NCCR TransCure Final Scientific Conference

Bern, 17-19 August 2022

Conference program as of July 2021

Wednesday, August 17, 2022

08:15 – 08:45	Registration
08:45 – 09:00	**Conference opening and welcome**
09:00 – 12:30	**Session 1** *(with break)* **Nutrient transporters: function, structure and impact on health and disease** Chair / co-chair: Christiane Albrecht and Dimitrios Fotiadis
12:30 – 14:00	Lunch break
14:00 – 16:30	**Session 2** *(with break)* **Lipid transport between and within membranes** Chair / co-chair: Wanda Kukulski and Jürg Gertsch
16:30 – 16:45	Short break
16:45 – 18:15	**Poster session I**
18:15 – 19:15	Welcome apéro
19:15	Visit to the NCCR TransCure public exhibition "Vitaport" (for SNSF review panel members and NCCR TransCure PIs only)

Thursday, August 18, 2022

08:45 – 09:00	**Welcome to the second day**
09:00 – 12:30	**Session 3** *(with break)* **Recent developments in ion channel research** Chair / Co-chair: Hugues Abriel and Christine Peinelt
12:30 – 14:00	Lunch break
14:00 – 16:30	**Session 4** *(with break)* **Novel drug targets in neuropsychiatric disorders** Chair / co-chair: Andrea Volterra and Jean-Louis Reymond
16:30 – 16:45	Short break
16:45 – 17:45	**Paul Walton: gender equality session**
17:45 – 19:15	**Poster session II**
20:00	Conference dinner

Friday, August 19, 2022

08:45 – 09:00	**Conference opening and welcome**
09:00 – 12:30	**Session 5** *(with break)* **Synthetic antibody fragments as tools in membrane protein research** Chair / co-chair: Kaspar Locher and Raimund Dutzler
12:30 – 14:00	Lunch break
14:00 – 16:30	**Session 6** *(with break)* **Chemical Biology and Drugging SLCs** Chair / co-chair: Martin Lochner and Karl-Heinz Altmann
16:30 – 17:15	Award ceremony and conclusion
17:30	Review panel session & dinner (for SNSF review panel members and NCCR TransCure PIs only)

Overview of the sessions

1. Nutrient transporters: function, structure and impact on health and disease
Chair / co-chair: C. Albrecht, D. Fotiadis

This session allows to elegantly combine the field structural biology and physiology. Speakers may address topics such as folate or peptide transporters, amino acid transporters and metabolic programming of the offspring, regulation of iron transport and the interplay between V-ATPases, transporters and tumorigenesis. As such, the session will be suitable not only for researchers working on amino acid transporters (SLC7 family) and iron (DMT, ferroportin), but could also be interesting for scientist at the international level investigating for instance vitamin or peptide transporters.

2. Lipid transport between and within membranes
Chair / co-chair: W. Kukulski / J. Gertsch

In cells, lipids and related hydrophobic molecules localise differentially to cellular membranes and are asymmetrically distributed within membranes. Moreover, the local availability of lipids actively involved in signalling needs to be tightly regulated. Recently, proteins that facilitate the distribution between different membranes and across bilayers are being characterised, however many mysteries remain regarding transport mechanisms and regulation on the cellular level. In this session we cover emerging research on the cellular distribution of lipid species, identification of lipid transport proteins and structural / molecular mechanisms of lipid transfer proteins.

3. Recent developments in ion channel research
Chair / Co-chair: H. Abriel, C. Peinelt

Within our session we plan to present recent developments in ion channel research. The speakers may address topics such as the discovery of new ion channels, the function of ion channels structure unraveled by Cryo-EM, as well as novel concepts of autoantibodies in cardiac ion channel (dys)function.

4. Novel drug targets in neuropsychiatric disorders

Chair / Co-chair: A. Volterra, J.-L. Reymond

According to classical views, the specific neurobiological substrate of neurological and psychiatric conditions resides in an acute or chronic alteration of the neuronal circuitry. In keeping, drug strategies for CNS disorders have classically focused on interacting specifically with neuronal molecular targets (neurotransmitter receptors, transporters, ion channels etc.). Glial cells, the other 50% of brain cells, were considered to just react secondarily to neuronal alterations/damage and mostly ignored as drug targets. However, work of the last 30 years has overturned these views and shown that glial cells are integrally involved in normal brain physiology and computations and could be among the primary actors of derangement in pathology. Our session aims at presenting in a logical continuum: 1) the basic biology discoveries supporting the paradigm shift about the role of glial cells in brain function/dysfunction. 2) The approaches used, notably in NCCR TransCure, to selectively target drugs to glial cells. 3) Current efforts by industrial partners to develop glia-centred therapeutic strategies with clinical potential against specific CNS conditions.

5. Synthetic antibody fragments as tools in membrane protein research

Chair / Co-chair: K. Locher, R. Dutzler

Over the past years, antibody fragments obtained from synthetic libraries have become important tools in various aspects of membrane protein research. They complement monoclonal antibodies, which are generated by animal immunization and cell fusion to produce hybridoma cells. In this session, two experts in the field will describe the current state of the art of generating synthetic antibody fragments from libraries and discuss applications in fundamental and applied research. Their full talks will be supplemented by short presentations highlighting the use of such protein binders for structural and in vitro functional experiments.

6. Chemical Biology and Drugging SLCs

Chair / Co-chair: M. Lochner, K.-H. Altmann

Membrane proteins such as ion channels and receptors have been notoriously difficult to target with small compounds as they are most often multimeric and conformationally flexible. Developing therapeutic and tool compounds that bind with high affinity and selectivity, and achieve the stabilisation of one particular conformation (active or inactive), is still challenging. Even more so in the realm of transporters that are very dynamic and small molecule binding site are ever changing. With increasingly improving structural biology methods and medicinal chemistry structure-activity relationship data significant progress was achieved in the last few years. Experts in the field will give an insight on the basis of case studies (neuronal glutamate transporters EAATs and L-type amino acid transporter LAT-1) and show how combination of various methodologies help to discover novel, potent transporter modulators, and how such compounds potentially could be advanced into the clinic.