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Supplementary Materials for

Genetically-determined thymic function affects strength and duration of immune response in COVID patients with pneumonia

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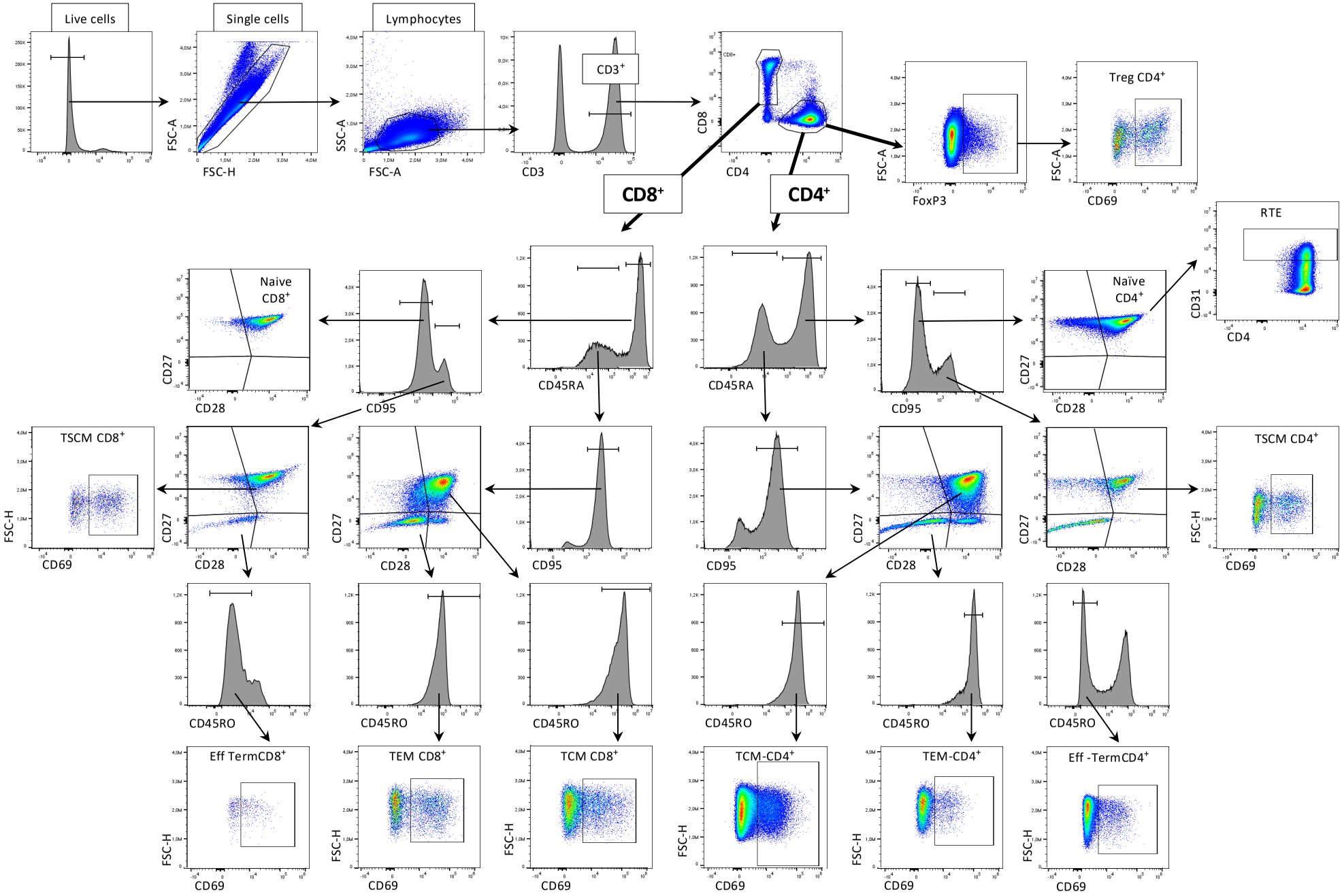
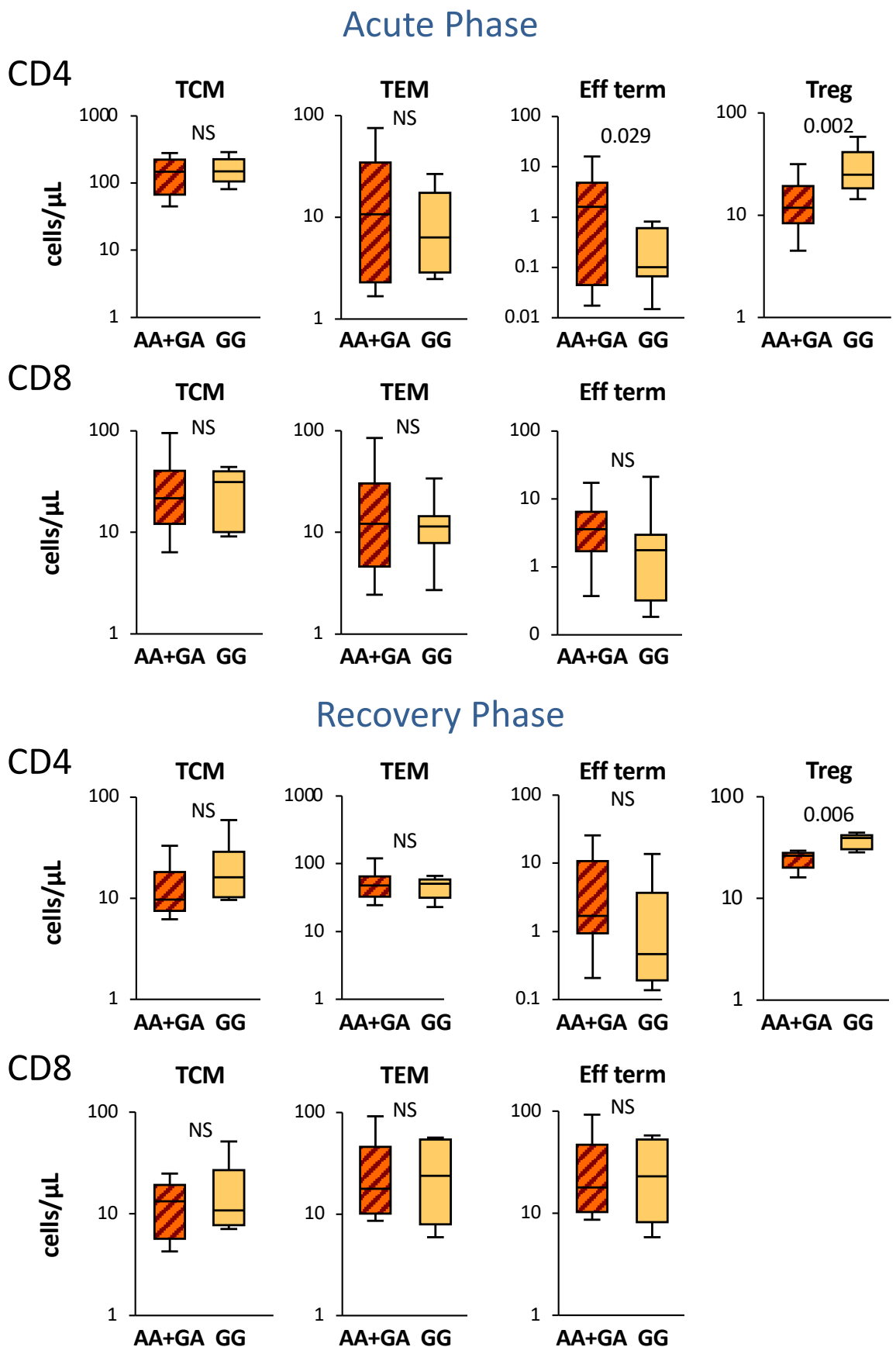
Supplemental Table 1: Multivariate analysis with hypertension, BMI, diabetes, cancer, BPCO, renal failure as co-variables

