

Volpriehausen

Optogenetics 2023 Meeting

1st October - 4th October 2023

Sunday, 1st October

Opening Remarks

Keynote Lecture

Chair: Tobias Moser (University Medical Center Göttingen)

08:00 pm

Botond Roska (Institute of Molecular and Clinical Ophthalmology Basel, Switzerland)

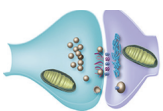
"Restoring vision"

Get together

We thank all the sponsors of this Optogenetics 2023 Meeting for their support!



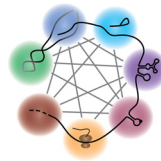
SFB 1286



Quantitative
Synaptology



CRC 1456
MATHEMATICS
OF EXPERIMENT



SFB1565



GRK2824



OptoGenTech

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Optogenetics 2023 Meeting

1st October - 4th October 2023

Monday, 2nd October

from 07:00 am Breakfast at La Cantina

Session 1: Translation

Chairs: *Lukasz Jablonski (German Primate Center, Göttingen) & Tobias Moser (University Medical Center Göttingen)*

- 08:30 am *Deniz Dalkara (Institut de la Vision, Paris, France)*
"Optogenetics in the retina - from circuit investigation to disease modeling and restoring vision"
- 08:55 am *Bettina Wolf (University Medical Center Göttingen), Marcus Jeschke (German Primate Center, Göttingen)*
"Optogenetic cochlea implants: from rodent early preclinical to non-human primates"
- 09:20 am *David Zipf (University Medical Center Göttingen, Germany)*
"Optogenetics as a new approach to control gastric contractility"
- 09:35 am *Daniel Hillier (German Primate Center, Göttingen, Germany)*
"Optogenetics in large-animal models"
- 09:50 am *Stéphanie Lacour (École Polytechnique Fédérale de Lausanne, Switzerland)*
"Implantable optoelectronic interfaces"
- 10:15 am Coffee Break

Session 2: Optogenetic Regulation of Protein Function

Chairs: *Günter Mayer (University of Bonn) & Andreas Möglich (University of Bayreuth)*

- 10:45 am *Lukas Bugaj (University of Pennsylvania, Philadelphia, USA)*
"Harnessing a multi-input/multi-output protein for novel optical and thermal probes"
- 11:10 am *Dagmar Wachten (University of Bonn, Germany)*
"How to control ciliary signaling by light"
- 11:35 am *Tejal Patwari (University of Bonn, Germany)*
"Optoribogenetics: Light dependent control of biological processes through PAL-RNA system"
- 11:50 am *Michael Wenzel (University of Bonn, Germany)*
"Controlling epilepsy with targeted phototherapeutics"
- 12:15 pm *Wilfried Weber (INM - Leibniz Institute for New Materials, Saarbrücken, Germany)*
"Programming cells and materials with light"
- 12:40 pm Lunch
- 03:30 pm Coffee Break

Session 3: Cardiac

Chairs: *Stephan Lehnart (University Medical Center Göttingen) & Philipp Sasse (University of Bonn)*

- 04:00 pm *Emilia Entcheva (The George Washington University, Washington DC, USA)*
"Applications of optogenetics to high-throughput all-optical cardiac electrophysiology for human functional genomics"
- 04:25 pm *Leonardo Sacconi (University of Florence, Italy)*
"All-optical electrophysiology in single cardiomyocyte and isolated heart"
- 04:50 pm *Franziska Schneider-Warme (University of Freiburg, Germany)*
"Illuminating the heterocellular heart: optogenetic approaches to assess non-myocyte contributions to cardiac electrophysiology"
- 05:10 pm *Judith Weidtmann (University of Bonn, Germany)*
"Contrary effects of optogenetic- or K⁺ induced pre-depolarisation on cardiac conduction"
- 05:25 pm *Claudia Richter (German Primate Center, Göttingen, Germany)*
"Always the same? – Effects of sex and tissue remodelling in aging optogenetic hearts by means of successful arrhythmia phototermination"
- 05:40 pm *Silvia Rodriguez Rozada (University Medical Center Würzburg, Germany)*
"Optogenetic modulation of cardiac function in freely moving mice"
- 06:00 pm Dinner

Keynote Lecture

Chair: *Franziska Schneider-Warme (University of Freiburg)*

- 08:15 pm *Alexander Gottschalk (University of Frankfurt, Germany)*
"Optogenetic voltage clamp, OG tools for neurotransmission, and a new molecular solution for sensing UV and blue light"

Optogenetics 2023 Meeting

1st October - 4th October 2023

Tuesday, 3rd October

from 07:00 am Breakfast at La Cantina

Session 4: Brain

*Chairs: Thomas Frank (University of Göttingen) & Simon Wiegert (University Medical Centre Mannheim)
Werner Hemmert (Technical University of Munich, Germany)*

