

12th International Conference on Microelectrode Arrays for Life Sciences

July 6-8, 2022 · Tübingen, Germany · www.nmi.de/en/mea-meeting/ · meameeting@nmi.de

Conference chairs: Dr. Peter D. Jones (NMI) & Prof. Günther Zeck (TU Wien)

Wednesday, July 6

8:00	Registration opens	
9:00	Welcome address	
Flexible electrode arrays (Chair: Peter Jones)		
9:15	Ellis Meng (invited) <i>University of Southern California, USA</i>	Polymer Microelectrode Array Interfaces to the Nervous System
9:55	Helen Steins <i>NMI Reutlingen, Germany</i>	A Flexible Microelectrode Array for Bioelectronic Interfacing
10:10	Ivan Minev <i>University of Sheffield, UK</i>	Rapid prototyping of soft electrode arrays
Coffee break (10:25-11:05)		
Insights to the brain (Chair: Kerstin Lenk)		
11:05	Lucia Wittner (invited) <i>Research Center for Natural Sciences, Hungary</i>	Physiological and pathological synchronisations in the human cortex
11:45	Brett Emery <i>German Center for Neurodegenerative Diseases, Germany</i>	Investigating Multimodal Neurogenesis: Olfactory Bulb and Hippocampal Networks on a High-density Neurochip
12:00	Marta Cerina <i>University of Twente, Netherlands</i>	Neuroprotective role of lactate release from astrocytes in a human in vitro model of the ischemic penumbra
12:15	Marta Care <i>IIT, Italy</i>	Towards personalized neurostimulation strategies to restore brain function after lesion
Lunch (12:30-14:00)		
Industry session (Chair: Günther Zeck)		
14:00	Giovanna De Filippi <i>Axion BioSystems</i>	Maestro platform for bioelectronic assays to advance drug discovery and disease modelling
14:15	Marie Obien <i>MaxWell Biosystems</i>	Next-generation in-vitro assays: Characterizing the activity of human iPSC-derived neuronal cultures and brain organoids at high resolution
14:30	Sven Schönecker <i>Multi Channel Systems GmbH</i> Anne Gresch <i>University of Münster</i>	Investigation of the network within pancreatic islets using CMOS MEAs
14:45	Giovanni Melle <i>Foresee Biosystems srl</i>	Acute and chronic cardiotoxicity on large hiPSC syncytia with laser cell optoporation
15:00	Sebastian Wegner <i>Sciospec</i>	Electro-analytical techniques for bioanalytical applications
Coffee break (15:15-15:45)		
Data sharing and modelling (Chair: Jari Hyttinen)		
15:45	Andrey Vinogradov <i>Tampere University, Finland</i>	Openly available MEA dataset from hPSC-derived and rat cortical networks
16:00	Nina Doorn <i>University of Twente, Netherlands</i>	In silico modeling to unravel human neuronal network phenotypes
16:15	Philipp Hornauer <i>ETH Zurich, Switzerland</i>	DeePhys, a machine learning-driven platform for electrophysiological phenotype screening
16:30	End of scientific program for day 1	
19:00	Conference dinner Wurstküche (Am Lustnauer Tor 8, Tübingen)	

Thursday, July 7

Artificial stimulation (Chair: Günther Zeck)

9:00	Diego Ghezzi (invited) <i>EPFL, Switzerland</i>	Neuroprostheses for artificial vision
9:40	Jiri Ehlich <i>CEITEC Brno, Czech Republic</i>	Direct measurement of oxygen reduction reactions at neurostimulation electrodes
9:55	Andrea Corna <i>TU Wien, Austria</i>	In-vitro evaluation of artificial vision restoration in the retina using high density micro-electrode arrays
10:10	Domingos Leite de Castro <i>i3S, Portugal</i>	Delayed feedback control as a closed-loop stimulation protocol to disrupt oscillatory network bursting in vitro

Coffee break (10:25-11:05)

Interrogating organoids (Chair: Andreas Hierlemann)

11:05	Susanna Mierau (invited) <i>Brigham and Women's Hospital, USA</i>	Network function in human cerebral organoids as a platform for mechanistic and therapeutic advances in cognitive disorders
11:45	Csaba Forro <i>Stanford University, USA</i>	Kirigami-like mesh-electrode-arrays for integration with human electrogenic organoids
12:00	Oramany Phouphetlinthong <i>University of Montpellier, France</i>	Microelectrode array for the monitoring of inner electrical activity of cerebral organoids
12:15	Anssi Pelkonen <i>University of Eastern Finland, Finland</i>	Microelectrode array recording of midbrain organoid slices cultured in air-liquid interface

Lunch (12:30-14:30)

14:30	Poster session	
16:30	End of scientific program for day 3	
18:00	Punt ride (1.5 h)	Pier at FREISTIL Biergarten Wöhrdstraße 25, Tübingen

Friday, July 8

New technology (Chair: Roland Thewes)

9:00	Donhee Ham (invited) <i>Harvard University, USA</i>	Brain, copy and paste
9:40	Hasan Ulasan <i>ETH Zurich, Switzerland</i>	Impedance Measurements and Electrophysiological Recordings on a Multifunctional HD-MEA Platform
9:55	Paweł Jurgielewicz <i>AGH University of Science and Technology, Poland</i>	Microstimulation in the rat barrel cortex using custom ASIC-based 512-channel system and high-density silicon probes
10:10	Rahul Panat <i>Carnegie Mellon University, USA</i>	3D Printed Customizable Neural Probes

Coffee break (10:25-11:05)

In vitro disease models (Chair: Udo Kraushaar)

11:05	Paolo Cesare <i>NMI Reutlingen, Germany</i>	A multimodal 3D neuro-microphysiological system
11:25	Ropafadzo Mzezewa <i>Tampere University, Finland</i>	Development of functional in vitro model in Dravet syndrome patient hiPSC-derived cortical neurons
11:40	Andrea Kauth <i>RWTH Aachen University, Germany</i>	Development of a microelectrode array with embedded microfluidic inputs for electroporation of retinal slices
11:55	Giada Cattelan <i>Eurac Research, Italy</i>	Evaluation of a novel in vitro neurocardiac cellular model for the study of heart disorders.
12:10	End of scientific program for day 2	
12:15	Scientific committee	Awards for best poster and talk
Lunch (12:20-13:30)		
13:30	End of conference	