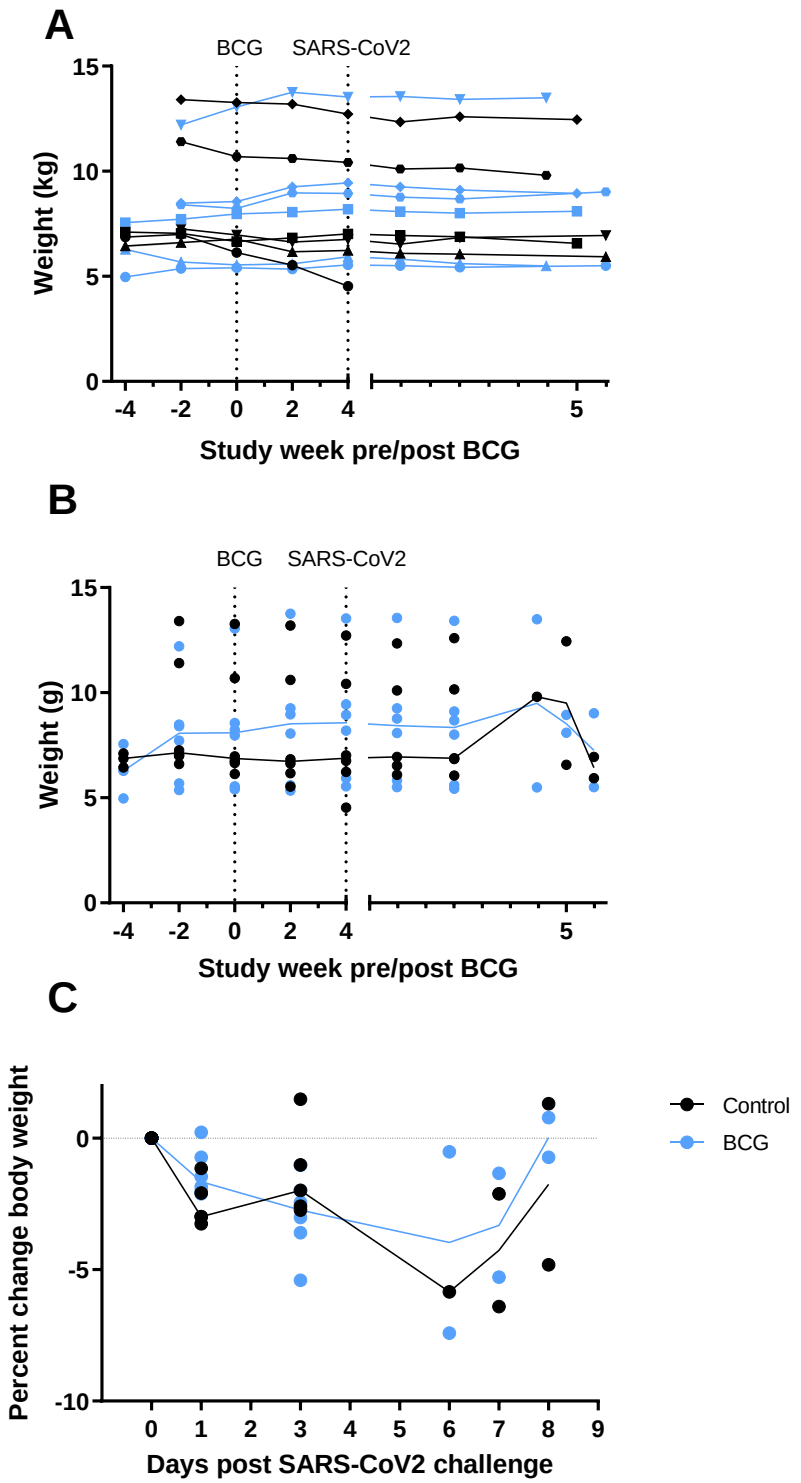
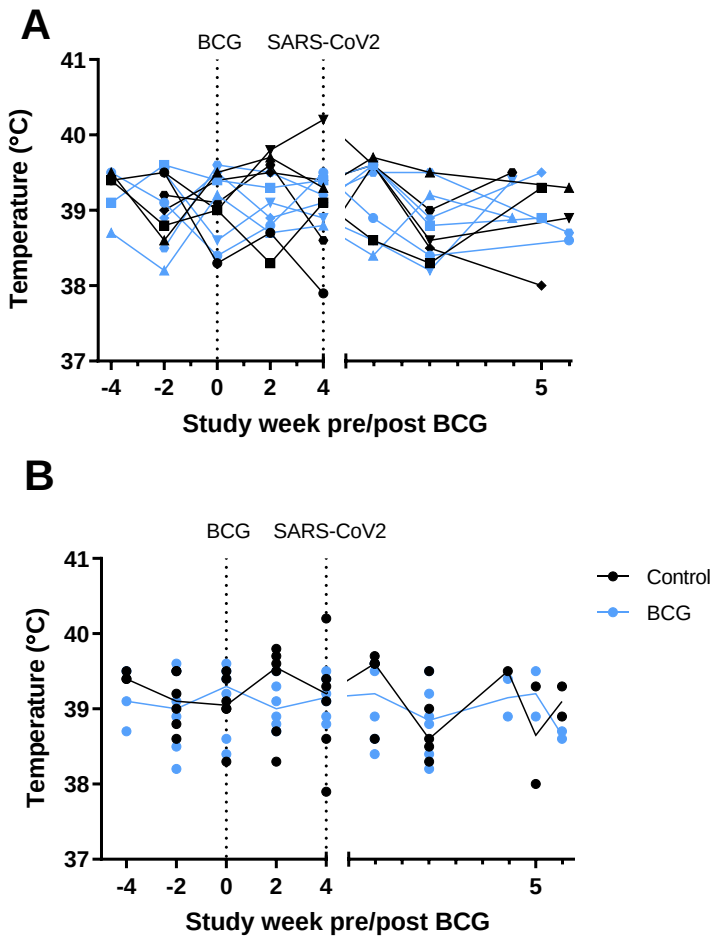
