



ReceptorLight Symposium No. 1

HIGH-END LIGHT MICROSCOPY ELUCIDATES MEMBRANE RECEPTOR FUNCTION

June 7th to 9th, 2017

ORGANIZERS

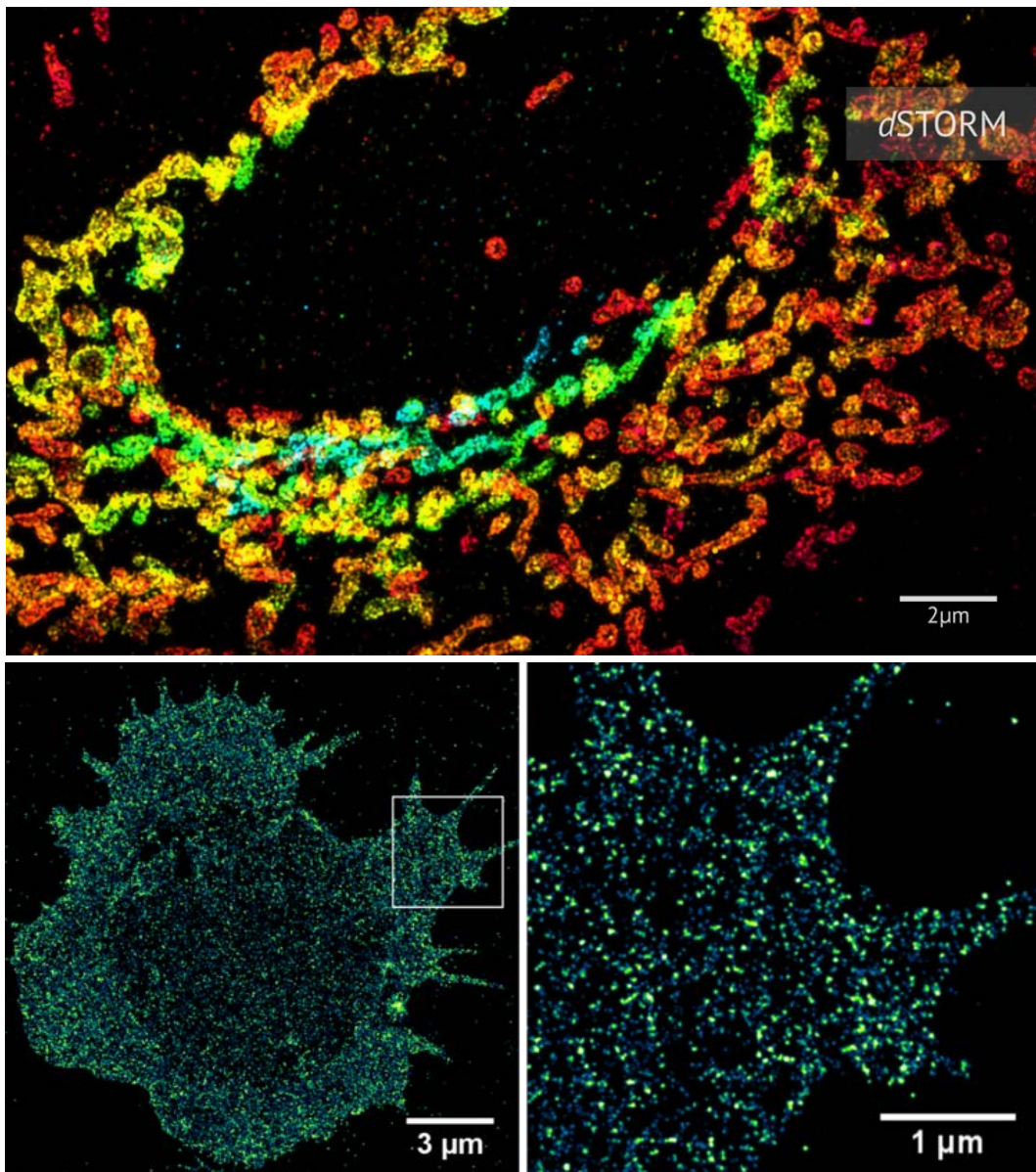
Klaus Benndorf, Markus Sauer

LOCATION

Juliusspital Conference Center
Klinikstraße 1, 97070 Würzburg

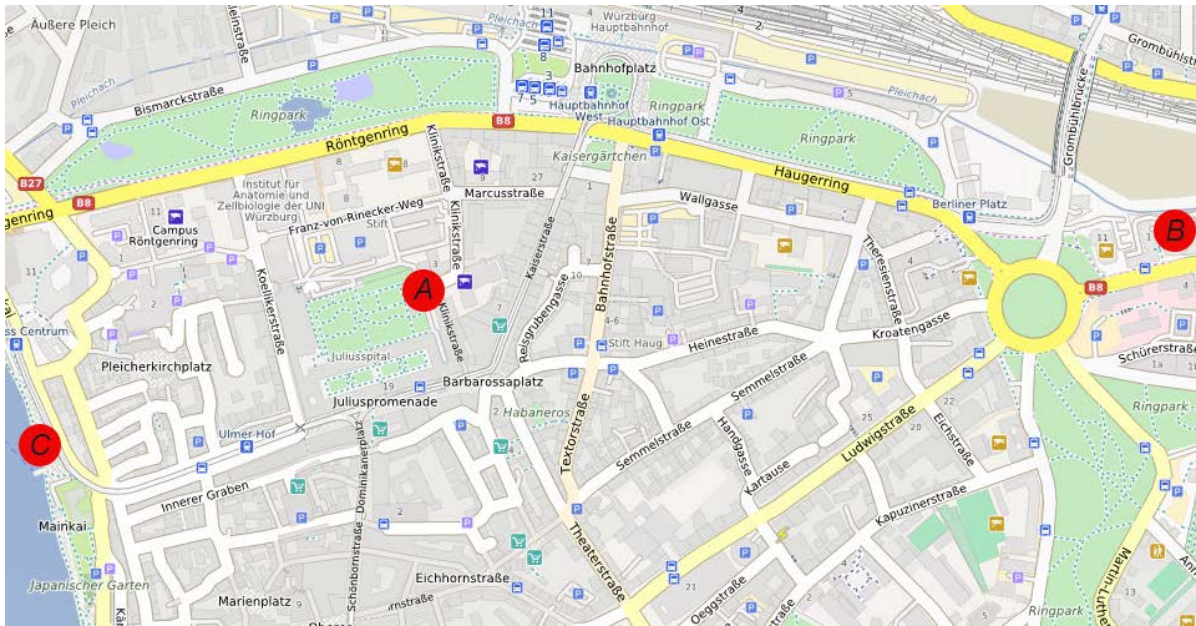
RECEPTORLIGHT uses novel and exceedingly promising techniques of „high-end“ LIGHT MICROSCOPY to analyze the FUNCTION of membrane receptors by gaining new spatial and temporal information.

The 1st ReceptorLight Symposium brings together international experts in high-end microscopy and receptor science to discuss latest results and future directions of receptor research.



dSTORM visualizes the distribution of receptors on the plasma membrane of primary tumor cells.

DIRECTIONS



- A Juliuspital Conference Center**
Klinikstraße 1, 97070 Würzburg
- B GHOTEL**
Schweinfurter Straße 3, 97080 Würzburg
Phone: +49 (0)931 35962 2501
- C Alter Kranen**
Kranenkai 1, 97070 Würzburg
(at a red-yellow kiosk)

PROGRAM

Wednesday, June 7th

12:00 - 13:00	Registration & Snacks
13:00 - 13:15	Klaus Benndorf, Jena <i>Opening/Welcome</i>
