Exploring the distribution and phenotype of human γδ T cells across peripheral tissues

Daniela Moreno-Vicencio[1,2], Ellen Mann[1,2], Daniel Arsovski[1,2], Nicole La Gruta[1], Jamie Rossjohn[1] and Martin Davey[2]

[1] Department of Biochemistry and Molecular Biology, Monash University, Monash Biomedicine Discovery Institute, Melbourne, Australia. [2] Division of Biomedical Sciences, Warwick Medical School, The University of Warwick, Coventry, UK.

Mouse models of disease and injury have been invaluable for researching the functional role of γδ T cells. However, it has been well known that translating their biological features to human γδ T cells has proposed a rather challenging situation. The distribution and repertoire restriction of γδ T cells in solid tissues has been particularly well described in mice. Furthermore, the linkage between these two has allowed us to acquire a more comprehensive knowledge of γδ T cell's general biology.

In humans, this unconventional population of T cells has been majorly assessed in the blood due to the difficulties we encounter when accessing human tissue samples. Nevertheless, recent publications have described a type of γδ T cell present in some human tissues characterised mainly by a Vδ1 TCR. These populations of Vδ1 T cells seem to differ from those Vδ1 T cells in the blood in that they could potentially be tissue-restricted γδ T cells with adaptive-like properties. By using cutting-edge single-cell RNA sequencing and high dimensional immunophenotyping, we have successfully mapped different subsets of γδ T cells in different healthy human tissues and have an overview of their phenotypic and transcriptional signatures. Notably, we have found differences between Vδ1 in the blood and Vδ1 in the tissues, linking their distribution, characteristics and repertoires. In conclusion, contrary to mice γδ T cell subsets, our preliminary results highlight a tissue-residency characteristic that Vδ1 T cell subsets have when we found in solid tissues.