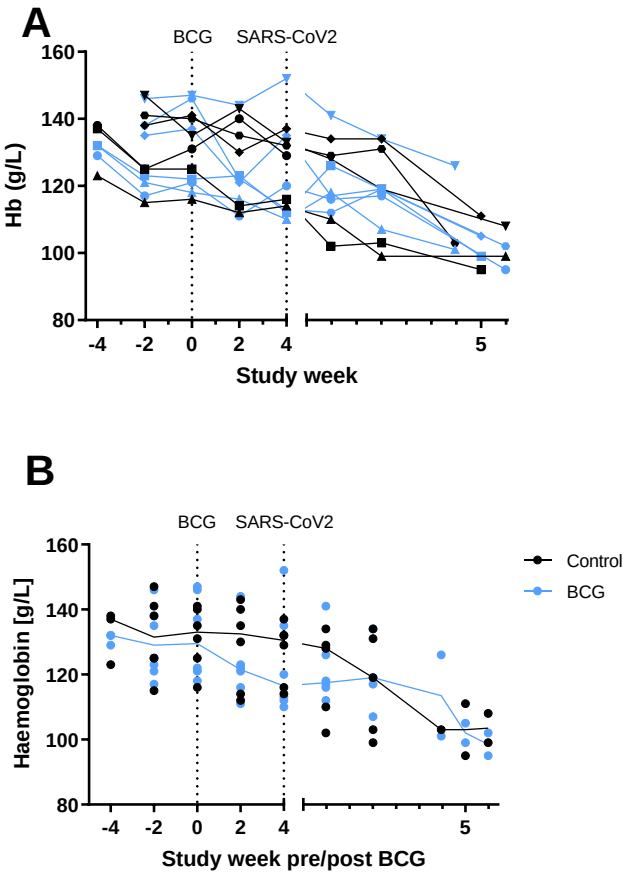
## Supplementary data



