell response against SARS-CoV-2 persists after one year in patients surviving severe COVID-19

Fabienne Venet PhD[1,2], Morgane Gossez PhD[1,2], Frank Bidar MD[3,4], Maxime Bodinier MSc[3], Rémy Coudereau MSc[1,3], Anne-Claire Lukaszewicz MD[3,4], Claire Tardiveau PhD[3], Karen Brengel-Pesce PhD[3], Valérie Cheynet PhD[3], Marie-Angélique Cazalis[3], Rémi Pescarmona PharmD[2,5], Lorna Garnier PharmD[5], Marine Ortillon MSc[1], Marielle Buisson[6], Maude Bouscambert-Duchamp PharmD[7], Florence Morfin-Sherpa PhD[7], Jean-Sébastien Casalegno MD[7], Filippo Conti PhD[3], Thomas Rimmelé MD[3,4], Laurent Argaud MD[8], Martin Cour MD[8], Mitra Saadatian-Elahi MD[2,9], Laetitia Henaff MSc[2,9], Philippe Vanhems MD[2,9], Guillaume Monneret PhD[1,3] for the RICO study group

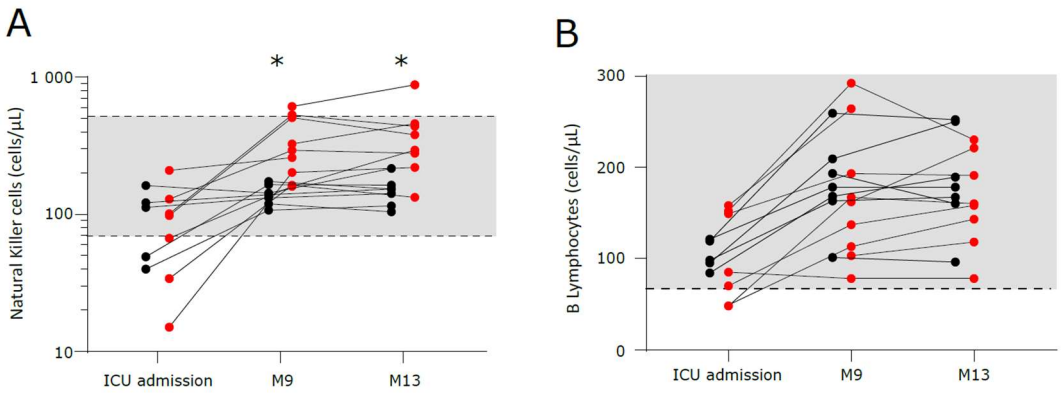
This appendix has been provided by the authors to give readers additional information about the work.

Table of content

Supplementary Figures

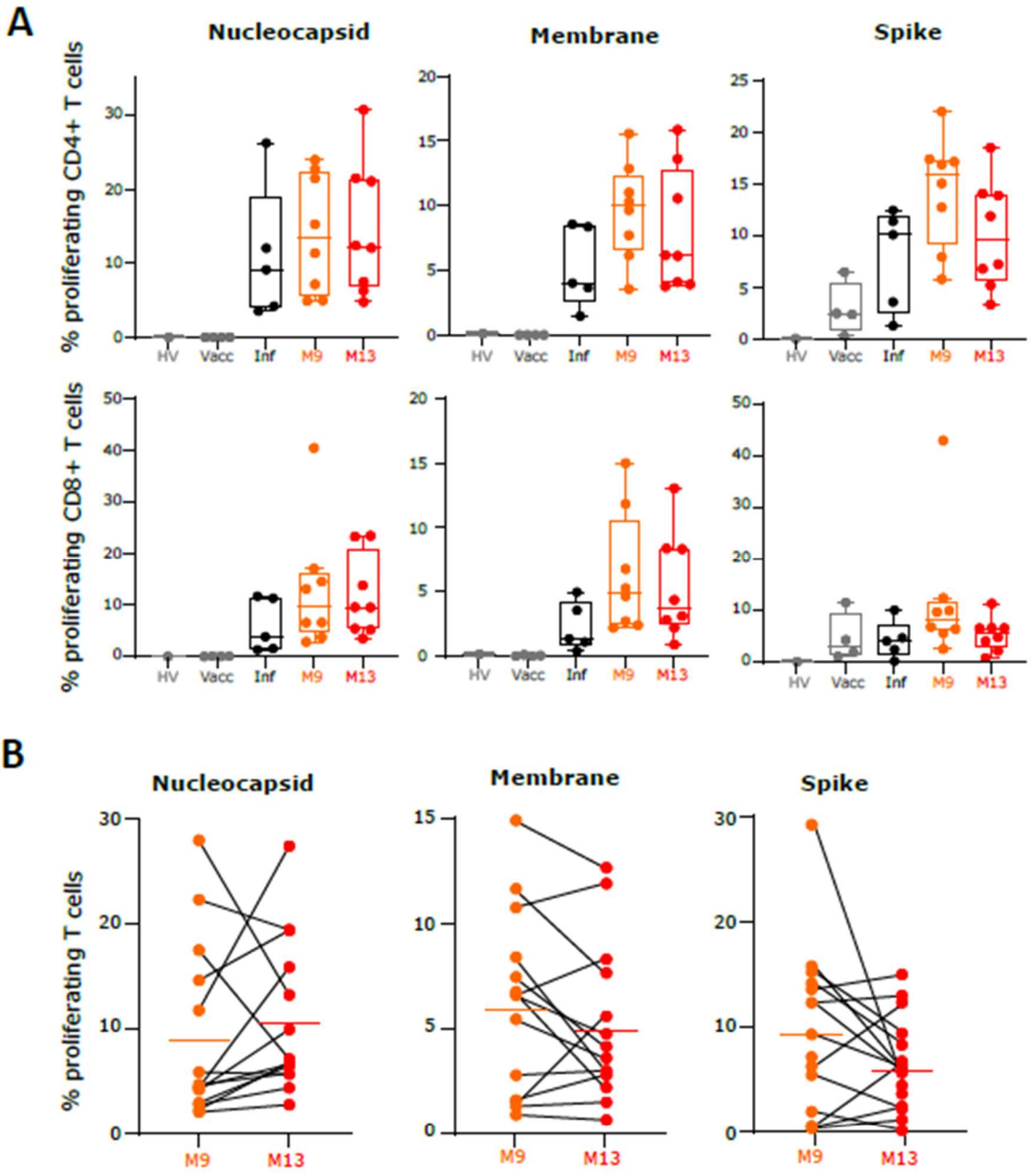
Supplementary Figure 1. COVID-19-induced cellular immune alterations.

