

Dear colleagues,

we cordially invite you to our symposium focused on human brain physiology and pathophysiology using state-of-the-art functional experiments in vital tissue. In our symposium we will bring together scientists from Berlin and abroad and discuss cellular and network function of human brain cells. We aim to foster know-how transfer, scientific exchange and potential future collaborations.

Our symposium is divided in several sessions. We will start with a morning session in which Berlin-based scientists will present physiological and pathophysiological data obtained from human brain tissue. Around noon, speakers from other German centers and speakers from abroad will present their approaches and projects.

After the lunch break, we will continue with a keynote session in which Gabor Tamas from Hungary and Huibert Mansvelder from the Netherlands will present their work on human CNS (patho)physiology.

In the afternoon session, the focus will shift towards historical, clinical and neuropathological aspects which will be followed by a poster session.

In the final session, we will hear talks from Jonathan Ting and his colleagues from the Allen Brain Institute, who will give an overview of their approaches to connect cellular neurophysiology and single cell genomics. We will adjourn with a get-together in the Anatomy Hall.

We appreciate your interest and look forward to a lively meeting and discussions.

**Pawel Fidzinski**      **Dietmar Schmitz**      **Jörg Geiger**

## Venue

**Charité – Universitätsmedizin Berlin  
Campus Charité Mitte**

### Talks:

- 1 Lecture Hall, Bernstein Center for Computational Neuroscience, Haus 6, Philippstraße 12

### Coffee/Lunch Break; Poster session; Get-together:

- 2 Foyer, Center for Anatomy; Main building, Philippstr. 11

## Participation

Please confirm your participation until 15.05.2023 by E-mail to Pawel Fidzinski: [pawel.fdzinski@charite.de](mailto:pawel.fdzinski@charite.de)



# Functional studies in human brain tissue

Monday June 12, 2023

9:00 a.m. – 9:00 p.m.

## **SCIENTIFIC PROGRAM**

Organisation: Pawel Fidzinski

### **9:00 WELCOME & INTRODUCTION**

Pawel Fidzinski; Jörg Geiger; Dietmar Schmitz

### **9:15 MORNING SESSION (Berlin speakers)**

Chairs: Henner Koch; Dirk Feldmeyer

#### **9:15 The Berlin platform for human brain physiology and pathophysiology**

• Pawel Fidzinski, Berlin

#### **9:30 Directed and acyclic connectivity in human cortical microcircuits**

• Yangfan Peng, Oxford

#### **9:45 Neuronal basis of interindividual differences in microcircuits**

• Henrike Planert, Berlin

#### **10:00 Human L2-3 pyramidal neurons are functionally diverse and differentially embedded in the local network**

• Franz Mittermaier, Berlin

#### **10:15 From viral injection to optogenetics on the same day with fast acting RNA viruses**

• Albert Gidon, Berlin

#### **10:30 Targeted re-patching to assess single cell neuronal plasticity**

• Rosie Sammons, Berlin

#### **10:45 KCC2 dampens epileptogenic network activity in the human temporal lobe**

• Alice Falck, Berlin

### **11:00 COFFEE BREAK**

### **11:30 NOON SESSION (Guest speakers)**

Chairs: Pawel Fidzinski; Yangfan Peng

#### **11:30 In vitro investigation of glioma effects on peritumoral neuronal microenvironment in human cortex**

• Aniella Bak, Aachen

#### **11:45 New in vitro tools to investigate the role of microglia in neurodegeneration**

• Deborah Kronenberg-Versteeg, Tübingen

#### **12:00 Structural complexity supports computational richness in human hippocampal CA1 pyramidal neurons**

• Christiaan P.J. de Kock, Amsterdam

#### **12:15 “Broadband” cortical neuronal ensembles**

• Michele Giugliano, Trieste

#### **12:30 Structural and functional specializations of human fast spiking neurons support fast cortical signaling**

• Natalia A. Goriounova, Amsterdam

#### **12:45 Rescuing chloride transport function in temporal lobe epilepsy**

• Jean Christophe Poncer, Paris

### **13:00 LUNCH BREAK**

### **14:00 KEYNOTE SESSION**

Chairs: Dietmar Schmitz; Matthew Larkum

#### **14:00 Similarities and differences of human and rodent neocortical synapses, neurons and networks**

• Gabor Tamas, Szeged

#### **14:30 Human voltage-gated Na<sup>+</sup> and K<sup>+</sup> channel properties underlie sustained fast AP signaling**

• Huibert Mansvelder, Amsterdam

### **15:00 AFTERNOON SESSION (historical & clinical)**

Chairs: Matthias Simon; Martin Holtkamp

#### **15:00 How it all started – about the early days of human brain tissue experiments**

• Rüdiger Köhling, Rostock

#### **15:15 Structure of human cortical synapses**

• Joachim Lübke, Jülich

#### **15:30 NAD(P)H lifetime fluorescence to detect functional oxidases in cultured human brain slices**

• Helena Radbruch, Berlin

#### **15:45 Tissue preserving resection techniques – the Bielefeld point of view**

• Thilo Kalbhenn, Bielefeld

#### **16:00 Surgical preparation of human cortical tissue for neuroscientific investigations**

• Jakob Strähle, Freiburg

#### **16:15 3D topography of resected brain tissue**

• Ran Xu, Berlin

### **16:30 COFFEE BREAK AND POSTER SESSION**

#### **Alice Podesta, Berlin:**

Role of Ca<sup>++</sup>-permeable AMPA receptors in seizure, onset and propagation in human neocortex

#### **Karen van Loo, Aachen:**

Gene modulation in epilepsy: using human organotypic brain slice cultures to adjust and analyze the molecular landscape

#### **Guanxiao Qi, Jülich:**

A platform for simultaneous on- and off-site electromorphological, pharmacological and molecular studies of neurons and neuronal networks in acute human cortical slices

#### **Danqing Yang, Jülich:**

Modulation of Giant Depolarizing Potentials (GDPs) in Human Large Basket Cells by Norepinephrine and Acetylcholine

#### **Verjina Metodieva, Berlin:**

Homeostatic plasticity of pyramidal layer 2/3 cortical human neurons

#### **Sarah Duverdin, Berlin:**

Dendritic activity in human and mouse neocortical interneurons

#### **Laura Monni, Berlin:**

In vitro effects of human LGI1 autoantibodies on CA3 pyramidal neurons of human hippocampal slice cultures

#### **Ecem Tütüncü, Berlin:**

Dynamic frequency modulation of human neocortical gamma oscillations by fast-spiking interneurons

#### **Henrik Alle, Berlin:**

Methodology of vital human brain tissue transfer over large distances

### **18:00 ALLEN BRAIN SESSION (ONLINE)**

Chairs: Jörg Geiger; Huibert Mansvelder

#### **18:00 Reimagining human cellular neurophysiology in the era of single cell genomics**

• Jonathan Ting • Brian Lee • Brian Kalmbach

### **19:00 GET-TOGETHER**