Table S1. Patients' characteristics by sample availability for analysis. The table presents the distribution of key parameters analyzed for all patients in our series (All, n = 157), those with pre- and post-third dose samples (Two samples available, n = 110), and those contributing to the study with an only sample collected before the third vaccine dose (One sample only, n = 47). For the later group, the table further provides descriptives for patients who failed to complete follow-up due to death (Exitus, n = 3), SARS-CoV-2 infection after the pre-third dose sample (COVID-19 infection, n = 17), and other reasons related to the study logistics (Logistics, n = 27). Cells display the medians and ranges for continuous variables (anti-S protein antibody titers and age), and the frequencies/percentages for categorical variables, including positivity for neutralizing antibodies (nABs) against diferents SARS-CoV-2 variants, such as: **Wild type, B.1.1.529** (Omicron), **B.1.1.7** (Alpha), **B.1.351** (Beta), **B.1.617.2** (Delta) and **P.1** (Gamma). The last column presents p-values from Mann-Whitney tests (continuous variables) of a   Fisher's tests (categorical variables) comparing patients with and without second sample available for analyses. **SLE:** Systemic Lupus Erythematosus; **RA:** Rheumatoid Arthritis; **B27-AS:** HLA-B27 positive Ankylosing Spondylitis; **PSA:** Psoriatic Arthritis; **GCA:** Giant Cell Arteritis; **JAKi:** JAK inhibitors.

		All n=157	Two samples available n=110 (70.1%)	Exitus n=3 (1.9%)	COVID-19 n=17 (10.8%)	Logistics n=27 (17.2%)	All n=47 (29.9%)	P-value (Two vs One samples
Anti-S-protein antibody (BAU/ml)		537.0 (0.2, 87880.0)	618.0 (0.0, 85340.0)	233.0 (23.0, 1693.0)	295.0 (0.2, 8672.0)	332.0 (9.4, 87880.0)	295.0 (0.2, 87880.0)	0.135461
Wild type - Positive		78 (50.0%)	61 (56.0%)	1 (33.3%)	8 (47.1%)	8 (29.6%)	17 (36.2%)	0.035666
B.1.1.529 - Positive		17 (10.9%)	15 (13.8%)	0 (0.0%)	0 (0.0%)	2 (7.4%)	2 (4.3%)	0.097276
B.1.1.7 - Positive		58 (37.2%)	42 (38.5%)	1 (33.3%)	8 (47.1%)	7 (25.9%)	16 (34.0%)	0.718381
B.1.351 - Positive		44 (28.6%)	34 (31.8%)	1 (33.3%)	4 (23.5%)	5 (18.5%)	10 (21.3%)	0.245299
B.1.617.2 - Positive		52 (33.3%)	40 (36.7%)	1 (33.3%)	6 (35.3%)	5 (18.5%)	12 (25.5%)	0.198702
P.1 - Positive		47 (30.1%)	36 (33.0%)	2 (66.7%)	5 (29.4%)	4 (14.8%)	11 (23.4%)	0.258635
Sex - Female		100 (63.7%)	70 (63.6%)	0 (0.0%)	15 (88.2%)	15 (55.6%)	30 (63.8%)	> 0.9999
Age at third dose of SARS-CoV-2 vaccine		58.8 (33.5, 88.2)	59.2 (33.5, 88.2)	68.7 (61.0, 83.8)	56.8 (41.7, 85.0)	58.2 (43.4, 79.6)	58.3 (41.7, 85.0)	0.557594
Rheumatic condition	LES	35 (22.3%)	20 (18.2%)	0 (0.0%)	9 (52.9%)	6 (22.2%)	15 (31.9%)	0.010199
	AR	36 (22.9%)	32 (29.1%)	0 (0.0%)	0 (0.0%)	4 (14.8%)	4 (8.5%)	
	EA B27	22 (14.0%)	17 (15.5%)	0 (0.0%)	2 (11.8%)	3 (11.1%)	5 (10.6%)	
	APSO	40 (25.5%)	23 (20.9%)	2 (66.7%)	5 (29.4%)	10 (37.0%)	17 (36.2%)	
	VGV	24 (15.3%)	18 (16.4%)	1 (33.3%)	1 (5.9%)	4 (14.8%)	6 (12.8%)	
Treatmen type	Not treated or Glucorticoids only	25 (15.9%)	18 (16.4%)	0 (0.0%)	3 (17.6%)	4 (14.8%)	7 (14.9%)	0.558644
	Immunosupressive	48 (30.6%)	30 (27.3%)	1 (33.3%)	9 (52.9%)	8 (29.6%)	18 (38.3%)	
	Biological	69 (43.9%)	50 (45.5%)	2 (66.7%)	4 (23.5%)	13 (48.1%)	19 (40.4%)	
	JAKi	15 (9.6%)	12 (10.9%)	0 (0.0%)	1 (5.9%)	2 (7.4%)	3 (6.4%)	
Glucocorticoids use		43 (27.4%)	31 (28.2%)	2 (66.7%)	5 (29.4%)	5 (18.5%)	12 (25.5%)	0.845809
mRNA-based vaccine type	mRNA-1273	100 (63.7%)	71 (64.5%)	2 (66.7%)	11 (64.7%)	16 (59.3%)	29 (61.7%)	0.856361
	BNT162b2	57 (36.3%)	39 (35.5%)	1 (33.3%)	6 (35.3%)	11 (40.7%)	18 (38.3%)	