Sixteen convalescent critically ill COVID-19 patients were sampled within the first 48h after admission (Day 0: D0, n = 15) and then twice at follow-up visits (i.e. after 9 and 13 months after hospital discharge (M9, n = 16; M13; n = 15). At each sampling time, **A-** absolute count of circulating NK cells (numbers of cells / µL) and **B-** absolute count of B lymphocytes (numbers of cells / µL) were monitored. Patients with short hospital length of stay (HLS) are represented with black symbols; patients with long HLS with red symbols. Results are presented as individual values. Grey zones represent normal values from the routine Immunology Laboratory of Hospices Civils de Lyon. Results were compared between patients with short and long HLS using non parametric Mann Whitney test. * $p < 0.05$



Supplementary Figure 2. Monitoring of SARS-CoV-2 specific T cell proliferation and correlation with immune parameters

A. Sixteen convalescent critically ill COVID-19 patients were sampled twice at follow-up visits (i.e. after 9 and 13 months after hospital discharge (M9, n = 16; M13; n = 15)). Fifteen healthy donors either non-infected and non-vaccinated (HV, n = 4), or after full vaccination (Vacc, n = 4) or after resolution of a non-severe SARS-CoV-2 infection (Inf, n = 7) were concomitantly included. At each sampling time, the percentages of CD4+ and CD8+ T lymphocytes that had proliferated in response to 3 SARS-CoV-2 antigens (Nucleocapsid, Membrane, Spike) were monitored. Results are expressed as the percentage of proliferating T CD4+ or CD8+ cells among total T cells and are presented as individual values and as Tukey Box-plots. **B.** Results of percentages of proliferating T cells in response to the three antigens are shown as paired samples between M9 and M13 as individual values and medians. **C.** Correlations between all immune parameters measured at M9 and M13 in critically ill COVID-19 patients are represented. Spearman's rho correlation coefficients were estimated and summarized in a correlation matrix. Cells were colored according to the strength of the correlations estimated by the R value ranging from green (negative correlations) to red (positive correlations). Correlations with a $R \geq 0.5$ or ≤ -0.5 and a p value ≤ 0.005 are identified by a symbol.


A
Nucleocapsid
Membrane
Spike
% proliferating CD4+ T cells
% proliferating CD8+ T cells
HV
Vacc
Inf
M9
M13
B
Nucleocapsid
Membrane
Spike
% proliferating T cells
M9
M13
C
mHLA-DR
Total lymphocytes
T lymphocytes
CD4+ T lymphocytes
CD8+ T lymphocytes
Interleukin-6
Interleukin-10
Tumor Necrosis Factor-a
Interferon-g
Anti-SARS-CoV-2 IgG
T cell prolif (NCAP)
T cell prolif (VME1)
T cell prolif (Spike)