

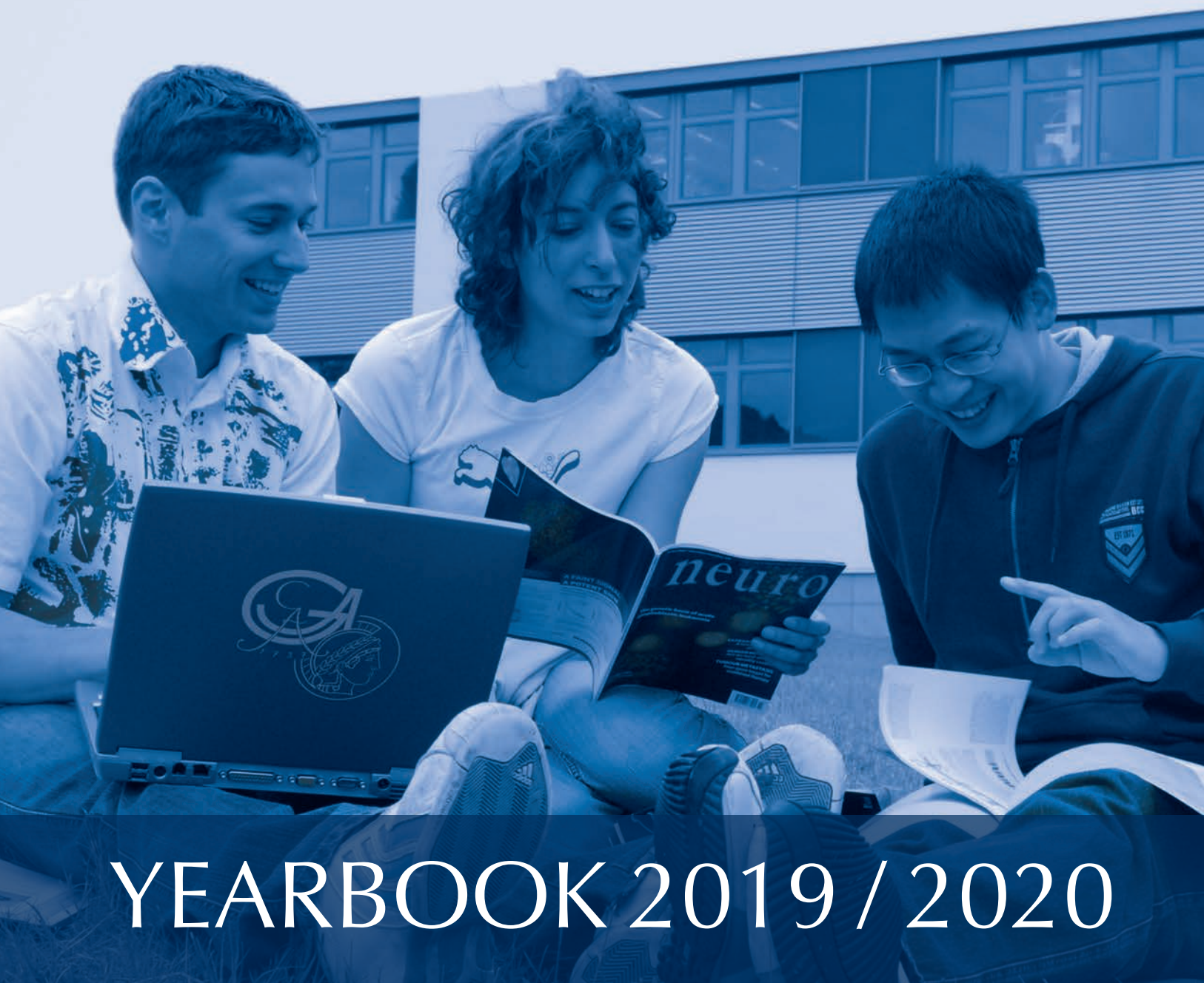


GEORG-AUGUST-UNIVERSITÄT
GÖTTINGEN / GERMANY

International Max Planck Research School

Neurosciences

MSc/PhD/MD-PhD Program



YEARBOOK 2019 / 2020

Yearbook 2019/2020

**MSc/PhD/MD-PhD
Neuroscience Program**
at the University of Göttingen

**International Max Planck
Research School**

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Letter from the President

The University of Göttingen is committed to the education of the next-generation scientists. Firmly rooted in excellent science, our goals are to train competent and critical young academics that are able to meet the challenges of the future. Within the Göttingen Campus, the cooperation between our university, the local Max-Planck Institutes and the German Primate Center fosters a dynamic and vibrant research environment in which the free exchange of ideas leads to top science in a true manifestation of the famous “Göttingen Spirit”.

The two international MSc/PhD programs in Neurosciences and Molecular Biology are highly acclaimed role models in graduate training that almost 20 years after their foundation continue to be enormously successful. Embedded in the Göttingen Campus they integrate faculty members across institutional borders and provide junior faculty members with full rights as thesis supervisors. The programs offer not only scientific training of outstanding quality but also a comprehensive range of services including training in professional skills, career counseling, and practical support for dealing with daily life, greatly facilitating integration of students from abroad. Due to their success, these programs served as blueprints for the creation of additional PhD training programs that are united under the roof of the Göttingen Graduate Center for Neurosciences, Biophysics and Molecular Biosciences (GGNB). GGNB was supported by the Federal Excellence Initiative until the expiration of its Graduate School program and is now stably financed by the university in cooperation with its partners on the Göttingen Campus.

The Neuroscience and Molecular Biology programs remain unique within the GGNB in offering integrated MSc/PhD curricula with a fast track option, which allow excellent BSc graduates to directly enter the PhD phase after successfully absolving the initial 1st year training phase. For almost two decades, these international programs have been particularly successful in attracting large numbers of high quality applicants from all around the world, allowing for the selection of the very best candidates. The new concepts that were introduced by these programs have recently been adopted by the Georg-August University School of Science (GAUSS) and other graduate schools for the benefit of the entire University.

While maintaining their successful structure, the content and focus of the training curriculum of the programs has continuously been adapted to keep pace with the dynamic change of research areas in the participating institutions. Accordingly, new faculty members are integrated to reflect novel developments in research. They will further ensure optimal individual supervision and up-to-date research-oriented training. Beyond academia, both programs maintain close links with the relevant industries to enhance the opportunities of the graduates for a successful professional career in the private sector.

As founding member and former speaker of the international MSc/PhD program in Molecular Biology I am very proud of what we all have achieved, and I remain on board as an active faculty member despite the many obligations in my new office. Most importantly, I would like to thank all colleagues and institutions for their unwavering commitment to these international programs and, last but not least, the German Academic Exchange Service (DAAD), the Lower Saxony Ministry of Science and Culture, and the various generous donors. The University of Göttingen will continue to support these programs to promote international exchange at all levels and for further interaction with our partners worldwide.

Prof. Dr. Reinhard Jahn
(President of the University of Göttingen)



Letter from the Max Planck Society

The mission of the Max Planck Society is to conduct top-level basic research in science and the humanities. Because this is only possible with bright young minds, the Max Planck Society funds graduate education nationwide - including the Neuroscience program in Göttingen.

Currently, over 80 Max Planck Institutes are located on scientific campuses across Germany, most of them close to universities. To strengthen the scientific ties with universities, the Max Planck Society, together with the German University Rectors' Conference, launched the International Max Planck Research Schools (IMPRSs) as a new joint program - during celebrations in Göttingen on the occasion of the 50th anniversary of the Max Planck Society.

The goals of the IMPRSs are

- to attract excellent students from all around the world to intensive PhD training programs in Germany, preparing them for careers in science,
- to integrate internationally renowned Max Planck researchers into top-level scientific training programs for junior scientists, and
- to strengthen international relationships by providing individual support to each student and by exposing foreign students to German culture and the German language.

By now, 66 International Max Planck Research Schools have been established involving 83 Max Planck Institutes, 36 German universities, and 26 universities abroad. Over 3,200 PhD students from over 123 countries are presently enrolled.

Since their foundation in 2000, the Göttingen IMPRSs in Neurosciences and Molecular Biology have met with particular - and extraordinary - success. This is due to multiple factors. Most notably, the Göttingen IMPRSs in Neurosciences and Molecular Biology are the result of a true synergism between the local Max Planck Institutes and the University of Göttingen, the University Medical Center Göttingen, the German Primate Center, and additional extra-university institutions, which allowed to completely reform local graduate education in the course of their establishment. Moreover, all of the respective IMPRS funds are invested into the Neurosciences and Molecular Biology graduate programs. This allows us to offer excellent training conditions and financial support, which is a major attraction for the best students worldwide. Accordingly, most former students of our programs moved on to postdoctoral positions, typically at prestigious international institutions, and many have become successful independent scientists themselves.

Over the past two decades, the IMPRS-funded graduate programs in Neurosciences and Molecular Biology have received unanimous acclaim during external evaluations and won national awards. For instance, they are the only Life Science Programs within Germany that were selected for the „Top Ten International Master's Degree Courses 2006“. The Schools have also re-shaped the local scientific community, strengthening the ties between the participating institutions, and initiated new scientific collaborations that augment the international reputation of Göttingen as a centre of scientific excellence. Furthermore, the schools served as role models and founding members of the Göttingen Graduate Center for Neurosciences, Biophysics, and Molecular Biosciences, thus being instrumental for the continued support by the German Excellence Initiative provided to the University. We hope that in the years to come our IMPRS students will continue to be successful in their professional careers - and that they will remember their training period in Göttingen as an exciting, stimulating, and formative phase of their lives.

Nils Brose
Dean of the IMPRS
Neurosciences

Overview

This yearbook is intended to provide information on the International MSc/PhD/MD-PhD Program for Neurosciences in Göttingen, Germany, which was established in 2000. In addition to general information on the program, the yearbook introduces the current year's students, the faculty members, the program committee, and the coordination team.

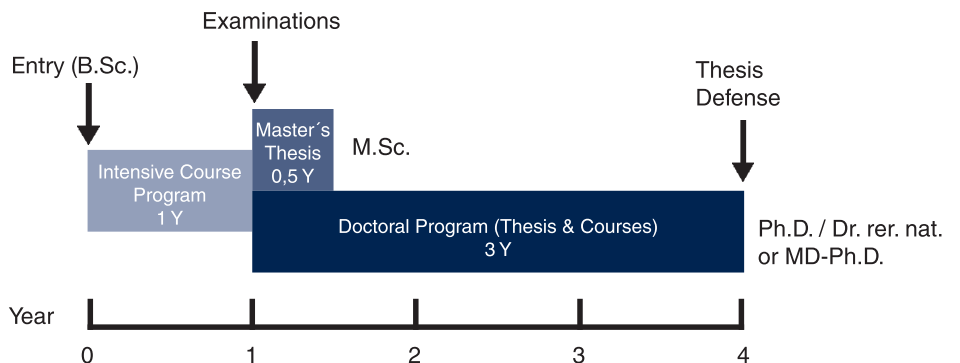
The program is a member of the Göttingen Graduate Center for Neurosciences, Biophysics, and Molecular Biosciences (GGNB), which was supported by the Federal Excellence Initiative until the expiration of its Graduate School program and is now stably financed by the university in cooperation with its partners on the Göttingen Campus. It is offered by the University of Göttingen, the Max Planck Institute for Biophysical Chemistry (MPIbpc), the Max Planck Institute for Experimental Medicine (MPIem), the Max Planck Institute for Dynamics and Self-Organization (MPIId), the German Primate Center (DPZ), and the European Neuroscience Institute (ENI). Further to their active participation in the Neuroscience Program, the above mentioned partners closely cooperate in the current and former Clusters of Excellence (CNMPB 2002-2019 and MBExC since 2019), the Göttingen Center for Molecular Biosciences (GZMB), the Center for Systems Neuroscience (ZNV), in several collaborative research centers (Sonderforschungsbereiche, SFB), and in interdisciplinary doctoral programs (Graduiertenkollegs, GRK).

The International MSc/PhD/MD-PhD Neuroscience Program qualifies students for professional work in the neurosciences. The program is open to students from Germany and from abroad, who hold a Bachelor's degree (or equivalent) in the biosciences, medicine, psychology, physics, or related fields. All courses are held in English. Scholarships are available. The academic year starts in October and is preceded by a three week orientation program. Applications may be submitted until January 15 of the year of enrollment. To ensure a high standard of individual training, the number of participants is limited to 20 students per year.

All students initially participate in one year of intensive course work. This first segment of the program comprises lectures, tutorials, seminars, methods courses, and independent, individually supervised research projects (laboratory rotations). The traditional German structure of academic semesters is not followed. The condensed schedule allows students to accumulate 90 credits (ECTS) within one year, which would normally require three semesters.

Subsequently, two separate segments are offered:

- **PhD Program:** Good to excellent results after the first year qualify for direct admission to a three-year doctoral project in one of the participating research groups. The Master's thesis requirement is waived in this case. After successful defense of a doctoral thesis, the degree Doctor of Philosophy (Ph.D.) or the equivalent title Doctor rerum naturalium (Dr. rer. nat.) is conferred. Students who finished medical school can apply for an MD-Ph.D. title.
- **MSc Program:** Alternatively, students may conclude the program with a Master's thesis, based on six months of experimental scientific research. The degree Master of Science (M.Sc.) is awarded upon successful completion of the Master's thesis. The continuation in the PhD program is possible and desired.



Intensive Course Program (First Year)

Throughout the first year, current topics in the neurosciences are covered by

- lectures
- tutorials
- methods courses
- laboratory rotations
- seminars
- skills courses

Lectures and Tutorials (Theoretical Modules)

A comprehensive lecture series is organized into a sequence of 4-6 week units. The following topics are taught on an advanced level throughout the first year (36 weeks, 4 hours per week):

- A. (Module M.Neuro.11) Neuroanatomy, Development**
- B. (Module M.Neuro.12) Physiology and Basic Statistics**
- C. (Module M.Neuro.13) Modelling, Autonomous Nervous System, Pharmacology**
- D. (Module M.Neuro.14) Molecular Biology, Development, Neurogenetics**
- E. (Module M.Neuro.15) Sensory and Motor Functions**
- F. (Module M.Neuro.16) Clinical Neurosciences and Higher Brain Functions**
- G. Specialization Seminars and Tutorials**

Each lecture is accompanied by a tutorial session, where students meet with a tutor in small groups. Tutorials involve exercises, review of lecture material, and discussion of related topics.

Methods Courses (Practical Modules)

During the first months of the Neuroscience Program, students participate in a series of methods courses to introduce them to principles and practical aspects of basic scientific techniques and the handling of model organisms. The practical courses and tutorials comprise the following topics:

M.Neuro.21 Histology & Cytology

- comparative development of the vertebrate brain
- cytology and ultrastructure of the human brain
- functional neuroanatomy of sensory and motor systems
- immunocytochemical techniques and single neuron recording
- development and neuroanatomy of invertebrate models

M.Neuro.22 Electrophysiology

- introduction to medical statistics and programming languages
- electrophysiological techniques
- membrane physiology / synaptic transmission
- FLIM / Ca-imaging / FCS techniques / confocal microscopy
- sensory and behavioral physiology

M.Neuro. 23 Microscopy & Imaging

- neuronal modelling
- behavioral analysis
- neuroendocrinology / neuropharmacology
- protein separation techniques

M. Neuro.24 Zoo-Physiology

- cell culture methods
- methods in molecular biology
- genetics of transgenic mouse models

Laboratory Rotations (Practical Module M.Neuro.25)

Starting in January, every student carries out three independent research projects (laboratory rotations) in participating laboratories. Each project is individually supervised and involves seven weeks of experimental work, followed by one week for data analysis and presentation. For each project, a report must be completed in the format of a scientific publication. The laboratory rotations must cover at least two different subjects.

Seminars

Seminars start in March. The class meets weekly for two hours to discuss two or three student presentations. The presentations are research reports based on work from the laboratory rotations.

Examinations

After the first year of intensive training, all students take one written and two oral Master's examinations. The Master's examinations explore the students' theoretical background in topics covered by lectures and tutorials. All candidates are examined both in the field of anatomy and physiology in two separate oral exams.

PhD Program

Students who have passed the Master's examinations with good or excellent results qualify for direct admission to a three-year doctoral project in one of the participating research groups without being required to complete a Master's thesis first.

The PhD program emphasizes independent research by the students in the group of a faculty member. The PhD students select three independent faculty members as their thesis advisory committee who closely monitor progress and advise the students in their research project. Laboratory work is accompanied by seminars and lecture series, a wide variety of advanced methods courses, training in scientific writing and oral presentation skills, courses in intercultural communication, career planning, time and project management, bioethics and research ethics, elective courses, and participation in international conferences or workshops. Regular industry excursions are offered to biotechnological or pharmaceutical companies, including visits of the R&D facilities and discussions of career options with representatives of the HR departments.

Doctoral students of the program organize the international PhD student symposium "Neurizons" every two years with great success, attracting outstanding speakers and up to 300 participants from all over the world. The meeting was designed by the students to promote scientific exchange between young researchers from different disciplines. Since a few years, a "Career Fair for Scientists" precedes the Neurizons meetings. The career fair offers a unique and exciting program of career presentations, workshops and networking opportunities and is also organized by the Neuroscience students. Both events include an increasing number of alumni, sharing their experience.

At the end of the PhD training program, a doctoral thesis is submitted either in the traditional format, or as a collection of scientific publications in internationally recognized journals along with a general introduction and a discussion of the results. The degree Ph.D. or, alternatively, Dr. rer. nat. will be awarded after the successful defense of the doctoral thesis. Having fulfilled all PhD degree requirements, medical students may apply for the degree of an M.D.-Ph.D. at the Medical Faculty.

Master's Program

After the first year of intensive training, students may conclude the program with a six-month thesis project, leading to a Master of Science degree. The thesis project involves experimental work under the supervision of faculty members of the Neuroscience Program. Students have the opportunity to conduct their Master's thesis project at an affiliated research institution abroad.

Orientation, Language Courses, Social Activities

A three-week orientation prior to the program provides assistance and advice for managing day-to-day life, including arrangements for bank account, health insurance, residence permit, housing, and enrollment. Students have the opportunity to meet faculty members and visit laboratories of the participating institutions. In addition, the orientation program informs students about computing and library facilities, the city and university of Göttingen, sports facilities, and cultural events.

An intensive basic language course in German is offered in cooperation with the *Lektorat Deutsch als Fremdsprache* to facilitate the start in Göttingen. Additional language courses and social activities accompany the program.

Application, Selection, and Admission 2019

Applicants must hold a Bachelor's degree or equivalent in biology, medicine, psychology, physics, chemistry, or related fields. Applicants who are not native speakers of English should demonstrate adequate competence of the English language by acceptable results in an internationally recognized test.

In the year 2019, the coordination office received 447 applications from 68 countries.

Continent	Applications	Admissions
Europe (total)	58	5
Germany	31	2
other West Europe / Middle Europe	15	2
East Europe	12	1
America (total)	31	2
North America	15	0
Central/South America	16	2
Africa (total)	90	3
North Africa	22	2
Central/South Africa	68	1
Asia (total)	267	10
Near East	108	4
Central Asia/ Far East	159	6
Australia	1	0

Incl. 1 NEURASMUS student (from Sudan).

Neurasmus is an Erasmus Mundus Joint Master Degree program (EMJMDs) which is based on the cooperation of 5 partner universities, comprising Université de Bordeaux/France, Vrije Universiteit Amsterdam/Netherlands, Universitätsmedizin Göttingen/Germany, Charité - Universitätsmedizin Berlin/Germany and Université Laval/Canada.

For details please refer to the Neurasmus website:
<http://www.neurasmus.u-bordeaux2.fr/>

Students 2019/2020

Name		Home Country
Hazim	Abdelrahman*	Sudan
Abdelrahman	AIOkda	Egypt
Pietro	Amerio	Italy
Rachna	Balaji	India
Laurin	Büld	Germany
Bruno	Carniatto Marques Garcia	Brazil
Avika	Chopra	India
Hanna	Dubrovska	Ukraine
Yomna	Gohar	Egypt
Paloma-Renata	Huguet Rodríguez	Spain
Mariia	Metelova	Ukraine
Ranjit	Pradhan	India
Varsha	Ramakrishna	India
Perianen	Ramasawmy	Mauritius
Lucía	Rojas Meza	Peru
Hanna	Rula	Ukraine
Jaya	Sathiyamani	India
Asude	Tura	Turkey
Alexandra	Witt	Germany

* NEURASMUS student



Sudan

Hazim Abdelrahman

EDUCATION

College / University:

University of Khartoum

Highest Degree:

MBBS (Bachelor of Medicine & Surgery)

Major Subjects:

Medicine

Lab Experience:

Basic molecular biology techniques (DNA/RNA Extraction, PCR Methods, Gel Electrophoresis, Protein Separation [SDS-PAGE]), immunological techniques (ELISA, IIFT), microscopy (Light, Confocal), cell culture techniques, cell sorting, immunohistochemistry, EEG

Projects / Research:

2018 – 2019: Internship at Central Lab of Ministry of Higher Education & Scientific Research, Sudan (Khalid Enan, Head department), researcher in “Molecular characterization of Human bocavirus and coinfection among Sudanese nomads”

2018 – 19: Member of Sudanese Neuroscience’s Projects “Genetic Basis of Parkinson’s disease in a cohort of Sudanese Patients”; “EEG study project”

Scholarships:

2019 – 2021: Erasmus Mundus Scholarship



Egypt

Abdelrahman AIOkda

EDUCATION

College / University:

University of Science and Technology at Zewail City (USTZC)

Highest Degree:

B.Sc. Biomedical Sciences

Major Subjects:

Molecular Biology, Medical Sciences (Pathology, Physiology/ Pathophysiology, Anatomy)

Lab Experience:

Cell culture, PCR-mutagenesis, Western blotting, Size exclusion chromatography, Confocal/ Fluorescence microscopy, High resolution respirometry, Flow Cytometry, Rat/Mouse dissection

Projects / Research:

08/2017 – 06/2018: Bachelor Thesis “Investigation of novel functions for DNA repair proteins in *Saccharomyces cerevisiae*”, Center for Genomics, Zewail City of Science and Technology (ZCST), Egypt

05/2015 – 05/2016: “Resolving Contributions of Oxygen-Consuming and ROS-Generating Enzymes at the Synapse”, Center for Aging and Associated Diseases, ZCST

04/2015 – 09/2017: “Induction of pluripotency in adult stem cells via ovarian tissue extract”, Center of Excellence for Stem Cells Research and Regenerative Medicine, ZCST

Scholarships:

2019 – 2020: Stipend by the International Max Planck Research School

01 – 06/2019: Research Internship Stipend by the EPFL

2014 – 2018: USTZC Academic Scholarship

2015: CESC Research Grant, Science & Technology Development Fund in Egypt



Italy

Pietro Amerio

EDUCATION

College / University:

Università degli Studi di Torino

Highest Degree:

B.Sc.