Session I	Chair: Klaus Benndorf, Jena
13:15 - 14:00	William N. Zagotta, Seattle <i>Molecular mechanisms of regulation of ion channels by intracellular domains</i>
14:00 - 14:45	Martin Biel, Munich <i>Two-pore cation channels of the endolysosomal system</i>
14:45 - 15:00	Christian Karras/Jessica Tröger, Jena <i>A fast multi-channel structured illumination microscope for enlightening inhibitory neurotransmitter receptor organization and dynamics</i>
15:00 - 15:30	Coffee & Tea
Session II	Chair: Markus Sauer, Würzburg
15:30 - 16:15	Claus Seidel, Düsseldorf <i>Quantitative FRET image spectroscopy and integrative modeling unravel the structure and dynamics of biomolecular systems</i>
16:15 - 17:00	Christian Eggeling, Oxford <i>Membrane bioactivity: New insights from super-resolution STED(-FCS) microscopy</i>
17:00 - 17:15	Thomas Heitkamp, Jena <i>Purification of active mNeonGreen-tagged neurotensin receptor 1 and FRET-based analysis of ligand binding</i>
17:15 - 17:45	Coffee & Tea
17:45 - 18:30	Erwin Neher, Göttingen <i>Short-term synaptic plasticity: Katz's concept in the light of recent results from the calyx of Held</i>
18:30 -	Reception & Poster Session

