Abstract

Virtual memory (VM) $CD8^+$ T cells represent a population of antigen-inexperienced T cells with an apparent memory phenotype. In lymphoreplete germ-free mice VM $CD8^+$ T cells represent 10-20% of all peripheral $CD8^+$ T cells. Their origin correlates with the levels of self-reactivity where the main factor that determinates the T-cell fate decision is the strength of homeostatic signals.

In the first part of this thesis, we demonstrated that VM $CD8^+$ T cells and naïve $CD8^+$ T cells had distinct TCR repertoire and T-cell subsets contained different clonotypes. Moreover, 'VM clones' were enriched among VM T cells and were also present in naïve T cells. In contrast, 'naïve clones' were almost exclusively detected in naïve T cells. Next, we characterized the signaling of particular OVA-reactive TCRs from both naïve and VM subsets. We confirmed that 6 out of 8 tested TCRs were responsive to Kb-OVA. In the last part of the thesis, we developed and optimized a qPCR-based method for the relative quantification of specific T-cell clonotypes prior to and during the immune response. This method will serve as a tool for studying the biology of particular VM and naïve T-cell subsets and their role during the immune response.

Keywords: T-cell receptor, homeostatic signaling, self-reactivity, virtual memory cells, T cells