Supplementary Table S1. Conversion factors for the different assays used

Company	Platform	Assay	Antigen	Assay Unit	Conversion factor to BAU/mL
Abbott	Alinity /Architect	SARS-CoV-2 (IgG)	Nucleocapsid	S/CO	Not available
		SARS-CoV-2 (IgG) QUANT II	RBD	AU/mL	0.142
Roche	Elecsys	Anti-SARS-CoV-2	Nucleocasid	U/mL	Not available
		Anti-SARS-CoV-2 S	RBD		1.0288
MSD	V-Plex	SARS-CoV-2 (Spike) (IgG)	Spike	AU/mL	0.00901
		SARS-CoV-2 (RBD) (IgG)	RBD		0.0272
		SARS-CoV-2 (N) (IgG)	Nucleocapsid		0.00236
Diasorin	Liaison	SARS-CoV-2 TrimericS (IgG)	Spike	BAU/mL	Not required

Supplementary Table S2. Odds Ratio (OR) and Adjusted Odds Ratio (AOR) from fitting a logistic regression model of the probability of failing to achieve a robust/above-average anti-S/RBD response post vaccination VE90% (**Panel A**) and OCOnAbs (**Panel B**) endpoints after <u>excluding</u> subjects and data quantified with Elecsys Anti-SARS-CoV2 S (Roche)

Panel A (VE90%)	Unadjsuted Odds ratio (95% CI)	p-value	Adjusted* Odds ratio (95% CI)	p-value	&Type III p-value
CD4 count at T1	*Fail to achieve VE90% after primary cycle (T3)*				
HCD4	1		1		0.019
ICD4	1.95 (1.43, 2.66)	<.001	1.58 (0.90, 2.76)	0.112	
LCD4	4.50 (2.37, 8.53)	<.001	3.93 (1.37, 11.26)	**0.011**	
per 1 SD lower (log2 scale)	1.72 (1.46, 2.03)	<.001	1.76 (1.27, 2.44)	**<.001**	
	Fail to achieve VE90% after first booster dose (T5)				
HCD4	1		1		0.937
ICD4	1.37 (0.89, 2.13)	0.157	0.91 (0.41, 2.03)	0.814	
LCD4	2.00 (1.08, 3.72)	0.028	0.81 (0.24, 2.75)	0.733	
per 1 SD lower (log2 scale) CD4 count at T1	1.42 (1.16, 1.74)	<.001	1.19 (0.78, 1.83)	0.421	

Panel B (OCOnAbs)	Unadjsuted Odds ratio (95% CI)	p-value	Adjusted* Odds ratio (95% CI)	p-value	&Type III p-value
CD4 count at T1	*Fail to achieve OCOnAbs after primary cycle (T3)*				
HCD4	1		1		0.403
ICD4	1.67 (1.18, 2.37)	0.004	1.48 (0.81, 2.68)	0.202	
LCD4	3.08 (1.50, 6.33)	0.002	1.48 (0.52, 4.23)	0.468	
per 1 SD lower (log2 scale)	1.47 (1.23, 1.76)	<.001	1.38 (0.99, 1.93)	0.057	
	Fail to achieve OCOnAbs after first booster dose (T5)				
HCD4	1		1		0.925
ICD4	1.29 (0.84, 1.98)	0.244	0.87 (0.40, 1.89)	0.730	
LCD4	1.72 (0.93, 3.19)	0.083	0.83 (0.26, 2.67)	0.759	
per 1 SD lower (log2 scale)	1.35 (1.11, 1.65)	0.003	1.19 (0.79, 1.80)	0.409	

*adjusted for age, VL<=50 copies/mL at T1,no. of comorbidities and nadir CD4 count; &from the adjusted model

Supplementary Table S3. OR and AOR from fitting a logistic regression model of the probability of failing to achieve a robust/above-average anti-S/RBD response post vaccination VE90% (**Panel A**) and OCOnAbs (**Panel B**) endpoints after <u>excluding</u> subjects and data quantified with Elecsys Anti-SARS-CoV2 S (Roche)

| Panel A (VE90%)	Unadjsuted Odds ratio (95% CI)	p-value	Adjusted* Odds ratio (95% CI)	p-value	&Type III p-value
CD4/CD8 ratio at T1	*Fail to achieve VE90% after primary cycle (T3)*				
HR	1		1		0.246
IR	1.21 (0.87, 1.66)	0.253	0.75 (0.42, 1.35)	0.346	
LR	1.72 (1.25, 2.36)	<.001	1.22 (0.66, 2.27)	0.526	
per 1 SD lower (log2 scale)	1.32 (1.16, 1.50)	<.001	1.18 (0.92, 1.53)	0.199	
	Fail to achieve VE90% after first booster dose (T5)				
HR	1		1		0.474
IR	1.12 (0.67, 1.89)	0.659	0.58 (0.23, 1.46)	0.247	
LR	1.50 (0.92, 2.45)	0.106	0.82 (0.33, 2.05)	0.677	
per 1 SD lower (log2 scale)	1.31 (1.09, 1.57)	0.004	0.98 (0.68, 1.41)	0.921	

