

ZNZ

Zentrum für Neurowissenschaften Zürich
Neuroscience Center Zurich



**University of
Zurich** UZH

ETH

Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

ZNZ SYMPOSIUM 2014

11 September 2014

08.30 – 18.30

UZH Main Campus

Häldeliweg 2

8044 Zurich

PROGRAM

Thursday, 11 September 2014

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

- 8:30 – 8:45 **Introduction**
- 8:45 – 9:30 Volker-Henn Lecture:
Connectomics in the peripheral and central nervous system
Prof. Jeff Lichtman, Harvard University
- 9:30 – 10:00 Coffee Break
- 10:00 – 11:30 Parallel Workshops:
- Clinical Research Priority Program in Neurorehabilitation:
 Neuroimaging in translational neuroscience** (Lecture Hall E 3)
 Organization: Prof. Armin Curt and Prof. Andreas Luft
- Neuromorphic systems for neuroscience, robotics and computing:
 Current state-of-art and impact** (Lecture Hall F1)
 Organization: Prof. Giacomo Indiveri and PD Dr. Shih-Chii Liu
- Translational studies of altered reward processing in psychiatric
 disorders** (Lecture Hall E 11)
 Organization: Prof. Erich Seifritz and PD Dr. Christopher Pryce
- 11:30 – 14:00 **Poster Session, Lunch (Foyer)**
11:30 **General Assembly of ZNZ Group Leaders** (Lecture Hall E3)
- 14:00 – 14:20 Short Talks, Part I:
**Pathogenic mechanisms of ALS and FTD: From RNA misregulation to
protein aggregation**
Prof. Magdalini Polymenidou, Institute of Molecular Life Sciences,
University of Zurich
- 14:20 – 14:40 **Neuromodulatory opto-fMRI**
Dr. Bechara Saab, University Hospital for Psychiatry, Zurich
- 14:40 – 15:00 **Long-range functional interactions in the resting human brain**
Dr. Dante Mantini, Neural Control of Movement Lab ETH Zurich and Oxford
University
- 15:00 – 15:20 **Current translational research in child and adolescent psychiatry**
Prof. Susanne Walitza, Dept. of Child and Adolescent Psychiatry, University of
Zurich
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- 15:20 – 16:00 Coffee Break
- 16:00 – 16:20 Short Talks, Part II:
Behavioral and neural mechanisms of self-control in goal-directed choice
Prof. Todd Hare, Laboratory for Social and Neural Systems Research,
University of Zurich
- 16:20 – 16:40 **Computational modeling of cerebrospinal fluid dynamics**
Prof. Vartan Kurtcuoglu, Institute of Physiology, University of Zurich
- 16:40 – 16:55 **ZNZ Award for the Best PhD Thesis 2014**
- Short break
- 17:00 – 17:45 Memorial Award Lecture of the Koetser Foundation:
Cortical circuits of vision
Prof. Massimo Scanziani, Dept. of Biology, University of California San Diego
- 17:45 – 18:30 Apéro

Parallel Workshops

Workshop 1

Clinical Research Priority Program in Neurorehabilitation: Neuroimaging in translational neuroscience (Lecture Hall E 3)

The workshop focuses on the role of neuroimaging techniques for diagnosis, treatment selection and monitoring of nervous system diseases. In the last two decades neuroimaging has fundamentally contributed to a better pathophysiological understanding of CNS disorders. In addition, neuroimaging has provided several surrogate markers that enable the measurement of disease progression and the effects of therapeutic interventions. Hence, neuroimaging has a central role in clinical trials investigating treatment efficacy. This workshop will illustrate how the application of imaging surrogate markers improved the translational process in neuroscience from preclinical concepts to the treatment of specific CNS disorders.