Supplementary Table S2. Fold-changes (FC), boostrap 95% confidence intervals (CI) and p-values for comparison of treatment groups within each time point of sample extraction. P-values are derived from a Mann-Whitney's test. **JAKi:** JAK inhibitors; **GCs:** Glucocorticoids.

	Pre-3rd dose		Post-3rd dose	
	FC [95%CI]	P-value	FC [95%CI]	P-value
Non-biological - Not treated or GCs only	1.13 [0.43, 2.52]	0.8799	0.95 [0.39, 3.18]	0.9830
Biological - Not treated or GCs only	0.38 [0.14, 1.06]	0.0132	0.70 [0.31, 2.46]	0.5973
JAKi - Not treated or GCs only	0.70 [0.15, 2.14]	0.3565	0.56 [0.24, 2.26]	0.4718
Biological - Non-biological	0.34 [0.21, 0.72]	0.0038	0.73 [0.39, 1.49]	0.6837
JAKi - Non-biological	0.62 [0.18, 1.41]	0.3329	0.59 [0.30, 1.47]	0.2776
JAKi - Biological	1.85 [0.44, 3.85]	0.3032	0.80 [0.33, 2.21]	0.6304

Supplementary Table S3. Anti-S protein antibody levels and neutralizing antibodies positivity (nABs) by rhuematic condition group before (Pre-3rd dose) and after (Post-3rd dose) of a third dose of the SARS-CoV-2 mRNA-based vaccine. Cells show the medians and ranges of anti-S protein antibody titers, and the frequencies and percentages of positivity for nABs of diferents SARS-CoV-2 variants including: B.1.1.529 (Omicron), B.1.1.7 (Alpha), B.1.351 (Beta), B.1.617.2 (Delta) and P.1 (Gamma). The last row display the rheumatic conditions of patients represented in each treatment group and sample draw. P-values are derived from a Kruskal-Wallis tests comparing treatment groups within each sample time point. **SLE:** Systemic Lupus Erythematosus; **RA:** Rheumatoid Arthritis; **B27-AS:** HLA-B27 positive Ankylosing Spondylitis; **PSA:** Psoriatic Arthritis; **GCA:** Giant Cell Arteritis; **GCs:** Glucocorticoids; **JAKi:** JAK inhibitors.