Panel B (OCOnAbs)	Unadjsuted Odds ratio (95% CI)	p-value	Adjusted* Odds ratio (95% CI)	p-value	&Type III p-value
CD4/CD8 ratio at T1	*Fail to achieve OCOnAbs after primary cycle (T3)*				
HR	1		1		0.834
IR	0.99 (0.69, 1.41)	0.941	0.89 (0.49, 1.61)	0.699	
LR	1.26 (0.89, 1.80)	0.193	1.06 (0.56, 2.02)	0.853	
per 1 SD lower (log2 scale)	1.18 (1.02, 1.36)	0.024	1.02 (0.78, 1.34)	0.878	
	Fail to achieve OCOnAbs after first booster dose (T5)				
HR	1		1		0.396
IR	0.97 (0.59, 1.60)	0.900	0.65 (0.27, 1.56)	0.332	
LR	1.35 (0.84, 2.16)	0.216	1.06 (0.44, 2.55)	0.898	
per 1 SD lower (log2 scale)	1.27 (1.06, 1.52)	0.009	1.09 (0.77, 1.54)	0.635	

*adjusted for age, VL<=50 copies/mL at T1, no. of comorbidities and nadir CD4 count; &from the adjusted model

Supplementary Table S4. Adjusted mean anti-RBD values from fitting a mixed-linear model <u>EXCLUDING</u> subjects and data quantified with Elecsys Anti-SARS-CoV2 S (Roche)

anti-RBD, log2	T1 95% CI	T2 95% CI	T3 95% CI	T4 95% CI	T5 95% CI	T6 95% CI	p-value*
CD4 at T1							**<.001**
LCD4	-4.8 (-5.7, -4.0)	1.0 (0.2, 1.8)	4.8 (4.0, 5.6)	2.4 (1.6, 3.3)	8.0 (7.1, 8.9)	5.6 (4.2, 7.0)	
ICD4	-5.2 (-5.7, -4.7)	3.2 (2.7, 3.7)	9.1 (8.5, 9.6)	7.0 (6.6, 7.5)	8.2 (7.3, 9.0)	4.4 (3.9, 5.0)	
HCD4	-4.8 (-5.2, -4.4)	4.3 (3.9, 4.7)	9.1 (8.6, 9.6)	7.4 (7.0, 7.7)	7.7 (6.8, 8.6)	4.7 (4.3, 5.2)	
CD4/CD8 ratio at T1							**0.012**
HR	-4.9 (-5.4, -4.5)	2.8 (2.4, 3.2)	6.5 (6.1, 6.9)	3.7 (3.3, 4.2)	8.7 (8.2, 9.2)	7.3 (6.5, 8.0)	
IR	-5.0 (-5.6, -4.4)	4.0 (3.4, 4.5)	9.2 (8.5, 9.8)	7.2 (6.7, 7.7)	8.0 (6.8, 9.3)	4.7 (4.1, 5.3)	
LR	-4.9 (-5.5, -4.3)	4.4 (3.8, 4.9)	9.3 (8.5, 10.0)	7.4 (6.9, 7.8)	7.7 (6.4, 9.0)	5.1 (4.4, 5.7)	

*F-test type 3 interaction p-value
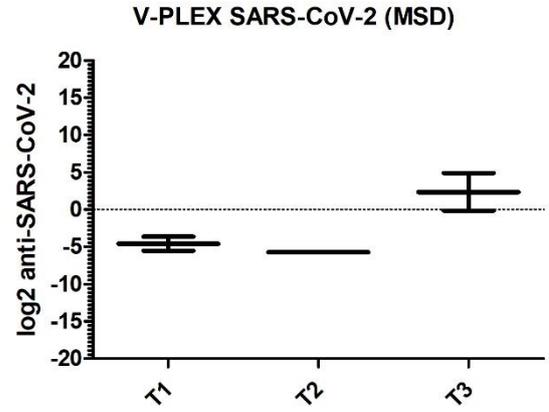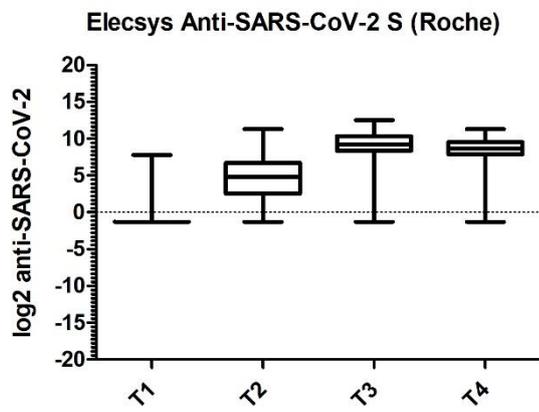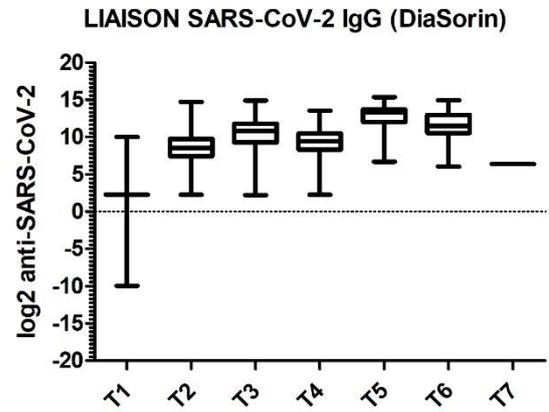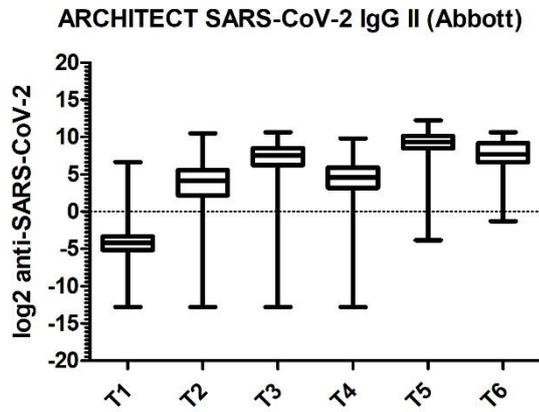
Supplementary Figure S1. Boxplots of Anti-SARS-CoV-2 titers (log2 transformation) according to the assay used