Thursday, June 8th**Session III**Chair: **Manfred Heckmann, Würzburg**

9:00 – 9:45

Horst Vogel, Lausanne*Transmembrane signaling: From single cells to single molecules*

9:45 – 10:30

Daniel Choquet, Bordeaux*Nanoscale organization of glutamate receptors and synaptic function*

10:30 – 10:45

Gerti Beliu, Würzburg*Unnatural amino acids for live cell labeling and super-resolution microscopy*

10:45 - 11:15

Coffee & Tea

Session IVChair: **Britta Qualmann, Jena**

11:15 – 12:00

Istvan Katona, Budapest*Cell-type-specific correlated confocal and super-resolution imaging in brain circuits by VividSTORM*

12:00 – 12:45

Dion Dickmann, Los Angeles*Active zones as substrates for the homeostatic modulation of synaptic strength*

12:45 – 13:00

Andrea Kliewer, Jena*Carboxyl-terminal multisite phosphorylation regulates μ -opioid receptor desensitization and tolerance*

13:00 – 14:30

Lunch & Poster Session

Session VChair: **Katrin Heinze, Würzburg**

14:30 - 15:15

Viacheslav Nikolaev, Hamburg*FRET and scanning ion conductance microscopy to study receptor/cyclic nucleotide signaling in microdomains*

15:15 – 15:45

Klaus Benndorf, Jena*Activation gating in HCN2 channels evoked by voltage and cAMP*

15:45 - 16:15

Tobias Langenhan, Leipzig*Converting force into signal: Metabotropic mechanosensing through adhesion GPCRs*

16:15- 16:45

Coffee & Tea

Session VI	Chair: Carsten Hoffmann, Jena
16:45 - 17:15	Martin J. Lohse, Berlin <i>Spatio-temporal signaling of G-protein-coupled receptors</i>
17:15 - 17:45	Markus Sauer, Würzburg <i>Super-resolution microscopy coming of age: from concepts to biomedical applications</i>
17:45 – 18:15	Dietmar Geiger, Würzburg <i>Resolving dynamic interactions within the Arabidopsis guard cell hormone-receptor anion-channel complex</i>
19:30 – 22:30	Conference Dinner On board the ship “Alte Liebe”. Meeting/embarkation point: 19:15 at “Alter Kranen” (a historic crane on the Main River, at a red-yellow kiosk)

Friday, June 9th

Session VII	Chair: Jana Kusch, Jena
9:00 – 9:45	Richard Blunck, Montréal <i>Using fluorescence spectroscopy to study structure-function relations of ion channels</i>
9:45 - 10:30	Andreas Reiner, Bochum <i>Optical control of glutamate receptors: Mechanistic insights and application to synaptic signaling</i>
10:30 - 11:00	Coffee & Tea
Session VIII	Chair: Robert Kittel, Würzburg
11:00 – 11:30	Mike Heilemann, Frankfurt <i>Counting subunits within receptor complexes using single-molecule localization microscopy</i>
11:30 – 12:00	Katrin Heinze, Würzburg <i>Boosting membrane imaging and spectroscopy by optoplasmonics</i>
12:00 – 12:30	Carsten Hoffmann, Jena <i>Photopharmacology meets muscarinic receptors</i>
12:30	Klaus Benndorf, Jena; Markus Sauer, Würzburg <i>Closing Remarks</i>
12:45	Light Lunch

POSTERS

Project Area A: Methodological developments

Project A01

Hendrik Sielaff, Ilka Starke, Mykhailo Ilchenko, Maria Dienerowitz, Sonja Rabe, Thomas Heitkamp & Michael Börsch

Confocal single-molecule FLIM-FRET analysis of gated receptors and transporters

Project A02

Ludovic Roussille & Volker Deckert

Chemical investigation at nanometer scale of biosamples using AFM-TERS approach

Project A03

Shang Yang, Jing Yu, Shiqiang Gao & Georg Nagel

Improved optogenetic tools, engineered from photoreceptors

Project A04

Ralph Götz, Alexander Kuhlemann, Patrick Eiring, Sebastian Letschert, Andreas Kurz, Sören Doose, Patrick Then, Rainer Heintzmann & Markus Sauer