Major Subjects:

Biotechnology

Lab Experience:

Fundamental cell-culturing techniques, Real Time-PCR and primer-designing, immuno-histochemistry, ELISA, FACS analysis of membrane and intra-cytoplasmic markers, isolation and characterization techniques for extracellular vesicles, in vitro osteogenic and adipogenic differentiation assays, liver organoids differentiation assay with RCCS, metabolic assays

Projects / Research:

2019: Bachelor's Thesis "Engineering of Extracellular Vesicles for intracellular delivery of therapeutic agents: analysis of three promising approaches for selective cargo loading and precise targeting of EVs"

2017 – 2019: Internship, Prof. Bussolati, Dept. of Molecular Biotechnology and Health Sciences, University of Torino

Scholarships:

2019 – 2020: Stipend by the International Max Planck Research School

2017 – 2019: Merit-based Scholarship by EDISU (Ente regionale per il Diritto allo Studio Universitario del Piemonte)



India

Rachna Balaji

EDUCATION

College / University:

Anna University

Highest Degree:

Bachelor of Technology Industrial Biotechnology

Major Subjects:

Molecular biology, Genetic engineering, Neurobiology and cognitive sciences, Bioprocess and Tissue engineering, Bioinformatics

Lab Experience:

Cell culture / animal handling, maintenance/ dissection of organs of mice, RT-PCR, Western blot, DNA/RNA isolation, ELISA, tissue preparation, blood count analysis, tDCS; MATLAB, C++, Arduino programming, LABVIEW, Autodock

Projects / Research:

Bachelor's thesis: "Study of fingertip force distributions during thumb perturbation", Neuromechanics laboratory, Dept. of Applied Mechanics, IIT-Madras

Internship 2018: "Influence of a 24hr consolidation period on generalization of motor skills", Cognitive workspace, Division of Biological engineering, IIT Gandhinagar

Training 2017: Molecular Biology techniques and fluorescence microscopy, VIT University, Vellore

Internship 2016: Haematology and Histopathology laboratory, Apollo Hospitals, Teynampet

Training 2015: Immunological techniques, Dr. M.G.R. Medical University, Tamil Nadu

Scholarships:

2019 – 2020: Stipend by the International Max Planck Research School

05 – 07/2018: Fellowship, Summer Research Internship programme, IIT Gandhinagar



Germany

Laurin Büld

EDUCATION

College / University:

Rheinische Friedrich-Wilhelms-Universität Bonn

Highest Degree:

B.Sc.

Major Subjects:

Connectomics, Behavioural Biology, Developmental Neurobiology

Lab Experience:

D. melanogaster larvae: handling of stocks, application of Gal4/UAS-System, optogenetics, calcium imaging, immunohistochemistry, foodintake experiments, dissection of CNS, ENS and gut

Dry Lab: neuronal reconstruction and data analysis using catmaid and R

Projects / Research:

07/2018 – 03/2019 Research Internship, Drosophila Connectomics Group (Dr. Jefferis), University of Cambridge: Reconstruction and analysis of neural circuits in the adult *D. melanogaster* brain involved in the processing of thermo- and hygrosensory input in the mushroombody

03 – 09/2018 Bachelor thesis, Molecular Brain Physiology and Behavior Group (Prof. Dr. Pankratz), Rheinische Friedrich-Wilhelms-Universität Bonn: Neural control mechanisms of fore- and midgut movements in *Drosophila melanogaster* larvae

Scholarships:

2019 – 2020: Stipend by the International Max Planck Research School

2018 – 2019: Wellcome Trust funded internship position



Brazil

Bruno Carniatto Marques Garcia

EDUCATION

College / University:

Universidade Federal do Paraná (UFPR), Brazil

Highest Degree:

M.D.

Major Subjects:

Medicine

Lab Experience:

Cell culture, immunohistochemistry, densitometry, genotyping, qPCR, Western-blot, mtDNA purification and analysis, mice handling, basis of mice stereotaxic surgery

Projects / Research:

2015: Sleep disorder in a mouse model of Parkinson, University of California Los Angeles

2015: Neuroprotective effects of urate on POLG mice, Beth Israel Deaconess Medical Center, Harvard Medical School 2016-2017: Neuro-ophthalmological findings in *Spinocerebellar ataxias*, Universidade Federal do Paraná

Scholarships:

2019 – 2020: Stipend by the International Max Planck Research School

2014 – 2015: Brazil Scientific Mobility Program (Ciência sem Fronteiras), funded by CAPES



India

Avika Chopra

EDUCATION

College / University:

Sri Venkateswara College, University of Delhi, New Delhi, India

Highest Degree:

B.Sc. (H) Biochemistry

Major Subjects:

Cell Biology, molecular biology, genetics, biotechnology, immunology etc.

Lab Experience:

Spectrophotometry, thin layer / ion-exchange chromatography, protein purification, sub-cellular fractionation, SDS-page, glucose tolerance test, hematological tests, isolation of DNA, total RNA / plasmid DNA, culturing Drosophila melanogaster mutant species, PCR, ELISA, Western Blot, transformation & blue-white-selection, Ouchterlony double diffusion, Mancini radial immunodiffusion, agglutination reactions, Widal Test, bioinformatics techniques; sequence retrieval, protein structure prediction

Projects / Research:

2018:

“Role of hyperglycemia on macrophage effectors function in tuberculosis”, AIIMS, New Delhi

“Immunoinformatic studies of Par h1 Parthenium allergen for epitope identification and mapping” / “To assess the effects of smoking on respiratory and cardiovascular system in young adult population” / “Using mycobacterial fingerprint as a rapid, non-invasive diagnostic test for tuberculosis”, Sri Venkateswara College, University of Delhi

Scholarships:

2019 – 2020: Stipend by the International Max Planck Research School



Ukraine

Hanna Dubrovskaya

EDUCATION

College / University:

Taras Shevchenko National University of Kiev

Highest Degree:

B.Sc.

Major Subjects:

Molecular Biology and Biochemistry

Lab Experience:

PCR genotyping, cell culture techniques, gene cloning, DNA/ RNA purification, cDNA synthesis, bisulfite treatment of DNA, Protein Electrophoresis, ELISA, Dot / Western blot, mouse behavior tests, stereotaxic surgery, neuronal tracers injection, perfusion, brain banking, cryosection, immunohistochemistry, immunofluorescence, fluorescence microscopy, microdialysis, Statistica, SnapGene, EthoVision, BLAST, UniProt, Target Scan

Projects / Research:

2018 – 2019: Investigation of epigenetic regulation of behavior and cognitive abnormalities in mouse. Korea Institute of Science and Technology, Brain Science Institute, Seoul

2015 – 2018: Developing of a non-invasive test system for detection renal cancer by blood sample based on detection of epigenetic changes of cell-free DNA. Institute of Molecular Biology and Genetics NAS Ukraine, Kiev

Scholarships:

2019 – 2020: Stipend by the International Max Planck Research School

2018-2019: Scholarship by Korea Institute of Science and Technology School

2018: “Zavtra.UA” Scholarship for outstanding students, Victor Pinchuk Foundation

2014 – 2018: Ukrainian State Scholarship for students with high academic achievements



Egypt

Yomna Gohar

EDUCATION

College / University:

German University in Cairo

Highest Degree:

Bachelor of Pharmacy

Major Subjects:

Pharmacy

Lab Experience:

Drug synthesis and extraction using chromatography (pharmaceutical chemistry dept.), nano particles manufacturing and evaluation (pharmaceutical technology dept.)

Internship "Molecular Modeling": Using molecular dynamics simulation to understand the mechanism behind the acceleration of Cycloaddition reactions on the surface of water. Paderborn University, Germany

Projects / Research:

Co-author in a poster accepted in PBP world meeting: "Chitosan Nanoparticles; The Effect of Surface Modification and the Protein Corona on NP Drug Release Kinetics"

2018 – 2019: Project in pharmaceutical technology dept. in GUC aiming at evaluation of drug release from different nanoparticle formulations

Scholarships:

2019–2020: Stipend by the International Max Planck Research School

GUC Excellence Award to study advanced molecular biology in Berlin, Germany

2017: GUC Excellence Award in computational chemistry, internship in Paderborn, Germany

2014: GUC Excellence Award for Undergraduate Study, Pharmacy & Biotechnology Program

2014: DAAD scholarship, summer language course in Ulm, Germany



Spain

Paloma-Renata Huguet Rodríguez

EDUCATION

College / University:

University of the Basque Country (UPV/EHU)

Highest Degree:

B.Sc.

Major Subjects:

Biochemistry and Molecular Biology

Lab Experience:

Primary microglial cultures, *in vitro* model of phagocytosis, Western Blotting, qPCR, immunofluorescence, fluorescence and confocal microscopy, ImageJ-Fiji, Python, Matlab

Projects / Research:

2018/2019 Bachelor's thesis "Microglial metabolism and phagocytosis: a bidirectional relationship". Achucarro Basque Center for Neuroscience, Laboratory of Glial Cell Biology

09/2018 – 01/2019: Microglial phagocytosis disruption under ischemic conditions: role of autophagy

06-09/2018: Regulation of phagocytic microglia by transcriptional regulation of HIF1 α

09/2017 – 06/2018: Analysis of the transcription factor HIF1 α in phagocytic microglia

Scholarships:

09/2018 – 01/2019 "Transition into the Working World" fellowship. University of the Basque Country (UPV/EHU)

06 – 09/2018 "IKASIKER" summer internship. Basque Government.

09/2017 – 06/2018 "IKASIKER" year through internship. Basque Government.



Ukraine

Mariia Metelova

EDUCATION

College / University:

Taras Shevchenko National University of Kiev

Highest Degree:

B.Sc.

Major Subjects:

Biology, Cytology and Histology

Lab Experience:

Immunocyto-/immunohistochemistry, confocal microscopy, isolation / maintaining of primary stem cells of different origins, hippocampal / spinal cord organotypic tissue cultures, oxygen-glucose deprivation, various histological techniques, qPCR, reporter mouse lines, fluorescence *in situ* hybridization.

Projects / Research:

2018-2019: Bachelor's Thesis "Effects of the derivative of fullerene C60 on the organotypic hippocampal slice culture after modeling of ischemic damage", Dept. of Cellular Membranology, Bogomoletz Institute of Physiology of NAS of Ukraine, Kiev

06-08/2018: "Analysis of GFRA1 expression in the medial habenula and related nuclei in the adult brain", Amgen Scholars Internship Program, Karolinska Institutet, Stockholm, Sweden

2017-2019: "Study of differences in the post-traumatic recovery of the spinal cord in mice FVB of different sexes", Dept. of Cellular Membranology, Bogomoletz Institute Kiev

Scholarships:

2019 – 2020: Stipend by the International Max Planck Research School

06 – 08/2018: Amgen Foundation Research Stipend

09/2015 – 06/2019: Ukrainian State Scholarship for students with excellent achievements

Ranjit Pradhan

EDUCATION

College / University:

National Brain Research Centre

Highest Degree:

M.Sc.

Major Subjects:

Neuroscience

Lab Experience:

Molecular Biology: Electrophoresis, Western Blotting, Polymerase chain reaction, Immunoprecipitation, Protein post-translational modification analysis, Immunocytochemistry

Cell culture: Bacterial culture, Mammalian cell culture, Haemocytometer

Biochemistry: Protein extraction, Protein estimation, Buffers and solutions

Microscopy: Light microscopy, Fluorescence microscopy

Projects / Research:

05/2018 – 05/2019: Master's Thesis "Dysregulation of ERK5 in Down Syndrome and its rescue by DYRK1A inhibitor", Molecular and Cellular Neuroscience Division, National Brain Research Centre, India

Scholarships:

2019 – 2020: Stipend by the International Max Planck Research School

08/2017 – 08.2019: National Brain Research Centre Master's Scholarship



India



India

Varsha Ramakrishna

EDUCATION

College / University:

National Brain Research Centre, Manesar, Haryana, India

Highest Degree:

M.Sc.

Major Subjects:

Neuroanatomy, Developmental Neuroscience, Cellular and Molecular Neuroscience, Neurochemistry, Cognitive and Computational Neuroscience

Lab Experience:

Animal handling, patch clamp, cryotome sectioning, molecular biology techniques, immunohistochemistry, light / epifluorescence microscopy, cell culture / animal dissection; Neurolucida, Clampex, ImageJ, SigmaPlot, MATLAB and Python

Projects / Research:

07/2018 – 07/2019: “Role of Darpp-32 in electrical bistability of purkinje neurons in zebrafish larvae”, National Centre for Biological Sciences, Bangalore, India

06/2017 – 06/2018: “Adult neurogenesis in Corvids: a preliminary study”, National Brain Research Centre, Manesar, India

04 – 06/2015: “Role of Syngap1 in neuronal deficits associated with Autism Spectrum Disorder”, Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, India

Scholarships:

2019 – 2020: Stipend by the International Max Planck Research School

07/2018 – 07/2019: CSIR-UGC NEET Junior Research Fellowship

08/2016 – 06/2018: Stipend by National Brain Reserach Centre (NBRC)

06/2013 – 04/2016: INSPIRE scholar, Government of India



Mauritius

Perianen Ramasawmy

EDUCATION

College / University:

University of Bristol, Bristol, United Kingdom

Highest Degree:

B.Sc.

Major Subjects:

Neuroscience

Lab Experience:

Neuroanatomy, histology, neurophysiology, quantitative sensory testing, spirometry, physiological monitoring, finger plethysmography, research governance and researcher-participant interactions in clinical setup; Resting state fMRI data analysis (dual regression, Melodic ICA, spectral DCM and network modelling analysis using FSLNets), basic coding in MATLAB, statistics using IBM SPSS and GraphPad

Projects / Research:

09/2018 – 08/2019: Bachelor’s thesis “The role of peripheral chemoreceptor activity during dynamic exercise in young adults with a family history of hypertension”, University of Bristol, UK

06 – 08/2018: Investigating differences in functional connectivity between fibromyalgia patients and healthy volunteers: A resting-state fMRI pilot study. University of Bristol, UK

Scholarships:

2019 – 2020: Stipend by the International Max Planck Research School

06 – 08/2018: Stipend for summer internship by the URC/IAS, University of Bristol, UK

09/2016 – 08/2019: State scholarship awarded by the Republic of Mauritius for being ranked 3rd nationally for the CIE A-Levels



Peru

Lucía Rojas Meza

EDUCATION

College / University:

Peruvian University Cayetano Heredia (UPCH)

Highest Degree:

B.Sc.

Major Subjects:

Biology

Lab Experience:

Basic techniques in molecular and cellular biology: PCR and gel electrophoresis, DNA extraction, cell culture, western blot, fluorescence microscopy, neuroblastoma transfection
Microbiology basic techniques: cloning and protein expression

Projects / Research:

2018 – 2019: Purification of RNAP enzyme and cofactor Sigma 70. Dr. Daniel Guerra Giraldez, Peruvian University Cayetano Heredia

2017 – 2018: Construction of chimeric protein of green fluorescent protein and calpain 10. Dra. Ana Victoria Vega Salcedo, National Autonomous University of México, UNAM

2017 – 2018: Protein-protein interactions of voltage dependent sodium channels. Dra. Ana Victoria Vega Salcedo, UNAM

Scholarships:

2019 – 2020: Stipend by the International Max Planck Research School

2017: UPCH student mobility support fund

Hanna Rula

EDUCATION

College / University:

Taras Shevchenko National University of Kiev

Highest Degree:

B.Sc.

Major Subjects:

Biology

Lab Experience:

Patch-clamp recording on brain slices, ex-vivo spinal cord; PCR, electrophoresis; rodent surgery and rodent behavior; data analysis via pCLAMP, MiniAnalysis

Projects / Research:

05 – 08/2018: “Sensory filtering in animal models for autism“, Dept. of anatomy and cell Biology, University of Western Ontario, London, Canada

2016 – 2019: “Characteristic of afferent inputs of the lamina I dorsal root projection neurons of rat spinal cord“, “Decreased dorsal horn excitability in mice overexpressing GAD65/VGAT in spinal cord“, Bogomoletz Institute of Physiology, Kiev, Ukraine

2015: “Methylation of cell-free DNA from blood plasma“, Institute of Molecular Biology and Genetics, Kiev, Ukraine

Scholarships:

2019 – 2020: Stipend by the International Max Planck Research School

2019: DAAD grant for participation in the European Summer School on Science Communication, Germany

2018: Mitacs Globalink Scholarship for summer research internship in Canada

2015-2019: Ukrainian State Scholarship for students with high academic achievements



Ukraine



India

Jaya Sowkyadha Sathiyamani

EDUCATION

College / University:

Sri Venkateswara College, University of Delhi

Highest Degree:

B.Sc.(Hons.) Biological Sciences

Major Subjects:

Zoology, Biochemistry, Cell Biology, Molecular Biology, Evolutionary Biology, Genetics

Lab Experience:

Spectrophotometry, Protein Biochemistry, Chromatography; DNA, RNA and Plasmid isolation, PCR; Computational: Python basics, Linux & HPC, Bioinformatics basics

Projects / Research:

Mitra Lab at Cold Spring Harbor Laboratory, Prof. Partha Mitra, CSHL in the undergoing Mouse Brain Architecture Project's Computational pipeline for injection coverage analysis

Scholarships:

2019 – 2020: Stipend by the International Max Planck Research School

07 – 09/2018: Khorana Program Stipend by IUSSTF, DBT (Govt. of India) and WinStep Forward for Internship at Cold Spring Harbor Laboratory, New York

01/2018: Japan Sakura Science Fellowship stipend by Japan Science and Technology for short-training visit (10 days), Dr. Hiroaki Wagatsuma Lab at Kyushu Institute of Technology, Japan



Turkey

Asude Tura

EDUCATION

College / University:

Yeditepe University

Highest Degree:

Doctor of Medicine (M.D.)

Major Subjects:

Medicine

Lab Experience:

Rat handling, behavioral tests on experimental animals, electrophysiological recordings (EEG, ECG), fMRI, tissue culture

Projects / Research:

2018 – 2019: Cell culture model of Alzheimer's disease, Prof. Dr. Gülderen Yanikkaya Demirel, Immunology and Tissue Typing Laboratory, Yeditepe University

2018 – 2019: "Safety of hospital discharge prior to the return of bowel function after colorectal surgery: international, prospective, cohort study", EuroSurg Collaborative

June 2018: Internship at Neuroimaging Unit of Hulusi Behçet Life Sciences Research Laboratory, Istanbul University Faculty of Medicine

Scholarships:

2019 – 2020: Stipend by the International Max Planck Research School



Germany

Alexandra Witt

EDUCATION

College / University:

Technische Universität Braunschweig

Highest Degree:

B.Sc.

Major Subjects:

Psychology

Lab Experience:

Basic chemical lab techniques (qualitative and quantitative analysis, inorganic and organic synthesis), EEG; Programming: Python (basic), R (advanced)

Projects / Research:

2019: Bachelor's thesis "Neural correlates of simulator sickness"

2018: Foraging as a model of reward-seeking behaviours in healthy and unhealthy patterns of consumption. Internship at Bangor University

2017 – 2018: Behavioural interventions concerning dietary behaviour. Internship and student research assistant position at the Technische Universität Braunschweig

Scholarships:

2019 – 2020: Stipend by the International Max Planck Research School

08 – 09/2018: DAAD rise scholarship

Faculty

Name		Department	Institute
Andrea	Antal	Clinical Neurophysiology	U Göttingen
Mathias	Bähr	Neurology	U Göttingen
Thomas	Bayer	Molecular Psychiatry	U Göttingen
Susann	Boretius	Functional Imaging Laboratory	DPZ
Nils	Brose	Molecular Neurobiology	MPI em
Wolfgang	Brück	Neuropathology	U Göttingen
Brett	Carter	Synaptic Physiology and Plasticity	ENI
Jan	Clemens	Neural Computation and Behavior	ENI
Camin	Dean	Trans-synaptic Signaling	ENI
Peter	Dechent	Cognitive Neurology	U Göttingen
Thomas	Dresbach	Anatomy and Embryology	U Göttingen
Hannelore	Ehrenreich	Clinical Neurosciences	MPI em
Gregor	Eichele	Genes and Behavior	MPI bpc
André	Fiala	Molecular Neurobiology of Behavior	U Göttingen
André	Fischer	German Center for Neurodegenerative Diseases	U Göttingen
Alexander	Flügel	Neuroimmunology	U Göttingen
Tim	Friede	Medical Statistics	U Göttingen
Alexander	Gail	Sensorimotor Transformations	DPZ
Tim	Gollisch	Ophthalmology	U Göttingen
Martin	Göpfert	Cellular Neurobiology	U Göttingen
Ralf	Heinrich	Cellular Neurobiology	U Göttingen
Stefan	Hell	NanoBiophotonics	MPI bpc
Swen	Hülsmann	Experimental Neuroanesthesiology	U Göttingen
Reinhard	Jahn	Neurobiology	MPI bpc
Igor	Kagan	Decision and Awareness	DPZ
Siegrid	Löwel	Systems Neuroscience	U Göttingen
Ira	Milosevic	Synaptic Vesicle Dynamics	ENI
Tobias	Moser	Auditory Neuroscience & InnerEarLab	U Göttingen
Klaus-Armin	Nave	Neurogenetics	MPI em
Tiago	Outeiro	Neurodegeneration and Restorative Research	U Göttingen
Luis	Pardo	Molecular Biology of Neuronal Signals	MPI em
Walter	Paulus	Clinical Neurophysiology	U Göttingen
Arezoo	Pooresmaelli	Perception and Cognition	ENI
Jeong Seop	Rhee	Neurophysiology	MPI-em
Silvio O.	Rizzoli	Neuro- and Sensory Physiology	ENI
Annekathrin	Schacht	CRC Text Structures	U Göttingen
Hansjörg	Scherberger	Neurobiology	DPZ
Oliver	Schlüter	Molecular Neurobiology	ENI
Manuela	Schmidt	Somatosensory Signaling	MPI em
Caspar	Schwiedrzik	Neural Circuits and Cognition	ENI
Michael	Sereda	Molecular and Translational Neurology	MPI em
Marion	Silies	Visual Processing	U Göttingen
Jochen	Staiger	Neuroanatomy	U Göttingen
Anastassia	Stoykova	Molecular Developmental Neurobiology	MPI bpc
Stefan	Treue	Cognitive Neurosciences	DPZ
Melanie	Wilke	Cognitive Neurology	U Göttingen
Sonja	Wojcik	Neurotransmitter Systems	MPI em
Fred	Wolf	Theoretical Neurophysics	MPI ds
Fred	Wouters	Molecular and Cellular Systems	U Göttingen

U Göttingen = University of Göttingen, MPI bpc = Max Planck Institute for Biophysical Chemistry, MPI em = Max Planck Institute for Experimental Medicine, MPI ds = Max Planck Institute for Dynamics and Self-Organization, DPZ = German Primate Center, ENI = European Neuroscience Institute



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<http://www.neurologie.uni-goettingen.de/andrea-antal.html>

Andrea Antal

Professor at the Clinical Neurophysiology

- 1990 Diploma in Biology, Attila József University of Sciences, Szeged, Hungary
- 1993 University Doctor, Attila József University of Sciences, Szeged, Hungary
- 1998 Ph.D., Albert Szent-Györgyi Medical University, Szeged, Hungary
- 2005 Habilitation Georg-August University, Göttingen, Germany
- 2010 Extraordinary professor, Georg-August University, Göttingen, Germany

Major Research Interests

Neuroplasticity became one central topic of neuroscience research in the last decades. Dynamic modifications of neuronal networks are an important substrate for learning and memory formation. Furthermore, pathological neuroplasticity might be one foundation of numerous central nervous system diseases.

