

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 2015

11 September 2015

08.30 – 18.30

ETH Main Building

Rämistrasse 101

8092 Zurich

PROGRAM

Friday, 11 September 2015
Lecture Hall F1, Building HG, ETH Zentrum, Rämistrasse 101, Zürich

- 8:30 – 8:45 **Introduction**
- 8:45 – 9:30 Volker-Henn Lecture
Functional organisation of cortical circuits important for vision
Prof. Thomas Mrsic-Flogel, Biozentrum, University of Basel
- 9:30 – 10:00 Coffee Break
- 10:00 – 11:30 Parallel Workshops
- Open questions on statistical inference and learning in neuroscience**
(Room E1.1)
Organization: Prof. Jean-Pascal Pfister
- Neurodegeneration and protein aggregation** (Room E1.2)
Organization: Prof. Magdalini Polymenidou and Prof. Paola Picotti
- Clinical neuroscience: eye and brain - innovation in neuro-ophthalmology**
(Room D1.1)
Organization: Prof. Klara Landau and Prof. Luca Regli
- 11:30 – 14:00 **Poster Session**, Lunch (Foyers E-Nord, D-Nord)
11:30 **General Assembly of ZNZ Group Leaders** (Lecture Hall F1)
- 14:00 – 15:30 **Oxford Neuroscience – opportunities for collaboration**
Introduction to brain research at the University of Oxford by several speakers
- 15:30 – 16:00 Coffee Break
- Plenary talk
- 16:00 – 16:45 **Astrocytes as master regulators of the sleep-wake cycle**
Prof. Maiken Nedergaard, University of Rochester
- 16:45 – 17:00 **ZNZ Award for the Best PhD Thesis 2015**
- Short break
- 17:05 – 17:50 Memorial Award Lecture of the Koetser Foundation
Saccadic eye movements: a window on normal and abnormal brain function
Prof. Christopher Kennard, Oxford University
- 17:50 – 18:30 Apéro

Parallel Workshops, 10:00 – 11:30

Open questions on statistical inference and learning in neuroscience (Room E1.1)

During the last decade, there has been an increasing interest in the so-called Bayesian brain hypothesis. This hypothesis postulates that the brain computes with uncertainty in a fashion which is close to optimal as defined by Bayesian statistics. While this approach gains in popularity, it is important to reflect on fundamental questions: What are the experimental evidences showing that the brain combines sensory information in a statistical optimal way? How can Bayesian inference be implemented in a neural tissue? Can this Bayesian brain hypothesis be falsified? What are the predictions from theory? This workshop will discuss and debate those issues in an interactive format.

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| 10:00 – 10:05 | Introduction |
| 10:05 – 10:25 | How do humans make use of statistical inference in multisensory perception and action?
Prof. Marc Ernst, Bielefeld University, Germany |
| 10:25 – 10:45 | Learning and inference in computational accounts of emotions
Dr. Quentin Huys, Department of Psychiatry, Psychotherapy and Psychosomatics, University of Zürich |
| 10:45 – 11:05 | Can neural networks perform nonlinear filtering?
Prof. Jean-Pascal Pfister, Institute of Neuroinformatics, University of Zurich/ETH Zurich |
| 11:05 – 11:25 | What can machine learning learn from studying the brain?
Dr. Michael Pfeiffer, Institute of Neuroinformatics, University of Zurich/ETH Zurich |
| 11:25 | Conclusions |

Parallel Workshops, 10:00 – 11:30

Neurodegeneration and protein aggregation (Room E1.2)

The workshop will discuss new and emerging mechanisms driving the initiation and progression of various neurodegenerative diseases, including amyotrophic lateral sclerosis, frontotemporal dementia, Parkinson's, Alzheimer's and prion diseases. Our invited speaker will give an overview on the toxic properties of disease-associated misfolded proteins, originating from an atypical type of translation (RAN translation). With focus on protein aggregation, toxicity and clearance, as well as novel detection tools of pathogenic protein assemblies, members of the ZNZ will present their current research.