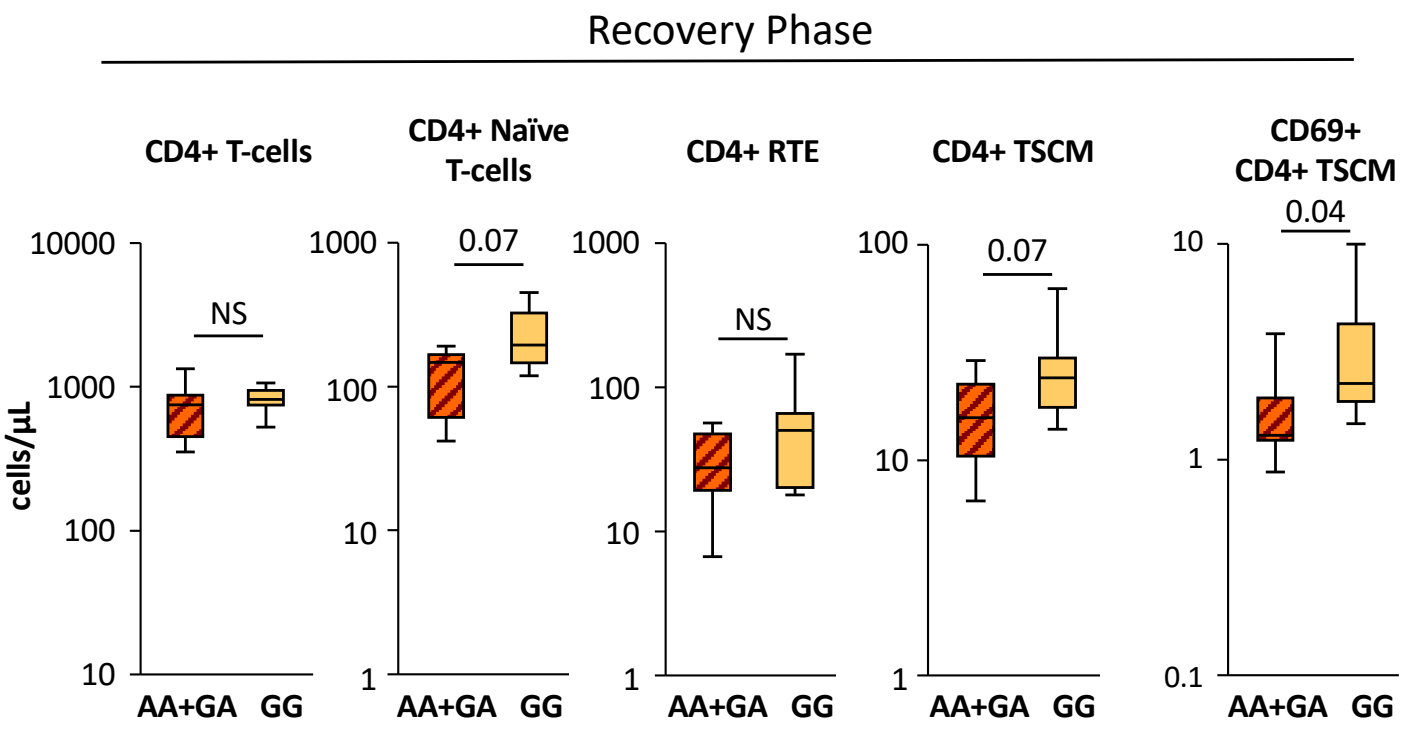
	OR (multivariate analysis)
HTA	1.01 (0.14-7.22; p=0.992)
BMI	0.97 (0.84-1.12; p=0.701)
SNP GG	**0.12 (0.01-0.75; p=0.034)**
Diabetes	0.27 (0.002-2.88; p=0.260)
Cancer	0.65 (0.04-17.88; p=0.763)
COPD	4649686 (0.00-NA; p=0.995)
Renal Failure	7103511 (0.00-NA; 0.995)