The primary aim of our recent work is to develop and establish new non-invasive brain stimulation methods to induce physiological changes in the central nervous system in order to investigate cognition and complex information processing. Transcranial direct current stimulation (tDCS) was developed by our group as a non-invasive tool to induce neuroplasticity in the human cerebral cortex. tDCS as a tool aims to induce prolonged neuronal excitability and activity alterations in the human brain via alterations of the neuronal membrane potential. Accordingly, this method is a promising tool in the treatment of diseases that are accompanied by changes of cortical excitability. Transcranial alternating current stimulation (tACS) and random noise stimulation (tRNS) are new external stimulation techniques influencing cortical activity. tACS and tRNS permit, due to the oscillating stimulation, external interference with the cortical oscillations. They can particularly modulate the temporary connections of cortical areas during a given task. Neuronal oscillations in the brain are associated with the processing of sensory information, learning, cognition, arousal, attention and also pathological conditions (e.g. Parkinson's tremor, epilepsy). Therefore, the external modulation of cortical oscillations could be an important component of induced cerebral plasticity. In terms of effectiveness tRNS seems to have at least the same therapeutic potential for the treatment of diseases such as depression and chronic pain as rTMS and tDCS.

Selected Recent Publications

Lehr A, Henneberg N, Nigam T, Paulus W, Antal A. Modulation of conflict processing by theta range tACS over the dorsolateral prefrontal cortex. *Neural Plasticity* in press.

Sabel BA, Abd Hamid AI, Borrmann C, Speck O, Antal A. Transorbital alternating current stimulation modifies BOLD activity in healthy subjects and in a stroke patient with hemianopia: a 7 Tesla fMRI feasibility study. *International Journal of Psychophysiology* in press.

de Lara GA, Alekseichuk I, Turi Zs, Lehr A, Antal A, Paulus W (2018) Perturbation of theta-gamma coupling at the temporal lobe hinders verbal declarative memory. *Brain Stimulation* 11: 509-517

Huang YZ, Lu MK, Antal A, Classen J, Nitsche MA, Ziemann U, Ridding M, Hamada M, Ugawa Y, Jaberzadeh S, Suppa A, Paulus W, Rothwell J (2017) Plasticity induced by non-invasive transcranial brain stimulation: a position paper. *Clinical Neurophysiology*, 128: 2318-2329

De Lara GA, Knechtges PN, Paulus W, Antal A (2017) Anodal tDCS over the left DLPFC did not affect the encoding and retrieval of verbal declarative information. *Frontiers in Neuroscience* 11: 452

Antal A, Alekseichuk I, Bikson M, Brockmüller J, Brunoni AR, Chen R, Cohen LG, Douthwaite G, Ellrich J, Flöel A, Fregni F, George MS, Hamilton R, Haueisen J, Herrmann CS, Hummel FC, Lefaucheur JP, Liebetanz D, Loo CK, McCaig CD, Miniussi C, Miranda PC, Moliadze V, Nitsche MA, Nowak R, Padberg F, Pascual-Leone A, Poppendieck W, Priori A, Rossi S, Rossini PM, Rothwell J, Rueger MA, Ruffini G, Schellhorn K, Siebner HR, Ugawa Y, Wexler A, Ziemann U, Hallett M, Paulus W (2017) Low intensity transcranial electric stimulation: Safety, ethical, legal regulatory and application guidelines. *Clinical Neurophysiology* 128: 1774-1809



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Mathias Bähr

Professor of Neurology

- 1985 MD, University of Tübingen Medical School, Training in Neurology at University Hospitals in Tübingen and Düsseldorf
- DFG and Max Planck Fellow at the Max Planck Institute for Developmental Biology Tübingen and at the Department of Anatomy and Cell Biology, Washington University St.Louis
- Schilling-Foundation Professor for Clinical and Experimental Neurology, University of Tübingen
- Director at the Department of Neurology, University of Göttingen since 2001

Major Research Interests

Neuronal cell loss is not only a major feature of human neurodegenerative diseases like Parkinson's disease (PD), Alzheimer's disease (AD) or stroke, but can also be observed in neuroinflammatory conditions like Multiple Sclerosis (MS) or after traumatic lesions, e.g. of the optic nerve. We examine the cellular and molecular mechanisms of neuronal dysfunction and neuronal cell death in animal models of the respective disorders with the ultimate goal to detect new targets for a therapeutic neuroprotective intervention.

We have used for many years the retino-tectal system in rodents as our standard model to study de- and regeneration *in vitro* and *in vivo*. Our group has in detail analysed the cellular and molecular cascades that follow lesions of the optic nerve and ultimately lead to cell death of the retinal ganglion cells. To monitor the changes that occur directly after lesions we succeeded in implementing *in vivo* life-imaging of the rat and mouse optic nerve, which offers us a unique opportunity to study the complex processes that follow traumatic or inflammatory lesions of CNS fibre tracts.

In classical neurodegeneration research we have chosen PD as our topic. In this field, a multidisciplinary research team with our participation in the area C2 of the excellence cluster CNMPB examines the role of α -synuclein aggregation for dopaminergic dysfunction and cell death and characterizes other disease related proteins in order to develop new neuroprotective strategies.

In all our model systems we use AAV-mediated viral gene transfer to express different disease- or de-/regeneration associated genes as research tools and also as potential therapeutic factors to manipulate the respective molecular events *in vitro* and *in vivo*. To that end, we have e.g. developed regulatory elements that allow a controlled gene expression in complex *in vivo* models.

The final aim of our research approaches is to describe in detail the molecular pathophysiology that leads to axonal and neuronal loss and to develop new therapeutic strategies, some of which have already been translated into proof of concept studies in human patients.

Selected Recent Publications

Tolö J, Taschenberger G, Leite K, Stahlberg MA, Spehlbrink G, Kues J, Munari F, Capaldi S, Becker S, Zweckstetter M, Dean C, Bähr M, Kügler S (2018) Pathophysiological consequences of neuronal α -synuclein overexpression: Impacts on ion homeostasis, stress signaling, mitochondrial integrity, and electrical activity. *Front Mol Neurosci*

Maass F, Michalke B, Leha A, Boerger M, Zerr I, Koch JC, Tönges L, Bähr M, Lingor PJ (2018) Elemental fingerprint as a cerebrospinal fluid biomarker for the diagnosis of Parkinson's disease. *Neurochem*

Eckermann K, Kügler S, Bähr M. (2015) Dimerization propensities of Synucleins are not predictive for Synuclein aggregation. *Biochim Biophys Acta* 1852(8): 1658-64

Ribas VT, Schnepf B, Challagundla M, Koch JC, Bähr M, Lingor P (2015) Early and sustained activation of autophagy in degenerating axons after spinal cord injury. *Brain Pathol* 25(2): 157-70

Kretschmar B, Hein K, Moynar Z, Könnicke B, Sättler MB, Hess H, Weissert R, Bähr M (2014) Treatment with atacicept enhances neuronal cell death in a rat model of optic neuritis. *J Neuroimmunol* Mar 15;268(1-2): 58-63

Tereshchenko J, Maddalena A, Bähr M, Kügler S (2014) Pharmacologically controlled, discontinuous GDNF gene therapy restores motor function in a rat model of Parkinson's disease. *Neurobiol Dis* 65: 35-42



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<http://www.alzheimer-bayer.de/>

Thomas Bayer

Professor of Molecular Psychiatry

- 1984 – 1989 Diploma in biology, University of Stuttgart and Whitney Lab Florida
- 1989 – 1993 PhD at the University of Cologne (PhD Thyssen Graduate School)
- 1993 Postdoctoral Research Fellow, University of Cologne, Cologne
- 1993 – 1997 Postdoctoral Research Fellow, Institute of Neuropathology, University of Bonn Medical Center, Bonn
- 1997 – 2002 Lab leader, Department of Psychiatry, University of Bonn Medical Center, Bonn
- 2002 – 2007 Head of Neurobiology Lab, University of Saarland Medical Center, Homburg
- 2004 Appointment to apl Professor at the University Medical Center Saarland
- 2007 – present University Professor in “Molecular Psychiatry” at the Georg-August-University Göttingen, University Medicine Göttingen
- 2006 – 2011 Coordinator of the European Commission funded International Alzheimer PhD School «Neurodegeneration in Alzheimer’s disease – mechanism, consequence and therapy»
- Personal tutor of the Studienstiftung at the Georg-August-University Göttingen

Major Research Interests

Pathogenesis of Alzheimer’s disease, neuronal cell death mechanisms, preclinical proof-of-concept studies; characterization and development of mouse models for Alzheimer’s disease (neuropathology, anatomy, biochemistry, behavioural tests), preclinical therapy studies in mouse models, blood and CSF biomarker analysis, coordination and design of a phase II clinical study with Alzheimer’s disease patients.

Selected Recent Publications

Dietrich K, Bouter Y, Müller M, Bayer TA (2018) Synaptic alterations in mouse models for Alzheimer Disease - a Special Focus on N-truncated Aβ4-42. *Molecules* 23(4). pii: E718

Noguerola JSL, Giessen NME, Ueberück M, Meißner JN, Pelgrim C, Adams J, Wirths O, Bouter Y, Bayer TA (2018) Synergistic effect on neurodegeneration by N-truncated Aβ4-42 and pyroglutamate Aβ3-42 in a mouse model of Alzheimer’s Disease. *Front. Aging Neurosci* 10: 64

Storck SE, Meister S, Nahrath J, Meißner JN, Schubert N, Di Spiezio A, Baches S, Vandenbroucke RE, Bouter Y, Prikulis I, Korth C, Weggen S, Heimann A, Schwaninger M, Bayer TA and Pietrzik CU (2016) Endothelial LRP1 transports amyloid-? 1-42 across the blood-brain barrier. *J Clin Invest* 126: 123-36

Antonios G, Borgers H, Richard BC, Brauß A, Meißner J, Weggen S, Pena V, Pillot T, Davies SL, Bakrania P, Matthews D, Brownlees J, Bouter Y, Bayer TA (2015) Alzheimer therapy with an antibody against N-terminal Aβ4-X and pyroglutamate Aβ3-X. *Scientific Reports* 5: 17338 | DOI: 10.1038/srep17338

Bouter Y, Noguerola JSL, Tucholla P, Crespi GAN, Parker MW, Wiltfang J, Miles LA and Bayer TA (2015) Aβ4 targets of the biosimilar antibodies of Bapineuzumab, Crenezumab, Solanezumab in comparison to an antibody against N-truncated Aβ4 in sporadic Alzheimer disease cases and mouse models. *Acta Neuropathol* 130(5)713-729

Bayer TA (2015) Proteinopathies, a core concept for understanding and ultimately treating degenerative disorders? *European Neuropsychopharmacology* 25: 713-724

Bayer TA, Wirths O (2014) Focusing the amyloid cascade hypothesis on N-truncated Aβ4 peptides as drug targets against Alzheimer’s disease. *Acta Neuropathol* 127(6): 787-801



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Further Information

<http://www.dpz.eu/de/abteilung/funktionelle-bildgebung/>

Susann Boretius

Professor of Functional Imaging at the German Primate Center

- 1994: License to practice veterinary medicine
- 2000: Doctor of veterinary medicine, University of Leipzig
- 2003: Diploma in Physics, Georg-August-University of Göttingen
- 2003-2011: Scientific assistant, Max-Planck-Institute for Biophysical Chemistry, Göttingen, Biomedizinische NMR Forschungs GmbH (Prof. J. Frahm)
- 2011-2015: Professor of Biomedical Imaging with focus on magnetic resonance technologies, Christian-Albrechts University of Kiel, Germany
- 2013-2015: Head of the Molecular Imaging North Competence Center, Christian-Albrechts University of Kiel
- 2015-today: Professor of Functional Imaging, Faculty of Biology and Psychology, Georg-August University Göttingen and head of the Functional Imaging Laboratory, German Primate Center, Göttingen

Major Research Interests

Magnetic resonance imaging (MRI) and spectroscopy (MRS) Neurosciences: basic and translational research

Our research is focused on the development and improvement of magnetic resonance (MR) methods for application in basic biomedical and applied clinical research especially in the fields of neurosciences. We are particularly interested in applying this method on experimental animals, but we do complementary studies in humans as well. As truly non-invasive techniques, MRI and MRS are important methods for translational research, because almost the same methods can be applied in animals and humans. In this context, our research and development activities aim to continuously improve the spatial and temporal resolution of MRI and MRS in rodents, in non-human primates and in humans. With the help of these techniques we are “watching” the brain while it thinks and aiming to better understand what happens with the brain during maturation and aging, and under healthy and pathological conditions as well. Moreover, by using appropriate animal models and more advanced contrast mechanism like diffusion based techniques, magnetization transfer and susceptibility mapping our goal is to increase the sensitivity and specificity of these MR methods for more precise diagnostics and for a more specific and early detection of the response to therapeutic intervention.

Selected Recent Publications

Poggi G, Boretius S, Möbius W, Moschny N, Baudewig J, Ruhwedel T, Hassouna I, Wieser GL, Werner HB, Goebbels S, Nave KA, Ehrenreich H (2016) Cortical network dysfunction caused by a subtle defect of myelination. *GLIA* 2016 64(11): 2025-40

Dommaschk M, Peters M, Gutzeit F, Schütt C, Näther C, Sönnichsen FD, Tiwari S, Riedel C, Boretius S, Herges R (2015) Photoswitchable Magnetic Resonance Imaging Contrast by Improved Light-Driven Coordination-Induced Spin State Switch. *J AM CHEM SOC* 137: 7552-7555

Boretius S, Tammer R, Michaelis T, Brockmöller J, Frahm J (2013) Halogenated volatile anesthetics alter brain metabolism as revealed by proton magnetic resonance spectroscopy of mice *in vivo*. *NEUROIMAGE* 69: 244-55

Fünfschilling U*, Supplie LM*, Mahad D*, Boretius S*, Saab AS, Edgar J, Brinkmann BG, Kassmann CM, Tzvetanova ID, Möbius W, Diaz F, Meijer D, Suter U, Hamprecht B, Sereda MW, Moraes CT, Frahm J, Goebbels S, Nave K (2012) Glycolytic oligodendrocytes maintain myelin and long-term axonal integrity. *NATURE* 485: 517-21

Boretius S, Kasper L, Tammer R, Michaelis T, Frahm J (2009) MRI of cellular layers in mouse brain *in vivo*. *NEUROIMAGE* 47: 1252-60



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Nils Brose

Professor, Director at the Max Planck Institute for Experimental Medicine

- Undergraduate studies in Biochemistry, Eberhard Karls University, Tübingen, Germany (1981 – 1985)
- MSc in Physiology with Marianne Fillenz, University of Oxford, Oxford, UK (1987)
- PhD in Biology with Reinhard Jahn, Ludwig Maximilians University, Munich, Germany (1990)
- Postdoctoral training with Stephen F. Heinemann (Salk Institute, La Jolla, CA, USA) and Thomas C. Südhof (University of Texas Southwestern Medical Center, Dallas, TX, USA) (1991 – 1995)
- Research Group Leader, Max Planck Institute of Experimental Medicine, Göttingen, Germany (1995 – 2001)
- Director, Department of Molecular Neurobiology, Max Planck Institute of Experimental Medicine, Göttingen, Germany (since 2001)

Major Research Interests

Our research focuses on the molecular mechanisms of nerve cell development and synapse formation and function in the vertebrate central nervous system. To this end, we combine biochemical, morphological, mouse genetic, physiological, and behavioral methods to elucidate the molecular basis of nerve cell differentiation, synapse formation, transmitter release, and postsynaptic transmitter sensing. In selected cases, we explore the dysfunction of corresponding biological processes in neuropsychiatric diseases. Our work in the field of nerve cell development focuses on the role of SUMOylation in cell polarity formation, cell migration, and neuritogenesis, our synaptogenesis research concentrates on synaptic cell adhesion proteins and their role in synapse formation and function, and our studies on the molecular mechanisms of neurotransmitter release focus on components of the presynaptic active zone and their regulatory function in synaptic vesicle fusion.

Selected Recent Publications

Sigler A, Oh WC, Imig C, Altas B, Kawabe H, Cooper BH, Kwon H-B, Rhee J-S*, Brose N* (2017) Formation and maintenance of functional spines in the absence of presynaptic glutamate release. *Neuron* 94: 304-311 (*joint corresponding authors)

Kawabe H, Mitkovski M, Kaeser PS, Hirrlinger J, Opazo F, Nestvogel D, Kalla S, Fejtova A, Verrier SE, Bungers SR, Cooper BH, Varoqueaux F, Wang Y, Nehring RB, Gundelfinger ED, Rosenmund C, Rizzoli SO, Südhof TC, Rhee J-S, Brose, N. (2017) ELKS1 localizes the synaptic vesicle priming protein bMunc13-2 to a specific subset of active zones. *J Cell Biol* 216: 1143-1161

Lipstein N, Verhoeven-Duif NM, Michelassi FE, Calloway N, van Hasselt PM, Pienkowska K, van Haaften G, van Haelst MM, van Empelen R, Cuppen I, van Teeseling HC, Evelein AMV, Vorstman JA, Thoms S, Jahn O, Duran KJ, Monroe GR, Ryan TA, Taschenberger H, Dittman JS, Rhee J-S, Visser G, Jans JJ*, Brose N* (2017) Synaptic UNC13A protein variant causes increased synaptic transmission and dyskinetic movement disorder. *J Clin Invest* 127: 1005-1018 (*joint corresponding authors)

Hammer M, Krueger-Burg D, Tuffy LP, Cooper BH, Taschenberger H, Goswami SP, Ehrenreich H, Jonas P, Varoqueaux F, Rhee J-S, Brose N (2015) Perturbed hippocampal synaptic inhibition and gamma-oscillations in a Neuroligin-4 knock-out mouse model of autism. *Cell Rep* 13: 516-523

Soykan T, Schneeberger D, Tria G, Buechner C, Bader N, Svergun D, Tessmer I, Pouloupoulos A, Papadopoulos T, Varoqueaux F, Schindelin H, Brose N (2014) A conformational switch in Collybistin determines the differentiation of inhibitory postsynapses. *EMBO J* 18: 2113-2133



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Wolfgang Brück

Professor of Neuropathology

- 1986 MD Johannes Gutenberg University in Mainz, 1994 national boards in neuropathology
- 1996 – 2002 Associate professorships for neuropathology at the University of Göttingen and the Charité in Berlin
- Since 2002 full professor and director of the Department of Neuropathology, University of Göttingen

Major Research Interests

- Immunopathology of multiple sclerosis
- Brain-specific mechanisms of immune response in multiple sclerosis
- Axonal damage in inflammatory demyelination and mechanisms of remyelination
- Mechanisms and consequences of microglial activation

Selected Recent Publications

Lagumersindez-Denis N, Wrzos C, Mack M, Winkler A, van der Meer F, Reinert MC, Hollasch H, Flach A, Brühl H, Cullen E, Schlumbohm C, Fuchs E, Linington C, Barrantes-Freer A, Metz I, Wegner C, Liebetanz D, Prinz M, Brück W, Stadelmann C, Nessler S (2017) Differential contribution of immune effector mechanisms to cortical demyelination in multiple sclerosis. *Acta Neuropathol* 134: 15-34

Fard MK, van der Meer F, Sánchez P, Cantuti-Castelvetri L, Mandad S, Jäkel S, Fornasiero EF, Schmitt S, Ehrlich M, Starost L, Kuhlmann T, Sergiou C, Schultz V, Wrzos C, Brück W, Urlaub H, Dimou L, Stadelmann C, Simons M (2017) BCAS1 expression defines a population of early myelinating oligodendrocytes in multiple sclerosis lesions. *Sci Transl Med* 2017 Dec 6;9(419)

Romanelli E, Merkler D, Mezydło A, Weil MT, Weber MS, Nikić I, Potz S, Meinl E, Matznick FE, Kreutzfeldt M, Ghanem A, Conzelmann KK, Metz I, Brück W, Routh M, Simons M, Bishop D, Misgeld T, Kerschensteiner M (2016) Myelinosome formation represents an early stage of oligodendrocyte damage in multiple sclerosis and its animal model. *Nat Commun* 2016 Nov 16;7: 13275

Kinzel S, Lehmann-Horn K, Torke S, Häusler D, Winkler A, Stadelmann C, Payne N, Feldmann L, Saiz A, Reindl M, Lalive PH, Bernard CC, Brück W, Weber MS (2016) Myelin-reactive antibodies initiate T cell-mediated CNS autoimmune disease by opsonization of endogenous antigen. *Acta Neuropathol* 132: 43-58

Jürgens T, Jafari M, Kreutzfeldt M, Bahn E, Brück W, Kerschensteiner M, Merkler D (2016) Reconstruction of single cortical projection neurons reveals primary spine loss in multiple sclerosis. *Brain* 139: 39-46

Pfeifenbring S, Bunyan RF, Metz I, Röver C, Huppke P, Gärtner J, Lucchinetti CF, Brück W (2015) Extensive acute axonal damage in pediatric multiple sclerosis lesions. *Ann. Neurol.*, 77: 655-667

Metz I, Weigand SD, Popescu BF, Frischer JM, Parisi JE, Guo Y, Lassmann H, Brück W*, Lucchinetti CF* (2014) Pathologic heterogeneity persists in early active multiple sclerosis lesions. *Ann Neurol* 75: 728-738



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Brett Carter

Group Leader at ENI

- 2002 Undergraduate studies in chemical engineering, Georgia Institute of Technology, Atlanta, USA
- 2004 – 2006 Research Assistant with David Clapham, Children's Hospital Boston, USA
- 2006 – 2011 PhD in Neurobiology with Bruce Bean, Harvard, Boston, USA
- 2011 – 2017 Postdoctoral training with Craig Jahr, Vollum Institute, Portland, USA
- since 2017 Research group leader, European Neuroscience Institute, Göttingen, Germany

Major Research Interests

Our research focuses on synaptic function and the changes that can occur after synaptic plasticity. We study intact glutamatergic synapses in brain slices using a combination of electrophysiology, 2-photon imaging, and pharmacology. In particular, we are interested in understanding the role of NMDA receptors in signaling synaptic depression.