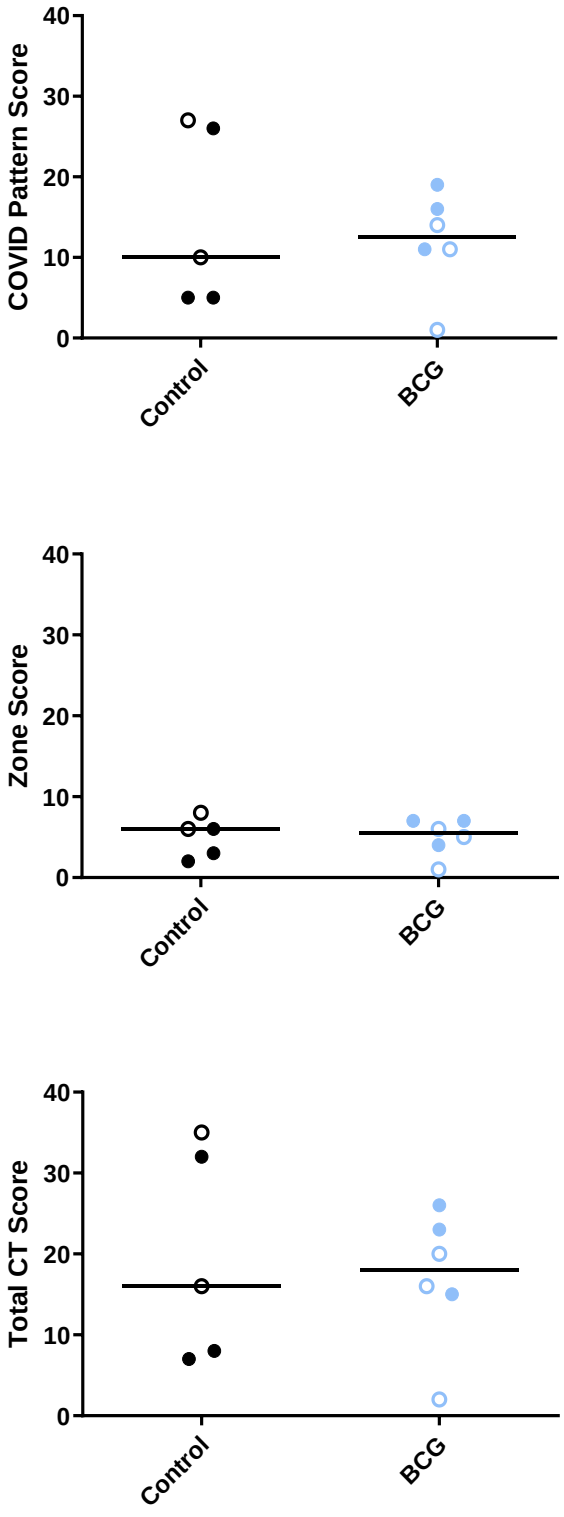

**Supplementary figure 1: Body weight measurements recorded pre/post aerosol BCG vaccination and SARS-CoV-2 challenge.** Weight measurements recorded from individual animals are shown in Figure A (unvaccinated = black, vaccinated = blue), with group median values indicated in figures B and C.



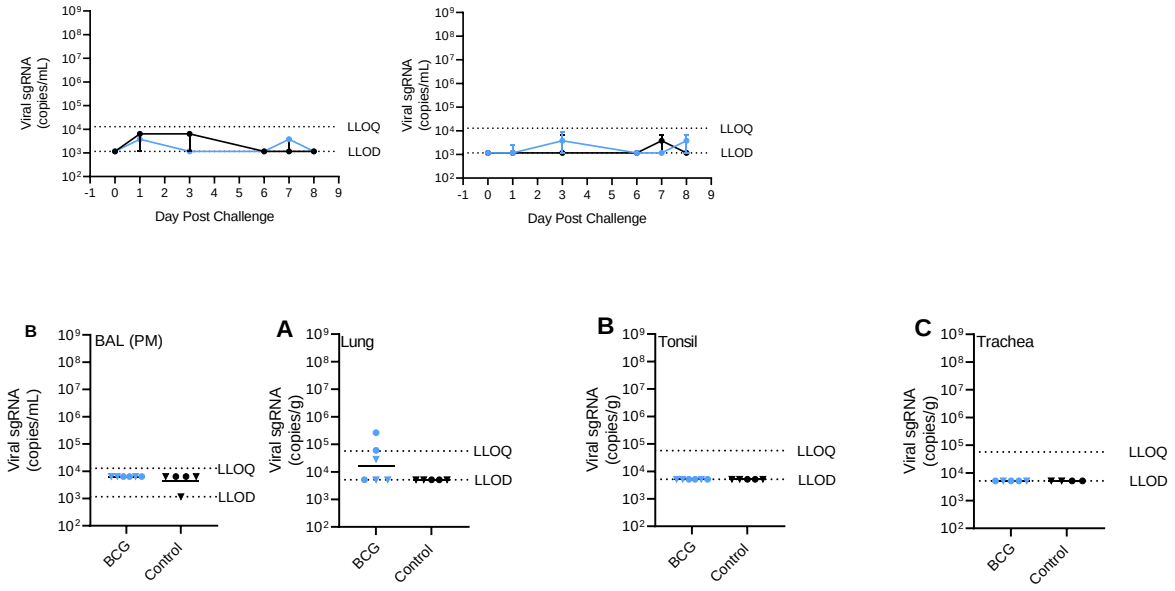

**Supplementary figure 2. Body temperature measurements recorded before and after aerosol BCG vaccination and SARS-CoV-2 challenge.** Temperature measurements recorded from individual animals are shown in Figure A (unvaccinated = black, vaccinated = blue), with group median values indicated in figure B.