Supplemental Figure 1: Gating strategy for T-cell subsets

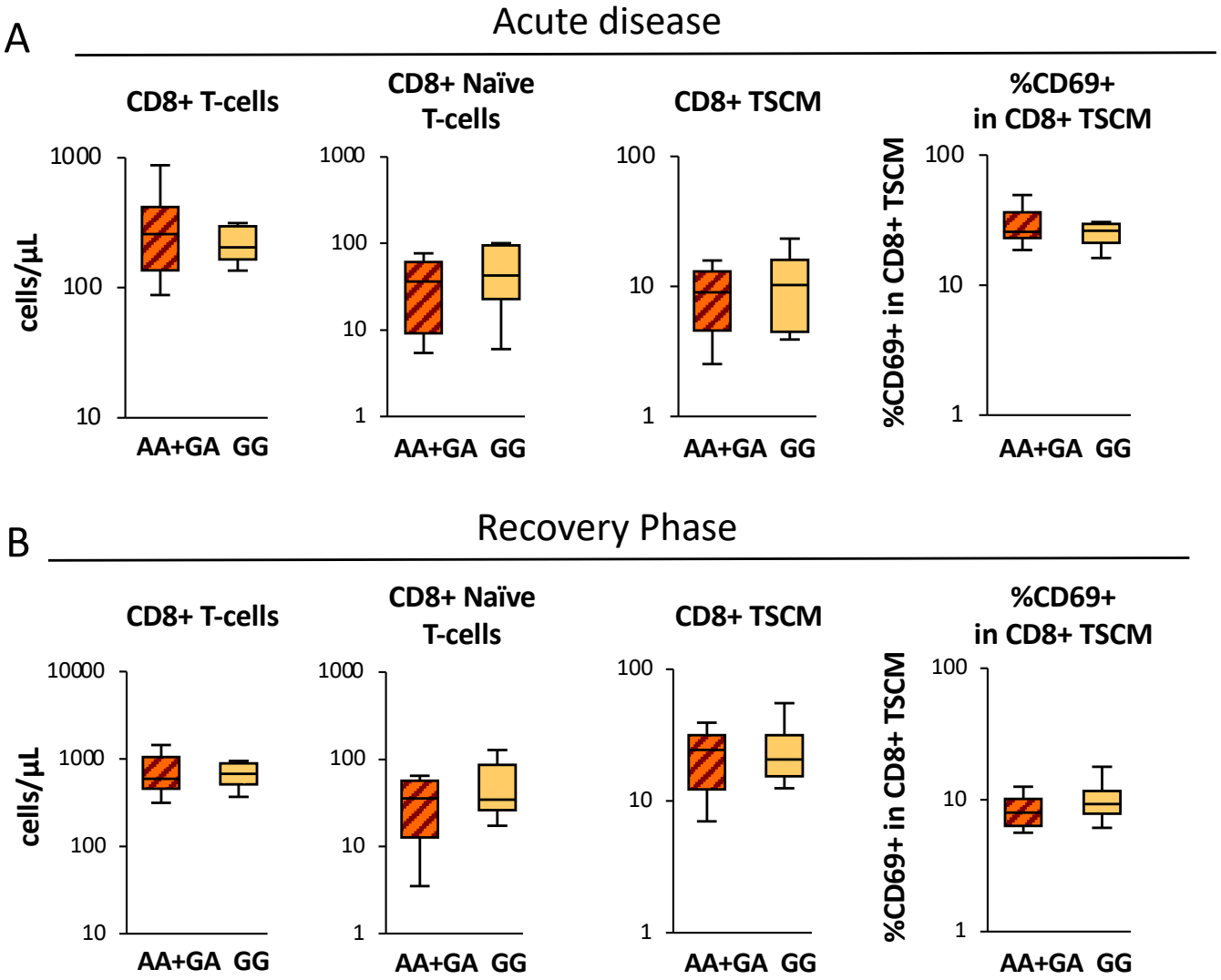


Supplemental Figure 2. Memory T-cell subsets in COVID-19 patients
COVID-19 patients were classified according to their genotype at the rs2204985 locus (n=4 AA, n=9 GA and n=10 GG). Central Memory (TCM), Effector Memory (TEM), Terminal Effector memory (Eff term) $CD4^+$ and $CD8^+$ as well as regulatory $CD4^+$ T-cells (Treg) were quantified by FACS in PBMCs from both groups of COVID-19 patients (AA+GA and GG genotypes) during the acute phase and 6 months after recovery. Statistical significance of the differences between groups is shown (Mann-Whitney Test). Patients with AA and GA genotypes were analyzed together.



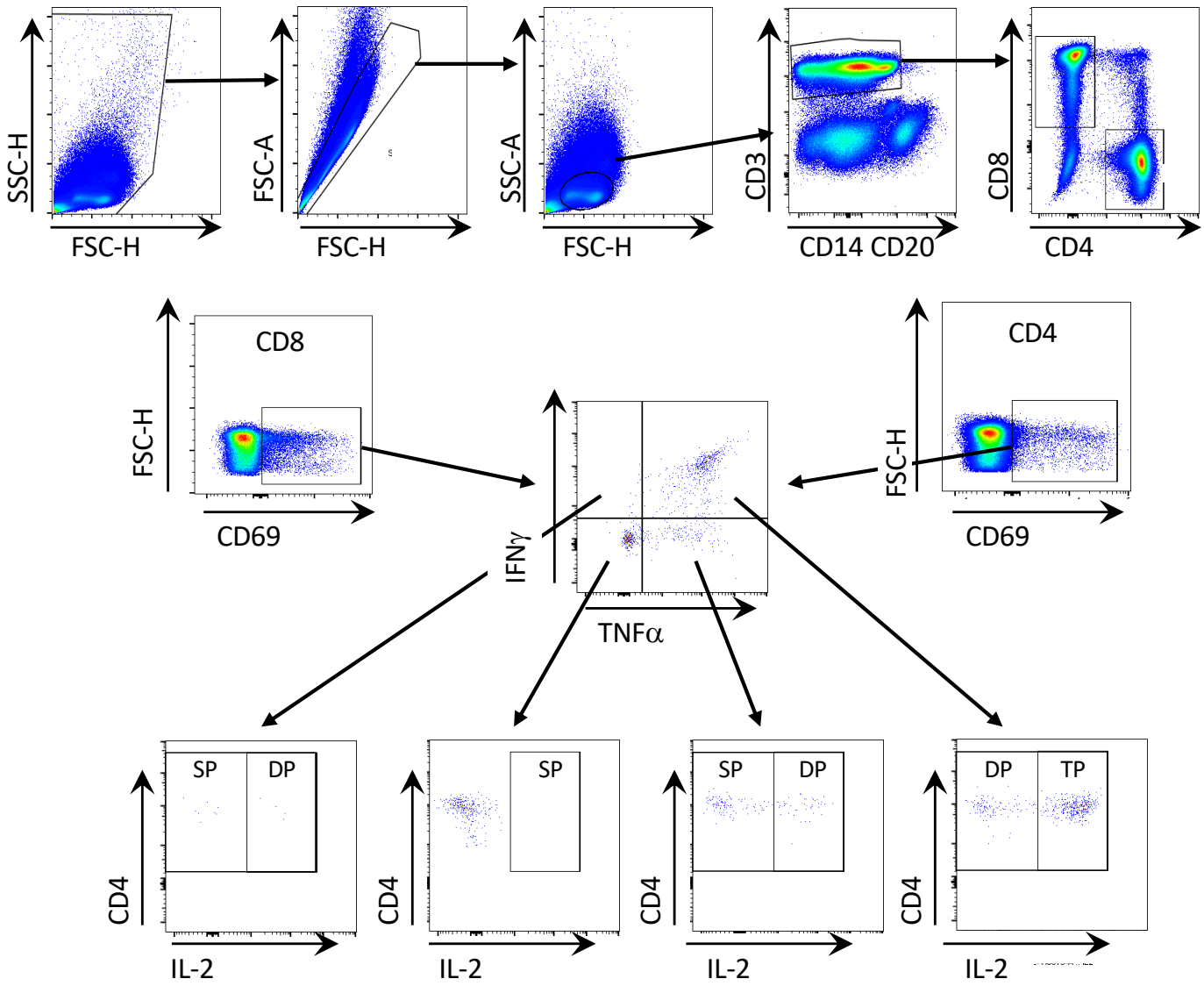
Supplemental Figure 3. CD4⁺ T-cell subsets in COVID-19 patients after recovery