Multidimensional super-resolution imaging of membrane receptors

Project A05

Maik Otte, Marco Lelle, Ralf Schmauder, Jana Schirmeyer, Susanne Thon, Andrea Schweinitz & Klaus Benndorf

Relating the binding of single ligands to activation in single HCN and CNG channels

Sabine Hummert, Jan Münch, Nisa Wongsamitkul, Vasilica Nache, Thomas Eick, Eckhard Schulz, Ralf Schmauder, Jana Schirmeyer, Thomas Zimmer & Klaus Benndorf

Global fit strategies in marcov modelling

Project Area B: Ligand gated ion channel

Project B01

Kathrin Groeneveld, Sophie Wucherpfennig, Teresa Langenstück, Christoph Biskup & Vasilica Nache

Elucidating assembly, ligand binding and gating of retinal CNG channels

Project B02

Franziska Neubert, Lars Schmidl, Christian Werner, Holger Haselmann, Sören Doose & Christian Geis

Investigating humoral autoimmunity against the NMDA-receptor NR1 subunit by super-resolution fluorescence microscopy: effects on synapse integrity and function

Project B03

Jürgen Graf, Tom Floßmann, Chuanqiang Zhang, Knut Holthoff & Knut Kirmse

Interaction of GABAA-receptor function and network activity in the developing hippocampus

Project B04

Sina Wäldchen, Divya Sachidanandan, Markus Sauer & Robert Kittel

Activity-induced ionotropic glutamate receptor dynamics at super-resolution *in vivo*

Project B05

Jessica Tröger, Christian Karras, Britta Qualmann & Rainer Heintzmann

Enlightening inhibitory neurotransmitter receptor organization and dynamics applying high-end microscopy

Project B06

Martin Pauli, Mila M. Paul, Sven Proppert, Marzieh Sharifi, Felix Repp, Philipp Kollmannsberger, Markus Sauer, Manfred Heckmann & Anna-Leena Sirén

Functional plasticity of glutamate receptor channels on hippocampal mossy fiber terminals

Project B07

Abhilasha Ladha, Vera Martos, Andrew J.R. Plested & Jana Kusch

A fluorescent agonist of the muscle-type nicotinic acetylcholine receptor

Project B08

Michael A. Geringer, Julian Lehmann, Dietmar Geiger & Rainer Hedrich

Dynamic interactions within Arabidopsis guard cell hormone-receptor anion-channel complex

Project Area C: GPCR's and other membrane receptors**Project C01**

Marie-Lise Jobin, Sana Siddig, Titiwat Sungkaworn & Davide Calebiro

Spatial organization and dynamics of GPCR signaling as revealed by single-molecule and super-resolution microscopy

Project C02

Nelly Rüttiger, Nicole Ziegler, Ulrike Zabel, Anette Stumpf & Carsten Hoffmann
Positive allosteric modulators increase ligand residence time at the adenosine A1 receptor

Project C03

Steffen Altrichter, Gerti Beliu, Markus Sauer, Carsten Hoffmann, Nicole Scholz & Tobias Langenhan
Molecular mechanics of Adhesion class G protein-coupled receptor signaling

Project C04

Taulant Kukaj, Ralf Schmauder, Ulrike Zabel, Martin J. Lohse & Klaus Benndorf
Activation kinetics of metabotropic glutamate receptor 1 investigated by piezo-controlled concentration jumps

Project C05

Elke Miess, Ralph Steinborn, Andrea Kliewer, Nadja Mösslein, Yunshi Yang, Martin Göldner, Julia G. Ruland, Moritz Bünemann, Cornelius Krasel & Stefan Schulz
Differential recruitment of G protein-coupled receptor kinases and β -arrestins to activated μ -opioid receptors

Project C06

Mike Friedrich, Jan-Hagen Krohn, Julia Wagner, Martin J. Lohse & Katrin G. Heinze
Revealing fast dynamics of G-protein coupled receptors with fluorescence correlation spectroscopy

Project C07

Jorge Martin Machado, Lisa Krebs, Sören Doose, Viacheslav O. Nikolaev, Carsten Hoffmann, Erick Miranda Laferte & Michaela Kuhn
A FRET-FIAsH approach to study atrial natriuretic peptide-induced conformational changes of the cGMP-producing GC-A receptor