	Pre-3rd dose						Post-3rd dose					
	SLE n=35	RA n=35	B27-AS n=22	PSA n=40	GCA n=24	P-value	SLE n=20	RA n=32	B27-AS n=17	PSA n=23	GCA n=18	P-value
Anti-S-protein antibody (BAU/ml)	486 [0, 83890]	335 [0, 85340]	671 [50, 4455]	796 [19, 9567]	239 [0, 87880]	0.23968	11323 [38, 55080]	6433 [0, 166760]	11712 [2342, 137780]	14547 [888.0, 112590.0]	4311 [0, 74400]	0.10945
Wild type - Positive	21 (60.0%)	21 (60%%)	19 (86.4%)	30 (75.0%)	12 (50%)	0.04812	19 (95.0%)	30 (93.8%)	17 (100%)	23 (100%)	16 (88.9%)	0.25326
B.1.1.529 - Positive	6 (17.1%)	3 (8.6%)	1 (4.5%)	3 (7.5%)	4 (16.7%)	0.47496	11 (55.0%)	18 (56.2%)	9 (52.9%)	16 (69.6%)	6 (33.3%)	0.25326
B.1.1.7 - Positive	18 (51.4%)	11 (31.4%)	8 (36.4%)	15 (37.5%)	6 (25.0%)	0.29535	18 (90.0%)	28 (87.5%)	17 (100.0%)	22 (95.7%)	15 (83.3%)	0.43294
B.1.351 - Positive	15 (42.9%)	8 (23.5%)	6 (27.3%)	10 (25.0%)	5 (21.7%)	0.35435	17 (89.5%)	27 (87.1%)	15 (93.8%)	21 (91.3%)	14 (77.8%)	0.69225
B.1.617.2 - Positive	17 (48.6%)	11 (31.4%)	7 (31.8%)	11 (27.5%)	6 (25.0%)	0.30516	18 (90.0%)	28 (87.5%)	17 (100.0%)	21 (91.3%)	15 (83.3%)	0.57836
P.1 - Positive	15 (42.9%)	12 (34.3%)	4 (18.2%)	10 (25.0%)	6 (25.0%)	0.28335	17 (85.0%)	27 (84.4%)	15 (88.2%)	20 (87.0%)	15 (83.3%)	0.9999

Supplementary Table S4. Comparison of anti-S protein antibody titers between rheumatic condition groups within each time point of sample extraction. Cells show Fold-changes (FC), 95% confidence intervals (CI) and p-values of the corresponding comparison. FCs and p-values were derived from a mixed-effects linear model where sex, age, rheumatic condition, treatment type, use of glucocorticoids, type of vaccine, sample type (pre- or post-3rd dose) and time from previous dose where included as fixed effects, as well as the interaction between: sex and sample type; treatment and sample type; rheumatic condition and sample type; use of glucocorticoids and sample type; time from 2nd and third vaccine dose and sample type; glucocorticoids use and treatment regimen; and glucorticoids use and rheumatic condition. Individual effects were included as random effects in this model. **SLE:** Systemic Lupus Erythematosus; **RA:** Rheumatoid Arthritis; **B27-AS:** HLA-B27 positive Ankylosing Spondylitis; **PSA:** Psoriatic Arthritis; **GCA:** Giant Cell Arteritis; **JAKi:** JAK inhibitors; **GCs:** Glucocorticoids; **FC:** Fold-Change; **95%CI:** 95% confidence interval.

	Pre-3rd dose		Post-3rd dose	
	FC [95%CI]	P-value	FC [95%CI]	P-value
RA - SLE	3.31 [0.87, 12.60]	0.0788	2.58 [0.64, 10.43]	0.1844
B27-AS - SLE	3.21 [0.85, 12.13]	0.0850	1.34 [0.33, 5.51]	0.6860
PSA - SLE	8.27 [2.08, 32.80]	0.0027	3.74 [0.85, 16.59]	0.0821
GCA - SLE	5.14 [1.15, 22.94]	0.0317	1.31 [0.27, 6.50]	0.7373
B27-AS - RA	0.97 [0.20, 4.60]	0.9695	0.52 [0.10, 2.81]	0.4469
PSA - RA	2.50 [0.79, 7.93]	0.1208	1.45 [0.38, 5.52]	0.5830
GCA - RA	1.55 [0.38, 6.36]	0.5406	0.51 [0.11, 2.39]	0.3933
PSA - B27-AS	2.57 [0.57, 11.60]	0.2186	2.80 [0.53, 14.64]	0.22353
GCA - B27-AS	1.60 [0.31, 8.28]	0.57438	0.98 [0.16, 6.05]	0.9840
GCA - PSA	0.62 [0.15, 2.53]	0.5074	0.35 [0.07, 1.77]	0.2054

Supplementary Table S5. Increase of anti-S protein antibody levels after the third dose of the SARS-CoV-2 vaccine by treatment group. Cells show the Fold-changes (FC), bootstrap 95% confidence intervals (CI) and p-values comparing the the patients' titer levels after and before the administration of the third vaccine's dose. P-values are derived from a Wilcoxon test using only patients with both samples available. **JAKi:** JAK inhibitors; **GCs:** Glucocorticoids.