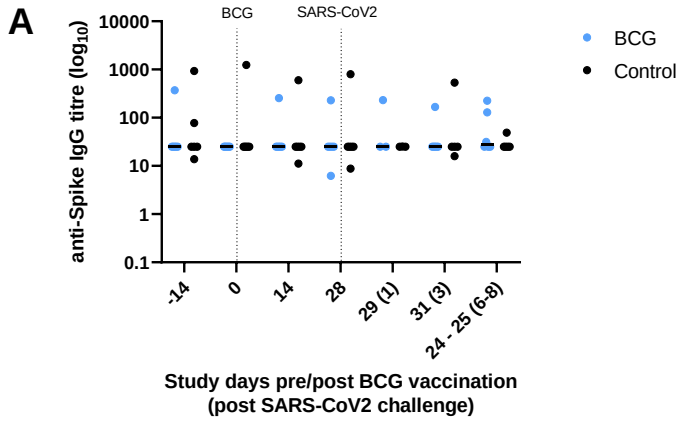

**Supplementary figure 3: Red blood cell haemoglobin concentration measurements recorded before and after aerosol BCG vaccination and SARS-CoV-2 challenge.** Red blood cell haemoglobin concentration recorded from individual animals are shown in Figure A (unvaccinated = black, vaccinated = blue), with group median values indicated in figure B.

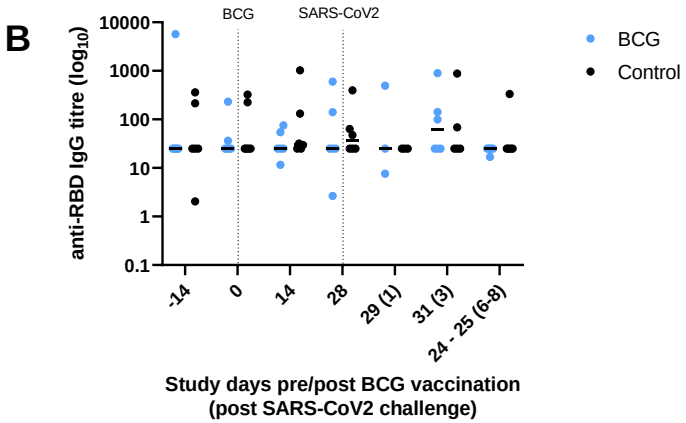


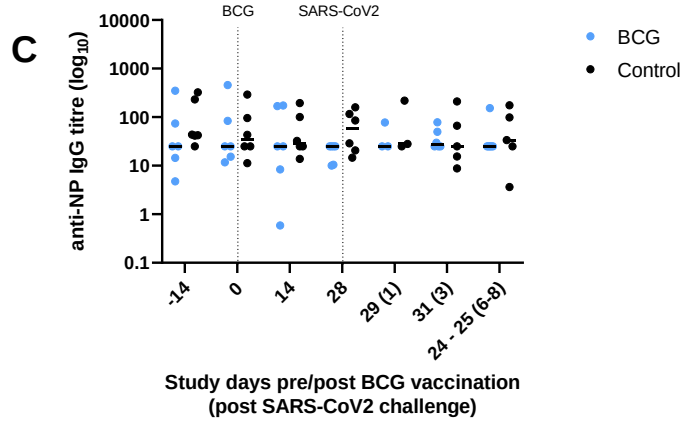

**Supplementary figure 4: Graphical representation of the CT scan pulmonary disease burden quantitative score.** Bars show the group median. Closed symbols show males, open symbols show females.