Project area Z: Core project**Project Z02**

Frank Taubert, Daniel Walther, Sheeba Samuel, Andreas Henkel, H. Martin Bückler & Birgitta König-Ries
Integrative data management and processing

Additional Posters

Ralf Schmauder, Thomas Eick, Elmar Herbst, Günter Mayer & Klaus Benndorf
Fast microfluidic based 30-barrel solution applicator for electrophysiology

Nicole Koch, Dennis Koch, Sarah Krüger, Victor Sabanov, Tariq Ahmed,
Dirk Montag, Michael M. Kessels, Detlef Balschun & Britta Qualmann
**LTD and LTP expression, GluR1 surface organisation and internalisation
require syndapin I**

Nadja Mößlein

**Role of Phosphoserine and Phosphothreonine for binding of arrestin to G-
protein-coupled receptors**

Volker Jelinek

Role of Galpha C-terminal helix for binding affinity to muscarinic receptors

Michael Kurz

Thromboxane receptor shows voltage dependence

Olga Prokopets & Moritz Bünemann

**Imaging dynamics of receptor - G protein complexes to determine coupling
efficiency and G protein subtype selectivity**

Pragya Goel, Xiling Li & Dion Dickman

**Disparate postsynaptic induction mechanisms ultimately converge to drive
the retrograde enhancement of presynaptic efficacy**

Natalia Wolf, Tim Walter, Lena Collenburg, Sebastian Letschert, Anne Burgert,
Sibylle Schneider-Schaulies, Markus Sauer & Jürgen Seibel

Compounds for super-resolution fluorescence imaging

PARTICIPANTS

Alexander Al Saroori

Leibniz Institute of Photonic Technology Jena | alexander.alsaroori@leibniz-ipht.de

Steffen Altrichter

University Leipzig | steffen.altrichter@medizin.uni-leipzig.de

Paolo Annibale

Julius Maximilian University Würzburg & MDC Berlin | paolo.annibale@uni-wuerzburg.de

