

# Dynamics of cellular immune responses elicited by COVID-19 vaccines in older adults and people living with HIV receiving suppressive ART

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## Abstract A110

### Introduction

COVID-19 vaccines are effective at preventing serious disease caused by SARS-CoV-2, but they are often unable to block infection by more immune-evasive variants, including Omicron and its descendants. Understanding how cross-reactive immunity develops will inform future vaccine strategies.

### Objectives

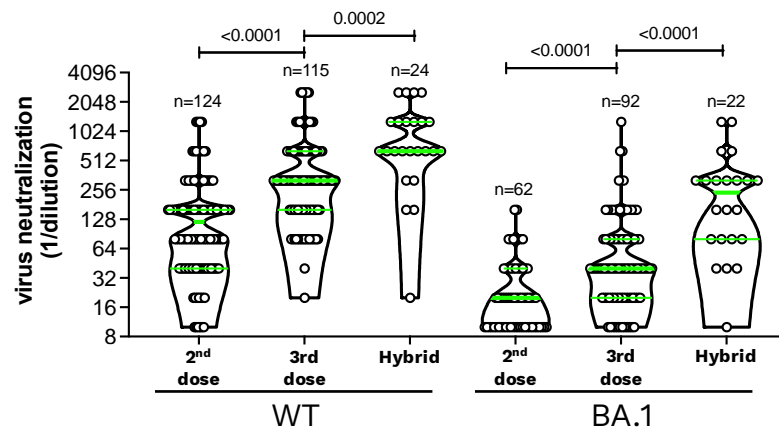
To identify mechanisms and determinants of humoral and cellular immune responses to SARS-CoV-2 variants following vaccination and breakthrough infection.

### Methods

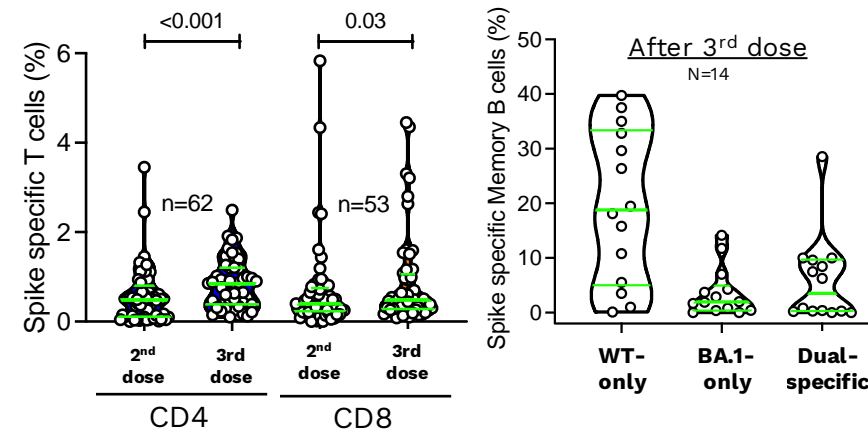
SARS-CoV-2 spike-specific B cells and T cells are being quantified using flow cytometry. B cell receptor (BCR) and T cell receptor (TCR) repertoires are being examined using single-cell RNA sequencing methods

### Results

**Figure 1. Neutralizing antibody responses after vaccination and Omicron breakthrough infection:** Wild type and Omicron BA.1 strains.

