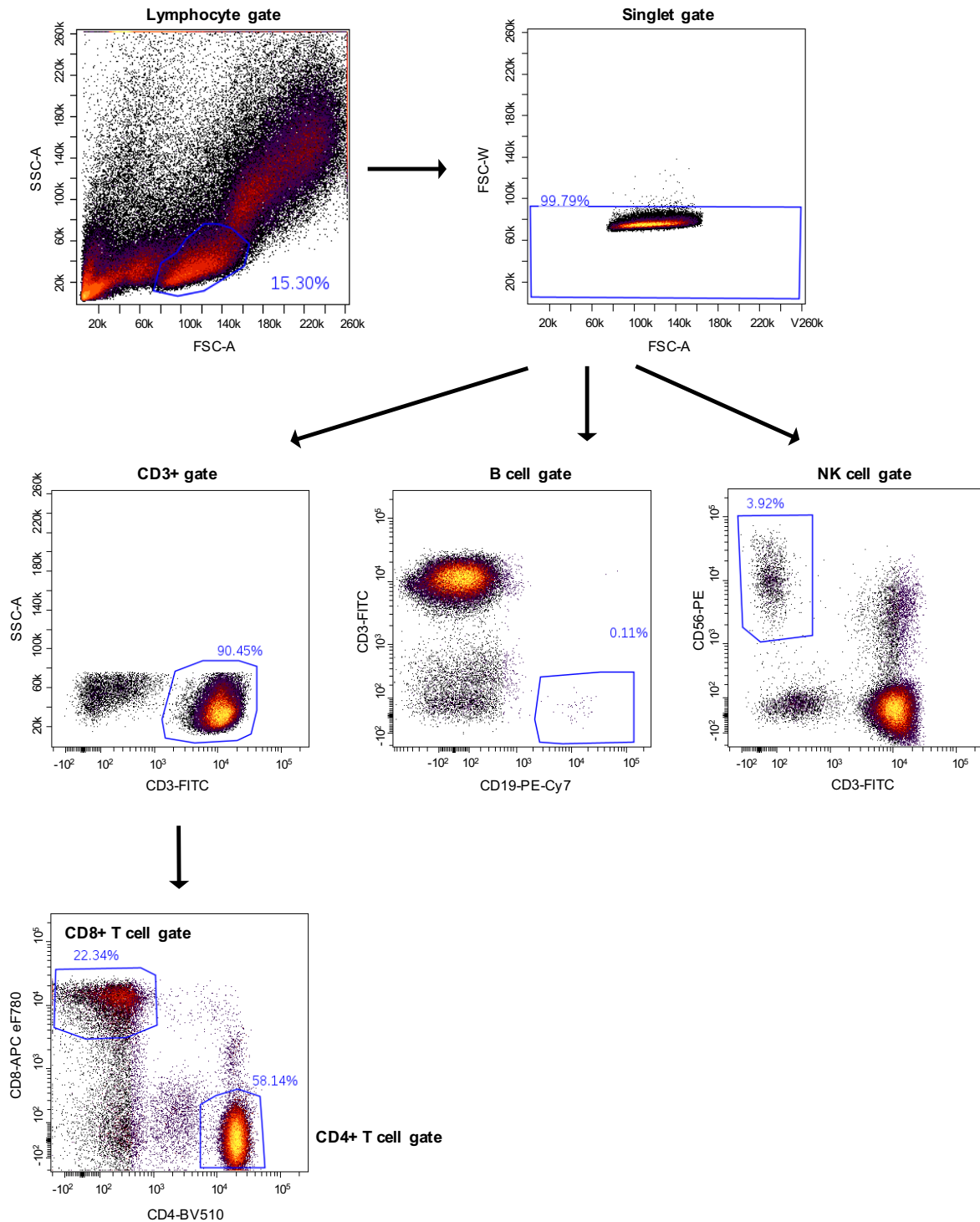

Supplementary information

**Immune responses against SARS-CoV-2
variants after two and three doses of
vaccine in B-cell malignancies: UK
PROSECO study**

In the format provided by the
authors and unedited



Supplementary Figure 1. Flow cytometry gating strategy.

The gating strategy used in this study for quantification of CD4⁺ T, CD8⁺ T, B and NK cell quantification.

