Mon 6. May 2019
Time: 12:00 h

Institute of Biochemistry and Molecular Medicine (IBMM)
Seminar Room
Gertrud-Woker-Str. 5,
3012 Bern

Everybody is welcome

Follow the NCCR TransCure lectures:
http://www.nccr-transcure.ch/events
Twitter: @NCCR_TransCure

Manuele Rebsamen is senior postdoctoral pellow at CeMM - Research Center for Molecular Medicine of the Austrian Academy of Sciences, Vienna (AT)

This lecture is hosted by Prof. Hugues Abriel (IBMM).

NCCR TransCure Lecture in Biology
by Manuele Rebsamen

Functional characterization of solute carriers using omics approaches: cell growth, signaling and death

Solute carriers (SLCs) contribute to essential physiological functions by mediating the transport of nutrients, metabolites and chemical matter across membranes. Despite this critical role, a large proportion of the over 450 SLCs remains poorly studied. In order to address this knowledge gap, we applied unbiased proteomics as well as gain- and loss-of-function genetic approaches to identify and functionally characterize SLCs involved in cellular processes of central pathophysiological relevance such as cell growth, cell death and immune activation.

Through extensive proteomic analysis, we identified the previously uncharacterized amino acid transporter SLC38A9 as a member of the lysosomal sensing machinery that signals amino acid availability to mTORC1, a central regulator of cell growth and metabolism. Based on our findings, we propose that SLC38A9 acts as a transceptor (transporter-receptor) in which amino acid engagement is used for allosteric signal transduction rather than mere transport.

While investigating SLCs involved in cell death and inflammation, we uncovered the essential role for the zinc transporter SLC39A7 in TNF receptor trafficking, and showed that a novel protein complex involving the histidine/oligopeptide transporter SLC15A4 is required for endosomal Toll-like receptor signaling.

Altogether, these results illustrate how complementary approaches can be used to identify and characterize SLCs affecting different disease-associated processes, revealing novel potential targets for pharmacologic intervention.

NCCR TransCure
Excellence in Membrane Transport Research

FNSNF
Swiss National Science Foundation

UNIVERSITÄT BERN