Selected Recent Publications

Sun W, Wong JM, Gray JA, Carter BC (2018) Incomplete block of NMDA receptors by intracellular MK-801. *Neuropharmacology* 143: 122-129

Carter BC and Jahr CE (2016) Postsynaptic, not presynaptic NMDA receptors are required for spike timing dependent LTD induction. *Nat Neurosci* 19: 1218-1224

Carter BC, Giessel AJ, Sabatini BL, Bean BP (2012) Transient sodium current at subthreshold voltages: activation by EPSP waveforms. *Neuron* 75(6): 1081-1093

Desai BN, Krapivinsky G, Navarro B, Krapivinsky L, Carter BC, Febvay, S, Delling M, Penumaka A, Ramsey IS, Manasian Y, Clapham DE (2012). Cleavage of TRPM7 releases the kinase domain from the ion channel and regulates its participation in Fas-induced apoptosis. *Dev Cell* 22(6): 1149-1162

Carter BC and Bean BP (2011) Incomplete inactivation and rapid recovery of voltage-dependent sodium channels during high-frequency firing in cerebellar Purkinje neurons. *J Neurophysiol.* 105(2): 860-871

Carter BC and Bean BP (2009) Sodium entry during action potentials of mammalian neurons: incomplete inactivation and reduced metabolic efficiency in fast-spiking neurons. *Neuron* 64(6): 898-909



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Jan Clemens

Group leader, European Neuroscience Institute

- 2012 PhD in Computational Neuroscience, Humboldt-Universität zu Berlin, BCCN Berlin
- 2012 – 2017 Postdoctoral Fellow, Princeton University
- since 2017 Group leader, European Neuroscience Institute

Major Research Interests

The “Neural Computation and Behavior” works on how acoustic communication signals are processed to inform behavior. Acoustic communication is widespread in the animal kingdom – yet its neural basis is only poorly understood. Like songbirds or crickets – fruit flies also produce mating songs during courtship. We use high-throughput behavioral assays and computer vision to precisely quantify how song influences behavior on multiple time scales – from changes in locomotion in response to the song over tens of milliseconds to a mating decision based on song accumulated over several minutes of courtship. We then exploit the genetic toolbox available in *Drosophila* to identify the neural substrates of these behaviors: Using optogenetics, we activate or inactivate individual neurons in the fly brain during courtship interactions – quantitative models of the behavior then allow us to identify the time scales and components of the behavior controlled by these neurons. Having found individual neurons involved in processing song, we then use electrophysiology and two-photon Calcium imaging to interrogate the dynamical neural representations of song to determine how song is encoded in the brain and how these neural codes give rise to behavior.

Selected Recent Publications

Clemens J, Deutsch D, Thiberge S, Murthy M (2018) Shared song object detector neurons in *Drosophila* male and female brains drive divergent, sex-specific behaviors. *bioRxiv*

Clemens J, Coen P, Roemschied FA, Pereira T, Mazumder D, Pacheco D, Murthy M (2018) Discovery of a new song mode in *Drosophila* reveals hidden structure in the sensory and neural drivers of behavior. *Current Biology* 28: 2400–2412

Clemens J, Ozeri N, Murthy N (2018) Fast intensity adaptation enhances the encoding of sound in *Drosophila*. *Nature Communications* 9: 134

Stern D, Clemens J, Coen P, Calhoun A, Shirangi T, Hogenesch J, Arthur B, Murthy M (2017) Experimental and statistical reevaluation provides no evidence for *Drosophila* courtship song rhythms. *PNAS* 114(37): 9978–9983

Coen P, Xie M, Clemens J, Murthy M (2016) Sensorimotor transformations underlying variability in song intensity during *Drosophila* courtship. *Neuron* 89(3): 629–644

Clemens J, Girardin C, Coen P, Guan G, Dickson B, Murthy M (2015) Connecting neural codes with behavior in the auditory system of *Drosophila*. *Neuron* 87(6): 1332–1343



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Camin Dean

Group Leader Trans-synaptic Signaling

- 2003: Ph.D. University of California, Berkeley, and Columbia University
- 2004 – 2010: Postdoctoral Fellow, University of Wisconsin, Madison
- since 2010: Group Leader, European Neuroscience Institute Göttingen

Major Research Interests

Our lab is interested in the mechanisms by which individual synapses, neurons and circuits dynamically adjust their transmission properties in response to changes in neuronal network activity. To accomplish this, neurons signal to each other not only unidirectionally via classical pre to post-synaptic transmission, but also bidirectionally via pre or post-synaptic release of neuropeptides and neurotrophins. This bidirectional channel of communication is essential for the modulation of synapse and circuit strength, via regulation of distinct membrane fusion events on both sides of the synapse, including synaptic vesicle exocytosis, post-synaptic receptor recycling, and adhesion molecule recycling. We investigate the mechanisms by which these trans-synaptic signaling events are regulated, at the level of single synapses, single neurons and neuronal networks, using a combination of live imaging approaches, electrophysiology, and biochemistry in neuronal cell culture and brain slices. Our overall goal is to understand how neurons communicate changes in activity to affect circuit function, and ultimately behavior, during learning and memory acquisition, or to counteract aberrant brain states such as seizure activity.

Selected Recent Publications

Awasthi A, Ramachandran B, Ahmed S, Benito E, Shinoda Y, Nitzan N, Heukamp A, Rannio S, Martens H, Barth J, Burk K, Wang YT, Fischer A, Dean C. Synaptotagmin-3 drives AMPA receptor endocytosis, depression of synapse strength, and forgetting. *Science*, in press

Bharat V, Siebrecht M, Burk K, Ahmed S, Reissner C, Kohansal-Nodehi M, Steubler V, Zweckstetter M, Ting JT, Dean C (2017) Capture of dense core vesicles at synapses by JNK-dependent phosphorylation of synaptotagmin-4. *Cell Rep* Nov 21;21(8):2118-2133.

Hurtado-Zavala JI, Ramachandran B, Ahmed S, Halder R, Bolleyer C, Awasthi A, Wagener RJ, Anderson K, Drenan RM, Lester HA, Miwa JM, Staiger JF, Fischer A, Dean C (2017) TRPV1 regulates excitatory innervation of OLM neurons in the hippocampus. *Nat Commun* Jul 19;8: 15878

Burk K, Ramachandran B, Ahmed S, Hurtado-Zavala JI, Awasthi A, Benito E, Faram R, Ahmad H, Swaminathan A, McIlhinney J, Fischer A, Perestenko P, Dean C (2017) Regulation of Dendritic Spine Morphology in Hippocampal Neurons by Copine-6. *Cereb Cortex* Feb 3: 1-18

Wolfes AC, Ahmed S, Awasthi A, Stahlberg MA, Rajput A, Magruder DS, Bonn S, Dean C (2017) A novel method for culturing stellate astrocytes reveals spatially distinct Ca²⁺ signaling and vesicle recycling in astrocytic processes. *J Gen Physiol* Jan;149(1): 149-170

Ramachandran B, Ahmed S, Dean C (2015) Long-term depression is differentially expressed in distinct lamina of hippocampal CA1 dendrites. *Front Cellular Neurosci* Feb 5;9: 23

Shinoda Y, Ahmed S, Ramachandran B, Bharat V, Brockelt D, Altas B, Dean C (2014) BDNF enhances spontaneous and activity-dependent neurotransmitter release at excitatory terminals but not at inhibitory terminals in hippocampal neurons. *Front Synaptic Neurosci* Nov 10;6: 27

Dean C, Dunning FM, Liu H, Bomba-Warczak E, Martens H, Bharat V, Ahmed S, Chapman ER (2012) Axonal and dendritic synaptotagmin isoforms revealed by a pHluorin-syt functional screen. *Mol Biol Cell* May 23(9): 1715-27



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Peter Dechent

Research Group Leader, Cognitive Neurology

- 1991 – 2001 Studies of Biology, University of Mainz
- 1994 Scientific Assistant at the Biophysical Institute, University of Mainz
- 1995 – 1996 Scholarship of the Erasmus-Program, University of Manchester, England
- 1996 Research Fellow at the Neuroscience Department, Karolinska Institute, Stockholm, Sweden
- 1997 – 1998 Diploma Thesis at the ‘Biomedical NMR Research’ at the Max-Planck-Institute for Biophysical Chemistry, Göttingen; Diploma in Biology
- 1998 – 2001 Doctoral thesis at the ‘Biomedical NMR Research’; Dr.rer.nat. (Biology)
- 2001 – 2003 Postdoc at the ‘Biomedical NMR Research’ (Laboratory of Prof. Dr. J. Frahm)
- since 2004 Head of the Research Group ‘MR-Research in Neurology and Psychiatry’ Medical Faculty, University Göttingen

Major Research Interests

- Combination of functional magnetic resonance imaging (fMRI) with non-invasive brain stimulation techniques like transcranial Direct / Alternating Current Stimulation (tDCS/tACS) and Transcranial Magnetic Stimulation (TMS) to modulate functional brain networks in healthy and pathologic conditions.
- Characterization of hemodynamic processes, the basis of blood oxygenation level dependent (BOLD) changes in standard fMRI investigations.
- Application of modern MR techniques to investigate the human brain in healthy and pathologic conditions. Applied methods comprise:
 - Structural MRI
 - Diffusion-weighted- and diffusion-tensor-imaging (DWI/DTI)
 - Localized MR-spectroscopy (MRS)

Selected Recent Publications

Wilke M, Schneider L, Dominguez-Vargas AU, Schmidt-Samoa C, Miloserdov K, Nazzari A, Dechent P, Cabral-Calderin Y, Scherberger H, Kagan I, Bähr M (2018) Reach and grasp deficits following damage to the dorsal pulvinar. *Cortex* 99: 135-149

Wilke M, Dechent P, Bähr M (2017) Sarcoidosis Manifestation Centered on the Thalamic Pulvinar Leading to Persistent Anisotropia. *Mov Disord Clin Pract*. 4(6): 898-900

Barke A, Preis MA, Schmidt-Samoa C, Baudewig J, Kröner-Herwig B, Dechent P (2016) Neural correlates differ in high and low fear-avoidant chronic low back pain patients when imagining back-straining movements. *J Pain* 17(8): 930-43

Cabral-Calderin Y, Weinrich C, Schmidt-Samoa C, Poland E, Dechent P, Bähr M, Wilke M (2016) Transcranial alternating current stimulation affects the BOLD signal in a frequency and task-dependent manner. *Hum Brain Mapp* 37(1): 94-121

Cabral-Calderin Y, Williams K, Dechent P, Opitz A, Wilke M (2016) Transcranial alternating current stimulation modulates spontaneous low frequency fluctuations as measured with fMRI. *Neuroimage* 2016 Jul 5. [Epub ahead of print]

August JM, Rothenberger A, Baudewig J, Roessner V, Dechent P (2015) May Functional Imaging be Helpful for Behavioral Assessment in Children? Regions of Motor and Associative Cortico-Subcortical Circuits Can be Differentiated by Laterality and Rostrality. *Front Hum Neurosci* 9: 314

Goya-Maldonado R, Weber K, Trost S, Diekhof E, Keil M, Dechent P, Gruber O (2015) Dissociating pathomechanisms of depression with fMRI: bottom-up or top-down dysfunctions of the reward system. *Eur Arch Psychiatry Clin Neurosci* 265(1): 57-66



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Thomas Dresbach

Professor of Anatomy

- Dr. rer. nat. (Biology), 1996, University of Bonn
- DFG research fellow and postdoctoral Fellow with E. Gundelfinger at the Leibniz Institute for Neurobiology, 1997 – 2003
- Teacher and independent research group leader at the University of Heidelberg, Institute for Anatomy and Cell Biology (Dept. Prof. Dr. J. Kirsch), 2003 – 2010
- Professor at the School of Medicine, University of Göttingen, 2010

Major Research Interests

Our group studies synapse formation with particular focus on the biogenesis of presynaptic nerve terminals. Our goal is to understand the mechanisms of synaptogenesis in enough detail to pinpoint molecular causes of synaptopathies. We study neuronal cultures to unravel fundamental mechanisms operating at the heart of synaptogenesis, and we have begun to study specialized synapses such as the giant synapses of the mammalian auditory system to determine how these mechanisms act together to generate the remarkable specification and heterogeneity of synapses in the brain.

Using live imaging, molecular biological and ultrastructural approaches, we currently analyze

- the role of novel, vertebrate-specific presynaptic proteins in synaptic function
- the trafficking and assembly of synaptic organelles and protein complexes
- the transsynaptic signalling events controlling presynaptic differentiation.

These efforts should help us understand both the common principles by which the various types of synapses are generated, and how they are fine-tuned for specific tasks, such as a particular strength, reliability or adaptivity.

Selected Recent Publications

Körber C, Horstmann H, Venkataramani V, Herrmannsdörfer F, Kremer T, Kaiser M, Schwenger DB, Ahmed S, Dean C, Dresbach T, Kuner T (2015) Modulation of Presynaptic Release Probability by the Vertebrate-Specific Protein Mover. *Neuron* 87: 521-33

Mendoza Schulz A, Jing Z, Sánchez Caro JM, Wetzel F, Dresbach T, Strenzke N, Wichmann C, Moser T (2014) Bassoon-disruption slows vesicle replenishment and induces homeostatic plasticity at a CNS synapse. *EMBO J* 33: 512-27

Ahmed S, Wittenmayer N, kremer T, Hoeber J, Kiran Akula A, urlaub H, Islinger M, Kirsch J, Dean C, Dresbach T (2013) Mover is a homomeric phospho-protein present on synaptic vesicles. *PLoS One* 8: e63474

Stan A, Pielarski KN, Brigadski T, Wittenmayer N, Fedorchenko O, Gohla A, Lessmann V, Dresbach T, Gottmann K (2010) Essential co-operation of N-Cadherin and Neuroligin-1 in the transsynaptic control of vesicle accumulation. *Proc Natl Acad Sci USA* 107: 11116-111121

Wittenmayer N, Kremer T, Varoqueaux N, Brose N, Dresbach T (2009) Neuro-ligin 1 promotes the maturation of presynaptic boutons. *Proc Natl Acad Sci USA* 106: 13564-13569



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Hannelore Ehrenreich

Professor of Neurology and Psychiatry, Head, Clinical Neuroscience, MPI-EM

- 1981 Doctor of Veterinary Medicine, University of Munich
- 1983 Elective Period, University of Newcastle-upon-Tyne, England
- 1985 Guest Lecturer, University of the Philippines, Manila
- 1985 – 1986 Clinical Fellow, Department of Internal Medicine, University of Munich
- 1987 Graduation (Medicine), University of Munich
- 1987 – 1988 Residency, Department of Neurology, University of Munich
- 1989 Doctor of Medicine, University of Munich
- 1989 – 1991 Postdoctoral Fellow NIAID, NIH, Bethesda, MD, USA
- 1992 – 1994 Residency, Departments of Neurology and Psychiatry, University of Göttingen
- 1994 Habilitation (Neurology and Psychiatry)
- 1994 – present Head, Clinical Neuroscience, Max Planck Institute of Experimental Medicine
- 1995 – present Consultant & Professor of Neurology & Psychiatry, University of Göttingen
- 2000 – 2002 Vice President, University of Göttingen
- 2008 Professor of Biology and Psychology (Honorary), University of Göttingen
- 2016 Member of the Leopoldina, German National Academy of Science

Major Research Interests

Translational Neuroscience

Research with particular focus on:

- (1) Genetic and environmental underpinnings of neuropsychiatric diseases;
- (2) Endogenous neuroprotection and neuroregeneration as therapeutic strategies for patients: Research centering on the brain erythropoietin system and hypoxia;
- (3) Autoimmune and inflammatory processes contributing to neuropsychiatric phenotypes.

Selected Recent Publications

Mitjans M et al (2018) Violent aggression predicted by multiple pre-adult environmental hits. *Mol Psychiatry* May 24. doi: 10.1038/s41380-018-0043-3. [Epub ahead of print]

Pan H et al (2018) Uncoupling the widespread occurrence of anti-NMDAR1 autoantibodies from neuropsychiatric disease in a novel autoimmune model. *Mol Psychiatry* Feb 9. doi: 10.1038/s41380-017-0011-3. [Epub ahead of print]

Ehrenreich H et al (2018): OTTO: A new strategy to extract mental disease-relevant combinations of GWAS hits from individuals. *Mol Psychiatry* Feb 23(2):476-486

Janova H et al (2018) Microglia ablation alleviates myelin-associated catatonic signs in mice. *J Clin Invest* 128(2): 734-745

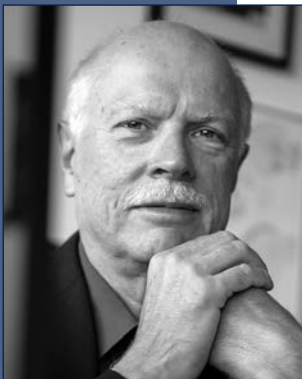
Castillo-Gomez E et al (2017): All naturally occurring autoantibodies against the NMDA receptor subunit NR1 have pathogenic potential irrespective of epitope and immunoglobulin class. *Mol Psychiatry* 22(12): 1776-1784

Hassouna I et al (2016): Revisiting adult neurogenesis and the role of erythropoietin for neuronal and oligodendroglial differentiation in the hippocampus. *Mol Psychiatry*, 21(12): 1752-1767

Stepniak B et al (2015): Accumulated common variants in the broader fragile X gene family modulate autistic phenotypes. *EMBO Mol Med* 7(12):1565-79.

PGC (2014) Biological insights from 108 schizophrenia-associated genetic loci. *Nature* 511(7510): 421-7

Stepniak B et al (2014) Accumulated environmental risk determining age at schizophrenia onset, *Lancet Psychiatry*, 1(6): 444-53



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Gregor Eichele

Professor, Director at the Max Planck Institute for Biophysical Chemistry

- 1976 – 1980 Ph.D. protein crystallography (J. N. Jansonius, Biocenter, University of Basel, Switzerland)
- 1981 – 1984 Postdoctoral training in Developmental Biology (B. M. Alberts, University of California, San Francisco)
- 1985 – 1989 Assistant Professor of Cellular and Molecular Physiology, Harvard Medical School, Boston, USA
- 1989 – 1990 Associate Professor of Cellular and Molecular Physiology, Harvard Medical School, Boston, USA
- 1991 – 1992 Associate Professor of Biochemistry, Baylor College of Medicine, Houston, USA
- 1992 – 1998 Professor of Biochemistry and Neuroscience, Baylor College of Medicine, Houston, USA
- 1998 – 2006 Director at the Max Planck Institute of Experimental Endocrinology, Dept. of Molecular Embryology, Hanover, Germany
- 2006 – Director at the Max Planck Institute of Biophysical Chemistry, Dept. Genes and Behavior, Goettingen, Germany

Major Research Interests

Dynamic interplay between gene expression, brain development and architecture and behavior.

Selected Recent Publications

Faubel R, Westendorf C, Bodenschatz E, Eichele G (2016) Cilia-based flow network in the brain ventricles. *Science* 353(6295): 176-8

Hammerschmidt K, Whelan G, Eichele G, Fischer J (2015) Mice lacking the cerebral cortex develop normal song: insights into the foundations of vocal learning. *Sci Rep* (5): 8808

Husse J, Leliavski A, Tsang AH, Oster H, Eichele G (2014) The light-dark cycle controls peripheral rhythmicity in mice with a genetically ablated suprachiasmatic nucleus clock. *FASEB J* (11): 4950-4960

Diez-Roux G et al (2011) A high-resolution anatomical atlas of the transcriptome in the mouse embryo. *PLoS Biology* 9: e1000582

Kiessling S, Eichele G, Oster H (2010) Adrenal glucocorticoids have a key role in circadian resynchronization in a mouse model of jet lag. *Journal of Clinical Investigation* 120: 2600-2609

Lein ES et al (2007) Genome-Wide Atlas of Gene Expression in the Adult Mouse Brain. *Nature* 445: 168-176



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André Fiala

Professor of Molecular Neurobiology of Behavior

- 1996 Degree (Diploma) in Biology, Free University of Berlin
- 1996 – 1999 PhD student, Free University of Berlin
- 2000 – 2001 Research Fellow, Memorial Sloan-Kettering Cancer Center, New York
- 2001 – 2008 Research Assistant, University of Würzburg
- 2008 Habilitation in Neurobiology and Genetics, University of Würzburg
- 2008 Professor of Molecular Neurobiology of Behavior, University of Göttingen

Major Research Interests

We study neuronal mechanisms underlying olfaction, learning and memory, and goal-directed behavior using the model organism *Drosophila melanogaster*. The fruit fly *Drosophila* offers the advantage of expressing transgenes in almost any population of its about 100.000 neurons. Transgenes used by us are, for example, fluorescent sensor proteins that allow us to monitor the spatio-temporal activity of neurons, or light-sensitive proteins by which neuronal activity can be stimulated through illumination. Using these optogenetic techniques in combination with behavioral analyses we aim at unraveling the functioning of dedicated neuronal circuits, and how these circuits contribute to organizing behavior. In addition, molecular mechanisms underlying learning and memory processes are investigated.