	FC [95%CI]	P-value
Not treated or GCs only	16.89 [3.97, 50.67]	0.0066
Non-biological	11.26 [5.63, 19.19]	< 0.0001
Biological	22.35 [8.78, 49.27]	< 0.0001
JAKi	10.51 [3.22, 32.23]	0.02686

Supplementary Table S6. Increase of anti-S protein antibody levels after the third dose of the SARS-CoV-2 vaccine by rheumatic condition. Cells show the Fold-changes (FC), bootstrap 95% confidence intervals (CI) and p-values comparing the the patients' titer levels after and before the administration of the third vaccine's dose. P-values are derived from a Wilcoxon test using only patients with both samples available.

	FC [95%CI]	P-value
Systemic Lupus Erythematosus	23.30 [7.21, 62.25]	0.0010
Rheumatoid Arthritis	19.20 [6.71, 38.39]	< 0.0001
HLA-B27 positive Ankylosing Spondylitis	17.45 [6.99, 35.33]	< 0.0001
Psoriatic Arthritis	18.28 [7.89, 41.83]	< 0.0001
Giant Cell Arteritis	18.07 [6.28, 80.06]	0.0373

Supplementary Table S7. Anti-S protein antibody levels by treatment group before (Pre-3rd dose) and after (Post-3rd dose) a third dose of the SARS-CoV-2 mRNA-based vaccine. Cells show the medians an ranges of anti-S protein antibody titers. P-values are derived from a Mann-Whiteny test comparing treatment groups within each sample time point. **JAKi:** JAK inhibitors; **GCs:** Glucocorticoids.

	Pre-3rd dose			Post-3rd dose		
	No GCs	**Gcs**	**P-value**	**No GCs**	**Gcs**	**P-value**
Not treated or GCs only	1522 [152, 83890]	300 [43, 20363]	0.0272	11712 [2037, 55080]	3881 [1002, 74400]	0.6272
Non-biological	996 [14, 9567]	218 [16, 40700]	0.0538	10338 [2246, 112590]	11643 [433, 33200]	0.8512
Biological	419 [0, 12069]	72 [0, 87880]	0.0402	10890 [0, 137780]	1447 [0, 23022]	0.0124
JAKi	882 [34, 85340]	274 [43, 967]	0.2030	10229 [1479, 166760]	4378 [393, 16823]	0.1495

Supplementary Table S8 Comparison of anti-S protein antibody titers between users and non-users of Glucocroticoids (GCs) within each rheumatic condition and time point of sample extraction. Cells show Fold-changes (FC), 95% confidence intervals (CI) and p-values of the corresponding comparison. FCs and p-values were derived from a mixed-effects linear model where sex, age, rheumatic condition, treatment type, use of glucocorticoids, type of vaccine, sample type (pre- or post-3rd dose) and time from previous dose where included as fixed effects, as well as the interaction between: sex and sample type; treatment and sample type; rheumatic condition and sample type; use of glucocorticoids and sample type; time from 2nd and third vaccine dose and sample type; glucocorticoids use and treatment regimen; and glucorticoids use and rheumatic condition. Individual effects were included as random effects in this model. **SLE:** Systemic Lupus Erythematosus; **RA:** Rheumatoid Arthritis; **B27-AS:** HLA-B27 positive Ankylosing Spondylitis; **PSA:** Psoriatic Arthritis; **GCA:** Giant Cell Arteritis; **JAKi:** JAK inhibitors; **GCs:** Glucocorticoids; **FC:** Fold-Change; **95%CI:** 95% confidence interval.