Supplementary Table S5. Median (IQR) quantification of anti-SARS-CoV-2 titers (log2 transformation) at different time points after vaccination according to immunoassay used and CD4 strata **(A)** and CD4/CD8 strata **(B)**

Architect anti-SARS-CoV-2 IgG II (Abbott), anti-RBD IgG, log2, median (IQR)

(A)	T1	T2	T3	T4	T5	T6
CD4 at T1						
HCD4	-4.14 (-5.14, -3.33)	4.61 (3.3, 5.76)	7.73 (6.59, 8.65)	4.86 (3.76, 6.01)	9.35 (8.55, 9.89)	7.71 (6.88, 8.89)
ICD4	-4.55 (-5.14, -3.55)	3.92 (1.51, 5.3)	7.35 (6.21, 8.52)	4.54 (3.02, 6.15)	9.56 (8.74, 10.48)	8.44 (7.11, 9.6)
LCD4	-3.82 (-4.55, -3.33)	1.59 (-0.97, 3.61)	6.17 (3.83, 7.46)	3.19 (1.81, 4.9)	9.27 (7.64, 10.03)	5.68 (5.36, 7.36)

Liaison SARS-CoV-2 IgG (Diasorin), anti-S IgG , log2, median (IQR) anti-S IgG

	T1	T2	T3	T4	T5	T6
HCD4	2.26 (2.26, 2.26)	8.77 (7.73, 9.76)	10.88 (9.43, 11.8)	9.44 (8.33, 10.28)	13.29 (12.02, 13.7)	11.29 (10.39, 13.21)
ICD4	2.26 (2.26, 2.26)	7.98 (6.79, 9.64)	10.75 (8.71, 11.79)	9.73 (8.61, 10.74)	13.04 (11.31, 13.68)	11.54 (10.87, 12.78)
LCD4	2.26 (2.26, 2.98)	6.4 (3.52, 7.82)	9.19 (5.17, 11.71)	9.56 (6.48, 10.77)	13.27 (12.33, 14.33)	11.82 (10.56, 12.97)

Architect anti-SARS-CoV-2 IgG II (Abbott), anti-RBD IgG, log2, median (IQR)

(B)	T1	T2	T3	T4	T5	T6
CD4/CD8 ratio at T1						
HR	-4.35 (-5.14, -3.33)	4.64 (3.49, 5.83)	7.7 (6.62, 8.56)	4.97 (3.82, 6.02)	9.35 (8.59, 9.89)	7.59 (6.88, 8.77)
IR	-4.35 (-5.14, -3.55)	4.62 (2.95, 5.73)	7.42 (6.16, 8.64)	4.82 (3.72, 6.00)	9.35 (8.62, 9.95)	7.95 (7.11, 9.76)
LR	-4.14 (-5.14, -3.33)	3.41 (1.01, 5.1)	7.32 (5.81, 8.43)	4.37 (2.79, 5.56)	9.52 (8.24, 10.26)	7.66 (6.05, 9.18)

Liaison SARS-CoV-2 IgG (Diasorin), anti-S igG, log2, median (IQR)

	T1	T2	T3	T4	T5	T6
HR	2.26 (2.26, 2.26)	8.81 (8.04, 9.72)	10.72 (9.13, 11.63)	9.44 (8.27, 10.2)	13.36 (11.41, 13.61)	11.22 (10.12, 12.92)
IR	2.26 (2.26, 2.26)	8.51 (7.42, 9.67)	10.88 (9.46, 11.79)	9.62 (8.61, 10.34)	13.08 (12.35, 14)	11.7 (10.56, 13.44)
LR	2.26 (2.26, 2.26)	8.04 (6.48, 9.76)	10.87 (9.36, 12.17)	9.54 (7.98, 10.74)	13.08 (11.46, 13.85)	11.54 (10.79, 12.78)