Selected Recent Publications

Martelli C, Pech U, Kobbenbring S, Pauls D, Bahl B, Sommer MV, Pooryasin A, Barth J, Arias CWP, Vassiliou C, Luna AJF, Poppinga H, Richter FG, Wegener C, Fiala A, Riemensperger T (2017) SIFamide Translates Hunger Signals into Appetitive and Feeding Behavior in *Drosophila*. *Cell Rep* 20: 464-478

Gupta VK, Pech U, Bhukel A, Fulterer A, Ender A, Mauermann SF, Andlauer TF, Antwi-Adjei E, Beuschel C, Thriene K, Maglione M, Quentin C, Bushow R, Schwärzel M, Mielke T, Madeo F, Dengjel J, Fiala A, Sigrist SJ (2016) Spermidine Suppresses Age-Associated Memory Impairment by Preventing Adverse Increase of Presynaptic Active Zone Size and Release. *PLoS Biol* 14: e1002563

Riemensperger T, Kittel RJ, Fiala A (2016) Optogenetics in *Drosophila* neuroscience. *Methods Mol Biol* 1408: 167-75

Pooryasin A, Fiala A (2015). Identified serotonin-releasing neurons induce behavioral quiescence and suppress mating in *Drosophila*. *J Neurosci* 35: 12792-812

Pech U, Revelo NH, Seitz KJ, Rizzoli SO, Fiala A (2015) Optical dissection of experience-dependent pre- and postsynaptic plasticity in the *Drosophila* brain. *Cell Rep* 10: 2083-95

AzimiHashemi N, Erbguth K, Vogt A, Riemensperger T, Rauch E, Woodmansee D, Nagpal J, Brauner M, Sheves M, Fiala A, Kattner L, Trauner D, Hegemann P, Gottschalk A, Liewald JF (2014) Synthetic retinal analogues modify the spectral and kinetic characteristics of microbial rhodopsin optogenetic tools. *Nat Commun* 5: 5810

Andlauer TF, Scholz-Kornehl S, Tian R, Kirchner M, Babikir HA, Depner H, Loll B, Quentin C, Gupta VK, Holt MG, Dipt S, Cressy M, Wahl MC, Fiala A, Selbach M, Schwarzel M, Sigrist SJ (2014) Drep-2 is a novel synaptic protein important for learning and memory. *Elife* 2014 Nov 13;3. doi: 10.7554/eLife.03895

Dawydow A, Gueta R, Ljaschenko D, Ullrich S, Hermann M, Ehmann N, Gao S, Fiala A, Langenhan T, Nagel G, Kittel RJ (2014) Channelrhodopsin-2-XXL, a powerful optogenetic tool for low-light applications. *Proc Natl Acad Sci U S A* 111: 13972-7



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André Fischer

Professor for Psychiatry and Psychotherapy

- 2003 – 2006: Postdoctoral Associate in the lab of Li-Huei Tsai; Harvard Medical School, Department of Pathology, Boston, USA; Picower Center for Learning and Memory, M.I.T, Cambridge, USA
- 2007 – 2011: Independent Group Leader at ENI
- since 2011: W3 Professor at the Department for Psychiatry and Psychotherapy, University Medical Center Göttingen
- since 2011: Speaker of the German Center for Neurodegenerative Diseases (DZNE) site Göttingen

Major Research Interests

The long-term goal of our research is to understand the cellular and molecular mechanisms underlying brain diseases and to develop neuroprotective and neurodegenerative therapeutic approaches. There is now accumulating evidence that on an individual level health or disease critically depends on the interaction between genes and environment. Epigenetic mechanisms such as histone-modification, DNA-methylation and non-coding RNA-mediated processes are key-regulators of gene-environment interactions. Importantly, such epigenetic mechanisms have recently been implicated with the pathogenesis of neurodegenerative and psychiatric diseases. Thus our current hypothesis is that deregulation of genome-environment interactions, especially via epigenetic gene-expression, is a key feature of neurodegenerative diseases such as Alzheimer's disease. We combine studies in patient material, mouse and cellular models, behavioral, molecular, genetic, and bioinformatic techniques to address these questions.

Selected Recent Publications

Bahari-Javan S, Varbanov H, Halder R, Benito E, Kaurani L, Burkhardt S, Anderson-Schmidt H, Anghelescu I, Budde M, Stilling RM, Costa J, Dietrich D, Figge C, Folkerts H, Gade K, Heilbronner U, Koller M, Konrad C, Nussbeck SY, Scherk H, Spitze C, Stierl S, Stöckel J, Thiel J, Hagen M, Zimmermann J, Zitzelsberger A, Schulz A, Schmitt A, Delalls I, Falkai P, Schulze TG, Dityatev A, Sananbenesi F, Fischer A (2017) Hdac1 as a target for individualized therapy of schizophrenia patients. PNAS. Epub ahead of print

Benito E, Urbanke U, Ramachandran B, Barth J, Halder R, Awasthi A, Jain G, Capece V, Burkhardt S, Navarro-Sala M, Nagarajan N, Schütz AL, Johnsen SA, Bonn SA, Lührmann R, Dean C, Fischer A (2015) Reinstating transcriptome plasticity and memory function in models for cognitive decline. *Journal of Clinical Investigation* 125(9): 3572-84

Zovoilis A, Agbemenyah HY, Agis-Balboa RC, Stilling RM, Edbauer D, Rao P, Farinelli L, Delalle I, Schmitt A, Falkai P, Bahari-Javan S, Burkhardt S, Sananbenesi F, Fischer A (2011) microRNA-34c is a novel target to treat dementias. *EMBO J* 30(20): 4299-308. doi: 10.1038/emboj.2011.327

Peleg S, Sananbenesi F, Zovoilis A, Burkhardt S, Bahari-Javan S, Agis-Balboa RC, Cota P, Wittnam JL, Gogol-Doering A, Opitz L, Salinas-Riester G, Dettenhoffer M, Farinelli L, Chen W, Fischer A (2010) Altered histone H4 lysine 12 acetylation is associated with age-dependent memory impairment in mice. *Science* 328: 753



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Alexander Flügel

Professor of Neuroimmunology

- 1993 MD Ludwig-Maximilians-University (LMU) Munich
- 2002 – 2007 Group leader at the Institute of Neuroimmunology, Max-Planck-Institute for Neurobiology, Martinsried, Munich
- 2008 Associate professor for Experimental Immunology at the Institute for Immunology, LMU Munich
- since 12/2008 Full professor and director of the Institute for Neuroimmunology and Multiple Sclerosis Research, University of Göttingen

Major Research Interests

- Neuroimmunology
- T cell biology
- Intravital imaging

The focus of my interest lies on the mechanisms and factors that allow T cells to enter the central nervous system, to communicate in this milieu and to influence the brain tissue.

My colleagues and I pursue the following aims, i) development of new models and tools to study CNS autoimmunity; ii) revealing the basics of pathogenesis in (auto-)immune diseases of the nervous system; iii) deducing and developing new therapeutical approaches; and iv) analyzing the mechanisms of action for (adverse) effects of new therapeutical procedures.

Selected Recent Publications

Lodygin D, Hermann M, Schweingruber N, Flügel-Koch C, Watanabe T, Schlosser C, Merlini A, Körner H, Chang H-F, Fischer HJ, Reichardt HM, Zagrebelsky M, Mollenhauer B, Frahm J, Stadelmann C, Kügler S, Fitzner D, Haberl M, Odoardi F, Flügel A (2019) β -Synuclein reactive T cells induce autoimmune CNS grey matter degeneration: Nature 566: 503-508

Schläger C*, Körner H*, Krueger M, Vidoli S, Haberl M, Mielke D, Brylla E, Issekutz T, Cabañas C, Nelson PJ, Ziemssen T, Rohde V, Bechmann I, Lodygin D, Odoardi F*, Flügel A* (2016) Effector T-cell trafficking between the leptomeninges and the cerebrospinal fluid. Nature 530: 349-353. *equal contribution

Flach A*, Litke T*, Strauss J*, Haberl M, Cordero Gómez C, Reindl M, Saiz A, Fehling HJ, Wienands J, Odoardi F, Lühder F§, Flügel A§ (2016) Autoantibody-boosted T-cell reactivation in the target organ triggers manifestation of autoimmune CNS disease. PNAS 113: 3323-3328. *§equal contribution

Lodygin D, Odoardi F, Schläger C, Körner H, Kitz A, Nosov M, van den Brandt J, Reichardt HM, Haberl M, Flügel A (2013) A combination of fluorescent NFAT and H2B sensors uncovers dynamics of T cell activation in real time during CNS autoimmunity. Nature Medicine 19: 784-790

Odoardi F, Sie C, Strey K, Ulaganathan VK, Schläger C, Lodygin D, Heckelsmiller K, Nietfeld W, Ellwart J, Klinkert WE, Lottaz C, Nosov M, Brinkmann V, Spang R, Lehrach H, Vingron M, Wekerle H, Flügel-Koch C, Flügel A (2012) T cells become licensed in the lung to enter the central nervous system. Nature 488: 675-679

Cordiglieri C, Odoardi F, Zhang B, Nebel M, Kawakami N, Klinkert WE, Lodygin D, Lühder F, Breunig E, Schild D, Ulaganathan VK, Dornmair K, Dammermann W, Potter BV, Guse AH, Flügel A (2010) Nicotinic acid adenine dinucleotide phosphate-mediated calcium signalling in effector T cells regulates autoimmunity of the central nervous system. Brain 133: 1930-1943

Bartholomäus I, Kawakami N, Odoardi F, Schläger C, Miljkovic D, Ellwart JW, Klinkert WE, Flügel-Koch C, Issekutz TB, Wekerle H, Flügel A (2009) Effector T cell interactions with meningeal vascular structures in nascent autoimmune CNS lesions. Nature 462: 94-98



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Tim Friede

Professor of Biostatistics

- 1998 Dipl.-Math. (Master's degree in Mathematics), University of Karlsruhe, Germany
- 2001 Dr .sc. hum. (PhD), University of Heidelberg, Germany
- 2001 – 2004 PostDoc / lecturer, Dept. of Mathematics and Statistics, Lancaster University, UK
- 2004 – 2006 Expert Statistical Methodologist, Novartis Pharma AG, Basel, Switzerland
- 2006 – 2009 Associate Professor of Medical Statistics, University of Warwick, UK
- since 1/2010 Professor of Biostatistics and Director, Dept. of Medical Statistics, University Medical Center Göttingen

Major Research Interests

Clinical biostatistics including designs for clinical trials (in particular flexible adaptive designs) and systematic reviews / meta-analyses

Selected Recent Publications

Friede T, Pohlmann H, Schmidli H (2019) Blinded sample size reestimation in event-driven clinical trials: Methods and an application in multiple sclerosis. *Pharmaceutical Statistics* 18: 351–365

Nicholas RS, Han E, Raffel J, Chataway J, Friede T (2018) Over three decades study populations in progressive multiple sclerosis have become older and more disabled, but have lower on-trial progression rates: a systematic review and meta-analysis of 43 randomized placebo-controlled trials. *Multiple Sclerosis Journal* (in press)

Stork L, Ellenberger D, Beißbarth T, Friede T, Lucchinetti CF, Brück W, Metz I (2018) Differences in the responses to apheresis therapy of patients with 3 histopathologically classified immunopathological patterns of multiple sclerosis. *JAMA Neurology* 75: 428–435

Varges D, Manthey H, Heinemann U, Ponto C, Schmitz M, Krasnianski A, Breithaupt M, Fincke F, Kramer K, Friede T, Zerr I (2017) Doxycycline in early CJD ? double-blinded randomized phase II and observational study. *Journal of Neurology, Neurosurgery & Psychiatry* 88: 119–125

Raffel J, Wallace A, Gveric D, Reynolds R, Friede T, Nicholas R (2017) Patient-reported outcomes and survival in multiple sclerosis: a 10-year retrospective cohort study using the MSIS-29. *PLOS Medicine* 14(7): e1002346

Gold SM, Enck P, Hasselmann H, Friede T, Hegerl U, Mohr DC, Otto C (2017) Control conditions for randomized trials of behavioral interventions in psychiatry: A decision framework. *Lancet Psychiatry* 4: 725–732

Stellmann JP, Krumbholz M, Friede T, Gahlen A, Borisow N, Fischer K, Hellwig, Pache F, Ruprecht K, Havla J, Kümpfel T, Aktas O, Hartung HP, Ringelstein M, Geis C, Kleinschnitz C, Berthele A, Hemmer B, Angstwurm K, Young KL, Schuster S, Stangel M, Lauda F, Tamani H, Mayer C, Zeltner L, Ziemann U, Linker RA, Schwab M, Marziniak M, Then Bergh F, Hofstadt-van Oy U, Neuhaus O, Zettl U, Faiss J, Wildemann B, Paul F, Jarius S, Trebst C, Kleiter I on behalf of NEMOS (Neuromyelitis Optica Study Group) (2017) Immunotherapies in neuromyelitis optica spectrum disorder: Efficacy and predictors of response. *Journal of Neurology, Neurosurgery and Psychiatry* 88(8): 639–647

Mollenhauer B, Zimmermann J, Sixel-Döring F, Focke NK, Wicke T, Ebentheuer J, Schaumburg M, Lang E, Trautmann E, Zetterberg H, Taylor P, Friede T, Trenkwalder C & the DeNoPa Study Group (2015) Monitoring of thirty marker candidates in early Parkinson's disease as progression markers. *Neurology* 87: 168–77



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Alexander Gail

Professor for Sensorimotor Neuroscience and Neuroprosthetics at the German Primate Center

- 1997: Physics Diploma, Philipps University, Marburg
- 2002: Dr. rer. nat. (Physics) Philipps University, Marburg
- 2002 – 2003: Postdoc (Neurophysics Laboratory of R. Eckhorn, Marburg)
- 2003 – 2006: Postdoc (Laboratory of R. Andersen, Pasadena, CA, USA)
- 2006 – present: Head of Sensorimotor Research Group, German Primate Center and Bernstein Center for Computational Neuroscience
- 2012 – present: Professor for Sensorimotor Neuroscience and Neuroprosthetics, Georg-August University Göttingen

Major Research Interests

Sensorimotor integration, cognitive movement planning, neuroprosthetics, neuronal synchronization, visual object coding; methods: awake monkey electrophysiology, extracellular multi-channel microelectrode recordings, psychophysics in human and non-human primates, correlation and spectral coherence analysis, pattern recognition

Selected Recent Publications

Martinez-Vazquez P, Gail A (2018) Directed interaction between monkey premotor and posterior parietal cortex during motor-goal retrieval from working memory. *Cerebral Cortex*

Morel P, Ulbrich P, Gail A (2017) What makes a reach movement effortful? – Physical effort discounting supports common minimization principles in decision making and motor control. *PLOS Biology*, *PLoS Biol* 15(6): e2001323

Kuang S, Morel P, Gail A (2016) Planning movements in visual and physical space in monkey posterior parietal cortex. *Cerebral Cortex* 26(2): 731-747

Suriya-Arunroj L, Gail A (2015) I Plan Therefore I Choose: Free-Choice Bias Due to Prior Action-Probability but Not Action-Value. *Front Behav Neurosci* 9: 315

Taghizadeh B, Gail A (2014) Spatial task context makes short-latency reaches prone to induced Roelofs illusion. *Front Hum Neurosci* 8(673)

Klaes C, Schneegans S, Schöner G, Gail A (2012) Sensorimotor learning biases choice behavior: A learning neural field model for decision making. *PLOS Computational Biology* 8(11): e1002774

Klaes C, Westendorff S, Chakrabarti S, Gail A (2011) Choosing goals, not rules: Deciding among rule-based action plans. *Neuron* 70: 536-548

Westendorff S, Klaes C, Gail A (2010) The cortical timeline for deciding on reach motor-goals. *J Neurosci* 30: 5426-5436

Gail A, Klaes C, Westendorff S (2009) Implementation of Spatial Transformation Rules for Goal-Directed Reaching via Gain Modulation in Monkey Parietal and Premotor Cortex. *J Neurosci* 29: 9490-9499

Gail A, Andersen RA (2006) Neural dynamics in monkey parietal reach region reflect context-specific sensorimotor transformations. *J Neurosci* 26: 9376-9384



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Tim Gollisch

Professor for Sensory Processing in the Retina

- Diploma in Physics, University of Heidelberg, 2000
- PhD in Biophysics, Humboldt University Berlin, 2004
- Postdoctoral Researcher, Harvard University, Dept. of Molecular and Cellular Biology, 2004 – 2007
- Max Planck Research Group Leader, Max Planck Institute of Neurobiology, Munich-Martinsried, 2007 – 2010
- Professor for Sensory Processing in the Retina, School of Medicine, University of Göttingen since 2010

Major Research Interests

We are interested in how the neuronal network of the retina processes visual information. The focus of our work is on studying the function of the various neuron types in the retina and their synaptic connections. One goal is to better understand the “neural code” of the retina: how do the patterns of electrical activity in retinal neurons transmit information about the visual environment to downstream brain areas? Another goal is to better understand “neural computation” in the retina: how do the cells in the retinal network work, adapt, and interact to produce specific, useful responses? On the basis of these questions, we also study how dysfunction of the retinal circuitry, for example in retinal diseases, compromises sensory processing and how optogenetics can be used to artificially stimulate retinal neurons for vision restoration when photoreceptors are degenerating.

Our investigations are based on various techniques of recording the activity of neurons in the retina while stimulating the network with visual images or movies. To do so, we use isolated retinas of mice and salamanders and apply extracellular multi-electrode array recordings and intracellular recordings with glass pipettes. A central theme of our work is to combine the experiments with novel tools of data analysis and with mathematical modeling of the signal processing in the retina.

Selected Recent Publications

Kühn NK, Gollisch T (2019) Activity correlations between direction-selective retinal ganglion cells synergistically enhance motion decoding from complex visual scenes. *Neuron* 101: 963-976

Liu JK, Schreyer HM, Onken A, Rozenblit F, Khani MH, Krishnamoorthy V, Panzeri S, Gollisch T (2017) Inference of neuronal functional circuitry with spike-triggered non-negative matrix factorization. *Nature Communications* 8: 149

Krishnamoorthy V, Weick M, Gollisch T (2017) Sensitivity to image recurrence across eye-movement-like image transitions through local serial inhibition in the retina. *eLife* 6: 322431

Kühn NK, Gollisch T (2016) Joint encoding of object motion and motion direction in the salamander retina. *J Neurosci* 36:12203-12216

Liu JK, Gollisch T (2015) Spike-triggered covariance analysis reveals phenomenological diversity of contrast adaptation in the retina. *PLoS Comput Biol* 11: e1004425

Takeshita D, Gollisch T (2014) Nonlinear spatial integration in the receptive field surround of retinal ganglion cells. *J Neurosci* 34: 7548-7561

Garvert MM, Gollisch T (2013) Local and global contrast adaptation in retinal ganglion cells. *Neuron* 77: 915-928

Bölinger D, Gollisch T (2012) Closed-loop measurements of iso-response stimuli reveal dynamic nonlinear stimulus integration in the retina. *Neuron* 73: 333-346



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Martin Göpfert

Professor for Cellular Neurobiology

- 1998 Degree in Biology, University of Erlangen-Nürnberg
- 1998 – 2002 DAAD and Leopoldina Research Fellow, Dept. Neurobiology, University of Zürich and School of Biological Sciences, University of Bristol
- 2002 – 2003 Royal Society University Research Fellow, School of Biological Sciences, University of Bristol
- 2003 – 2008 Independent group leader, Volkswagen Foundation Group ‘Active auditory mechanics in insects’, Dept. Animal Physiology, University of Cologne
- 2008 Associate Professor for Molecular Biology and Biophysics of Sensory Systems, University of Cologne
- 2008 Full Professor for Cellular Neurobiology, University of Göttingen

Major Research Interests

Our group studies fundamental processes in hearing. By combining mechanical measurements with genetics, molecular biology, immunohistochemistry, electrophysiology, calcium imaging, and biophysical modelling, we are trying to decipher how molecular processes shape the performance of an ear. Our preferred model system is the hearing organ of the fruit fly *Drosophila melanogaster*, the auditory sensory cells of which share conserved molecular modules with the hair cells in our ears.

Our work has uncovered striking parallels between fly and vertebrate hearing, including the functional equivalence of the auditory transduction and adaptation machineries, the motility of auditory sensory cells, transducer-based force generation, and the expression of homologous genes. Our work also provided first insights into the diverse roles of –and interactions between– transient receptor potential (TRP) ion channels in hearing, and a model of TRP-function in the fly’s auditory system has been devised. Using a novel electrostatic actuation method, we were able to identify hair cell-like signatures of transducer gating and adaptation in the fly’s auditory mechanics and could show that a simple transduction model as proposed to describe hair cell mechanics comprehensively explains the macroscopic behaviour of an ear. Based on these findings, we are currently devising a computational model that allows for the high-throughput characterization of genetic hearing defects. Candidate genes for hearing, in turn, are narrowed down by expression profiling using whole-genome microarrays. By testing how these genes contribute to auditory function and performance, we aim for a comprehensive molecules-to-system description of the functional workings of an ear.

Selected Recent Publications

Versteven M, Vanden Broeck L, Geurten B, Zwarts L, Decraecker L, Beelen M, Göpfert MC, Heinrich R, Callaerts P (2017) Hearing regulates *Drosophila* aggression. *Proc Natl Acad Sci USA* 114: 1958-1963

Andrés M, Seifert M, Spalthoff C, Warren B, Weiss L, Giraldo D, Winkler M, Pauls S, Göpfert MC (2016) Auditory efferent system modulates mosquito hearing. *Curr Biol* 26: 2028-2036

Guo Y, Wang Y, Zhang W, Meltzer S, Zanini D, Yu Y, Li J, Cheng T, Guo Z, Wang Q, Jacobs JS, Sharma Y, Eberl DF, Göpfert MC, Jan LY, Jan YN, Wang Z (2016) Transmembrane channel-like (tmc) gene regulates *Drosophila* larval locomotion. *Proc Natl Acad Sci USA* 113: 7243-7248

Göpfert MC, Hennig RM (2016) Hearing in Insects. *Annu Rev Entomol* 61: 257-276

Zhang W, Cheng LE, Kittelmann M, Li J, Petkovic M, Cheng T, Jin P, Guo Z, Göpfert MC, Jan LY, Jan YN. (2015) Ankyrin repeats convey force to gate the NOMPC mechanotransduction channel. *Cell* 162: 1391-1403



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Ralf Heinrich

Professor, Department of Cellular Neurobiology

- 1995: Dr. rer. nat., University of Göttingen
- 1997 – 1999: Postdoctoral fellow, Harvard Medical School, Boston, USA
- 2004: Habilitation, Zoology
- 2002 – 2008: Junior professor for Molecular Neuropharmacology of Behavior, Göttingen
- since 2008: apl Professor, Dept. of Cellular Neurobiology

Major Research Interests

Vertebrates and invertebrates evolved from common ancestors that already possessed neurons, neurosecretory systems and structured central nervous systems. Though nervous systems of invertebrates are typically less complex than those of vertebrates (especially mammals) they share many molecular and functional characteristics. We study the neural basis of insect behaviors and mechanisms underlying neuroprotection and neuroregeneration in insect nervous systems with an evolutionary perspective.

