The major site of T cell production, the thymus, undergoes significant loss of function by mid-life, caused by the gradual loss of thymic epithelial cells from an early age by an as yet unresolved mechanism. This translates to a declining immune responsiveness to neoantigens and increased susceptibility to infections, cancer and autoimmunity. Of great clinical relevance, it also leads to a reduced capacity for T cell-mediated recovery following cytoablative therapies used in cancer treatments.

We recently identified the organ specific thymic epithelial progenitor cell (TEPC) population in the adult thymus, raising the intriguing possibility that compromised TEPC function is the basis for thymic ageing. In this project, we will use mouse models of ageing, chemotherapy-induced damage and immune regeneration, to explore alterations in TEPC differentiation and function.

Research Projects

1. Thymic epithelial stem cells and the nature of their niche
2. Thymic epithelial stem cells in development and aging
3. Generating ex vivo thymus organoids using defined biomatrices and growth factors
4. Generating functional thymic epithelial cells from pluripotent stem cells
5. Effects of chemotherapy on the thymus and bone marrow
6. Clinically relevant approaches for thymus regeneration, to replenish the T cell repertoire

Selected significant publications:


