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
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

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.

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