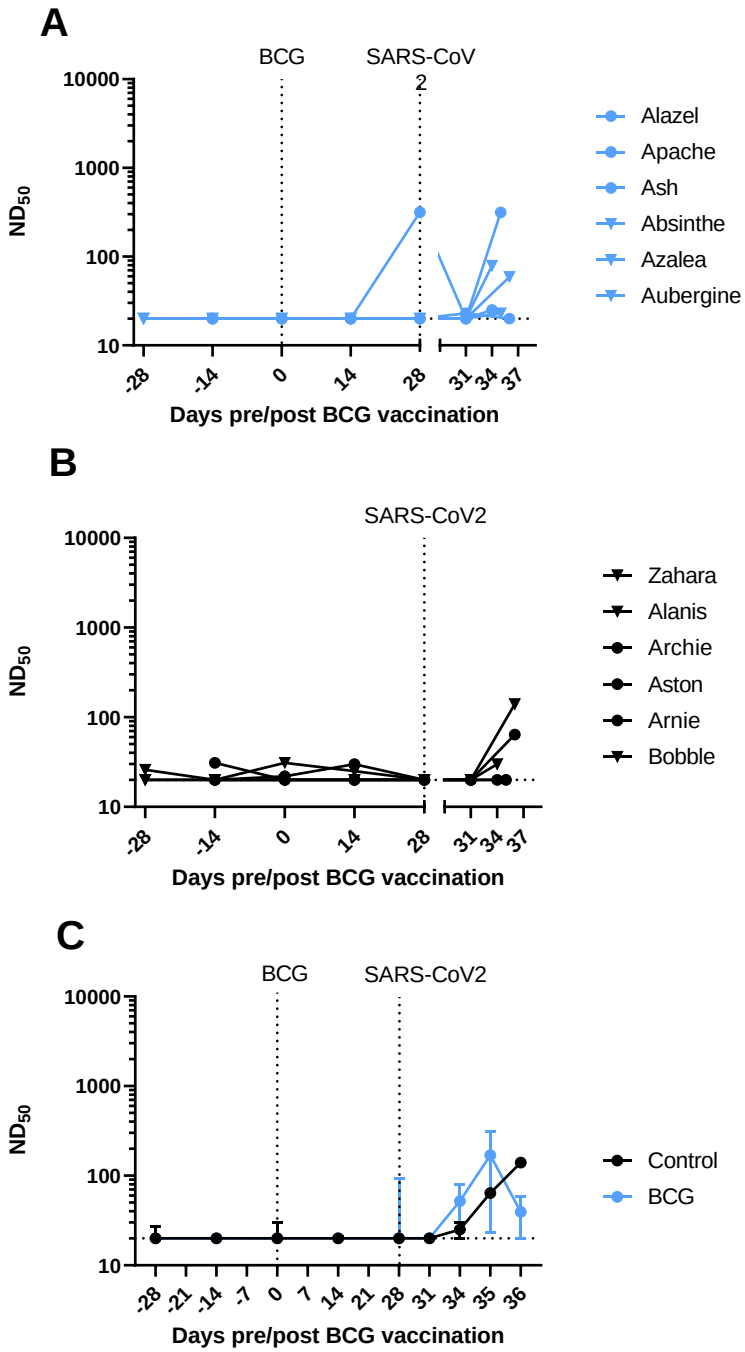

**Supplementary figure 5: Viral sgRNA detected in nasal or throat swab samples and in tissues collected at necropsy.** Group median titres of viral sgRNA (+/- IQR) detected in A) nasal and B) throat swab samples following SARS-CoV-2 challenge. Lower limits of detection (LLOD) and quantification (LLOQ) are indicated. C - F) Viral sgRNA detected in the BAL(C), Lung (D), tonsil (E)and trachea (F) samples collected at necropsy. Symbols represent viral sgRNA titres recorded from individual animals (females = triangles, males = circles) with group medians indicated.