COVID-19 patients were classified according to their genotype at the rs2204985 locus (n=4 AA, n=9 GA and n=10 GG). CD4⁺ T-cells, CD4⁺ naïve T-cells, CD4⁺ RTEs, CD4⁺ TSCM and activated (CD69⁺) CD4⁺ TSCM were quantified by FACS in PBMCs from both groups of COVID-19 patients (AA+GA and GG genotypes) 6 months after recovery. Statistical significance of the differences between groups is shown (Mann-Whitney Test). Patients with AA and GA genotypes were analyzed together.

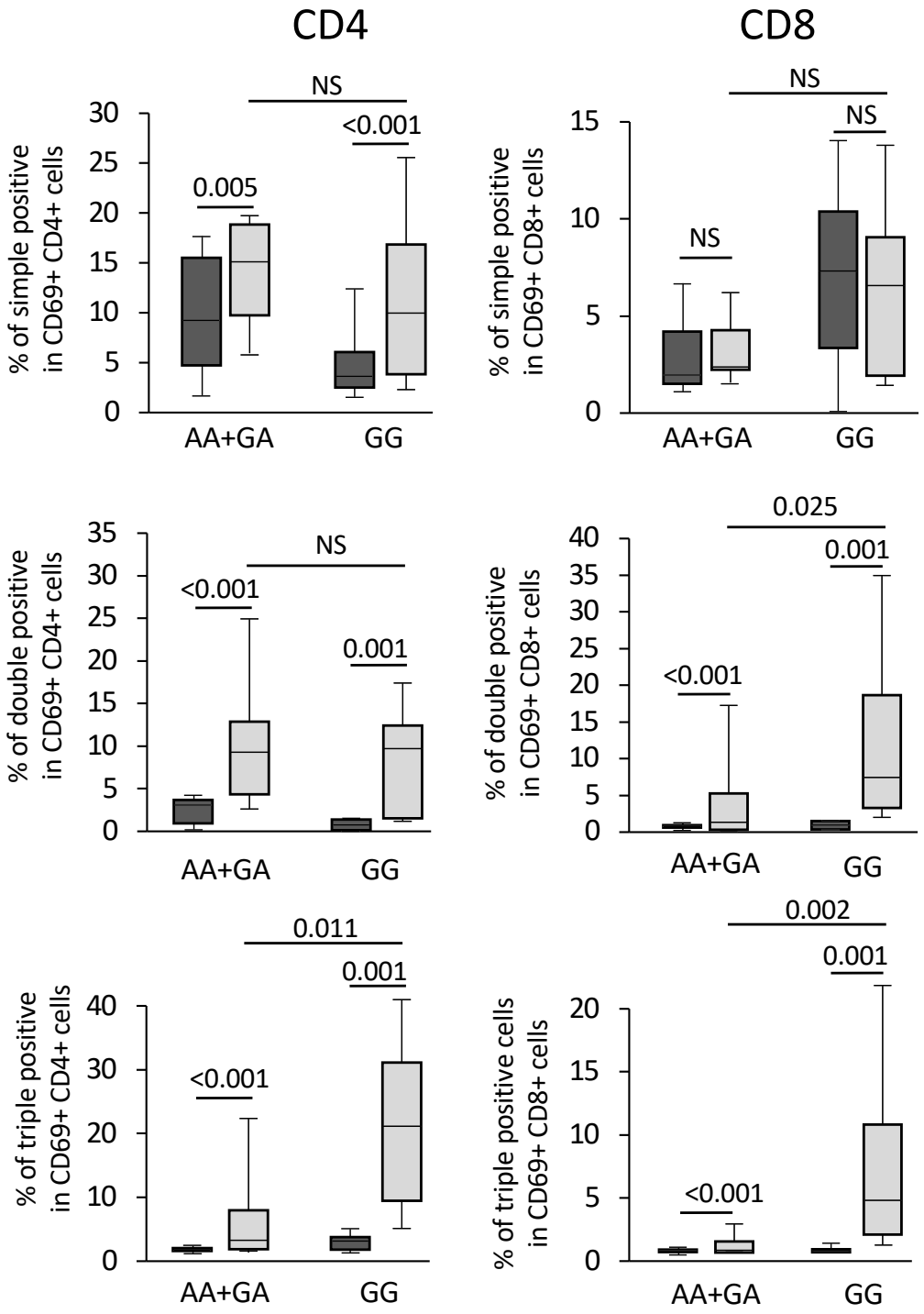


Supplemental Figure 4. CD8⁺ T-cell subsets in COVID-19 patients

COVID-19 patients were classified according to their genotype locus. CD8⁺ T-cells, CD8⁺ naïve T-cells, CD8⁺ TSCM and activated (CD69⁺) CD8⁺ TSCM were quantified by FACS in PBMCs from both groups of COVID-19 patients (AA+GA and GG genotypes) sampled during the acute phase of the disease (A; n=8 AA, n=20 GA and n=12 GG) and 6 months after recovery (B; n=4 AA, n=9 GA and n=10 GG). No statistical significance was observed between groups (Mann-Whitney Test). Patients with AA and GA genotypes were analyzed together.

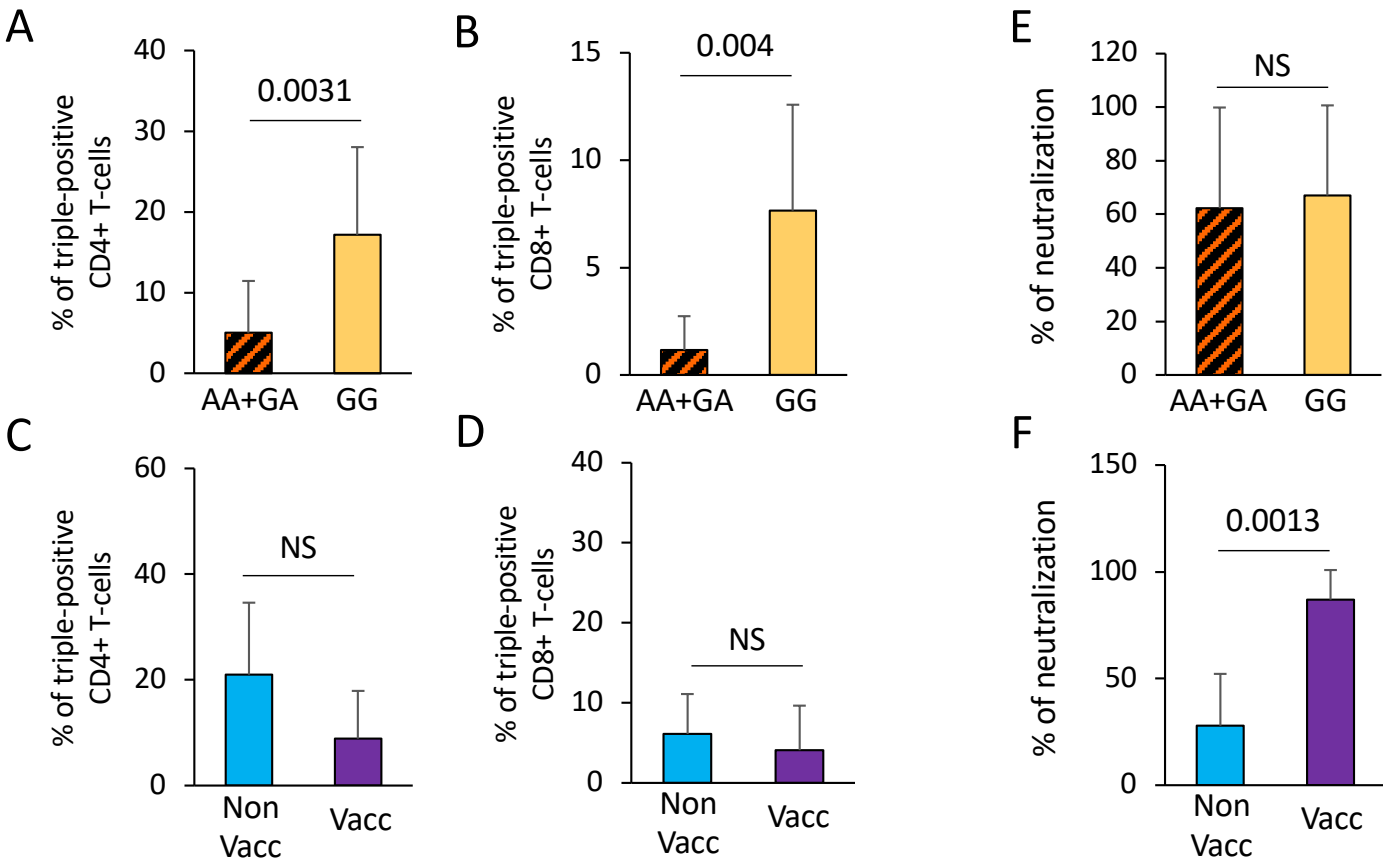


Supplemental Figure 5. Gating strategy for anti-SARS-CoV-2-specific T-cell responses.
PBMCs from COVID patients were stimulated (or not) *in vitro* with selected SARS-CoV-2 peptides for 6 hours, in the presence of brefeldin A during the last 4 hours. Intracellular cytokine expression by $CD69^{+}CD4^{+}$ and $CD69^{+}CD8^{+}$ T-cells was analyzed by FACS using IFNγ-, IL-2- and TNFα-specific antibodies. SP: Simple positive, DP: Double positive; TP: Triple positive.



Supplemental Figure 6. Comprehensive analysis of SARS-CoV-2-specific T-cell responses at recovery.

PBMCs collected 6 months after recovery were stimulated *in vitro* by a selected pool of SARS-CoV-2 peptides. The frequency of cells expressing 1 cytokine (IFNα, TNFα or IL-2; top panels), any combination of 2 cytokines (middle panels) or all 3 cytokines (bottom panels), without (dark grey) or after (light grey bars) *in vitro* stimulation with SARS-CoV-2 peptides is shown for $CD69^{+}CD4^{+}$ (left panels) and $CD69^{+}CD8^{+}$ (right panels) T-cells. Statistical significance of the differences between peptide stimulated and non-stimulated conditions, and between the 2 groups of patients are shown (Mann-Whitney Test).



Supplemental Figure 7. Impact of vaccination and genotype on SARS-CoV-2 specific neutralizing antibody and T-cell responses.

Plasma samples and PBMCs were collected 6 months after recovery. PBMCs were stimulated *in vitro* by a selected pool of SARS-CoV-2 peptides. The frequency of triple-positive cells among $CD69^{+}CD4^{+}$ (A and C) or $CD69^{+}CD8^{+}$ (B and D) T-cells are shown for AA+GA and GG patients (A, B) and compared to that determined in non-vaccinated and vaccinated patients (C, D). Neutralizing activity was not different in plasma samples of AA+GA and GG patients (E), but was significantly enhanced by vaccination (F).

Statistical significances of the differences between groups of patients are shown (Mann-Whitney Test).