

# ZNZ Annual Symposium 2022

Thursday, 15 September 2022  
UZH Central Campus, Lecture Hall HAH E3, Haldeliweg 2, Zurich

- 08:30 – 08:45     **Introduction**  
Prof. Fritjof Helmchen, Director ZNZ
- 08:45 – 09:30     Volker Henn Lecture  
**Molecular genetics of essential tremor**  
Prof. Guy Rouleau, Director Montreal Neurological Institute-Hospital, McGill University
- 09:30 – 10:15     Coffee Break
- 10:15 – 11:45     Parallel Workshops
- Structural and functional adaptations of brain networks (URPP AdaBD)**  
Lecture Hall E3, Organization: Prof. Fritjof Helmchen
- StimuLOOP: Precision sensorimotor neurorehabilitation through personalised stimulation loops**  
Lecture Hall E11, Organization: Dr. Oliver Lambercy and Prof. Andreas Luft
- The Hochschulmedizin Zurich Flagship Project STRESS**  
Lecture Hall F1, Organization: Dr. Miriam Ries
- 11:45 – 14:15     **Poster Session**, Lunch (Foyer)  
11:45                **General Assembly of ZNZ group leaders** (Lecture Hall E3)
- 14:15 – 14:30     **ZNZ Award for the Best PhD Thesis 2022**
- Short Talks of New Members
- 14:30 – 14:50     **Dopamine-dependent circuits and behavior across the lifespan**  
Dr. Marie Labouesse, Translational Nutritional Biology Lab, ETH Zurich
- 14:50 – 15:10     **Marmoset monkeys as model species in Evolutionary Anthropology and Neuroscience**  
Prof. Judith Burkart, Department of Anthropology, University of Zurich
- 15:10 – 15:30     **Beyond cortico-motor control: Probing the role of the reticulospinal system in movement control and functional recovery after spinal cord injury**  
PD Dr. Linard Filli, Spinal Cord Injury Center, Balgrist University Hospital
- 15:30 – 15:50     **Deep brain stimulation in epilepsy: Studying neural dynamics between the anterior thalamus and the cortex in epilepsy patients**  
PD Dr. Lukas Imbach, Medical Director, Swiss Epilepsy Clinic, Klinik Lengg AG
- 15:50 – 16:30     Coffee Break
- 16:30 – 17:15     Plenary Lecture  
**Mapping and modeling microglia states to function in development and disease**  
Prof. Beth Stevens, F.M. Kirby Neurobiology Center at Boston Children's Hospital and Harvard Medical School
- 17:15 – 18:00     Apéro

## Parallel Workshops, 10:15 – 11:45

### Structural and functional adaptations of brain networks

(Lecture Hall E3)

Neural circuits in the brain form during embryonic and postnatal development, but also remain adaptive throughout adulthood, which is considered the basis for flexible behavior and learning. Adaptations comprise both structural reorganizations (e.g., rewiring) and functional adaptations (e.g., changes in excitability or in the interactions of cells or brain regions). Structural and functional changes typically go hand in hand, as structural changes on one level often imply functional changes on the next higher level. However, we still poorly understand the principles that underlie brain plasticity or the responsible mechanisms. The University Research Priority Program “Adaptive Brain Circuits in Development and Learning” (URPP AdaBD) focuses on such mechanisms of brain network adaptations from the molecular level to the large-scale circuit level. In this workshop, we will discuss diverse examples of brain network adaptations, covering a wide range of spatial scales – from molecular programs to changes in brain connectivity – as well as the translational axis from mouse to humans. Furthermore, we will discuss the role of non-neuronal cells in adaptive processes. The challenges remain high to better bridge and connect adaptive phenomena across scales, to achieve a more comprehensive understanding of brain adaptations and their behavioral significance.

#### Introduction and moderation

Prof. Esther Stoeckli, Department of Molecular Life Sciences, University of Zurich

Prof. Fritjof Helmchen, Brain Research Institute, University of Zurich

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| 10:15 – 10:20 | <b>Introduction</b>   |
| 10:20 – 10:45 | <b>Shaping cortical wiring and molecular programs by spontaneous neuronal activity</b><br>Prof. Peter Scheiffele, Biozentrum, University of Basel   |
| 10:45 – 11:00 | <b>Adolescence is a sensitive period for glia cells to act on structural and functional maturation of the prefrontal cortex</b><br>Dr. Tina Notter, Institute of Pharmacology and Toxicology, University of Zurich    |
| 11:00 – 11:15 | <b>Changes in brain network connectivity with learning and maturation in child development</b><br>Prof. Silvia Brem, Department of Child and Adolescent Psychiatry and Psychotherapy, University of Zürich            |
| 11:15 – 11:30 | <b>Dynamic reorganization of the cortico-basal ganglia-thalamo-cortical network during task learning</b><br>Dr. Yaroslav Sych, Institute of Cellular and Integrative Neurosciences, University of Strasbourg and CNRS |
| 11:30 – 11:45 | <b>Rewiring of adult brain circuits</b><br>Prof. Csaba Földy, Brain Research Institute, University of Zurich  |