1) The cytokine erythropoietin (Epo) mediates neuroprotective and neuroregenerative functions in insects similar to its beneficial effects described in mammals including humans. Similar structural and functional characteristics of the Epo-binding receptors, partly shared transduction pathways that prevent apoptosis and the functional implication in neuroprotective and neuroregenerative processes in both mammalian and insect species suggest that Epo-like signaling was already established in their common ancestors. We study insects, both with *in vitro* and *in vivo* approaches, to identify “ancient” Epo-like signals and neuroprotective Epo-receptors and to characterize the beneficial molecular mechanisms mediated by these signalling systems. We expect that this “detour through evolutionary history” will also foster research on Epo-mediated tissue protection in mammals.

2) Social behavior is the product of complex interactions between various types of neurons that integrate external sensory information with internal physiological states. We study the regulation of social behaviors by synaptic molecules (e.g. neuroligins, transmitters) and the neurochemical mechanisms of motivational states with a combination of neuroethological, pharmacological, electrophysiological, histochemical and immunocytochemical methods. Most studies focus on sex-specific mating and aggressive behaviors of acoustically communicating grasshoppers and fruit flies.

Selected Recent Publications

Hahn N, Knorr DY, Liebig J, Wüstefeld L, Peters K, Büscher M, Bucher G, Ehrenreich H, Heinrich R (2017) The insect orthologue of the human orphan cytokine receptor CRLF3 is a neuroprotective erythropoietin receptor in insects. *Frontiers in Molecular Neuroscience* 10: 223

Miljus N, Massih B, Weis MA, Rison JV, Bonnas CB, Sillaber I, Ehrenreich H, Geurten BRH, Heinrich R (2017) Neuroprotection and endocytosis: erythropoietin receptors in insect nervous systems. *Journal of Neurochemistry* 141: 63-74

Miljus N, Heibeck S, Jarrar M, Micke M, Ostrowski D, Ehrenreich H, Heinrich R (2014) Erythropoietin-mediated protection of insect brain neurons involves JAK and STAT but not PI3K transduction pathways. *Neuroscience* 258:218-227

Hahn N, Geurten B, Gurvich A, Piepenbrock D, Kästner A, Zanini D, Xing G, Xie W, Göpfert MC, Ehrenreich H, Heinrich R (2013) Monogenic heritable autism gene neuroligin impacts *Drosophila* social behaviour. *Behavioural Brain Research* 252: 450-457

Heinrich R, Kunst M, Wirmer A (2012) Reproduction-related sound production of grasshoppers regulated by internal state and actual sensory environment. *Frontiers in Decision Neuroscience* 6, 89: 1-9



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Stefan Hell

Professor, Director at the Max Planck Institute for Biophysical Chemistry

- 1987 Diploma in Physics, University of Heidelberg
- 1990 Doctorate in Physics, University of Heidelberg
- 1991 – 1993 Postdoctoral Researcher, EMBL (European Molecular Biology Laboratory)
- 1993 – 1996 Principal Investigator, Laser Microscopy Group; Univ. of Turku, Finland
- 1996 Habilitation in Physics, Univ. Heidelberg; Physics teaching since 02/1996
- 1997 – 2002 Head, Max-Planck Junior Group High Resolution Optical Microscopy, at the Max-Planck-Institute for Biophysical Chemistry Göttingen, Germany
- since 10/2002 Director at the Max Planck Institute for Biophysical Chemistry, Head of Department of NanoBiophotonics
- since 12/2003 Apl. Prof., Faculty of Physics, Univ. of Heidelberg
- 2003 – 2017 Head of High Resolution Optical Microscopy Division, DKFZ Heidelberg
- since 01/2004 Hon. Prof., Faculty of Physics, Univ. of Göttingen
- 2014 Nobel Prize in Chemistry
- 2014 Kavli Prize in Nanoscience
- since 11/2015 Director at the Max Planck Institute for Medical Research, Head of Department of Optical Nanoscopy

Major Research Interests

Optical microscopy beyond the diffraction barrier with far-field optics

Invention of STED, RESOLFT, GSDIM and 4Pi microscopy and related techniques

Selected Recent Publications

Eilers Y, Ta H, Gwosch KC, Balzarotti F, Hell SW (2018) MINFLUX monitors rapid molecular jumps with superior spatiotemporal resolution. *Proc Natl Acad Sci USA* 115: 6117-6122

Balzarotti F, Eilers Y, Gwosch KC, Gynna AH, Westphal V, Stefani FD, Elf J, Hell SW (2017) Nanometer resolution imaging and tracking of fluorescent molecules with minimal photon fluxes. *Science* 355: 606-612

Heine J, Reuss M, Harke B, D'Este E, Sahl SJ, Hell SW (2017) Adaptive-illumination STED nanoscopy. *Proc Natl Acad Sci USA* 114:9797-9802

Ta H, Keller J, Haltmeier M, Saka SK, Schmied J, Opazo F, Tinnefeld P, Munk A, Hell SW (2015) Mapping molecules in scanning far-field fluorescence nanoscopy. *Nat Commun* 6: 7977

Schneider J, Zahn J, Maglione M, Sigrist SJ, Marquard J, Chojnacki J, Kräusslich HG, Sahl SJ, Engelhardt J, Hell SW (2015) Ultrafast, temporally stochastic STED nanoscopy of millisecond dynamics. *Nat Methods* 12(9): 827-30

Hell SW (2015) Nanoscopy with Focused Light (Nobel Lecture). *Angew Chem Int Ed Engl* 54(28):8054-66

Berning S, Willig KI, Steffens H, Dibaj P, Hell SW (2012) Nanoscopy in a Living Mouse Brain. *Science* 335: 551

Eggeling C, Ringemann C, Medda R, Schwarzmann G, Sandhoff K, Polyakova S, Belov VN, Hein B, von Middendorff C, Schönle A, Hell SW (2009) Direct observation of the nanoscale dynamics of membrane lipids in a living cell. *Nature* 457: 1159-1163

Willig KI, Rizzoli SO, Westphal V, Jahn R, Hell SW (2006) STED-microscopy reveals that synaptotagmin remains clustered after synaptic vesicle exocytosis. *Nature* 440: 935-939



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Sven Hülsmann

Professor of Neurophysiology

- Dr. med., University of Münster, 1995
- Postdoctoral fellow, University of Münster Dept. of Neurosurgery, 1995 – 1996
- Postdoctoral fellow, University of Göttingen, Dept. of Neurophysiology, 1996 – 2001
- Group leader (Wissenschaftlicher Assistent) Neurophysiology, since 2001
- Principle Investigator at the DFG Research Center for Molecular Physiology of the Brain (CMPB) since 2002
- Habilitation, University of Göttingen, 2005

Major Research Interests

Most behavioral aspects of life are attributed to neurons, leaving many white spots of knowledge about the function of the different types of glial cells. Our group aims to identify and clarify the mechanisms that allow astrocytes to modulate and stabilize the most vital behavior of breathing.

Selected Recent Publications

Hülsmann S, Mesuret G, Dannenberg J, Arnoldt M, Niebert M (2016) GlyT2-dependent preservation of MECP2-expression in inhibitory neurons improves early respiratory symptoms but does not rescue survival in a mouse model of Rett syndrome *Front. Physiol.* doi: 10.3389/fphys.2016.00385

Rahman J, Besser S, Schnell C, Eulenburg V, Hirrlinger J, Wojcik SM, Hülsmann S (2015) Genetic ablation of VIAAT in glycinergic neurons causes a severe respiratory phenotype and perinatal death. *Brain Struct Funct* 220: 2835-2849

Schnell C, Shahmoradi A, Wichert SP, Mayerl S, Hagos Y, Heuer H, Rossner MJ, Hülsmann S (2015) The multispecific thyroid hormone transporter OATP1C1 mediates cell-specific Sulforhodamine 101-labeling of hippocampal astrocytes. *Brain Struct Funct* 220: 193-203

Winter SM, Fresemann J, Schnell C, Oku Y, Hirrlinger J, Hülsmann S (2009) Glycinergic interneurons are functionally integrated into the inspiratory network of mouse medullary slices. *Pflügers Arch* 458: 459-469

Grass D, Pawlowski PG, Hirrlinger J, Papadopoulos N, Richter DW, Kirchhoff F, Hülsmann S (2004) Diversity of functional astroglial properties in the respiratory network. *J Neurosci* 24: 1358-1365



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Professor, Director at the Max Planck Institute for Biophysical Chemistry

- 1981 Dr. rer. nat., University of Göttingen
- 1985 Assistant Professor, The Rockefeller University, New York (USA)
- 1986 Junior Group leader, Max Planck Institute for Psychiatry, Martinsried
- 1991 Associate Professor of Pharmacology and Cell Biology, Yale University, and Investigator, Howard Hughes Medical Institute, New Haven (USA)
- 1995 Professor of Pharmacology and Cell Biology, Yale University, New Haven
- 1997 Director, Max Planck Institute for Biophysical Chemistry, Göttingen
- 1997 – 2001 Adjunct Professor of Pharmacology, Yale University School of Medicine, New Haven, USA
- 2001 Adjunct Professor of Biology, University of Göttingen
- 2019 Emeritus Group Leader, Max Planck Institute for Biophysical Chemistry, Göttingen
- 2019 President of the University of Göttingen

Major Research Interests

Our group is interested in the mechanisms of membrane fusion, with the main emphasis on regulated exocytosis in neurons. Intracellular membrane fusion events are mediated by a set of conserved membrane proteins, termed SNAREs. For fusion to occur, complementary sets of SNAREs need to be present on both of the fusing membranes, which then assemble in a zipper-like fashion to initiate membrane merger. The neuronal SNAREs are among the best characterized. They are the targets of the toxins responsible for botulism and tetanus, and they are regulated by several additional proteins including synaptotagmin, the calcium sensor for neurotransmitter release. To understand how these proteins mediate fusion, we study their properties in vitro with biochemical and biophysical approaches using native and artificial membranes.

In a second set of projects, we are interested in the mechanisms by which synaptic vesicles sequester and store neurotransmitters. Uptake is mediated by specific vesicular neurotransmitter transporters that are energized by an electrochemical proton gradient across the membrane. Presently we aim for a better understanding of the transport mechanisms using a variety of biochemical and biophysical approaches including imaging of single vesicles. Finally, we use quantitative proteomics to better understand how the presynaptic protein network contributes to the regulation of synaptic release, focusing on protein phosphorylation.

Selected Recent Publications

Jakhanwal S, Lee CT, Urlaub H, Jahn R (2017) An activated Q-SNARE/SM protein complex as a possible intermediate in SNARE assembly. *EMBO J* 36: 1788-1802

Farsi Z, Preobraschenski J, van den Bogaart G, Riedel D, Jahn R*, Woehler A (2016) Single-vesicle imaging reveals different transport mechanisms between glutamatergic and GABAergic vesicles. *Science* 351: 981-984 *corresponding author

Ryo J-K, Min D, Rah S-H, Kim SJ, Park Y, Kim H, Kim H-M, Jahn R*, Yoon T-Y* (2015) Spring-loaded unraveling of a single SNARE complex by NSF in one round of ATP turnover. *Science* 347: 1485-1489 *corresponding authors

Binotti B, Pavlos NJ, Riedel D, Wenzel D, Vorbrüggen G, Schalk AM, Kühnel K, Boyken J, Erck C, Martens H, Chua JJE, Jahn R (2015) The GTPase Rab26 links synaptic vesicles to the autophagy pathway. *eLife* 4: e05597

Par Y, Seo JB, Fraind A, Perez-Lara A, Yavuz H, Han K, Jung SR, Kattan I, Walla PJ, Choi MY, Cafiso DS, Koh D, Jahn R (2015) Synaptotagmin-1 binds to PI(4,5)P2-containing membranes but not to SNAREs in a physiological ionic environment. *Nature Struct Mol Biol* 10: 815-823

Honigmann A, van den Bogaart G, Iraheta E, Risselada HJ, Milovanovic D, Mueller V, Müller S, Diederichsen U, Fasshauer D, Grubmüller H, Hell SW, Eggeling C, Kühnel K, Jahn R (2013) Phosphatidylinositol 4,5-bisphosphate clusters act as molecular beacons for vesicle recruitment. *Nat Struct Mol Biol* 20: 679-686



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Igor Kagan

Group Leader, Decision and Awareness Group, Cognitive Neuroscience Laboratory, German Primate Center

- 2011 – present: Group Leader, German Primate Center, Göttingen, Germany
- 2009 – 2010: Senior Research Fellow, Andersen Lab, Caltech, Pasadena, CA, USA
- 2003 – 2008: Postdoctoral Scholar, Andersen Lab, Caltech, Pasadena, CA, USA
- 2003: Ph.D. Biomedical Engineering, Technion – Israel Institute of Technology, Haifa, Israel, and Schepens Eye Research Institute, Harvard Medical School, Boston, MA, USA
- 1996: B.Sc. Biology, Faculty of Life Sciences, Tel Aviv University, Israel
- 1989 – 1991: Department of Biophysics, Faculty of Physics and Mechanics, St. Petersburg State Technical University, Russia

Major Research Interests

Neurophysiology and functional imaging of decision-making, cognitive and visuomotor functions in primates, interhemispheric interactions and bihemispheric network processing for action planning in the context of goal-directed behaviors. Human-monkey cross-species comparison using functional imaging, pharmacological inactivation, and behavioral approaches. Neuronal basis of fMRI signals. Neurophysiology of active vision in primary visual cortex.

Selected Recent Publications

Domínguez-Vargas AU, Schneider L, Wilke M*, Kagan I* (2017) Electrical mi-crostimulation of the pulvinar biases saccade choices and reaction times in a time-dependent manner. *Journal of Neuroscience* 37(8): 2234-57

Christopoulos NV, Bonaiuto J, Kagan I, Andersen RA (2015) Inactivation of parietal reach region affects reaching but not saccade choices in internally guided decisions. *Journal of Neuroscience* 35(33): 11719-28

Kagan I, Hafed ZM (2013) Active vision: microsaccades direct the eye to where it matters most. *Current Biology* 23(17): R712-R714

Wilke M, Kagan I, Andersen RA (2013) Effects of pulvinar inactivation on spatial decisionmaking between equal and asymmetric reward options. *Journal of Cognitive Neuroscience* 25(8): 1270-83

Wilke M*, Kagan I*, Andersen RA (2012) Functional imaging reveals rapid reorganization of cortical activity after parietal inactivation in monkeys. *Proceedings of the National Academy of Sciences* 109(21): 8274-9

Kagan I (2012) Active vision: fixational eye movements help seeing space in time. *Current Biology* 22(6): R186-R188

Iyer A, Lindner A, Kagan I, Andersen RA (2010) Motor preparatory activity in posterior parietal cortex is modulated by subjective absolute value. *PLoS Biology* 8(8): e1000444

Lindner A, Iyer A, Kagan I, Andersen RA (2010) Human posterior parietal cortex plans where to reach and what to avoid. *Journal of Neuroscience* 30(35): 11715-25

Kagan I, Iyer A, Lindner A, Andersen RA (2010) Space representation for eye movements is more contralateral in monkeys than in humans. *Proceedings of the National Academy of Sciences* 107(17): 7933-8

Kagan I, Gur M, Snodderly DM (2008) Saccades and drifts differentially modulate neuronal activity in V1: Effects of retinal image motion, position, and extraretinal influences. *Journal of Vision* 8(14):19: 1-25

*shared authorship



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Siegrid Löwel

Professor, Head of Department of Systems Neuroscience, University of Göttingen

- 1988 Dr. phil. nat., University of Frankfurt a. M. / Department of Neurophysiology (Prof. Dr. Wolf Singer), Max-Planck-Institut für Hirnforschung, Frankfurt a. M.
- 1997-2005 Head of Independent Research Group “Visual Development and Plasticity”, Leibniz-Institute for Neurobiology, Magdeburg
- 2002-2003 Associate Research Physiologist/Research Associate Professor, School of Medicine, Department of Physiology, University of California in San Francisco, USA
- 2003-2004 Dorothea-Erxleben-Guest Professorship, University of Magdeburg
- 2004-2005 Scholarship Hertie-Excellency Program “Neurosciences”
- 2005-2010 Professor of Neurobiology, University of Jena
- since 2010 Full Professor of Systems Neuroscience, Institute for Zoology and Anthropology, University of Göttingen

Major Research Interests

The Löwel lab is focussed on understanding the development and plasticity of neuronal circuits in the mammalian cortex. We use a combination of techniques, including optical imaging, 2-photon imaging, electrophysiology and virus-mediated knock-down to explore how experience and learning influence the structure and function of nerve cell networks. We hope that answering these key questions not only helps to understand the rules underlying brain development, functioning and learning but additionally will open up new avenues to develop clinically relevant concepts to promote regeneration and rehabilitation for diseased and injured brains. The Löwel lab has made major contributions to experience-dependent changes in nerve cell networks: We were e.g. the first to demonstrate that the learning rule for the development of long-range cortical circuits is correlated activity: “neurons wire together if they fire together” (Löwel & Singer, 1992, *Science* 255: 209-212).

Selected Recent Publications

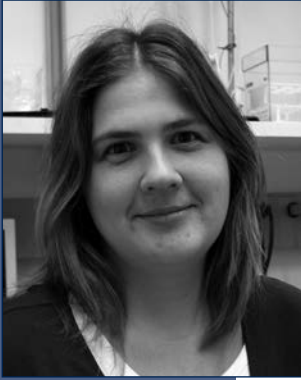
Huang X*, Stodieck SK*, Goetze B, Schmidt K-F, Cui L, Wenzel C, Hosang L, Dong Y, Löwel S*, Schlüter OM* (2015) The progressive maturation of silent synapses governs the duration of a critical period. *Proc Natl Acad Sci USA* 112: E3131-40. *equal contribution
van Wyk M, Pielecka-Fortuna J, Löwel S, Kleinlogel S (2015) Restoring the ON-switch in blind retinas: Opto-mGluR6, a next-generation, cell-tailored optogenetic tool. *PLoS Biology* 13(5): e1002143

Kalogeraki E, Greifzu F, Haack F, Löwel S (2014) Voluntary physical exercise promotes ocular dominance plasticity in adult mouse primary visual cortex. *J Neurosci* 34: 15476-15481

Greifzu F, Pielecka-Fortuna J, Kalogeraki E, Krempler K, Favaro PD, Schlüter OM, Löwel S (2014) Environmental enrichment extends ocular dominance plasticity into adulthood and protects from stroke-induced impairments of plasticity. *Proc Natl Acad Sci USA* 111: 1150-1155

Greifzu F, Schmidt S, Schmidt K-F, Kreikemeier K, Witte OW, Löwel S (2011) Global impairment and therapeutic restoration of visual plasticity mechanisms after a localized cortical stroke. *Proc Natl Acad Sci USA* 108: 15450-15455

Kaschube M, Schnabel M, Löwel S, Coppola DM, White LE, Wolf F (2010) Universality in the evolution of orientation columns in the visual cortex. *Science* 330: 1113-1116



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Ira Milosevic

Group Leader Synaptic Vesicle Dynamics

- 2001: Diploma (Dipl. Ing.) in Molecular Biology University of Zagreb, Zagreb, Croatia; thesis work performed at Eötvös Lorand University, Dept. of Biochemistry, Budapest, Hungary and Ruder, Boskovic Institute, Dept. of Molecular Genetics, Zagreb, Croatia (advisors: Prof. Ivana Weygand-Durasevic, Prof. Laszlo Nyitray)
- 2003: M.Sc., IMPRS Neurosciences, Georg August University Göttingen, Germany; thesis work performed at Max Planck Institute for Biophysical Chemistry, Dept. of Membrane Biophysics and Dept. of Biochemistry (advisors: Prof. Erwin Neher, Prof. Reinhard Jahn)
- 2006: Ph.D., IMPRS Neurosciences, Georg August University Göttingen, Germany; thesis work performed at Max Planck Institute for Biophysical Chemistry, Dept. of Membrane Biophysics and Dept. of Biochemistry (advisors: Prof. Erwin Neher, Prof. Reinhard Jahn)
- 2007 – 2012: PostDoc, HHMI and Yale University School of Medicine, Dept. of Cell Biology, New Haven, CT, USA (advisor: Prof. Pietro De Camilli)
- since December 2012: Independent Group Leader at the European Neuroscience Institute Göttingen

Major Research Interests

The laboratory investigates fundamental aspects of exocytosis, endocytosis and synaptic vesicle recycling that have relevance to neuronal and brain functions, using mouse and mammalian cells as model systems. We combine biochemistry, imaging (light and electron microscopy), cell biology and electrophysiology to study the processes that regulate synaptic vesicle formation. In a distinct but related line of work, we are exploring the signaling processes that originate from altered neurotransmission and lead to neurodegeneration.

Selected Recent Publications

Fonseca TB, Sánchez-Guerrero A, Milosevic I, Raimundo N (2019) Mitochondrial fission requires Drp1 but not dynamins. *Nature* 570(7761):E34-E42, doi: 10.1038/s41586-019-1296-y

Kroll J, Jaime Tobón LM, Vogl C, Neef J, Kondratiuk I, König M, Strenzke N, Wichmann C, Milosevic I, Moser T (2019) Endophilin-A regulates presynaptic Ca²⁺ influx and synaptic vesicle recycling in auditory hair cells. *EMBO J* 38(5), doi: 10.15252/embj.2018100116

Yambire KF, Fernández-Mosquera L, Steinfeld R, Muhle C, Ikonen E, Milosevic I, Raimundo N (2019) Mitochondrial biogenesis is transcriptionally repressed in lysosomal lipid storage diseases. *eLife* 8, doi: 10.7554/eLife.39598

Watanabe S, Mamer LE, Raychaudhuri S, Luvsanjav D, Eisen J, Trimbuch T, Söhl-Kielczynski B, Fenske P, Milosevic I, Rosenmund C, Jorgensen EM (2018) Synaptojanin and endophilin mediate neck formation during ultrafast endocytosis. *Neuron* 98(6): 1184-1197

Farsi Z, Gowrisankaran S, Matija K, Rammner B, Woehler A, Mim C, Jahn R, Milosevic I (2018) Clathrin coat controls vesicle acidification by blocking vacuolar ATPase activity. *eLife* 7, doi: 10.7554/eLife.32569

Fiuza M, Rostosky C, Parkinson G, Bygrave A, Halemani N, Baptista M, Milosevic I, Hanley J (2017) PICK1 regulates AMPA receptor endocytosis via direct interactions with AP2 α -appendage and dynamin. *J Cell Biol* 216(10): 3323-3338

Murdoch JD, Rostsoky C, Gowrisankaran S, Arora AS, Soukup SF, Vidal R, Capece V, Freytag S, Fischer A, Verstreken P, Bonn S, Raimundo N, Milosevic I (2016) Endophilin-A deficiency induces the FoxO3a-Fbxo32 network in the brain and causes dysregulation of autophagy and the ubiquitin-proteasome system. *Cell Rep* 17(4): 1071-1086

Giordano F, Saheki Y, Idevall-Hagren O, Colombo SF, Pirruccello M, Milosevic I, Gracheva EO, Bagriantsev SN, Borgese N, De Camilli P (2013) PI(4,5)P2-dependent and Ca²⁺-regulated ER-PM interactions mediated by the extended synaptotagmins. *Cell* 153(7): 1494-509



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http://www.em.mpg.de/index.php?id=373&tx_jppageteaser_pi1%5BbackId%5D=16

Tobias Moser

Professor of Auditory Neuroscience

- 1995 M.D. University of Jena
- 1994 – 1997 Postdoc with E. Neher at the MPI for Biophysical Chemistry
- 1997 – 2001 Junior Group Leader at the at the MPI for Biophysical Chemistry, Göttingen
- since 2001 Leader of the InnerEarLab and Clinical Work at the Department of Otolaryngology, University Medical Center Göttingen
- Director of the Institute for Auditory Neuroscience, University Medical Center Göttingen and group leader at the MPIs for Experimental Medicine and Biophysical Chemistry and the German Primate Center

Major Research Interests

Auditory Neuroscience - Synaptic Physiology and Pathophysiology – Audiology and Neuroprosthetics

Our work focuses on the molecular anatomy, physiology and pathophysiology of sound encoding and information processing in the auditory system as well as the restoration of hearing by gene replacement therapy and optogenetic stimulation. We combine various techniques to characterize synapses of hair cells and the auditory brainstem from the molecular to the systems level. This way we have contributed to the understanding of structure and function of auditory synapses and initiated the concept of auditory synaptopathy. Towards restoration of hearing we aim to establish virus-mediated gene replacement therapy of auditory synaptopathy and pursue the optogenetic stimulation of auditory nerve for improving the performance of the cochlear implant.