Ashwin Balakrishnan

Julius Maximilian University Würzburg | ashwin.balakrishnan@uni-wuerzburg.de

Lisa Behringer-Pließ

Julius Maximilian University Würzburg | pliess@biozentrum.uni-wuerzburg.de

Gerti Beliu

Julius Maximilian University Würzburg | gerti.beliu@uni-wuerzburg.de

Klaus Benndorf

Jena University Hospital | klaus.benndorf@med.uni-jena.de

Martin Biel

Ludwig Maximilians University Munich | mbiel@cup.uni-muenchen.de

Christoph Biskup

Jena University Hospital | christoph.biskup@med.uni-jena.de

Rikard Blunck

Université de Montréal | rikard.blunck@umontreal.ca

Andreas Bock

Julius Maximilian University Würzburg | andreas.bock@uni-wuerzburg.de

Michael Börsch

Jena University Hospital | michael.boersch@med.uni-jena.de

Davide Botteri

Friedrich Schiller University Jena | davide.botteri@uni-jena.de

Martin Bücke

Friedrich Schiller University Jena | martin.buecker@uni-jena.de

Mihai Ceanga

Jena University Hospital | mihai.ceanga@med.uni-jena.de

Daniel Choquet

University of Bordeaux | daniel.choquet@u-bordeaux.fr

Susobhan Choudhury

Julius Maximilian University Würzburg | susobhan.choudhury@uni-wuerzburg.de

Maria Consuelo Alonso Canizal

Julius Maximilian University Würzburg | consuelo.alonso_canizal@uni-wuerzburg.de

Yiliam Cruz-Garcia

Julius Maximilian University Würzburg | yiliam.cruz-garcia@uni-wuerzburg.de

Stefan Dahlhoff

Julius Maximilian University Würzburg | stefan.dahlhoff@uni-wuerzburg.de

Sven Dannhäuser

Julius Maximilian University Würzburg | sven.dannhaeuser@uni-wuerzburg.de

Volker Deckert

Leibniz Institute of Photonic Technology Jena | volker.deckert@uni-jena.de

Julia Delgado-Tascon

University Hospital Würzburg | delgado_j@ukw.de

Dion Dickman

University of Southern California Los Angeles | dickman@usc.edu

Sören Doose

Julius Maximilian University Würzburg | soeren.doose@uni-wuerzburg.de

Christian Eggeling

University of Oxford | christian.eggeling@rdm.ox.ac.uk

Nadine Ehmann

Julius Maximilian University Würzburg | nadine.ehmann@uni-wuerzburg.de

Jens Eilers

University Leipzig | jens-karl.eilers@medizin.uni-leipzig.de

Tom Floßmann

Jena University Hospital | tom.flossmann@med.uni-jena.de

Mike Friedrich

Julius Maximilian University Würzburg | mike.friedrich@virchow.uni-wuerzburg.de

Sebastian Fritzwanker

Jena University Hospital | sebastian.fritzwanker@med.uni-jena.de

Shiqiang Gao

Julius Maximilian University Würzburg | gao.shiqiang@uni-wuerzburg.de

Dietmar Geiger

Julius Maximilian University Würzburg | geiger@botanik.uni-wuerzburg.de

Christian Geis

Jena University Hospital | christian.geis@med.uni-jena.de

Thomas Gensch

Research Centre Jülich | t.gensch@fz-juelich.de

Michael Andreas Geringer

Julius Maximilian University Würzburg | michael.geringer@uni-wuerzburg.de

Amod Godbole

Julius Maximilian University Würzburg | amod.godbole@uni-wuerzburg.de

Pragya Goel

University of Southern California Los Angeles | pragyago@usc.edu

Ralph Götz

Julius Maximilian University Würzburg | ralph.goetz@uni-wuerzburg.de

Jürgen Graf

Jena University Hospital | juergen.graf@med.uni-jena.de

Kathrin Groeneveld

Jena University Hospital | kathrin.groeneveld@med.uni-jena.de

Benedikt Grünewald

Jena University Hospital | Benedikt.Gruenewald@med.uni-jena.de

Yevgenii Grushevskiy

Julius Maximilian University Würzburg | yevgenii.grushevskiy@uni-wuerzburg.de

Thomas Günther

Jena University Hospital | thomas.guether@med.uni-jena.de

Holger Haselmann

Jena University Hospital | holger.haselmann@med.uni-jena.de

Natalie Hasenauer

Julius Maximilian University Würzburg | natalie.hasenauer@web.de

Manfred Heckmann

Julius Maximilian University Würzburg | heckmann@uni-wuerzburg.de

Rainer Hedrich

Julius Maximilian University Würzburg | hedrich@botanik.uni-wuerzburg.de

Hannah Heil

Julius Maximilian University Würzburg | hannah.heil@uni-wuerzburg.de

Mike Heilemann

Johann Wolfgang Goethe-University Frankfurt | heilemann@chemie.uni-frankfurt.de

Rainer Heintzmann

Leibniz Institute of Photonic Technology Jena | heintzmann@gmail.com

Katrin Heinze

Julius Maximilian University Würzburg | katrin.heinze@virchow.uni-wuerzburg.de

Thomas Heitkamp

Jena University Hospital | thomas.heitkamp@med.uni-jena.de

Carsten Hoffmann

Jena University Hospital | carsten.hoffmann@med.uni-jena.de

Knut Holthoff

Jena University Hospital | knut.holthoff@med.uni-jena.de

Sabine Hummert

Jena University Hospital | sabine.hummert@med.uni-jena.de

Volker Jelinek

Philipps University Marburg | volker.jelinek@pharmazie.uni-marburg.de

Marie-Lise Jobin

Julius Maximilian University Würzburg | marie-lise.jobin@uni-wuerzburg.de

Christian Karras

Leibniz Institute of Photonic Technology Jena | christian.karras@leibniz-ipht.de

Istvan Katona

Hungarian Academy of Sciences Budapest | katona@koki.hu

Michael Kauk

Julius Maximilian University Würzburg | michael.kauk@uni-wuerzburg.de

Sina Kirchofer

Philipps University Marburg | kirchho4@students.uni-marburg.de

Knut Kirmse

Jena University Hospital | knut.kirmse@med.uni-jena.de

Robert Kittel

Julius Maximilian University Würzburg | robert.kittel@uni-wuerzburg.de

Andrea Kliewer

Jena University Hospital | andrea.kliewer@med.uni-jena.de

Dennis Koch

Jena University Hospital | dennis.koch@med.uni-jena.de

Nicole Koch

Jena University Hospital | nicole.koch@med.uni-jena.de

Birgitta König-Ries

Friedrich Schiller University Jena | birgitta.koenig-ries@uni-jena.de

Jan-Hagen Krohn

Julius Maximilian University Würzburg | jan-hagen.krohn@stud-mail.uni-wuerzburg.de

