



Universität
Basel

Research Project

Development and immune function of innate lymphoid cells

Third-party funded project

Project title Development and immune function of innate lymphoid cells

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Organisation / Research unit

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Bereich Kinder- und Jugendheilkunde (Klinik) / Molekulare Medizin in der Pädiatrie (Finke)

Department

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In the last decade, we have gained substantial knowledge on the control of the fate of innate lymphoid cells (ILCs), a group of lymphocytes including natural killer (NK) cells, which lack, in contrast to T and B cells, somatically rearranged antigen (Ag) receptors. ILCs are characterized by producing cytokines analogous to Th1, Th2 and Th17 cell subsets and hence divide into 3 major families: 1) INF α -producing ILC1, 2) IL-4, -5, and -13-producing ILC2, and 3) IL-22 and -17-producing ILC3; the latter depend on the nuclear orphan receptor ROR α t. Our previous research has shed light on how a subset of ILC3 named lymphoid tissue inducer (LTi) cells is regulated by cytokines. Less is known about their roles in early response to inflammation and in tissue remodelling. In addition various subsets of ILCs with immunogenic or tolerogenic function have been described that may depend on environmental cues. The identification of molecular pathways that regulate ILC differentiation and function is essential for a better understanding of how ILCs contribute to protective or pathological responses.

A main focus of this proposal is to discriminate immune functions of ILCs under steady-state and activating conditions in various organs, and to identify pathways that regulate the differentiation of the cells. Using genetically modified mouse models as well as *in vitro* assays we will investigate whether ILCs can stimulate dendritic cells (DC), T cells and non-hematopoietic cells under steady-state or activating conditions. Finally we will study the transcriptional program regulating ILC development from hematopoietic precursor cells and their functional maturation. This proposal aims at understanding

.äää ***the response of ILCs towards inflammatory changes***

.äää ***the role of ILCs in tissue homeostasis and remodelling***

.äää ***the pathways regulating ILC development and differentiation***

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