- 10:00 – 10:30 **Neurodegeneration caused by C9orf72 repeat expansions**
Dr. Adrian Isaacs, Department for Neurodegenerative Disease, Institute of Neurology, University College London
- 10:30 – 10:45 **New amyloid amplification assay for the ultrasensitive detection and quantification of protein aggregates**
Manuela Pfammatter, PhD Student, Institute of Neuroradiology, University Hospital Zurich
- 10:45 – 11:00 **Biochemical and functional characterization of TDP-43 aggregates in ALS**
Dr. Florent Laferriere, Postdoctoral Fellow, Institute of Molecular Life Sciences, University of Zurich
- 11:00 – 11:15 **Probing the structural transitions of amyloidogenic proteins in a complex biological matrix**
Yuehan Feng, PhD Student, Institute of Biochemistry, ETH Zurich
- 11:15 – 11:30 **Role of TDP-43 in microglial function**
Dr. Rosa Paolicelli, Postdoctoral Fellow, Division of Psychiatry Research, University of Zurich

Parallel Workshops, 10:00 – 11:30

Clinical neuroscience: eye and brain - innovation in neuro-ophthalmology (Room D1.1)

The interaction between the eyes and the brain is both fascinating and complex. Patients with lesions of the involved afferent and efferent pathways present visual signs and symptoms to physicians. This interdisciplinary field called Neuro-Ophthalmology is in constant evolution. Recent innovations such as a new test for Myasthenia gravis and the use of Optical Coherence Tomography in the human visual pathway will be presented in our workshop by experts from the ZNZ and from abroad. Moreover, we will introduce a project towards interdisciplinary care for patients with Neurofibromatosis Type 2, a rare disease affecting the central nervous system. NF2 patients profit from an integrated approach by specialists from many clinical neuroscience fields.

- 10:00 – 10:20 **Ocular vestibular evoked myogenic potentials: a novel diagnostic tool for myasthenia gravis**
PD Dr. Konrad Weber, Dept. of Ophthalmology and Neurology, University Hospital Zurich
- 10:20 – 10:50 **Optical coherence tomography and magnetic resonance imaging evidence of trans-synaptic degeneration in the human visual pathway**
Dr. Gordon Plant, MA, MD, FRCP, FRCOphth, Moorfields Eye Hospital and The National Hospital for Neurology and Neurosurgery, London
- 10:50 – 11:30 **Establishment of a Zurich Center for Neurofibromatosis Type 2**
Prof. Klara Landau, Dept. of Ophthalmology, University Hospital Zurich
PD Dr. Niklaus Krayenbühl, Dept. of Neurosurgery, University Hospital Zurich
Prof. Wolfgang Berger, Inst.of Medical Molecular Genetics, University of Zurich
Prof. Christopher Kennard, PhD, FRCP, FMed Sci, Nuffield Dept. of Clinical Neurosciences, University of Oxford

Oxford Neuroscience – opportunities for collaboration

(14:00 – 15:30, Lecture Hall F1)

This workshop will give an overview of various research directions at Oxford Neuroscience, a research network at the University of Oxford. The ZNZ collaborates with Oxford Neuroscience within the framework of the McGill – Oxford – ZNZ Partnership in the Neurosciences 2014-2016 supporting pilot projects, workshops and the exchange of graduate students.

14.00 – 14.10

An overview

Prof. Christopher Kennard, Chair Neuroscience Strategic Oversight Committee

14.10 – 14.30

Cellular, molecular & systems neuroscience

Prof. Andy King, WT Principal Research Fellow, Dept Physiology, Anatomy and Genetics

14.30 – 14:50

Experimental psychology

Prof. Glyn Humphreys, Head Dept Experimental Psychology

14.50 – 15:10

Psychiatry

Prof. Noel Buckley, Dept Psychiatry

15.10 – 15.30

Clinical neurosciences

Prof. Christopher Kennard, Head Nuffield Dept of Clinical Neurosciences