## Parallel Workshops, 10:15 – 11:45

### **StimuLOOP: Precision sensorimotor neurorehabilitation through personalised stimulation loops** (Lecture Hall E11)

Parkinson's disease and stroke lead to a considerable socioeconomic burden for patients and health systems worldwide. Neurorehabilitation includes treatments to reduce disability, but their efficacies vary largely between individuals, and they frequently fail to achieve meaningful outcomes. The StimuLOOP project (supported by the LOOP Zurich and the Vontobel Foundation), aims at investigating two personalized and complementary approaches: real-time feedback during neurorehabilitation therapy sessions based on biomechanical or neural biomarkers, and modulation of sleep for offline consolidation.

In this workshop, we will highlight the different research avenues of the project at the interface between neurology, neurorehabilitation, and technology development. We will discuss the key research questions in the ongoing clinical trials, present preliminary results and depict a roadmap for the implementation of more personalized neurorehabilitation approaches that bridge the domains of neurorehabilitation and sleep.

#### **Introduction and moderation**

Prof. Andreas Luft, Stroke Center, University Hospital of Zurich

Dr. Olivier Lambercy, Rehabilitation Engineering Laboratory, ETH Zurich

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| 10:15 – 10:25 | <b>Introduction</b>  |
| 10:25 – 10:40 | <b>Neurorehabilitation: feedback, motor learning and recovery</b><br>Dr. Meret Branscheidt, cereneo Center for Neurology and Rehabilitation, Hertenstein |
| 10:40 – 10:55 | <b>Designing actionable feedback for personalised gait rehabilitation</b><br>Dr. Christopher Awai, cereneo Foundation, Hertenstein                       |
| 10:55 – 11:10 | <b>Deep Brain Stimulation neurofeedback in Parkinson's patients</b><br>Lena Salzmann, Rehabilitation Engineering Laboratory, ETH Zurich                  |
| 11:10 – 11:25 | <b>Sleep enhancement for boosting and consolidating rehabilitation gains</b><br>Nora Hjördis-Moser, Clinic for Neurology, University Hospital of Zurich  |
| 11:25 – 11:40 | <b>Gait biomarkers for personalised rehabilitation in people with Parkinson's disease</b><br>Dr. Deepak Ravi, Institute for Biomechanics, ETH Zurich     |
| 11:40 – 11:45 | <b>Closing remarks</b>   |

## **Parallel Workshops, 10:15 – 11:45**

### **Hochschulmedizin Zurich Flagship Project STRESS**

(Lecture Hall F1)

Stress affect millions of people worldwide and can have a continuing impact on physical and psychological wellbeing. It is a risk factor for chronic conditions including cardiovascular diseases and can negatively influence mental health. Despite its prevalence, the diagnosis and treatment of stress remain a challenge, especially in young people. A better understanding is needed of the mechanisms linking stress exposure to its negative effects.

This workshop, organized in conjunction with the Hochschulmedizin Zurich Flagship Project STRESS, will highlight the transdisciplinary nature of stress research, from the molecular to the clinical.

#### **Introduction and moderation**

Prof. Dr. Birgit Kleim, Psychiatric University Hospital Zurich and Department of Psychology, University of Zurich

Dr. Miriam Ries, Scientific Coordinator of Hochschulmedizin Zurich Flagship Project STRESS, ETH Zurich and University of Zurich

10:15 – 11:00

#### **Neurocognitive markers of stress-resilience: the relevance of emotional action control**

Prof. Karin Roelofs, Behavioural Science Institute, Radboud University

11:00 – 11:10

#### **Presentation of the Hochschulmedizin Zurich Flagship Project STRESS**

Prof. Isabelle Mansuy, Institute for Neuroscience, ETH Zurich and Brain Research Institute, University of Zurich

Prof. Birgit Kleim, Psychiatric University Hospital Zurich and Department of Psychology, University of Zurich

11:10 – 11:45

#### **Short talks**

##### **Investigating brain-based predictors of stress resilience and mental health in medical personnel**

Ella McPherson, Institute of Psychology, University of Zurich

##### **Effects of parenting on the emotion regulatory brain development**

Mirjam Habegger, Department of Psychology and Department of Economics, Jacobs Center for Productive Youth Development, University of Zurich

##### **More points, fewer mice**

Dr. Oliver Sturman, Institute for Neuroscience, ETH Zurich

##### **Cell-free RNA biomarkers of stress**

Dr. Bogdan Mateescu, Brain Research Institute, University of Zurich and Department of Chemistry and Applied Biosciences, ETH Zurich

##### **The effects of pupil-based neurofeedback on emotional responses**

Dr. Sarah Meissner, Department of Health Sciences and Technology, ETH Zurich