	Pre-3rd dose		Post-3rd dose	
	FC [95%CI]	**P-value**	**FC [95%CI]**	**P-value**
SLE	0.25 [0.05, 1.25]	0.0911	0.39 [0.07, 2.20]	0.2832
RA	0.46 [0.11, 1.89]	0.2837	0.71 [0.17, 2.91]	0.6384
PSA	0.85 [0.17, 4.24]	0.8435	1.31 [0.23, 7.47]	0.7639
CGA	0.25 [0.04, 1.69]	0.1563	0.39 [0.05, 2.82]	0.3494

Supplementary Table S9. Positivity of neutralizing antibodies by glucorcorticoids use in the overall series. Cells show, for different variants of the SARS-CoV-2, the absolute frequency and the percentage of positive immune response, and the p-value for the comparison of this frequencies derived from a exact Fisher's test. Variants of SARS-Cov-2 are: **B.1.1.529** (Omicron), **B.1.1.7** (Alpha), **B.1.351** (Beta), **B.1.617.2** (Delta) and **P.1** (Gamma). **GCs:** Glucocorticoids.

	Pre-3rd dose			Post-3rd dose		
	No GCs N(%)	**GCs N(%)**	**P-value**	**No GCs N(%)**	**GCs N(%)**	**P-value**
Wild type	84 (73.7%)	19 (45.2%)	0.0012	77 (97.5%)	28 (90.3%)	0.1349
B.1.1.529	12 (10.5%)	5 (11.9%)	0.7780	47 (59.5%)	13 (41.9%)	0.1359
B.1.1.7	47 (41.2%)	11 (26.2%)	0.0955	76 (96.2%)	24 (77.4%)	0.0050
B.1.351	37 (32.7%)	7 (17.1%)	0.0698	71 (93.4%)	23 (74.2%)	0.0097
B.1.617.2	43 (37.7%)	9 (21.4%)	0.0588	75 (94.9%)	24 (77.4%)	0.0109
P.1	38 (33.3%)	9 (21.4%)	0.1726	71 (89.9%)	23 (74.2%)	0.0670

Supplementary Table S10. Positivity of neutralizing antibodies by glucorcorticoids use in patients under biological treatment. Cells show, for different variants of the SARS-CoV-2, the absolute frequency and the percentage of positive immune response, and the p-value for the comparison of this frequencies derived from a exact Fisher's test. Variants of SARS-Cov-2 are: **B.1.1.529** (Omicron), **B.1.1.7** (Alpha), **B.1.351** (Beta), **B.1.617.2** (Delta) and **P.1** (Gamma). **GCs:** Glucocorticoids.

	Pre-3rd dose			Post-3rd dose		
	No GCs N(%)	**GCs N(%)**	**P-value**	**No GCs N(%)**	**GCs N(%)**	**P-value**
Wild type	34 (60.7%)	3 (25.0%)	0.0299	40 (95.2%)	5 (62.5%)	0.0242
B.1.1.529	2 (3.6%)	1 (8.3%)	0.4469	24 (57.1%)	1 (12.5%)	0.0488
B.1.1.7	17 (30.4%)	2 (16.7%)	0.4866	40 (95.2%)	4 (50.0%)	0.0039
B.1.351	10 (18.2%)	2 (16.7%)	0.9999	37 (90.2%)	4 (50.0%)	0.0171
B.1.617.2	14 (25.0%)	2 (16.7%)	0.7171	39 (92.9%)	4 (50.0%)	0.0085
P.1	12 (21.4%)	3 (25.0%)	0.7188	39 (92.9%)	3 (37.5%)	0.0012

Table S11. Distribution of biological treatments by use of Glucocorticoids (GCs).

	No GCs	GCs
anti-TFN	21 (87.5%)	3 (12.5%)
Baricitinib	0 (0.0%)	1 (100.0%)
Belimumab	3 (75.0%)	1 (25.0%)
IL-17	17 (94.4%)	1 (5.6%)
Mycophenolate mofetil	2 (100.0%)	0 (0.0%)
Rituximab	4 (100.0%)	0 (0.0%)
Sulfasalazine	0 (0.0%)	1 (100.0%)
Tocilizumab	10 (62.5%)	6 (37.5%)
Ustekinumab	1 (50.0%)	1 (50.0%)