Anika Mann

Jena University Hospital | anika.mann@med.uni-jena.de

Michaela Kuhn

Julius Maximilian University Würzburg | michaela.kuhn@mail.uni-wuerzburg.de

Taulant Kukaj

Jena University Hospital | taulant.kukaj@med.uni-jena.de

Michael Kurz

Philipps University Marburg | kurzmic@staff.uni-marburg.de

Jana Kusch

Jena University Hospital | jana.kusch@med.uni-jena.de

Abhilasha Ladha

Jena University Hospital | abhilasha.ladha@med.uni-jena.de

Erick Miranda Laferte

Julius Maximilian University Würzburg | erick.miranda_laferte@uni-wuerzburg.de

Marius Lamberty

Julius Maximilian University Würzburg | malamberty@aol.com

Tobias Langenhan

University Leipzig | tobias.langenhan@uni-wuerzburg.de

Julian Lehmann

Julius Maximilian University Würzburg | julian.lehmann@uni-wuerzburg.de

Marco Lelle

Jena University Hospital | marco.lelle@med.uni-jena.de

Katharina Lichter

Julius Maximilian University Würzburg | katharina.lichter@t-online.de

Martin J. Lohse

Julius Maximilian University Würzburg & Max Delbrück Center Berlin | lohse@toxi.uni-wuerzburg.de

Javier Gracia López

Friedrich Schiller University Jena | javiergalo92@gmail.com

Jorge Martin Machado

Julius Maximilian University Würzburg | jorge.martin-machado@uni-wuerzburg.de

Elke Miess

Jena University Hospital | elke.miess@med.uni-jena.de

Alexander Möhwald

Friedrich Alexander University Erlangen-Nürnberg | alexander.moehwald@fau.de

Nadja Mößlein

Philipps University Marburg | nadja.moesslein@pharmazie.uni-marburg.de

Zeinab Mokhtari

University Hospital Würzburg | mokhtarias_z@ukw.de

Jan Münch

Jena University Hospital | jan.muench@med.uni-jena.de

Vasilica Nache

Jena University Hospital | vasilica.nache@med.uni-jena.de

Georg Nagel

Julius Maximilian University Würzburg | georg.nagel@botanik.uni-wuerzburg.de

Erwin Neher

Max Planck Institute for Biophysical Chemistry Göttingen | eneher@gwdg.de

Franziska Neubert

Julius Maximilian University Würzburg | franziska.neubert@uni-wuerzburg.de

Viacheslav Nikolaev

University Medical Center Hamburg-Eppendorf | v.nikolaev@uke.de

Maik Otte

Jena University Hospital | maik.otte@med.uni-jena.de

Martin Pauli

Julius Maximilian University Würzburg | martin.pauli@uni-wuerzburg.de

Kalina Peneva

Friedrich Schiller University Jena | kalina.peneva@uni-jena.de

Olga Prokopets

Philipps University Marburg | olga.prokopets@pharmazie.uni-marburg.de

Sven Proppert

Julius Maximilian University Würzburg | sven.proppert@uni-wuerzburg.de

Britta Qualmann

Jena University Hospital | britta.qualmann@med.uni-jena.de

Andreas Reiner

Ruhr University Bochum | andreas.reiner@rub.de

Felix Repp

Julius Maximilian University Würzburg | felix.repp@uni-wuerzburg.de

Ludovic Roussille

Leibniz Institute of Photonic Technology Jena | ludovic.roussille@leibniz-ipht.de

