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Understanding signaling pathways regulating CD4⁺ T cell effector function

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Our laboratory is interested in the signaling pathways that regulate the T cell development and differentiation required for successful responses to diverse immune challenges. We are currently examining the role of the Tec kinases and T cell receptor signaling in regulating distinct types of T cell development in the thymus leading to the selection and maturation of conventional T cells versus T lymphocytes with innate cell properties. Similarly, in the periphery, we are interested in how altered TCR signaling in mice deficient in the Tec kinase Itk and related signaling molecules affects the differentiation of distinct effector T cell populations required for proper responses to infection. In parallel, we are studying signaling from the adaptor molecule SAP and the associated SLAM family receptors and how these pathways affect innate T cell development as well as the function of mature T cell effector populations. Recent studies have revealed a critical role for SAP and SLAM family members in regulating cell adhesion required for successful T:B cell interactions and have helped delineate distinct regulation of T cell interactions with dendritic cells and B cells.

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