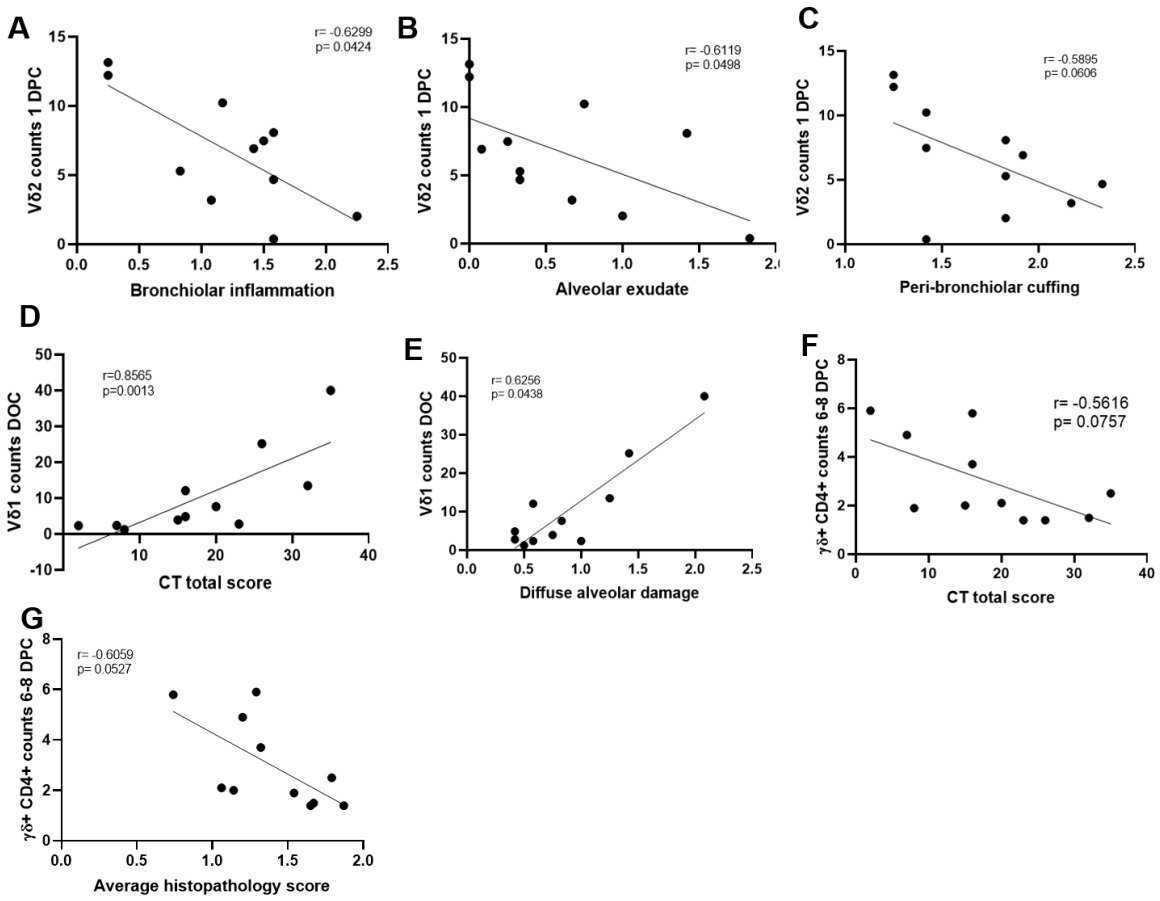



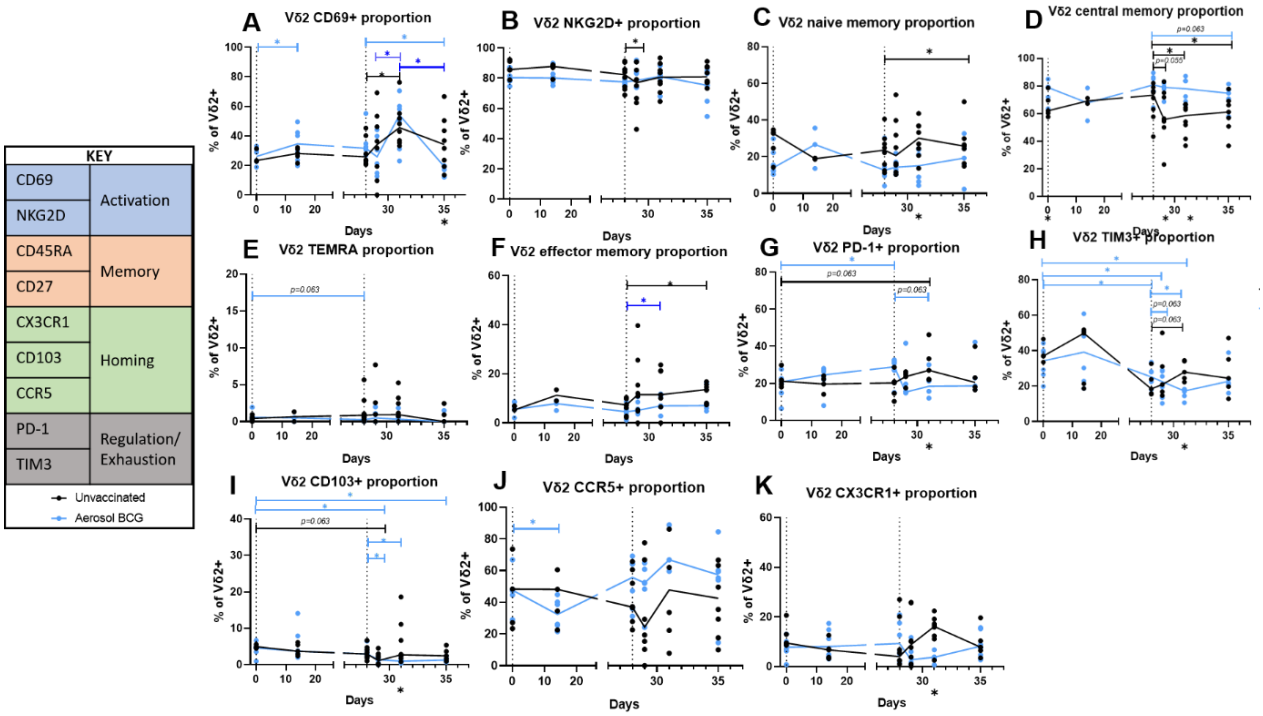

**Supplementary figure 6: A) Spike-, B) RBD- and C) NP-specific IgG titres measured in serum before and after aerosol BCG vaccination and SARS-CoV-2 challenge.** IgG titres measured in individual animals are shown with group median values indicated.



