The immune system has 2 essential types of thymus-derived (T) cells: i. Conventional T cells (T-conv) promote inflammation to rid the body of pathogens and tumours, and ii. Regulatory T cells (T-reg) suppress inflammation.

Charles Darwin referred to competition between individuals and species as a “struggle for existence”. T-conv and T-reg cells also compete against each other for resources. A feature of a safe immune system is that T-reg cells outcompete T-conv cells in the steady state. A key limiting resource is antigen, to which a T cell binds via its unique T-cell receptor (TCR). Self-proteins dominate the body’s antigen landscape in the steady state. We aim to understand mechanisms that focus T-reg cells on key self-proteins. We hope that detailed insight into the T-reg/self-protein axis will improve diagnostic accuracy and therapeutic efficacy in autoimmune diseases and cancers.

Research Projects

1. Defining the B-cell-dependent T-regulatory cell repertoire