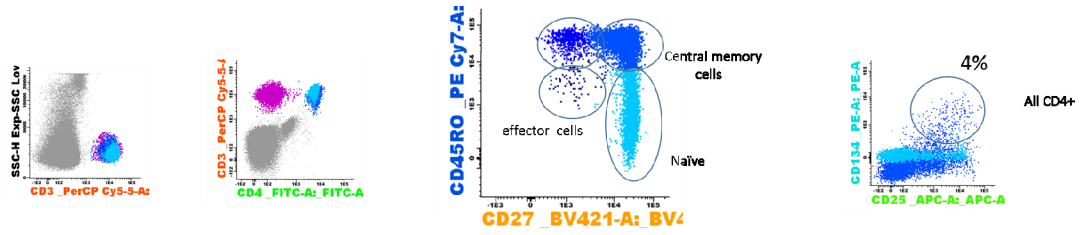
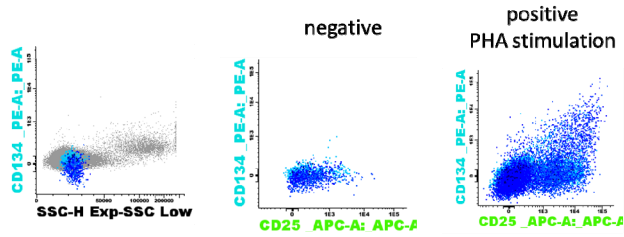


Figure S1. Cellular response gating technique and analysis

A.

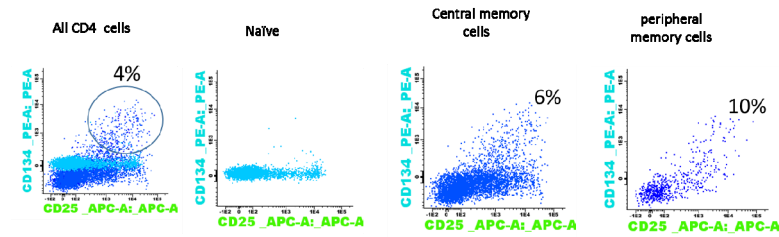


B.



C.

SARS-CoV-2 Prot_s Complete
(surface glycoprotein "spike protein")



A) CD3 T lymphocytes were gated. CD4 T helper lymphocytes were gated out of the CD3 population. CD4 sub-populations were gated according to their expression of CD45RO and CD27: Naïve cells (CD45RO⁻, CD27⁺), T central memory cells (CD45RO⁺, CD27⁺), T effector memory (CD45RO⁺, CD27⁻), T effectors (CD45RO⁻, CD27⁻).⁴¹ B-C) To find the frequency of activated cells to stimulation, each subpopulation was gated for CD134⁺ and CD25⁺ double expresser cells.⁴² B) stimulation with PHA. C) stimulation with the spike-protein.

Table S1. Cellular response values

	Responders (≥ 150 AU/ml); n=12	Non-responders (< 150 AU/ml) ; n=18	Healthy controls; n=7	P value
T cells (CD3+)	59 [50.25-64.75]	72 [62.25-81.5]	75 [73-79]	P1=0.007 P2=0.013 P3=0.071
T helper (CD4+)	44 [35-53]	25.5 [17-30.75]	64 [61-71]	P=0.002 P2=0.078 P3<0.001
% Activated cells (CD134+, CD25+)				
Negative control	0	0	0	0
Positive control (PHA)	23.5 [18.25-38.75]	23 [12-31.5]	15 [10-24]	P=0.46 P=0.25
Test samples (s-protein)	2 [1.13-7.25]	0 [0-0.95]	1.3 [0.7-2]	P=0.001 P2=0.29 P3<0.001
Naïve CD4 T cells	22 [6.75-31.50]	5 [3.75-11.25]	40 [19-46]	P=0.007 P2=0.15 P3<0.001
% Activated cells (CD134+, CD25+)				
Negative control	0	0	0	0
Positive control (PHA)	0	0	4 [0-5]	P2=0.017 P3=0.001
Test samples (s-protein)	0	0	0	0
Central memory CD4 T cells	55 [45.5-70.5]	47 [39.25-55.75]	48 [36-63]	P1=0.09 P2=0.22
% Activated cells (CD134+, CD25+)				
Negative control	0	0	0	0
Positive control (PHA)	32.5 [17-42.50]	25 [11.5-35.25]	25 [9-28]	P1=0.20 P2=0.25
Test samples (s-protein)	3 [2-7.75]	0 [0-1.53]	1.5 [1-6]	P=0.001 P2=0.30 P3<0.001
Effector memory CD4 T cells	15 [8.25-24.25]	33 [24-44.25]	14 [5-15]	P=0.008 P2=0.010 P3=0.001
% Activated cells (CD134+, CD25+)				
Negative control	0	0	0	0
Positive control (PHA)	28 [23.75-55.5]	26.5 [13.25-31.25]	22 [14-37]	P=0.13 P=0.23
Test samples (s-protein)	3 [1-9.75]	0 [0-0.25]	3 [2-10]	P=0.001 P2=0.58 P3<0.001
Effector CD4 T cells	1.5 [1-3]	5.5 [3-8.25]	1 [0-3]	P=0.004 P2=0.007 P3=0.002
% Activated cells (CD134+, CD25+)				
Negative control	0	0	0	
Positive control (PHA)	0	0	0	
Test samples (s-protein)	0	0	0	

Frequencies are presented as percent of positive cells. Median and range [..] are presented. P1 = responders vs. non-responders, P2 = responders vs. healthy controls, P3=non-responders vs. healthy controls.

Table S2. Antibody titer values after the second vaccine dose in responders and non-responders for the entire cohort

Antibody titer (AU/ml) after vaccine second dose, median [range]	Responders* (≥ 150 AU/ml)	Non-responders* (< 150 AU/ml)	P value
1 month	2917 [401-40000], N=14	10 [0-148], N=17	< 0.0001
3 months	1628.5 [33-40000], N=17	5 [0-133], N=20	< 0.0001
6 months	1612.5 [78-40000], N=45	3 [0-135], N=17	< 0.0001
1 month post 3rd dose	40000 [881-40000], N=30	715 [0-17879], N=19	< 0.0001
3 month post 3rd dose	8524 [76-40000], N=15	1030 [0-4560], N=16	< 0.0001

Response to the second vaccine dose.

N - Number of patients with available data.

Table S3. Multivariate analysis for response to the second vaccine dose

Response (≥ 150 AU/ml)			
Predictors	Odds ratio	95% CI	P value
Gender [female]	8.551	1.931 - 53.65	0.0095
Age	0.9721	0.9159 - 1.026	0.3176
Donor [haplo]	0.05442	0.0005306 - 2.546	0.1650
Donor [MRD]	3.901	0.3243 - 70.24	0.3124
Disease status [CR]	1.599	0.2946 - 8.672	0.5798
Anti CD20 [yes]	0.03284	0.0006897 - 0.5525	0.0359
ATG [no]	0.8126	0.05485 - 11.84	0.8761
Vaccine timing [int]	2.597	0.4056 - 19.06	0.3212
Vaccine timing [late]	11.59	1.771 - 104.1	0.0158
Steroids Rx at vaccine [no]	3.610	0.7187 - 20.17	0.1220

Haplo – haploidentical donor, MRD – matched related donor, CR – complete remission, int - intermediate time period after transplant (>6 months and < 12 months), late - intermediate time period after transplant (> 12 months). Multiple logistic regression.