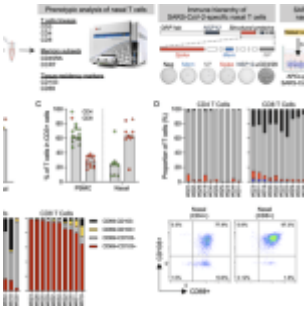
SARS-CoV-2 infection following vaccination – more robust immunity



In a new study, researchers have looked at the primary site of SARS-CoV-2 infection and done T-cell analysis of nasal swab samples (Figure 1). The study has shown that SARS-CoV-2 infection after vaccination may lead to a better induction of nasal-based immunity to COVID-19. These virus-specific T cells have been shown to provide a more robust immunisation to SARS-CoV-2 in patients who have been infected following vaccination when compared to those with only vaccination.

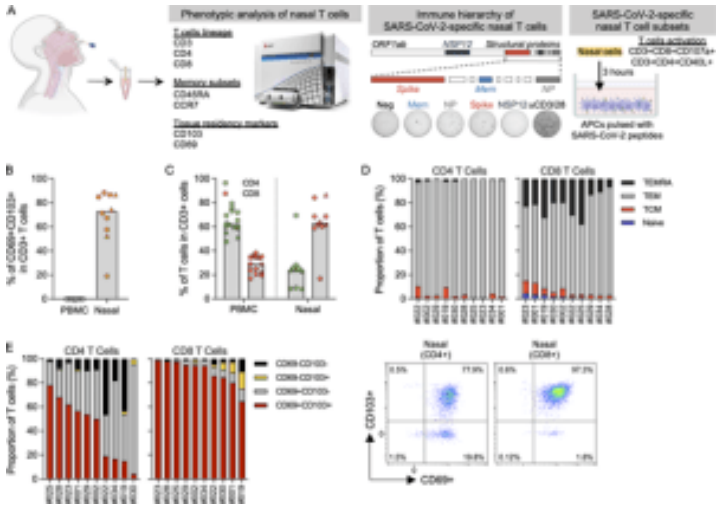


Figure 1: Phenotypic analysis of T cells in nasal secretion. *(A) Schematic of experimental design. (B) Frequency of tissue-resident T cells present in PBMCs (n = 8) and*

nasal secretion (n = 10). Convalescent vaccinees are indicated by a triangle symbol. (C) Frequency of CD4 and CD8 T cells present in PBMCs (n = 14) or nasal cells (n = 10). Convalescent vaccinees are indicated by a triangle. (D) Proportion of naive (CCR7+CD45RA+), central (CCR7+CD45RA−; TCM), effector (CCR7−CD45RA−; TEM) and terminally differentiated (CCR7−CD45RA+; TEMRA) memory CD4+ and CD8+ nasal T cells (n = 10). (E) Proportion of tissue-resident marker (CD69 and CD103) expression on CD8 and CD4 nasal T cells (n = 10) and corresponding representative plots.

The researchers looked analysed the T cell population of 16 people who received two doses of the Pfizer-BioNTech mRNA vaccine who have never been infected with SARS-CoV-2 and compared it to nasal swab samples from another 34 people who had been vaccinated and infected with SARS-CoV-2 following vaccination.

It was found that virus-specific T cells were found to exist mostly in the nose of the group of patients who had the vaccine and SARS-CoV-2 infection following vaccination. Interestingly, this was not observed in patients who had only the vaccine, with only these T cells being found in the blood.

Future research is needed as the sample size is small, but this study unveils some important insights into our understanding of SARS-CoV-2 vaccination and infection.

Journal article: Lim, J., et al., 2022. SARS-CoV-2

breakthrough infection in vaccinees induces virus-specific nasal-resident CD8+ and CD4+ T cells of broad specificity. ***Journal of Experimental Medicine*.**

Summary by Stefan Botha