

ZNZ Annual Symposium 2023

Thursday, 14 September 2023

ETH Zurich Main Building, Lecture Hall F7, Rämistrasse 101, 8092 Zurich

- 08:30 – 08:45 **Introduction**
Prof. Fritjof Helmchen, Director ZNZ
- 08:45 – 09:30 Volker Henn Lecture
Mechanisms of axon growth and regeneration
Prof. Frank Bradke, German Center for Neurodegenerative Diseases, Bonn
- 09:30 – 10:15 Coffee Break
- 10:15 – 11:45 Parallel Workshops
- Updates on neurodegeneration research: From bench to bedside and back**
Lecture Hall F7, Organization: Dr. Daniela Noain
- Precision recording and manipulation of brain circuits**
Lecture Hall F5, Organization: Prof. Fatih Yanik
- Beauty and the beast - hijacking of physiologic brain functions by glioblastoma**
Lecture Hall F3, Organization: PD Dr. Hans-Georg Wirsching
- 11:45 – 14:15 **Poster Session**, Lunch (Foyer)
11:45 **General Assembly of ZNZ group leaders** (Lecture Hall F7)
- 14:15 – 14:30 **ZNZ Award for the Best PhD Thesis 2023**
- Short Talks of New Members
- 14:30 – 14:50 **Astrocytes in brain development and behavior**
Dr. Tina Notter, Institute of Pharmacology and Toxicology, UZH
- 14:50 – 15:10 **The interface between epilepsy and neurodegeneration**
PD Dr. Marian Galovic, Department of Neurology, USZ
- 15:10 – 15:30 **Neurorehabilitation technologies: Supporting upper limb functional recovery from the clinic to home**
Dr. Olivier Lambercy, Institute of Robotics and Intelligent Systems, ETHZ
- 15:30 – 15:50 **Brain-inspired structure-function duality in resistive memory-based electronics**
Prof. Melika Payvand, Institute of Neuroinformatics, UZH and ETHZ
- 15:50 – 16:30 Coffee Break
- 16:30 – 17:15 Betty and David Koetser Award Lecture
Making memories in mice
Prof. Sheena Josselyn, University of Toronto, Canada
- 17:15 – 18:00 Apéro

Parallel Workshops, 10:15 – 11:45

Updates on neurodegeneration research: From bench to bedside and back

(Lecture Hall F7)

Neurodegenerative diseases, such as Alzheimer's disease (AD), Parkinson's disease (PD) and Prion disease, lead to a hugely decreased quality of life for patients as well as to a considerable socioeconomic burden for healthcare systems worldwide. Despite the investment of decades of intensive research, effective treatments for specific management of symptoms and disease-modifying therapies remain a largely unmet medical need.

In this workshop, we will highlight both basic and clinical AD, PD and Prion investigations and discuss key research questions ranging from molecular mechanisms involved in disease pathogenesis, to development and exploration of multimodal imaging approaches for disease monitoring, to non-invasive deep sleep modulation for symptoms management and disease modification in clinical populations. The rich expertise of the invited expert panel will provide wide opportunity for attendees to gain new insights into the bidirectional bench-bedside research dialogue.

Introduction and moderation

Dr. Daniela Noain, Department of Neurology, USZ

Dr. Juan Gerez, Laboratory of Physical Chemistry, ETHZ

Dr. Ruiqing Ni, D-ITET, ETHZ

10:15 – 10:25	Introduction
10:25 – 10:40	Unravelling the molecular basis of synucleinopathies: From biology to pathobiology Prof. Tiago Outeiro, Department of Neurodegeneration and Restorative Research, University Medical Center Göttingen
10:40 – 10:55	Slow wave enhancement in Parkinson disease - from symptomatic benefit to neuroprotection Dr. Angelina Maric, Department of Neurology, USZ
10:55 – 11:10	Multimodal imaging in animal models of neurodegenerative diseases Dr. Ruiqing Ni, D-ITET, ETHZ
11:10 – 11:25	Brain change during aging: Implications for prevention and treatment of dementia. Prof. Paul Unschuld, Geriatric Psychiatric Service, University Hospital Geneva
11:25 – 11:40	Studying the role of primary cilia in prion toxicity Dr. Tingting Liu, Institute of Neuropathology, USZ
11:40 – 11:45	Closing remarks

Parallel Workshops, 10:15 – 11:45

Precision recording and manipulation of brain circuits

(Lecture Hall F5)

This workshop will highlight recent advances and applications in precision recording and manipulation of brain circuits in animal models and discuss their clinical potential. The talks will cover high-density ultraflexible electrodes for brain machine interfaces, non-invasive ultrasound-based receptor-specific modulation of brain circuits, as well as potential applications in high-channel count neuroprosthetics and closed-loop systems for brain disorders.

- 10:15 – 10:30 **A thousand-channel deep-brain visual prosthesis**
Prof. Nathaniel Kilian, Albert Einstein College of Medicine, USA
- 10:30 – 10:45 **Closed-loop recruitment of striatal interneurons prevents compulsivity in mouse model**
Dr. Christiane Schreiweis, Paris Brain Institute, Paris, France
- 10:45 – 11:00 **Long-term single-neuron recordings from multiple brain areas with high-density ultra-flexible electrode arrays**
Baran Yasar, Institute of Neuroinformatics, UZH and ETHZ
- 11:00 – 11:15 **Combined electrical and optical recording of multi-scale neural circuit dynamics with flexible multi-electrode arrays**
Dr. Christopher Lewis, Brain Research Institute, UZH
- 11:15 – 11:30 **Non-invasive focally-concentrated drug delivery by AU-FUS**
Dr. Mehmet Ozdas, Institute of Neuroinformatics, UZH and ETHZ
- 11:30 – 11:45 **FUS for personalised medicine - from in silico to in vivo**
Dr. Esra Neufeld, Associate Director, IT'IS Foundation, Zurich

Parallel Workshops, 10:15 – 11:45

Beauty and the beast – hijacking of physiologic brain functions by glioblastoma

(Lecture Hall F3)

Glioblastoma is the most common primary malignant brain cancer in adults and conveys an invariably deadly disease course. Despite multimodal treatment comprising surgery and chemoradiotherapy, median survival of glioblastoma patients is in the range of just one year. A key obstacle to overcoming the highly malignant phenotype and resistance to anti-neoplastic therapy is the hijacking and reshaping of the brain microenvironment by glioblastoma cells. Beyond the induction of immunosuppressive, tumor cell-like phenotypes of microglia and macrophages, accumulating evidence established the presence of gap-junction-coupled glioma cell calcium signaling networks as well as the electrochemical integration and mutual modulation of these networks into astrocytic and neuronal signaling networks. In this workshop, we will introduce basics, emerging concepts and clinical strategies to reprogram the brain microenvironment for the benefit of glioblastoma patients.

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| 10:15 – 10:20 | Introduction
PD Dr. Hans-Georg Wirsching, Department of Neurology, USZ and UZH |
| 10:20 – 10:40 | Reprogramming of brain immunity in glioblastoma models
Dr. Tobias Weiss, Department of Neurology, USZ and UZH |
| 10:40 – 11:00 | Targeting glutamatergic signal transduction in glioblastoma patients
PD Dr. Hans-Georg Wirsching, Department of Neurology, USZ and UZH |
| 11:00 – 11:45 | The cancer neuroscience of brain tumor networks
Dr. Varun Venkataramani, Department of Functional Neuroanatomy, Heidelberg University |