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Research interests

Our long-term research interest is to understand molecular mechanisms that regulate the development and function of immune cells. The research in our laboratory focuses on studies to investigate epigenetic and transcriptional control mechanisms that regulate CD8 coreceptor gene expression, on the identification of genes that control developmental processes such as CD4/CD8 cell fate decision during T cell differentiation, and on studies to reveal the various roles of Tec family kinases in different cell lineages of the immune system. The experimental strategies to address our research interests include biochemical and molecular approaches, retroviral-mediated gene transduction into hematopoietic stem cells, and mouse molecular genetics tools.

Ongoing projects in the laboratory in the field of T cell development focus on the role of 3 transcriptional regulators: MAZR, ThPOK and PLZF, which are all members of the BTB zinc finger protein family. ThPOK is the master commitment factor for CD4 lineage development, MAZR is a regulator of *Cd8* and *ThPOK* gene expression, and PLZF is an essential factor for the development of the iNKT cell effector program. Projects within the DK address the function of some of these factors. In particular, in one of the projects we will investigate the function of a novel ThPOK and MAZR interacting protein using RNAi approaches and mouse molecular genetic tools.

Selected publications

Sakaguchi S, Hombauer M, Bilic I, Naoe Y, Schebesta A, Taniuchi I, **Ellmeier W.** (2010) The zinc-finger protein MAZR is part of the transcription factor network that controls the CD4 versus CD8 lineage fate of double-positive thymocytes. *Nature Immunology* 11, 442-8.

Raberger, J., Schebesta, A., Sakaguchi, S., Boucheron, N., Blomber, K.M., Berglöff, A., Kolbe, T., Smith, C.I.E., Rüllicke, T., and **Ellmeier, W.** (2008). The Transcriptional Regulator PLZF Induces the Development of CD44-High Memory-Phenotype T Cells. *PNAS*, 105, 17919-24.

Bilic, I., and **Ellmeier, W.** (2007). The role of BTB domain-containing zinc finger proteins in T cell development and function. *Immunol Lett.* 108, 1-9.

Bilic, I., Kösters, K., Unger, B., Sekimata, M. Hertweck, A., Maschek, R., Wilson, C.B. and **Ellmeier, W.** (2006). Negative regulation of CD8 expression via CD8 enhancer-mediated recruitment of the zinc finger protein MAZR. *Nature Immunology*, 7, 392-400.