Functional and mechanistic characterization of solute carriers in immune responses

Prof. Manuele Rebsamen

Abstract:

The Rebsamen laboratory focuses on the investigation of the signaling pathways and metabolic processes that allow immune cells to detect and respond to invading pathogens, and their implication in autoimmune diseases. A particular interest of the lab is the characterization of the role of Solute Carriers (SLCs), a family of transporter proteins, in immune functions and immunometabolism. These transporters play a critical role in cellular metabolism by mediating exchanges of nutrients, metabolites and chemical matter between the environment and the intracellular milieu as well as between subcellular organelles. Moreover, mounting evidences, including our studies on SLC38A9 and SLC15A4, suggest that SLCs can also work as signaling hubs controlling the activation of central transduction pathways.
Our research aims at providing a better understanding of the signaling and metabolic processes controlling innate immune responses and autoimmune disease, and thereby contributing to identify potential targets for therapeutic intervention.

The current main focus of the lab is the characterization of the molecular mechanisms and the regulatory processes controlling the SLC15A4/TASL/IRF5 pathway as well as the definition of its pathophysiological relevance in innate immune responses and autoimmunity. To achieve this goal, we employ state-of-the-art biochemical, molecular and cell biological approaches (including proteomics and CRISPR/Cas9-based screening technologies) as well as in vivo studies.

The prospective candidates are invited to contact Prof. Rebsamen to discuss the different available projects, which are based on the ongoing investigation on the SLC15A4/TASL and SLC38A9/mTORC1 pathways as well as other related SLCs.

Relevant publications:

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Zhang H, Bernaleau L, Delacrétaz M, Hasanovic E, Drobek A, Eibel H, Rebsamen M. SLC15A4 controls endolysosomal TLR7-9 responses by recruiting the innate immune adaptor TASL. Cell Reports 2023; 42:112916.

Heinz LX, Lee J, Kapoor U, Kartnig F, Sedlyarov V, Papakostas K, César-Razquin A, Essletzbichler P, Goldmann U, Stefanovic A, Bigenzahn JB, Scorzoni S, Pizzagalli MP, Bensimon A, Müller AC, King FJ, Li J, Girardi E, Mbow ML, Whitehurst CE, Rebsamen M#,

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