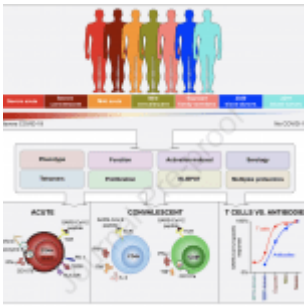
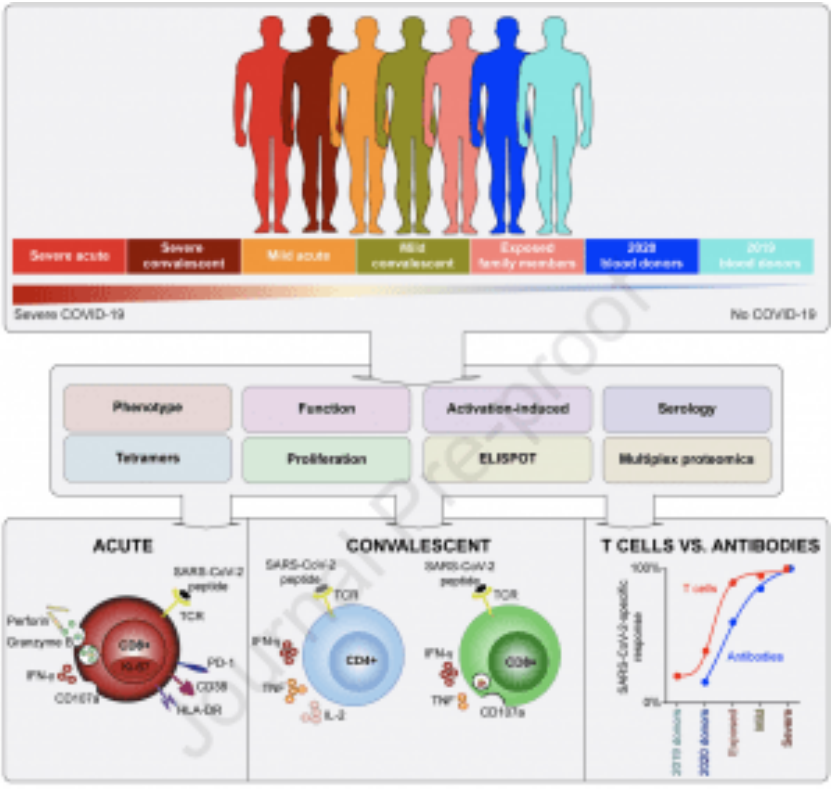
Do SARS-CoV-2-specific T cells confer long-lived protection?





Sekine et al., 2020 (Pre-Proof) Graphical Summary

Much has been reported on in terms of the rapid waning of antibody responses after COVID-19, which has raised the question around protective immunity against SARS-CoV-2 and prospects for successful vaccination. There are also anecdotal reports of possible re-infection scenarios and the question remains unanswered *“that if you have been infected once, can*

you become infected again”? These possibilities are currently unknown, but in a recent paper in Cell, investigators from Sweden have reported on SARS-CoV-2-specific memory T cells and long-term immune protection against COVID-19. The authors examined the function and phenotype of SARS-CoV-2-specific T cell responses in a total of 206 people consisting of unexposed individuals, exposed family members, and individuals with acute or convalescent COVID-19. They used a combination of overlapping peptides spanning regions of the spike, membrane and nucleocapsid proteins along with MHC class I tetramers for detection of SARS-CoV-2-specific CD8+ T cells. They found that in the acute phase of infection, these cells possessed a highly activated and cytotoxic phenotype, which associated with disease severity. However, in the convalescent phase, SARS-CoV-2-specific T cells were polyfunctional and showed a stem-like memory phenotype. What seemed to be important in this study is that these viral-specific memory T cells could be detected in SARS-CoV-2 exposed family members who were antibody negative and were either asymptomatic or had mild COVID-19. The authors state that “*Potent memory T cell responses were therefore elicited in the absence or presence of circulating antibodies*”. These results shed insight into possible protective immunity and that after SARS-CoV-2 infection, some people mount “robust, broad and highly functional memory T cell responses, suggesting that natural exposure or infection may prevent recurrent episodes of severe COVID-19.” This begs the question of whether the high recovery rate from SARS-CoV-2 infection reported in some countries is a measure of immune protection?

Journal Article: Sekine et al., 2020 (Pre-Proof). Robust T cell immunity in convalescent individuals with asymptomatic or mild COVID-19. Cell

Summary by Clive Gray