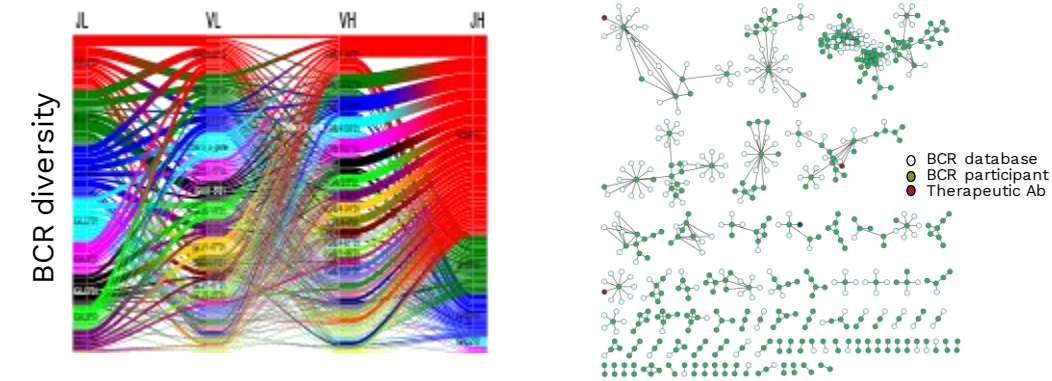


**Figure 2. Cellular immune responses after vaccination:** Spike-specific T cells and memory B cells.

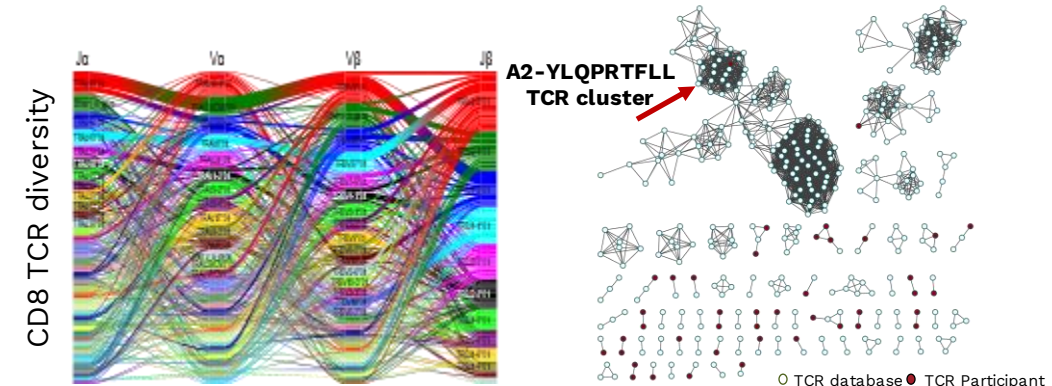


### Results

**Figure 3. Spike-specific B cell receptor repertoire:** B cells were isolated by FACS. BCR genes were sequenced using single-cell RNAseq and clustered with available public BCR datasets.



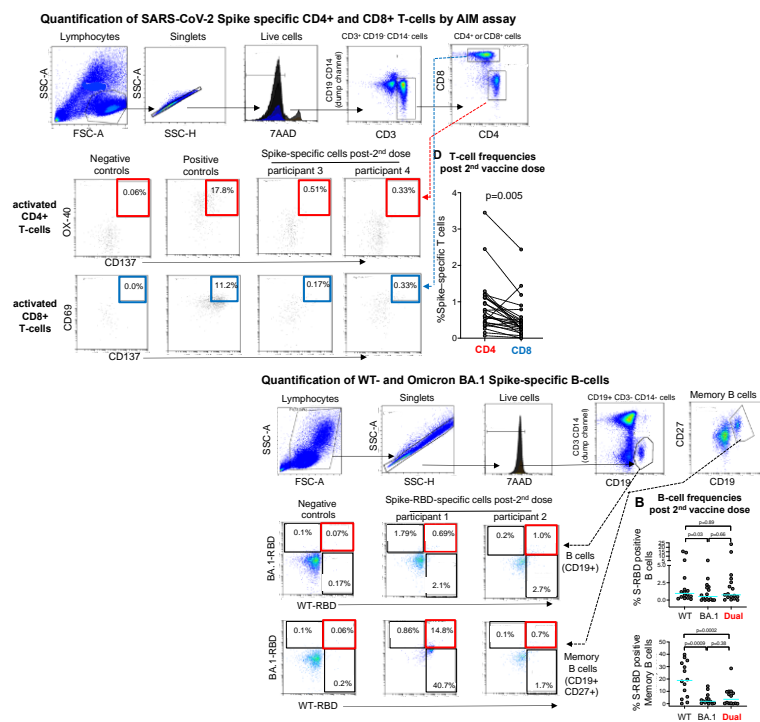
**Figure 4. Spike-specific T cell receptor repertoire:** T cells were isolated by FACS. TCR genes were sequenced using single-cell RNAseq and clustered with available public TCR datasets.



### Conclusions

**Our study illustrates the immune benefits of third COVID-19 vaccine doses, even among healthy adults.**

- ▶ Significantly enhanced neutralization activity against Omicron BA.1 and other strains (not shown)
  - ▶ Augmented CD4 T cell responses, consistent with higher frequencies of cross-reactive memory B cells
- BCR and TCR receptor profiling identifies “specificity clusters” that may inform future studies.**



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