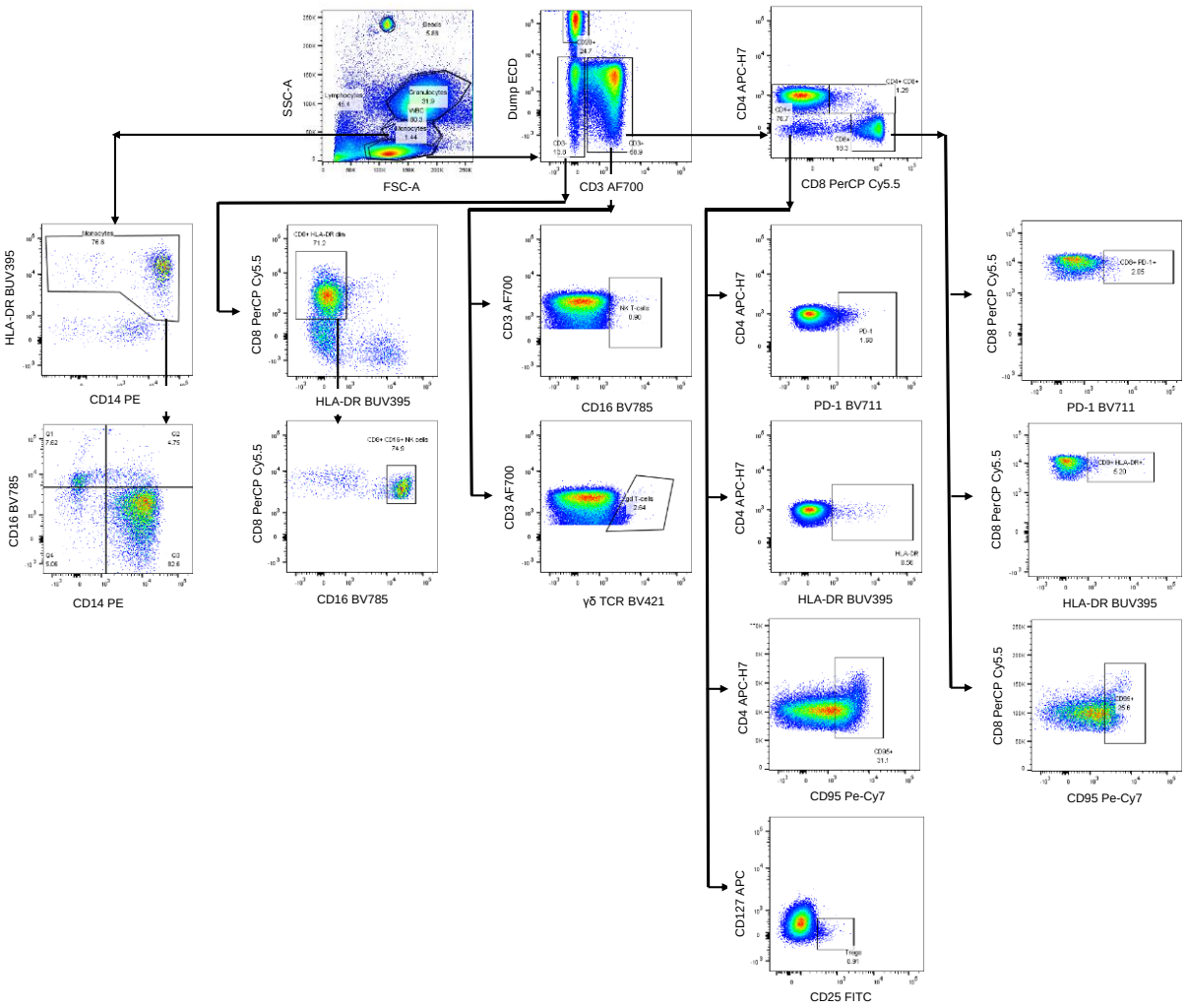

**Supplementary figure 7: Neutralising antibody titres measured in serum before and after aerosol BCG vaccination and SARS-CoV-2 challenge.** Neutralising antibody titres measured in A) aerosol BCG vaccinated and B) unvaccinated individual animals. Panel C shows group median titres +/- interquartile range. Aerosol BCG vaccination and SARS-CoV-2 challenge are indicated by reference lines.



