

Research Areas

The immune system has evolved to fight pathogens while remaining tolerant to self and harmless antigens. The need for simultaneous immune vigilance and tolerance is particularly evident in the intestine, which is confronted to antigens coming from food, commensals and pathogens. In mammals, several mechanisms are in place to restrict the reactivity of the innate and adaptive immune systems. One major focus of the lab is the induction of dominant tolerance through Foxp3+ regulatory T cells (Treg). Treg can be generated both in the thymus and the periphery, especially in the gut. We use mouse models to establish the role of the tissue environment, particularly epithelial cells, in Treg induction.

While most functional studies on Treg have been performed in rodents, there is evidence that Treg are also key for tolerance in humans. Mutations in Treg-associated genes can lead to the autoimmune disease IPEX or IPEX-like syndromes. In addition, there is evidence that Treg function is affected in autoimmunity-associated immunodeficiencies like Wiscott-Aldrich syndrome. We are interested in applying the knowledge gained in mouse models to understand and treat human disease. The affiliation of the research group to the Max Planck Institute and the CCI allows for a rapid translation from basic science to clinical studies.