Selected Recent Publications

Dieter A, Duque-Afonso CJ, Rankovic V, Jeschke M, Moser T (2019) Near physiological spectral selectivity of cochlear optogenetics. *Nature Communications* 10: 1962

Neef J, Ohn TL, Urban NT, Frank T, Jean P, Hell SW, Willig KI, Moser T (2018) Quantitative optical nanophysiology of Ca²⁺-signaling at inner hair cell active zones. *Nat commun* 18;9(1): 290. doi: 10.1038/s41467-017-02612-y

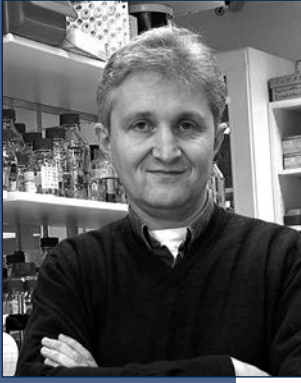
Mager T, Lopez de la Morena D, Senn V4,5, Schlotte J, D Errico A, Feldbauer K, Wrobel C, Jung S, Bodensiek K, Rankovic V, Browne L, Huet A, Jüttner J1, Wood PG, Letzkus JJ, Moser T, Bamberg E (2018) High frequency neural spiking and auditory signaling by ultrafast red-shifted optogenetics. *Nat Commun* 2018 May 1;9(1):1750. doi: 10.1038/s41467-018-04146-3

Wrobel C, Dieter A, Huet A, Keppeler D, Duque-Afonso C, Vogl C, Hoch G, Jeschke M, Moser T (2018) Optogenetic stimulation of cochlear neurons activates the auditory pathway and restores auditory-driven behavior in deaf adult gerbils. *Sci Translat Med* 11 Jul 2018: Vol. 10, Issue 449, eaao0540. DOI: 10.1126/scitranslmed.aa0540

Picher MM, Gehrt A, Meese S, Ivanovic A, Predoehl F, Jung SY, Schrauwen I, Dragonetti AG, Colombo R, Van Camp V, Strenzke N, Moser T (2017) Ca²⁺-binding protein 2 inhibits Ca²⁺ channel inactivation in mouse inner hair cells. *PNAS* 114: E1717-E1726

Ohn TZ, Rutherford MA, Jing Z, Jung SY, Duque-Afonso CJ, Hoch G, Picher MM, Scharinger A, Strenzke N, Moser T (2016) Hair cells employ active zones with different voltage-dependence of Ca²⁺-influx to decompose sounds into complementary neural codes. *PNAS* 113(32): E4716-25

Jung S, Maritzen T, Wichmann C, Jing Z, Neef A, Revelo NH, Al-Moyed H, Meese S, Wojcik SM, Panou I, Bulut H, Schu P, Ficner R, Reisinger E, Rizzoli SO, Neef J, Strenzke N, Haucke V, Moser T (2015) Disruption of adaptor protein 2μ (AP-2μ) in cochlear hair cells impairs vesicle reloading of synaptic release sites and hearing. *EMBO J* 34(21): 2686-702



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Klaus-Armin Nave

Director at the Max Planck Institute for Experimental Medicine

- 1987 PhD, University of California, San Diego
- 1987 – 1991 Postdoc, The Salk Institute, La Jolla, California
- 1991 Junior Group Leader, ZMBH, University of Heidelberg
- 1998 Professor of Molecular Biology (C4), ZMBH, University of Heidelberg
- since 1999 Director at the Max Planck Institute for Experimental Medicine

Major Research Interests

We are studying the interactions of neurons and glial cells in the mammalian nervous system with a special interest in the role of oligodendrocytes and Schwann cells, best known as myelin forming cells of the central and peripheral nervous system. These highly specialized glial cells enwrap axons with a multilayered sheath that provides electrical insulation for rapid impulse propagation. However the biology of these axon-glia interactions is complex. Using mouse genetics, originally to study the role of proteins in the myelin architecture and in neurogenetic disorders, we made the unexpected discovery of a novel function of oligodendrocytes, which even precedes myelin in nervous system evolution: the glial metabolic support of axonal conduction, axonal transport and long-term integrity. We determined that oligodendrocytes and Schwann cells take up glucose and deliver lactate, here the product of aerobic glycolysis, to the axonal compartment. This supportive function helps maintaining axon functions especially when ATP demands are increased at higher firing rates, also because access of axons to extracellular metabolites is restricted by myelin itself. Here, the fine architecture of the myelin sheath that we visualize with advanced electron microscopic techniques appears critical. Specialized cytoplasmic connections within the myelin sheath ('myelinic nanochannels') must provide a pathway of continuous communication between oligodendrocytes and the encapsulated axon. In neurological diseases, in which myelin is structurally affected or even destroyed, such as in multiple sclerosis, leukodystrophies and various peripheral neuropathies, there is invariably secondary axonal degeneration that we propose is caused by the lack of adequate metabolic support. We are investigating the underlying molecular mechanisms of these diseases in detail, using corresponding animal models that we have generated with a range of genetic techniques. A further goal is to understand the role of myelinating glial cells in higher brain functions and psychiatric diseases, which we approach in close collaboration with the Department of Hannelore Ehrenreich at our institute.

Selected Recent Publications

Saab AS, Tzvetavona ID, Trevisiol A, Baltan S, Dibaj P, Möbius W, Kusch K, Goetze B, Jahn HM, Huang W, Steffens H, Schomburg ED, Pérez-Samartín A, Pérez-Cerdá F, Bakhtiari D, Matute C, Löwel S, Griesinger C, Hirrlinger J, Kirchhoff F, Nave KA (2016) Oligodendroglial NMDA receptors regulate axonal energy metabolism. *Neuron* 91: 199-132

Goebbels S, Wieser GL, Pieper A, Spitzer S, Weege B, Yan K, Edgar JM, Yagensky O, Wichert S, Agarwal A, Karram K, Renier N, Tessier-Lavigne M, Rossner MJ, Káradóttir RT, Nave KA (2017) A neuronal PI(3,4,5)P3-dependent program of oligodendrocyte precursor recruitment and myelination. *Nature Neuroscience* 20: 10-15

Quintes S, Brinkmann BG, Ebert M, Fröb F, Kungl T., Arlt FA, Tarabykin V, Huylebroeck D, Meijer D, Suter U, Wegner M, Sereda MW, Nave KA (2016) Sip1 is essential for Schwann cell differentiation, myelination and nerve repair. *Nature Neuroscience* 19: 1050-1059

Fünfschilling U, Supplie LM, Mahad D, Boretius S, Saab AS, Edgar J, Brinkmann BG, Kassmann CM, Tzvetanova ID, Möbius W, Diaz F, Meijer D, Suter U, Hamprecht B, Sereda MW, Moraes CT, Frahm J, Goebbels S, Nave KA (2012) Glycolytic oligodendrocytes maintain myelin and long-term axonal integrity. *Nature* 485: 517-521

Nave KA (2010) Myelination and support of axonal integrity by glia. *Nature* 468: 244-252



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Tiago Fleming Outeiro

Professor of Aggregopathies, Director of the Department of Neurodegeneration and Restaurative Research

- 1994 – 1998 B.S. in Biochemistry Faculty of Sciences, University of Porto, Portugal
- 1999 – 2004 Ph.D. in Molecular and Cell Biology Whitehead Institute for Biomedical Research, MIT Cambridge, University of Chicago (UC), USA
- 2004 Consultant and Research Scientist, FoldRx Pharmaceuticals, Inc, Cambridge, USA: Ph.D. work was transferred to the start-up company FoldRx Pharmaceuticals, Inc.
- 2004 – 2007 Postdoctoral Research Fellow; advisor Dr. Brad Hyman, MGH Harvard University, USA
- 2007 – 2011 Principal Investigator and Group Leader at Instituto de Medicina Molecular, Lisbon, Portugal
- 2007 – 2008 Visiting Scientist, Massachusetts General Hospital, Harvard Medical School, Boston, USA
- 2007 – present Auxiliar Professor, Instituto de Fisiologia, Faculdade de Medicina da Universidade de Lisboa, Portugal
- 2010 – present: Full Professor of Aggregopathies, Director of the Department of Neurodegeneration and Restaurative Research, University Medical Center Göttingen

Major Research Interests

Our research interests are focused on the understanding of the molecular mechanisms which lead to neurodegeneration in diseases such as Parkinson's, Huntington's, or Alzheimer's disease. These diseases are intimately associated with protein misfolding and aggregation in specific regions of the brain.

Because the molecular pathways involved in protein homeostasis are highly conserved, we employ a wide variety of model organisms, from the simple but powerful budding yeast to mammalian cell culture and mice, to study the origin of the problems.

We are also developing novel *in vivo* imaging approaches based on multi-photon microscopy to observe protein misfolding and aggregation in the living brain.

Our ultimate goals are to develop novel therapeutic approaches for these and other related disorders. We are working closely together with clinicians in order to accelerate drug discovery efforts, translating basic research into clinical applications that will improve the lives of patients.

Selected Recent Publications

Vicente Miranda H, Szego ÉM, Oliveira LM, Breda C, Darendelioglu E, de Oliveira RM, Ferreira DG, Gomes MA, Rott R, Oliveira M, Munari F, Enguita FJ, Simões T, Rodrigues EF, Heinrich M, Martins IC, Zamolo I, Riess O, Cordeiro C, Ponces-Freire A, Lashuel HA, Santos NC, Lopes LV, Xiang W, Jovin TM, Penque D, Engelender S, Zweckstetter M, Klucken J, Giorgini F, Quintas A, Outeiro TF (2017) Glycation potentiates -synuclein-associated neurodegeneration in synucleinopathies. *Brain* 2017 Apr 10

de Oliveira RM, Vicente Miranda H, Francelle L, Pinho R, Szegő ÉM, Martinho R, Munari F, Lázaro DF, Moniot S, Guerreiro P, Fonseca-Ornelas L, Marijanovic Z, Antas P, Gerhardt E, Enguita FJ, Fauvet B, Penque D, Pais TF, Tong Q, Becker S, Kügler S, Lashuel HA, Steegborn C, Zweckstetter M, Outeiro TF (2017) Correction: The mechanism of sirtuin 2-mediated exacerbation of alpha-synuclein toxicity in models of Parkinson disease. *PLoS Biol* 2017 Apr 5;15(4): e1002601

Villar-Piqué A, Lopes da Fonseca T, Sant'Anna R, Szegő ÉM, Fonseca-Ornelas L, Pinho R, Carija A, Gerhardt E, Masaracchia C, Abad Gonzalez E, Rossetti G, Carloni P, Fernández CO, Foguel D, Milosevic I, Zweckstetter M, Ventura S, Outeiro TF (2016) Environmental and genetic factors support the dissociation between -synuclein aggregation and toxicity. *Proc Natl Acad Sci U S A* 2016 Oct 5



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Luis A. Pardo

Professor of Molecular Biology of Neuronal Signals, Group Leader at the Max Planck Institute for Experimental Medicine

- 1986 M.D., University of Oviedo, Spain
- 1990 Ph.D. University of Oviedo, Spain
- 1991 – 1993 Postdoctoral fellow, Max-Planck Institute of Biophysical Chemistry
- 1994 – 1996 Researcher, University of Oviedo, Spain
- 1997 – 2000 Senior researcher, Max-Planck Institute of Experimental Medicine
- 2001 – 2003 Chief Scientific Officer, iOnGen AG
- since 2004 group leader at the Max-Planck Institute of Experimental Medicine
- since 2008 Max-Planck Research Group Leader
- since 2011 Apl. Professor, University Medical Center Göttingen

Major Research Interests

Our research interest focuses on the role of ion channels in the initiation and progression of tumors. For this, we take advantage of the knowledge of the physiology and molecular biology of channels and use electrophysiological techniques along with advanced microscopy, protein engineering and animal models. Most of our work has been on a particular potassium channel frequently expressed (75%) in human tumors. We try to take advantage of the particular features of ion channels (for example, their surface expression) to design novel diagnostic and therapeutic procedures.

We also try to understand the mechanisms underlying the role of ion channels in tumors, regarding both permeation properties as well as non-canonical functions.

Selected Recent Publications

Sánchez A, Urrego D, Pardo LA. (2016) Cyclic expression of the voltage-gated potassium channel KV10.1 promotes disassembly of the primary cilium. *EMBO Rep* 2016 May;17(5): 708-23. doi: 10.15252/embr.201541082. Epub 2016 Apr 20

Urrego D, Movsisyan N, Ufartes R, Pardo LA. (2016) Periodic expression of Kv10.1 driven by pRb/E2F1 contributes to G2/M progression of cancer and non-transformed cells. *Cell Cycle* 2016 Mar 18;15(6): 799-811. doi: 10.1080/15384101.2016.1138187

Mortensen LS, Schmidt H, Farsi Z, Barrantes-Freer A, Rubio ME, Ufartes R, Eilers J, Sakaba T, Stuehmer W, Pardo LA (2015) K(V)10.1 opposes activity-dependent increase in Ca²⁺ influx into the presynaptic terminal of the parallel fibre-Purkinje cell synapse. *Journal of Physiology-London* 593: 181-196

Lörinczi É, Gómez-Posada JC, de la Peña P, Tomczak AP, Fernández-Trillo J, Leipscher U, Stühmer W, Barros F, Pardo LA (2015) Voltage-dependent gating of KCNH potassium channels lacking a covalent link between voltage-sensing and pore domains. *Nat Commun* 6

Pardo LA, Stühmer W (2014) The roles of K⁺ channels in cancer. *Nat Rev Cancer* 14: 39-48

Jimenez-Garduno AM, Mitkovski M, Alexopoulos IK, Sanchez A, Stuhmer W, Pardo LA, Ortega A (2014) KV10.1 K⁽⁺⁾-channel plasma membrane discrete domain partitioning and its functional correlation in neurons. *Biochim Biophys Acta* 1838: 921-31



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Walter Paulus

Professor of Clinical Neurophysiology

- Dr. med., University of Düsseldorf, 1978
- Training in Neurology at the Universities of Düsseldorf, UCL London and Munich
- Habilitation (Neurology and Clinical Neurophysiology) in Munich
- Prof. and Head of the Department of Clinical Neurophysiology 1992

Major Research Interests

We intend to understand and modulate cortical plasticity in man. This is mainly done on a behavioural, imaging and electrophysiological level. We use (motor) learning paradigms, evaluate them by behavioural techniques and by recording EMG; EEG or fMRI data in the context with connectivity analyses. We develop and/or apply stimulation techniques such as repetitive transcranial magnetic stimulation (rTMS), transcranial direct current stimulation, alternating current stimulation or random noise stimulation (tDCS, tACS, tRNS). TMS induces a short electric current in the human brain. Both rTMS and electric stimulation techniques offer the prospect of inducing LTD and LTP like effects in the human brain. Diseases in our focus are Parkinson's disease, epilepsy, migraine, stroke and dystonia.

The Department of Clinical Neurophysiology pursues other research areas such as Neurorehabilitation in conjunction with the Bernstein Centre of Computational Neuroscience and with the Company Otto Bock. Another focus concerns Hereditary Neuropathies in collaboration with the MPI for Experimental Medicine, speech disorders with a focus on stuttering and others (overview researcher ID A-3544-2009).

Selected Recent Publications

Alekseichuk et al. (2016) Spatial Working Memory in Humans Depends on Theta and High Gamma Synchronization in the Prefrontal Cortex. *Current Biology* 26: 1513-1521

Voss U, Holzmann R, Hobson A, Paulus W, Koppehele-Gossel J, Klimke A, Nitsche M A (2014) Induction of self awareness in dreams through frontal low current stimulation of gamma activity. *Nat Neurosci* 17(6): 810-2

Paulus W (2014) Transcranial brain stimulation: potential and limitations. *e-Neuroforum* doi:DOI 10.1007/s13295-014-0056-6

Sommer M, Norden C, Schmack L, Rothkegel H, Lang N, Paulus W (2013) Opposite optimal current flow directions for induction of neuroplasticity and excitation threshold in the human motor cortex. *Brain Stimul* 6(3): 363-70

Polanía R, Nitsche MA, Korman C, Batsikadze G, Paulus W (2012) The importance of timing in segregated theta phase-coupling for cognitive performance. *Curr Biol* 22: 1314-8

Antal A, Polania R, Schmidt-Samoa C, Dechent P, Paulus W. (2011) Transcranial direct current stimulation over the primary motor cortex during fMRI. *Neuro-image*. 2011 Mar 15;55(2): 590-6

Moliadze V, Antal A, Paulus W. Boosting brain excitability by transcranial high frequency stimulation in the ripple range. *J Physiol* 2010 588: 4891-904

Nitsche MA, Kuo MF, Karrasch R, Wächter B, Liebetanz D, Paulus W (2009) Serotonin affects transcranial direct current-induced neuroplasticity in humans. *BIOL PSYCHIAT* 66(5): 503-8



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Arezoo Pooresmaeili

Group Leader Perception and Cognition

- 1994 – 2001 Tehran University School of Medicine and Health Sciences, obtained degree: MD
- 2003 – 2009 PhD projects exploring mechanisms of visual attention in the primary visual cortex and Frontal Eye Fields (under supervision of Dr. Pieter Roelfsema)
- 2009 – 2011 Postdoctoral fellow, Pisa Vision Lab, with Dr. Concetta Morrone and Dr. David Burr
- 2011 – 2014 Postdoctoral fellow, Berlin School of Mind and Brain, with Dr. Ray Dolan (Einstein Visiting Fellow)
- Since 2015 Group Leader, Perception and Cognition Group, European Neuroscience Institute, Göttingen, Germany

Major Research Interests

- Systems Neuroscience
 - Cognitive Neuroscience
 - Behavioral, Neuroimaging, Electrophysiology and Brain Stimulation Studies in humans
 - Sensory Perception
 - Attention
 - Reward Processing
 - Decision Making
 - Social Cognition

Selected Recent Publications

Arezoo Pooresmaeili, Aurel Wannig, Raymond J. Dolan (2015) Receipt of reward leads to altered estimation of effort. *Proc Natl Acad Sci U S A* 112(43): 13407-10. doi: 10.1073/pnas.1507527112. Epub 2015 Oct 12

Arezoo Pooresmaeili, Thomas H.B. FitzGerald, Dominik R. Bach, Ulf Toelch, Florian Ostendorf, Raymond J. Dolan (2014) Crossmodal effects of value on perceptual acuity and stimulus encoding. *Proceedings of the National Academy of Sciences (PNAS)* 111(42): 15244-9. doi: 10.1073/pnas.1408873111

Arezoo Pooresmaeili and Pieter Roelfsema (2014) A growth-cone model for the spread of object-based attention. *Current Biology* 24(24): 2869-77. doi: 10.1016/j

Arezoo Pooresmaeili, Jasper Poort, Pieter R Roelfsema (2014) Simultaneous selection by object-based attention in visual and frontal cortex. *Proceedings of the National Academy of Sciences (PNAS)* 111(17): 6467-72. doi: 10.1073/pnas.1316181111

Arezoo Pooresmaeili, Roberto Arrighi, Laura Biagi, Maria Concetta Morrone: (2013) Blood Oxygen Level-Dependent Activation of the Primary Visual Cortex Predicts Size Adaptation Illusion. *Journal of Neuroscience* 33(40): 15999-16008

Arezoo Pooresmaeili, Jasper Poort, Alexander Thiele, Pieter R Roelfsema (2010) Separable codes for attention and luminance contrast in the primary visual cortex. *Journal of Neuroscience* 30(38): 12701-11



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- M.S. in Biology, Sogang University Master thesis, Seoul, Korea (1992)
- Ph. D. Kyushu University, School of Medicine Department of Physiology, Japan (1997)
- Assistant Professor, Kyushu University, Faculty School of Medicine Department of Physiology, Japan (1997 – 2000)
- Postdoctoral fellow, Max-Planck Institute Biophysical Chemistry, Department of Membranbiophysik, Germany (2000 – 2004)
- Assistant Professor, Baylor College of Medicine, Department of Human Genetics and Neuroscience, USA (2004 – 2006)
- Group Leader, Max Planck Institute of Experimental Medicine, Göttingen, Germany (since 2006)
- Professor, Georg August University Goettingen, Germany (since 2017)

Major Research Interests

We study that signaling between nerve cells in the brain is mainly mediated at synapses, which are specialized cellular contact sites. The transfer of information at synapses can be regulated dynamically, a process that is called synaptic plasticity. Our main research goal is to elucidate the molecular mechanisms that underlie synaptic plasticity at synapses in the central nervous system. For this purpose we mainly use electrophysiological methods, in combination with nerve cells from genetically modified mice or virus-mediated molecular perturbation of nerve cell function.