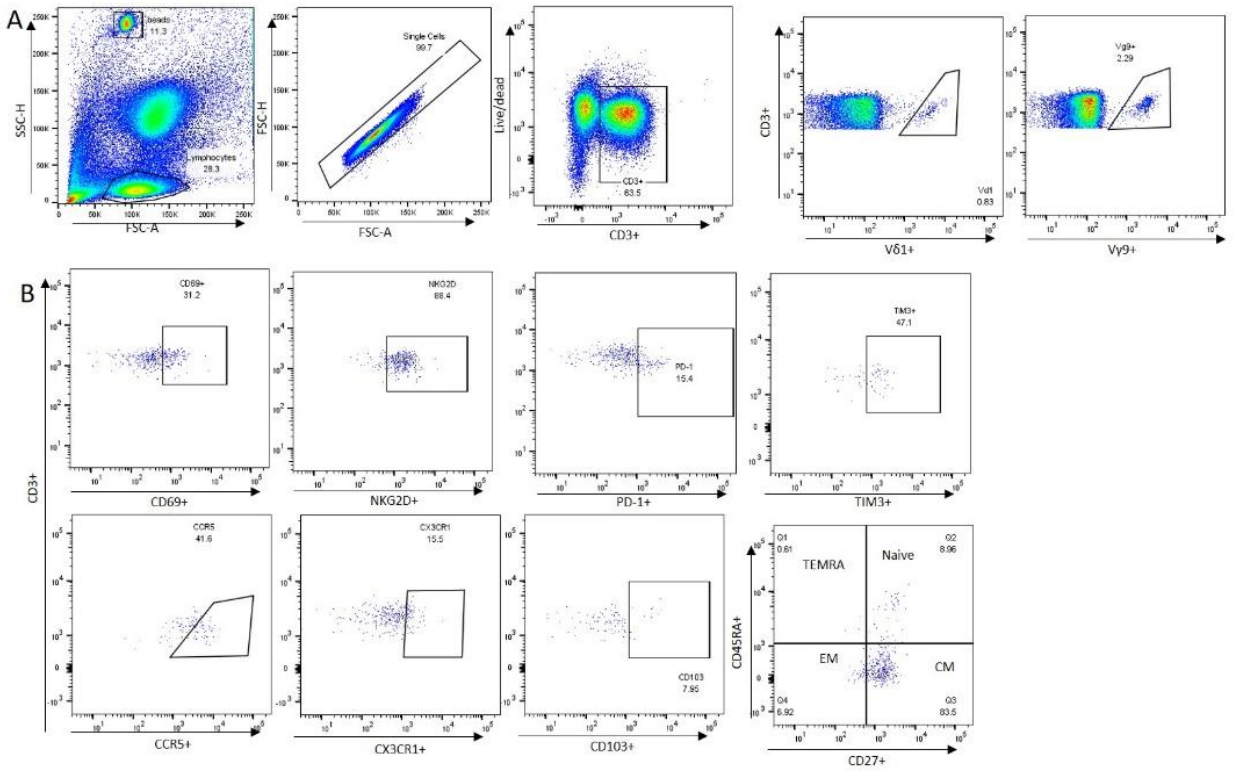

**Supplementary figure 8. γδ T cell WBIP correlations with post SARS-CoV-2 challenge disease outcome measures.** Correlations between disease outcome measures and whole blood counts of Vδ2+ (A-C), Vδ1+ (D-E) and γδ+ CD4+ (F-G) T cells at: the day of SARS-CoV-2 challenge (DOC); one day post challenge (1 DPC); and 6-8 days post challenge (6-8 DPC), were interrogated via Spearman rank correlation tests. Both vaccinated and unvaccinated animals are included in this analysis.




**Supplementary figure 9. Vδ2 phenotypes as measured using WBIP before and after aerosol BCG vaccination and SARS-CoV-2 challenge.** A-B) Activation, C-F) memory, G-H) regulated/exhausted and I-J) migration/homing phenotypes of Vδ2 T cells were investigated throughout the study. All populations shown as a proportion of Vδ2+ T cells using phenotypic markers indicated in the key. each animal represented by a dot. Light blue = BCG vaccinated, black = unvaccinated. Significant differences determined by Wilcoxon signed-rank test for comparisons within groups (colour coded by group and dark blue = both groups) denoted by asterisks above, and Mann-Whitney U-test for comparisons between groups are denoted by asterisks below X-axis. *$p$ = 0.05, **$p$ = 0.01, ***$p$ = 0.001.




**Supplementary figure 10: Whole blood immunophenotyping flow cytometry gating strategy.** Leukocyte populations were identified using a forward scatter-height (FSC-H) versus side scatter-area (SSC-A) dot plot to identify the lymphocyte, monocyte and granulocyte populations, to which appropriate gating strategies were applied to exclude doublet events and non-viable cells. Lymphocyte sub populations, including T-cells, NK-cells, NKT-cells and B-cells were delineated by the expression pattern of CD3, CD20, CD95, CD4, CD8, CD127, CD25, CD16 and the activation and inhibitory markers HLA-DR and PD-1.




**Supplementary figure 11: gating strategy for whole blood immunophenotyping of γδ T cells.** A) Lymphocytes were gated on from the whole blood using side scatter and forward scatter, and further gated on singe cells and live, CD3+ cells. From the CD3+ population Vδ1 and Vδ2 cells were gated on using Vδ1 and Vγ9 antibodies respectively. Cell counts were determined through the use of Flow-Count Fluoropheres. B) Vδ2 cells were gated on and phenotypic markers were used to look at activation (CD69, NKG2D), regulation/exhaustion (PD-1, TIM3), homing/tissue residency (CCR5, CX3CR1, CD103) and memory populations (CD45RA, CD27).