	OR favoring undetectable anti-S IgG (95% CI)
Treatment group	
- On	10.96 (6.44, 18.63; p<0.001)
- No	Reference
Vaccine	
- ChAdOx1	Reference
- BNT162b2	0.96 (0.60, 1.52; p=0.854)
Disease group	
- Aggressive BNHL	Reference
- HL	0.17 (0.05, 0.58; p=0.005)
- Indolent BNHL	1.52 (0.93, 2.50; p=0.098)
- Peripheral TNK	1.59 (0.46, 5.52; p=0.464)
Gender	
- Male	Reference
- Female	0.93 (0.59, 1.47; p=0.758)
Anti-CD20	
- No	Reference
- Yes	13.72 (7.78, 24.22; p<0.001)
Age	1.04 (1.02, 1.05; p<0.001)
Disease remission status	
- Complete/partial	Reference
- Stable disease	0.77 (0.36, 1.67; p=0.513)
- Progressive disease	2.10 (0.76, 5.86; p=0.155)
Serum IgG status	
- Normal/High	Reference
- Low	3.32 (1.62, 6.77 ; p=0.001)

Supplementary Table 1. Univariable analysis of factors contributing to undetectable anti-S IgG. Univariable logistic regression reporting odds ratios and 95% confidence intervals. Older age, anti-CD20 treatment in the last 12 months, low serum IgG status and being in the 'on treatment' group were associated with higher risk of undetectable anti-S IgG.

	OR favoring undetectable anti-S IgG (95% CI)
Treatment group	
- On	7.22 (3.80, 13.73; p<0.001)
- No	Reference
Vaccine	
- ChAdOx1	Reference
- BNT162b2	0.89 (0.49, 1.62; p=0.695)
Disease group	
- Aggressive B-NHL	Reference
- HL	0.70 (0.16, 3.08; p=0.641)
- Indolent B-NHL	1.53 (0.80, 2.92; p=0.202)
- PTCL	2.60 (0.53, 12.76; p=0.240)
Gender	
- Male	Reference
- Female	0.82 (0.45, 1.50; p=0.525)
Anti-CD20 administered in last 12 months	
- No	Reference
- Yes	5.60 (2.73, 11.52; p<0.001)
Age	1.03 (1.01, 1.06; p=0.011)
Disease remission status	
- Complete/partial	Reference
- Stable disease	0.60 (0.26, 1.85; p=0.468)
- Progressive disease	2.44 (0.62, 9.51; p=0.200)

Supplementary Table 2. Multivariable analysis of factors contributing to undetectable anti-S IgG. Multivariable logistic regression model, reporting odds ratios and 95% confidence intervals. Older age, anti-CD20 treatment in the last 12 months and being in the 'on treatment' group were associated with higher risk of undetectable anti-S IgG.

	OR favoring a positive IFNγ ELISpot response
	OR (95% CI; p-value)
Treatment group	
- On	2.17 (0.99, 4.72; p=0.051)
- No	Reference
Vaccine	
- ChAdOx1	2.01 (1.06, 3.79; p=0.031)
- BNT162b2	Reference
Disease group	
- Aggressive BNHL	Reference
- HL	0.86 (0.26, 2.78; p=0.797)
- Indolent BNHL	0.64 (0.31, 1.34; p=0.238)
Gender	
- Male	Reference
- Female	0.67 (0.35, 1.28; p=0.230)
Anti-CD20	
- No	Reference
- Yes	0.47 (0.20, 1.08; p=0.076)
Age	1.00 (0.97, 1.02; p=0.774)
Disease remission status	
- Complete/partial	Reference
- Stable disease	1.13 (0.37, 3.40; p=0.834)
- Progressive disease	0.75 (0.18, 3.16; p=0.698)

Supplementary Table 3. Multivariable analysis of factors favoring reduced cellular responses. Multivariable logistic regression model, reporting odds ratios and 95% confidence intervals. ChAdOx1 vaccination vaccine was the only significant predictor of positive IFN γ ELISpot response.

a

	On Treatment			No Treatment	
	Anti-CD20	BTKi/VEN	Chemo	I B-NHL	A B-NHL & HL
Increased anti-S post-D3 relative to pre-D3, n (%)	3/18 (17%)	6/8 (75%)	3/3 (100%)	33/35 (94%)	16/17 (94%)

b

	Healthy Donors	Lymphoma	
		Initial Non-Responder	Initial Responder
Positive ELISpot at post-D3 relative to pre-D3, n (%)	4/5 (80%)	6/12 (50%)	16/17 (94%)

Extended Data Table 4. Antibody and cellular responses after third vaccine dose. **a**, The number and percentage of participants whose antibody levels increased after the third vaccine dose in each of the indicated groups (concurrent or anti-CD20 therapy within 6 months in B-NHL (anti-CD20), concurrent BTK inhibitors or venetoclax in B-NHL (BTKi/VEN) and concurrent chemotherapy in HL (chemo), compared to those not on treatment (I B-NHL and A B-NHL & HL). **b**, Number of participants who had positive IFN γ T-cell responses in healthy donors, and lymphoma participants after three doses in those who had a negative (initial non-responder) or positive (initial responder) after two vaccine doses.