- 08:30 am** **"Watching hearing with a neuro-Implant: Ultra-high resolution models of neural activity in the human inner ear"**
- 08:55 am** *Thomas Oertner (Medical Center Hamburg-Eppendorf, Germany)*
"E Pluribus Unum: Optogenetic control reveals flaws in the interpretation of pharmacological experiments"
- 09:20 am** *Sevil Duvarci (Goethe University, Frankfurt, Germany)*
"Functional architecture of dopamine neurons driving fear extinction learning"
- 09:45 am** *Johannes Letzkus (University of Freiburg, Germany)*
"Top-down control of neocortical threat memory"
- 10:00 am** *Lukas Faiss (Charité – Universitätsmedizin Berlin, Germany)*
"Shedding light on presynaptic plasticity: Unveiling the secrets of contralateral projecting synapses in the hippocampus"
- 10:15 am** Coffee Break

Session 5: New ChRs

Chairs: Johannes Vierock (Charité – Universitätsmedizin Berlin) & Thomas Mager (University Medical Center Göttingen)

- 10:45 am** *Peter Hegemann (Humboldt Universität zu Berlin, Germany)*
"Unexpected rhodopsins with optogenetic potential"
- 11:10 am** *Thomas Mager (University Medical Center Göttingen, Germany)*
"ChReef – An improved ChR for future optogenetic therapies"
- 11:30 am** *Johannes Vierock (Charité, Universitätsmedizin Berlin, Germany)*
"New light gated ion channels for multicolor optogenetics"
- 11:50 am** *Elizaveta Podoliak (University of Bonn, Germany)*
"Electrophysiological characterization of a novel family of anion channelrhodopsins from Chrompodellida algae in mammalian cell lines and human iPSC-derived neurons"
- 12:03 pm** *Alexey Alekseev (University Medical Center Göttingen, Germany)*
"Establishing an automated screening pipeline for Channelrhodopsin variants: Combining planar patch-clamp and spinning disc confocal microscopy"
- 12:15 pm** *Stanislav Ott (Duke-NUS Medical School, Singapore)*
"Kalium channelrhodopsins effectively inhibit invertebrate neurons"
- 12:30 pm** Lunch
- 02:00 pm** Poster Session & Coffee Break

Session 6: OptoGPCR / Membrane receptors

*Chairs: Stefan Herlitze (Ruhr University of Bochum) & Tobias Brüggemann (University Medical Center Göttingen)
Ida Siveke (Ruhr University of Bochum, Germany)*

- 04:30 pm** **"InLOV: Optogenetics for light controlled insulin signaling"**
- 04:50 pm** *Arend Vogt (Charité – Universitätsmedizin Berlin, Germany)*
"A simultaneous spectral illumination device for the characterization of opto-GPCRs and engineered red light-activated cyclases in microplates"
- 05:05 pm** *Richard McDowell (University of Manchester, UK)*
"Spectral sensitivities of mammalian melanopsins"
- 05:20 pm** *Siri Leemann (University of Bern & University of Freiburg, Germany)*
"Functional optimization of the Opto-GPCR toolkit: shining light on the importance of the proximal C-terminus"
- 05:35 pm** *Sonja Kleinlogel (Roche Pharma Research and Early Development, Basel, Switzerland)*
"Optogenetic vision restoration: The many ways to get the best out of bipolar cells"
- 07:00 pm** Dinner

Optogenetics 2023 Meeting

1st October - 4th October 2023

Wednesday, 4th October

from 07:00 am Breakfast at La Cantina

Session 7: Imaging

Chairs: Jan Huisken (University of Göttingen) & Antoine Huet (University Medical Center Göttingen)

- 08:30 am** *Ed Boyden (Massachusetts Institute of Technology, USA)*
"Optical tools for analyzing and controlling biological systems"
- 08:55 am** *Emilie Macé (University Medical Center Göttingen, Germany)*
"Opto-fUS: Unveiling whole-brain optogenetic effects using functional ultrasound imaging"
- 09:20 am** *Christiane Grimm (Institut de la Vision, Paris, France)*
"Rhodopsin-based GEVIs for one- and two-photon voltage imaging"
- 09:40 am** *Mostafa Aakhte (University of Göttingen, Germany)*
"Cleared tissue light sheet microscopy with isotropic resolution"
- 09:55 am** *Anupriya Thirumalai and Lennart Roos (University Medical Center Göttingen, Germany)*
"Cochlear optogenetics and nano-structure visualized by light sheet fluorescence microscopy"
- 10:15 am** Coffee Break

Session 8: Optogenetic Switches for Regulation of intra- and extracellular Processes

Chairs: Matias Zurbruggen (University of Düsseldorf) & Andreas Möglich (University of Bayreuth)

- 10:45 am** *Jeff Tabor (Rice University Texas, USA)*
"Phytochrome-family proteins for bacterial optogenetics"
- 11:10 am** *Giada Forlani (University of Freiburg, Germany)*
"Tracking DNA damage in living cells with an optogenetically-induced nanobody against γ -H2AX"
- 11:25 am** *Stefanie Meier (University of Bayreuth, Germany)*
"Control of bacterial expression by red light"
- 11:40 am** *Kun Tang (University of Düsseldorf, Germany)*
"Optogenetic control of gene expression and subcellular protein localization with synthetic cyanobacteriochrome-based light-inducible dimers"
- 12:00 pm** *Robert Hughes (East Carolina University, North Carolina, USA)*
"A single component optogenetic biosensor of cellular stress"
- 12:20 pm** Closing Remarks
- 12:45 pm** End of the meeting