Nelly Rüttiger

Julius Maximilian University Würzburg | nelly.ruettiger@uni-wuerzburg.de

Divya Sachidanandan

Julius Maximilian University Würzburg | divya.sachidanandan@uni-wuerzburg.de

Sheeba Samuel

Friedrich Schiller University Jena | sheeba.samuel@uni-jena.de

Christian Sattler

Jena University Hospital | christian.sattler@med.uni-jena.de

Markus Sauer

Julius Maximilian University Würzburg | m.sauer@uni-wuerzburg.de

Michael Schaefer

Leipzig University Hospital | michael.schaefer@medizin.uni-leipzig.de

Hannes Schihada

Julius Maximilian University Würzburg | hannes.schihada@uni-wuerzburg.de

Ralf Schmauder

Jena University Hospital | ralf.schmauder@med.uni-jena.de

Lars Schmidl

Jena University Hospital | lars.schmidl@med.uni-jena.de

Nicole Scholz

University Leipzig | nicole.scholz@medizin.uni-leipzig.de

Stefan Schulz

Jena University Hospital | stefan.schulz@med.uni-jena.de

Andrea Schweinitz

Jena University Hospital | andrea.schweinitz@med.uni-jena.de

Jürgen Seibel

Julius Maximilian University Würzburg | seibel@chemie.uni-wuerzburg.de

Claus Seidel

Heinrich Heine University Düsseldorf | cseidel@hhu.de

Kerstin Seier

Julius Maximilian University Würzburg | kerstin.seier@uni-wuerzburg.de

Josefine Sell

Jena University Hospital | josefine.sell@med.uni-jena.de

Marzieh Sharifi

Julius Maximilian University Würzburg | marzieh.sharifi@uni-wuerzburg.de

Sana Siddig

Julius Maximilian University Würzburg | sana.siddig@uni-wuerzburg.de

Hendrik Sielaff

Jena University Hospital | hendrik.sielaff@med.uni-jena.de

Anna-Leena Sirén

University Hospital Würzburg | siren.a@nch.uni-wuerzburg.de

Katarina Spiranec

Julius Maximilian University Würzburg | katarina.spiranec@uni-wuerzburg.de

Ralph Steinborn

Jena University Hospital | ralph.steinborn@med.uni-jena.de

Titiwat Sungkaworn

Julius Maximilian University Würzburg | titiwat.sungkaworn@toxi.uni-wuerzburg.de

Frank Taubert

Friedrich Schiller University Jena | frank.taubert@uni-jena.de

Patrick Then

Leibniz Institute of Photonic Technology Jena | patrick.then@leibniz-ipht.de

Jessica Tröger

Jena University Hospital | jessica.troeger@med.uni-jena.de

Cristina Perpina Viciano

Julius Maximilian University Würzburg | cristina.perpina_viciano@uni-wuerzburg.de

Horst Vogel

École polytechnique fédérale de Lausanne | horst.vogel@epfl.ch

Sina Wäldchen

Julius Maximilian University Würzburg | sina.waeldchen@uni-wuerzburg.de

Daniel Walther

Friedrich Schiller University Jena | daniel.walther@uni-jena.de

Christian Werner

Julius Maximilian University Würzburg | christian.werner@uni-wuerzburg.de

Natalia Wolf

Julius Maximilian University Würzburg | natalia.wolf@uni-wuerzburg.de

Shang Yang

Julius Maximilian University Würzburg | shang.yang@uni-wuerzburg.de

Jing Yu

Julius Maximilian University Würzburg | jing.yu@uni-wuerzburg.de

William N. Zagotta

University of Washington Seattle | zagotta@uw.edu

CONTACT

Andrea Schweinitz

Friedrich Schiller University Jena
Jena University Hospital
Institute of Physiology II
Kollegiengasse 9, 07743 Jena

Phone: +49 (0)3641 938326

E-Mail: TRR166@med.uni-jena.de

Astrid Thal

Julius Maximilian University
Department of Biotechnology and Biophysics
Am Hubland, 97074 Würzburg

Phone: +49 (0)931 3184507

E-Mail: astrid.thal@uni-wuerzburg.de

<http://www.receptorlight.uni-jena.de>

Julius-Maximilians-Universität Würzburg
Bio-Imaging Center
Lehrstuhl für Biotechnologie und Biophysik
Institut für Pharmakologie und Toxikologie
Institut für Physiologie
- Schwerpunkt vegetative Physiologie -
Institut für Physiologie
- Abteilung Neurophysiologie -
Julius-von-Sachs-Institut für Biowissenschaften
Universitätsklinikum Würzburg
Klinik für Neurochirurgie
Rudolf-Virchow-Zentrum

Friedrich-Schiller-Universität Jena
Institut für Informatik
Institut für Physikalische Chemie
Universitätsklinikum Jena
AG Biomolekulare Photonik
Hans-Berger-Klinik für Neurologie
Institut für Biochemie I
Institut für Pharmakologie und Toxikologie
Institut für Physiologie II
Arbeitsgruppe Mikroskopie-Methodik
Geschäftsbereich Informationstechnologie
Leibniz Institut für Photonische Technologien Jena

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