- 10:00 – 10:05 **Introduction**
Prof. Armin Curt, Spinal Cord Injury Center, Balgrist University Hospital Zurich
- 10:05 - 10:20 **Neuroimaging in preclinical animal models**
Dr. Susanne Wegener, Dept. of Neurology, University Hospital Zurich
- 10:20 - 10:35 **Development of refined micro/macro-structural neuroimaging**
Dr. Nikolaus Weiskopf, Institute of Neurology, University College London
- 10:35 - 10:50 **Lessons learned in multiple sclerosis research**
Dr. Sven Schippling, Dept. of Neurology, University Hospital Zurich
- 10:50 - 11:05 **Lessons learned in spinal cord injury**
Dr. Patrick Freund, Spinal Cord Injury Center, Balgrist University Hospital Zurich
- 11:05 - 11:20 **Stroke and rehabilitation research**
Prof. Andreas Luft, Dept. of Neurology, University Hospital Zurich

Parallel Workshops

Workshop 2

Neuromorphic systems for neuroscience, robotics and computing: Current state-of-art and impact (Lecture Hall F1)

This workshop showcases examples of neuromorphic systems that have had impact in fields of neuroscience, robotics and computing. Although the field of neuromorphic engineering dates back to the 1980s, it has enjoyed a resurgence of attention in recent years in part because of electronic brain-inspired sensory-motor systems that successfully demonstrate the power and latency benefits of spike-based computing. Both research funding bodies and commercial groups in the US and Europe are currently investing heavily in neuromorphic computing technologies. This technology is also listed in the MIT Technology Review as one of the 10 breakthrough technologies of 2014. This workshop will provide a sampling of the research and development work ongoing in this field and will show examples of systems that have a high potential impact in experimental neuroscience and robotics as finer sensory algorithms are introduced and low-power embedded systems are improved.

- 10:00 - 10:20 **Neuromorphic circuits in neuroscience research**
Prof. Giacomo Indiveri, Institute of Neuroinformatics, University and ETH Zurich
- 10:20 – 10:40 **Neuromorphic sensory systems**
Prof. Tobi Delbruck, Institute of Neuroinformatics, University and ETH Zurich
- 10:40 - 11:00 **Event-based visual processing, a high-speed frame-free neuromorphic approach**
Prof. Alejandro Linares-Barranco, University of Seville, Spain
- 11:00 - 11:20 **A neuromorphic humanoid robot**
Dr. Chiara Bartolozzi, Italian Institute of Technology, Genova, Italy

Parallel Workshops

Workshop 3

Translational studies of altered reward processing in psychiatric disorders (Lecture Hall E11)

In psychiatry it is increasingly recognized that specific psychopathologies (rather than heterogeneous diagnostic entities) need to be the focus of research aimed at understanding aetio-pathophysiology and discovering new, improved treatments. Disrupted reward processing is a major example of such psychopathology domains, and cuts across several psychiatric disorders including mood disorders and schizophrenia. This workshop comprises talks on: (1) Monkey and mouse studies of how reward processing is regulated and can become disrupted. (2) Human studies of how impaired reward processing in depression and schizophrenia can be defined and measured. Integrating such approaches allows for improved neurobiological understanding of how reward processing is regulated and dysregulated, with the ultimate aim of developing improved treatments for reward psychopathologies.

- 10:00 - 10:20 **Neurobehavioural studies of the regulation of reward processing in primates**
Prof. Angela Roberts, University of Cambridge
- 10:20 - 10:40 **Controllability influences feedback processing in major depressive disorder**
Dr. Simona Spinelli, Dept. of Psychiatry, Psychotherapy and Psychosomatics, University of Zurich
- 10:40 - 11:00 **Neurobehavioural studies of reward processing and its dysfunction in inflammation-mediated developmental mouse models of schizophrenia**
Dr. Urs Meyer, Laboratory for Physiology and Behavior, ETH Zurich
- 11:00 - 11:20 **Developing tasks for the empirical study of apathy and other negative symptoms in schizophrenia**
PD Dr. Stefan Kaiser, Dept. of Psychiatry, Psychotherapy and Psychosomatics, University of Zurich
- 11:20 - 11:30 General discussion