

ZNZ Symposium 13 September 2018

Thursday, 13 September 2018

UZH Central Campus, Lecture Hall HAH E3, Häldeliweg 2, Zurich

- 8:30 – 8:45 **Introduction**
Prof. Fritjof Helmchen, Director ZNZ
- 8:45 – 9:30 Volker-Henn Lecture
Dopamine, reward and economic utility
Prof. Wolfram Schultz, University of Cambridge
- 9:30 – 10:00 Coffee Break
- 10:00 – 11:30 Parallel Workshops
- Electrical brain stimulation: From neurophysiology to clinical application**
(Lecture Hall E3)
Organization: Prof. Christian Ruff and Prof. Christian Baumann
- The bright and the dark side of glia**
(Lecture Hall F1)
Organization: Prof. Bruno Weber and Prof. Michael Weller
- Imaging pathological changes in CNS tissue composition and physiology**
(Lecture Hall E11)
Organization: Prof. Jan Klohs and PD Dr. Paul Unschuld
- 11:30 – 14:00 **Poster Session**, Lunch (Foyer)
- 11:30 **General Assembly of ZNZ Group Leaders** (Lecture Hall E3)
- Short Talks, Part I:
- 14:00 – 14:20 **MicroRNA function in mammalian synapse development and behavior**
Prof. Gerhard Schratt, Institute for Neuroscience, ETH
- 14:20 – 14:40 **Automated large-scale reconstruction of synaptic-resolution neural wiring diagrams from volume EM data**
Dr. Michal Januszewski, Google AI , Zurich
- 14:40 – 15:00 **Engineering brain activity patterns for therapeutics**
Prof. Mehmet Fatih Yanik, Neurotechnology Laboratories, ETH
- 15:00 – 15:20 **Understanding and modulating human decision behavior via neurocomputational modelling and brain stimulation**
Prof. Rafael Polania, Decision Neuroscience Lab, ETH
- 15:20 – 16:00 Coffee Break

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Short Talks, Part II:

- 16:00 – 16:20 **The bodily self and its plasticity in health and disease**
Prof. Bigna Lenggenhager, Department of Psychology, UZH
- 16:20 – 16:40 **Advanced MRI in gliomas**
Prof. Christoph Stippich, Department of Neuroradiology, University Hospital
Zürich
- 16:40 – 16:55 **ZNZ Award for the Best PhD Thesis 2018**
- Short Break
- 17:00 – 17:45 Betty and David Koetser Award Lecture:
Multiple sclerosis: the story of mechanism-based therapeutics
Prof. Alastair Compston, University of Cambridge
- 17:50 – 18:30 Apéro

Parallel Workshops, 10:00 – 11:30

Electrical brain stimulation: From neurophysiology to clinical application

(Lecture Hall E3)

Electrical brain stimulation methods are becoming increasingly popular in research and the clinic, due to their capacity to modulate human brain function in a safe and often non-invasive manner. The properties and possible limitations of these methods are currently the subject of lively debate. This workshop gives an overview of how these methods can be tailored - based on measures of neurophysiology and brain-behavior-relations - to assess and enhance clinically relevant aspects of brain function.

Introduction

Prof. Christian Ruff, Zurich Center for Neuroeconomics, UZH

- 10:00 – 10:30 **The neurophysiology of transcranial electrical stimulation**
Prof. Michael Nitsche, Leibniz Research Centre for Working Environment and Human Factor, University of Dortmund
- 10:30 – 10:45 **Studying large-scale oscillatory brain interactions with transcranial alternating current stimulation**
Prof. Rafael Polania, Decision Neuroscience Lab, ETH
- 10:45 – 11:00 **Brain network computations underlying value-based decisions revealed by transcranial alternating current stimulation**
Dr. Marius Moisa, Zurich Center for Neuroeconomics, UZH
- 11:00 – 11:15 **EEG feedback-controlled sleep stimulation establishes the influence of sleep oscillations on brain function**
Dr. Caroline Lustenberger, Mobile Health Systems Lab, ETH
- 11:15 – 11:30 **Assessing deep brain stimulation effects with Magnetic Resonance Spectroscopy**
PD Dr. Ruth O'Gorman Tuura, Center for MR Research, University Children's Hospital Zurich

Parallel Workshops, 10:00 – 11:30

The bright and the dark side of glia

(Room F1)

The discovery of glia as a major class of cells in the nervous system dates back more than a decade. But what do they do? What emerges from recent research is the importance of glial cells in development, function, and malfunction that can only be understood as a tight interplay between neurons and glial cells. Rather than being passive support cells as long thought, glial cells are highly active players in many - if not all - neurobiological processes. In this workshop, some of these intriguing glial functions are highlighted in normal physiology and when things go wrong.

Introduction

Prof. Bruno Weber, Institute of Pharmacology and Toxicology, UZH, and
Prof. Michael Weller, Dept. of Neurology, USZ

- 10:00 – 10:30 **Mechanisms of neuron-glia signaling and metabolic coupling**
Dr. Aiman Saab, Institute of Pharmacology and Toxicology, UZH
- 10:30 – 11:00 **Astrocytes as the pivotal damage management cells in the CNS:
The fine regulation of reactive astrogliosis**
PD Dr. Svetlana Sirko, Department of Physiological Genomics, Ludwig-
Maximilian-University of Munich
- 11:00 – 11:30 **How glial are gliomas?
Genetic glioma models to explore vulnerabilities of the tumor
microenvironment**
Dr. Hans-Georg Wirsching, Department of Neurology, University Hospital
Zurich

Parallel Workshops, 10:00 – 11:30

Imaging pathological changes in CNS tissue composition and physiology (Lecture Hall E11)

Neuroimaging has evolved from a platform providing mere anatomical data of the central nervous system to one that can quantitatively probe tissue composition and derive physiological and molecular information. This progress has been made possible by advances in imaging hardware and post-processing algorithms as well as the design and synthesis of new imaging probes. In this workshop, four lectures will present methodological advances in imaging and discuss their application to diseases of the central nervous system.

Introduction and Moderation

Jan Klohs, Institute for Biomedical Engineering, UZH & ETH, and Paul Unschuld, USZ

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| 10:00 - 10:45 | Amyloid and vascular dysfunction in Alzheimer`s disease
Jun Hua, Johns Hopkins University School of Medicine, Baltimore, USA |
| 10:45 - 11:00 | Quantitative susceptibility mapping of iron in Alzheimer`s disease
Laetitia Vionnet, Institute for Biomedical Engineering, UZH & ETH |
| 11:00 - 11:15 | Photoacoustic imaging of hemodynamic dysfunction and amyloid deposition in preclinical models of Alzheimer`s disease models
Ruiqing Ni, Institute for Biomedical Engineering, UZH & ETH |
| 11:15 - 11:30 | Quantitative MRI of spinal cord injury
Patrick Freund, Spinal Cord Injury Center, Balgrist University Hospital |