Neurotransmitter release is the first step in synaptic signaling. It is mediated by exocytosis of synaptic vesicles at highly specialized contact sites, the active zones of synapses. Neurotransmitters are stored in synaptic vesicles, which undergo a complex trafficking cycle in the presynaptic compartment in order to sustain the rapid and repetitive transfer of information between nerve cells. Synaptic vesicles are initially tethered at the active zone plasma membrane, a process termed docking. Subsequently vesicles undergo a pre-fusion reaction termed priming, which renders docked vesicles fusion competent, thus defining the readily releasable pool of vesicles. Triggered by the arrival of an action potential at the nerve terminal and the concomitant increase in the intracellular Ca^{2+} concentration, a fraction of fusion competent vesicles in the readily releasable pool fuse with the plasma membrane and release their content. After fusion, vesicular membrane and protein components are recycled by endocytosis and used for additional rounds of exocytosis.

Essentially, each step of the synaptic vesicle cycle can contribute to the regulation of synaptic plasticity. We combine mouse genetics, molecular biological and morphological methods, and patch clamp electrophysiological analyses of autaptic cultured neurons, organotypic brain slice cultures, acute brain slices, or acutely isolated neurons with active presynaptic terminals in order to identify the molecular mechanisms underlying the individual synaptic vesicle recycling steps. In the past, we characterized mutant mice lacking identified presynaptic protein components of the neurotransmitter release machinery. Experiments on mutant mouse neurons are complemented by virus mediated expression of proteins in cultured neurons, which allows us to perform detailed structure-function analyses of presynaptic proteins.

Selected Recent Publications

Lai Y, Choi UB, Leitz J, Rhee HJ, Lee C, Altas B, Zhao M, Pfuetzner RA, Wang A, Brose N, Rhee JS and Brunger AT (2017) Molecular mechanisms of synaptic vesicle priming by Munc13 and Munc18. *Neuron*, in press

Sigler A, Oh WC, Imig C, Altas B, Kawabe H, Cooper BH, Kwon HB, Rhee JS*, Brose N* (2017) Formation and Maintenance of Functional Spines in the Absence of Presynaptic Glutamate Release. *Neuron* 94: 304-311 (*joint corresponding authors)



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Silvio O. Rizzoli

Professor, Director of Department of Neuro- and Sensory Physiology

- 1996 – 2000 BSc in Biochemistry at the University of Bucharest, Romania
- 2000 – 2004 PhD in Physiology at the University of Colorado, Denver, USA (Department of Physiology and Biophysics, Prof. W. J. Betz)
- 2004 – 2007 Postdoctoral Fellow, Dept. of Neurobiology, Max-Planck Institute for Biophysical Chemistry, Göttingen
- 2007 – 2012 Group Leader (STED Microscopy) at the European Neuroscience Institute Göttingen (ENI-G)
- 2012 – 2014 Professor (W3), University Medical Center Göttingen
- 2014 – Director of the Department of Neuro- and Sensory Physiology, University Medical Center Göttingen

Major Research Interests

Conventional fluorescence microscopy is limited by the diffraction of light: fluorescent objects that are close together cannot be discerned. Stimulated emission depletion (STED) is a recent advancement in optical physics that breaks the diffraction barrier, allowing microscopes to obtain much clearer images.

The diffraction barrier has been particularly problematic for imaging synaptic vesicles, which are among the smallest known organelles (30-50 nm in diameter). They are located in small areas in the synapses (about 1 micron in diameter). The group takes advantage of the increased imaging resolution provided by STED to investigate synaptic vesicle function, with an emphasis on synaptic vesicle recycling. Since STED microscopy also allows imaging of protein domains, the group aims at studying the patterning of protein domains in the synapse, in order to understand its molecular architecture.

Selected Recent Publications

Vreja IC, Nikic I, Goettfert F, Bates M, Kröhnert K, Outeiro TF, Hell SV, Lemke EA, Rizzoli SO (2015) Super-resolution Microscopy of Clickable Amino Acids Reveals the Effects of Fluorescent Protein Tagging on Protein Assemblies. *ACS Nano* 9: 11034-41

Vreja IC, Kabatas S, Saka SK, Kröhnert K, Hörschen C, Opazo F, Diederichsen U, Rizzoli SO (2015) Secondary-ion mass spectrometry of genetically encoded targets. *Angew Chem Int Ed Engl* 54: 5784-5788

Wilhelm BG, Mandad S, Truckenbrodt S, Kröhnert K, Schäfer C, Rammner B, Koo SJ, Claßen GA, Krauss M, Haucke V, Urlaub H, Rizzoli SO (2014) Composition of isolated synaptic boutons reveals the amounts of vesicle trafficking proteins. *Science* 344: 1023-1028

Revelo NH, Kamin D, Truckenbrodt S, Wong AB, Reuter-Jessen K, Reisinger E, Moser T, Rizzoli SO (2014) A new probe for super-resolution imaging of membranes elucidates trafficking pathways. *J Cell Biol* 205: 591-606

Saka SK, Honigmann A, Eggeling C, Hell SW, Lang T, Rizzoli SO (2014) Multi-protein assemblies underlie the mesoscale organization of the plasma membrane. *Nat Commun* 5: 4509



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Annekathrin Schacht

Professor of Affective Neuroscience and Psychophysiology

- 2004 – 2008: Research Scientist, Biological Psychology / Psychophysiology (Prof. Dr. Werner Sommer), Institute of Psychology, HU Berlin
- 2008: Dissertation (Dr. rer. nat., HU Berlin)
- 2009: Visiting Professor of Psychology of Motivation and Emotion (substitution), Department of Psychology, University of Potsdam
- 2010: Invited Junior Professor of Affective Neuroscience, Swiss Center for Affective Sciences (CISA), University of Geneva
- 2010: Visiting Professor of Cognitive Neuroscience, Institute of Psychology, Humboldt-Universität zu Berlin
- 2011: Habilitation (venia legendi) in Psychology (HU Berlin)
- since 10/2010: Junior Professor (tenure track), Courant Research Centre “Text Structures”, University of Goettingen
- since 2016: Professor of Affective Neuroscience and Psychophysiology, Institute of Psychology, University of Goettingen

Major Research Interests

Our main research activities focus on the interplay of cognition and emotion in several domains of human information processing, including faces and written and spoken language. Our work aims to identify the specification of the origins, dynamics, and boundary conditions of emotion effects within and between different stimulus domains and modalities, as well as to better define the emotional outcomes of cognitive operations. In order to answer our research questions, we employ a combination of well-established experimental paradigms with several psychophysiological measures, including event-related brain potentials (ERPs), eye movements, electrodermal and respiratory activity, facial muscle activity (via EMG recordings), and changes of pupil diameter.

Research areas:

- Affective and motivational impacts on visual sensory processing
- Emotion-cognition interplay in the processing of written and spoken language
- Face processing, including emotional expressions, attractiveness, and face identity
- Audiovisual integration of social signals in human communication

Selected Recent Publications

Bayer M, Ruthmann K, Schacht A (2017) The impact of personal relevance on emotion processing: evidence from event-related potentials and pupillary responses. *Social Cognitive and Affective Neuroscience* 2017, nsx075, DOI: 10.1093/scan/nsx075

Hammerschmidt W, Sennhenn-Reulen H, Schacht A (2017) Associated motivational salience impacts early sensory processing of human faces. *NeuroImage* 156: 466-474. DOI: 10.1016/j.neuroimage.2017.04.032

Rossi V, Vanlessen N, Bayer M, Grass A, Pourtois G, Schacht A (2017) Motivational salience modulates early visual cortex responses across task sets. *Journal of Cognitive Neuroscience* 29: 968-979. DOI: 10.1162/jocn_a_01093

Rellecke J, Sommer W, Schacht A (2012) Does processing of emotional facial expressions depend on intention? Time-resolved evidence from event-related brain potentials. *Biological Psychology* 90(1): 23 - 32. DOI: 10.1016/j.biopsycho.2012.02.002

Schacht A, Adler N, Chen P, Guo T, Sommer W (2012) Association with Positive Outcome induces Early Effects in Event-related Brain Potentials. *Biological Psychology* 89: 130-136. DOI: 10.1016/j.biopsycho.2011.10.001

Rellecke J, Palazova M, Sommer W, Schacht A (2011) On the automaticity of emotion processing in words and faces: Event-related brain potentials evidence from a superficial task. *Brain and Cognition* 77: 23-32



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Hansjörg Scherberger

Professor of Primate Neurobiology at the German Primate Center

- Dipl. math. (MS Math), University of Freiburg, Germany, 1993
- Dr. med. (MD), University of Freiburg, Germany, 1996
- Postdoctoral Fellow, Dept of Neurology, University of Zürich, Switzerland, 1995 – 1998
- Postdoctoral Fellow, California Institute of Technology, 1998 – 2000
- Senior Postdoctoral Fellow, California Institute of Technology, 2000 – 2004
- Work group leader, Institute of Neuroinformatics, ETH / University of Zürich, Switzerland, 2004 – 2009
- Professor for Primate Neurobiology, University of Göttingen and Deutsches Primatenzentrum GmbH, since 2008

Major Research Interests

We are interested in how hand movements are generated in the primate brain and how intentions to grasp objects can be decoded for controlling a neural prosthesis. For this, we investigate the cortical representation of hand movements in motor-related cortical areas and their relation to sensory systems and decision making. Furthermore, we are developing brain-machine interfaces that can read out such movement intentions to control robotic devices. Such systems could be useful for future applications aiming to restore hand function in paralyzed patients.

Selected Recent Publications

Michaels JA, Dann B, Intveld RW, Scherberger H (2018). Neural dynamics of variable grasp movement preparation in the macaque fronto-parietal network. *J Neuroscience* 38: 5759-5773

Michaels JA, Scherberger H (2018) Population coding of grasp and laterality-related information in the macaque fronto-parietal network. *Scientific Reports* 8: 1710

Scherberger H (2017) Stirred, Not Shaken: Motor Control with Partially Mixed Selectivity. *Neuron* 95(3): 479-481

Michaels JA, Dann B, Scherberger H (2016) Neural Population Dynamics during Reaching Are Better Explained by a Dynamical System than Representational Tuning. *PLoS Computational Biology* 12(11): e1005175

Dann B, Michaels JA, Schaffelhofer S, Scherberger H (2016) Uniting functional network topology and oscillations in the fronto-parietal single unit network of behaving primates. *eLife* 5: e15719

Schaffelhofer S, Scherberger H (2016) Object vision to hand action in macaque parietal, premotor, and motor cortices. *eLife* 5: e15278

Michaels J, Dann B, Intveld RW, Scherberger H (2015) Predicting Reaction Time from the Neural State Space of the Premotor and Parietal Grasping Network. *J Neuroscience* 35: 11415-11432

Janssen P, Scherberger H (2015) Visual Guidance in Control of Grasping. *Annual Review of Neuroscience* 38: 69-86

Schaffelhofer S, Agudelo-Toro A, Scherberger H (2015) Decoding a Wide Range of Hand Configurations from Macaque Motor, Premotor, and Parietal Cortices. *J Neuroscience* 35: 1068-1081

Schaffelhofer S, Scherberger H (2012) A new method of accurate hand- and armtracking for small Primates. *Journal of Neural Engineering* 9: 026025



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Oliver Schlüter

Group Leader Molecular Neurobiology

- 1995 – 2001 M.D. Ph.D. with Thomas C. Südhof at the Max-Planck-Institute for Experimental Medicine in Göttingen
- 2000 Dr. rer. nat. (PhD), University of Hannover
- 2001 Dr. med. (Medical thesis), University of Göttingen
- 2001 – 2002 Postdoc with Christian Rosenmund and Reinhard Jahn at the Max-Planck-Institute for Biophysical Chemistry in Göttingen
- 2002 – 2006 Postdoc with Robert C. Malenka at Stanford University Medical Center (USA)
- 2006 – 2015 Independent group leader (Emmy-Noether/DFG) at the European Neuroscience Institute Göttingen (ENI-G), since 2006
- Assistant Professor at the Department of Neuroscience, University of Pittsburgh, since 2015
- since 2016 Adjunct Professor at the Department of Psychiatry and Psychotherapy, University Medical Center Göttingen

Major Research Interests

Activity-dependent modulations of synaptic transmission are important mechanisms of information processing and storage in neuronal circuits. A variety of related but mechanistically distinct forms of synaptic plasticity have been described in *in vitro* preparations of brain slices.

A major goal of my laboratory is to elucidate the underlying molecular events, leading to and regulating changes in synaptic efficacy. Newly developed techniques of molecular replacement, using mouse genetics and/or viral-mediated gene transfer allow us to manipulate the molecular composition of single neurons in a spatial and temporal controlled manner.

In particular, we are able to investigate the effects of heterologously expressed proteins on the background of wild-type neurons, or neurons, in which the endogenous protein expression is diminished. We combine this technique with simultaneous dual whole cell patch clamp recordings from rodent brain slices to monitor changes in synaptic efficacy in the manipulated cell in comparison to the neighboring control cell.

Knowledge gained from the understanding of molecular mechanisms of synaptic transmission and plasticity will ultimately provide important clues for the function of neuronal circuits and potentially the functioning of the brain.

Selected Recent Publications

Liu Y, Cui L, Schwartz MK, Dong Y, Schlüter OM (2017) Adrenergic gate release in spike timing-dependent synaptic potentiation. *Neuron* 93(2): 394-408

Shukla A, Beroun A, Panopoulou M, Neumann PA, Grant SGN, Olive MF, Dong Y, Schlüter OM (2017) Calcium permeable AMPA receptors and silent synapses in cocaine-conditioned place preference. *EMBO J* 36(4):458-474

Huang X, Stodieck SK, Goetze B, Cui L, Wong MH, Wenzel C, Hosang L, Dong Y, Löwel S#, Schlüter OM# (2015) Progressive Maturation of Silent Synapses Governs the Duration of a Critical Period. *PNAS*. 112(24): E3131-40

Lee BR*, Ma Y*, Huang YH, Wang X, Otaka M, Ishikawa M, Neumann PA, Graziane NM, Brown TE, Suska A, Guo C, Lobo MK, Sesack SR, Wolf ME, Nestler EJ, Shaham Y, Schlüter OM, Dong Y# (2013) Maturation of silent synapses in amygdala-accumbens projection contributes to incubation of cocaine craving. *Nat Neurosci* 16(11): 1644-51

Krüger JM, Favaro PD, Liu M, Kitlinska A, Huang X, Raabe M, Akad DS, Liu Y, Urlaub H, Dong Y, Xu W, Schlüter OM# (2013) Differential roles of Postsynaptic Density-93 isoforms in regulating synaptic transmission. *J Neurosci* 33(39): 15504-17

Bonnet SA, Akad DS, Samaddar T, Liu Y, Huang X, Dong Y, Schlüter OM (2013) Synaptic state-dependent functional interplay between Postsynaptic Density-95 and Synapse-associated Protein 102. *J Neurosci* 33(33): 13398-409



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Manuela Schmidt

Group Leader Somatosensory Signaling at the Max Planck Institute for Experimental Medicine

- Since 2019: W2-Professor at the Faculty of Biology and Psychology, University of Goettingen
- Since 2012: Emmy Noether Group Leader
- 2007 – 2012: Postdoc with Ardem Patapoutian, The Scripps Research Institute, La Jolla, California, USA
- 2002 – 2006: PhD, Neurosciences, International Max Planck School Neurosciences, Laboratory of Stephan Sigrist, ENI-G, Goettingen, Germany
- 2001 – 2002: Master, Neurosciences, International Max Planck School Neurosciences, Goettingen, Germany
- 1997 – 2002: Diploma, Biology, University of Wuerzburg, Germany

Major Research Interests

The perception of and appropriate reaction to external and internal stimuli is critical for survival. In vertebrates, chemical, mechanical (from pleasant touch to painful contact) and thermal stimuli are detected by specialized somatic sensory neurons which transfer these signals via the spinal cord to the brain. An important subset of these neurons, so-called nociceptors, senses noxious stimuli. Consequently, their activation mediates nociception and leads to the sensation of pain. Pain is the single most common symptom for which patients seek medical assistance. While acute pain has served as a protective mechanism throughout evolution to guard the body against injury, pain can also become chronic and highly debilitating. Unfortunately, chronic pain imposes substantial challenges to medical practice: current therapies can be effective for short-term treatment however many do not provide sufficient relief to chronic conditions or cause strong side-effects. Therefore, a deeper understanding of the specific molecular mechanisms underlying both, acute and chronic pain is crucially needed.

Our research focuses on the comparative and quantitative analysis of somatosensory signaling networks in established mouse models of acute and chronic pain. To this purpose our lab employs an integrative approach from comprehensive proteome profiling via mass spectrometry, biochemistry, calcium-imaging, and electrophysiology to virus-mediated gene transfer in mice and mouse behavioral studies.

Selected Recent Publications

Sondermann JR, Barry AM, Jahn O, Michel N, Abdelaziz R, Kügler S, Gomez-Varela D, Schmidt M (2019) Vti1b promotes TRPV1 sensitization during inflammatory pain. *PAIN*. doi: 10.1097/j.pain.0000000000001418

Barry AM, Sondermann JR, Sondermann JH, Gomez-Varela D and Schmidt M (2018) Region resolved quantitative proteome profiling reveals molecular dynamics associated with chronic pain in the PNS and spinal cord. *Front Mol Neurosci* doi: 10.3389/fnmol.2018.00259

Narayanan P, Hütte M, Kudryasheva G, Taberner FJ, Lechner SG, Rehfeldt F, Gomez-Varela D, Schmidt M (2018) Myotubularin related protein-2 and its phospholipid substrate PIP2 control Piezo2-mediated mechanotransduction in peripheral sensory neurons. *Elife* 7: e32346-e32346

Bruderer R, Bernhardt OM, Gandhi T, Yuan Y, Sondermann J, Schmidt M., Gomez-Varela D, Reiter L, (2017) Optimization of Experimental Parameters in Data-Independent Mass Spectrometry Significantly Increases Depth and Reproducibility of Results. *Mol Cell Proteomics*. doi: 10.1074/mcp.RA117.000314

Bruderer R, Sondermann J, Tsou CC, Barrantes-Freer A, Stadelmann C, Nesvizhskii AI, Schmidt M, Reiter L, Gomez-Varela D (2017) New targeted approaches for the quantification of data-independent acquisition mass spectrometry. *Proteomics* doi: 10.1002/pmic.201700021

Narayanan P, Sondermann J, Rouwette T, Karaca S, Urlaub H, Mitkovski M, Gomez-Varela D, Schmidt M (2016). Native Piezo2 Interactomics Identifies Pericentrin as a Novel Regulator of Piezo2 in Somatosensory Neurons. *J Proteome Res* 5;15(8): 2676-87. doi: 10.1021/acs.jproteome.6b00235



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Caspar M. Schwiedrzik

Group Leader

- 2003 – 2008: University of Konstanz, Germany, studies of Psychology
- 2008 – 2011: Max Planck Institute for Brain Research, Frankfurt a. M., Germany, PhD student, advisor Prof. Wolf Singer
- 2012 – 2016: The Rockefeller University, New York, USA, Postdoc, advisor Prof. Winrich Freiwald
- Since 2017: Group Leader, Neural Circuits and Cognition Lab, European Neuroscience Institute, Göttingen, Germany
- Since 2019: Group Leader, Perception and Plasticity Group, German Primate Center, Göttingen, Germany

Major Research Interests

Learning is a core building block of intelligent behavior. It endows complex systems with flexibility to adjust to changing environments and with the capacity to generalize to novel situations. We pursue the idea that inroads into understanding learning and generalization can be made in the visual system, where these complex problems can be broken down into tractable hypotheses. Visual processing hierarchies provide an ideal testing ground and offer unique opportunities to unravel the role of feedforward and feedback message passing along the hierarchy as a function of learning and generalization. To this end, we capitalize on combining noninvasive neuroimaging with electrophysiological recordings and causal manipulations of brain activity in non-human primates, and parallel experiments using fMRI in humans. We investigate learning at multiple time scales, from learning effects that build up within seconds to learning effects that take days and weeks to materialize, and across levels of complexity, from learning to discriminate simple visual features to high-level associative and statistical learning. Our overall goal is to determine the neural basis of the visual system's capacity to learn and generalize through an explicitly comparative approach - a necessary step towards understanding the human mind and its complexity.

Selected Recent Publications

Schwiedrzik CM, Sudmann SS, Thesen T, Wang X, Groppe DM, Mégevand P, Doyle W, Mehta AD, Devinsky O, Melloni L (2018) Medial prefrontal cortex supports perceptual memory. *Current Biology* 28(18): R1094-R1095

Schwiedrzik CM, Freiwald WA (2017) High-level prediction signals in a low-level area of the macaque face-processing hierarchy. *Neuron* 96(1): 89-97

Schwiedrzik CM, Bernstein B, Melloni L (2016) Motion along the mental number line reveals shared representations for numerosity and space. *eLife* 5:e10806

Schwiedrzik CM, Zarco W, Everling S, Freiwald WA (2015) Face patch resting state networks link face processing to social cognition. *PLoS Biology* 13(9): e1002245

Schwiedrzik CM, Ruff CC, Lazar A, Leitner FC, Singer W, Melloni L (2014) Untangling perceptual memory: hysteresis and adaptation map into separate cortical networks. *Cerebral Cortex* 24(5): 1152-64



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Michael Sereda

Professor of Molecular and Translational Neurology, Group Leader at the Max Planck Institute for Experimental Medicine

- 2007 Group leader "Molecular and Translational Neurology", Max Planck Institute of Experimental Medicine
- 2008 Board certification in Neurology (Facharzt für Neurologie)
- 2008 Attending Neurologist and Head Neurogenetics Outpatients Clinic, Dept. of Clinical Neurophysiology, University of Göttingen (UMG)
- 2010 Associate Professorship "Neurology and Neurogenetics" (Habilitation)
- 2012 DFG-Heisenberg Professorship "Hereditary Neuropathies", Dept. of Clinical Neurophysiology, UMG
- 2017 Tenured Professorship of Neurology, Dept. of Clinical Neurophysiology, UMG

Major Research Interests

We pursue a basic research interest in glia cell biology, axon-glia interaction and mechanisms of diseases of the peripheral nervous system (PNS). We have generated a transgenic rat model of the most frequent human neuropathy, Charcot-Marie-Tooth disease type 1A (CMT1A). This disease is associated with a partial duplication of chromosome 17 which leads to an overexpression of the tetraspan protein PMP22. Transgenic "CMT rats" expressing additional copies of this gene share characteristic clinical features of the human disease, including muscle weakness, reduced nerve conduction velocities, and marked Schwann cell hypertrophy resulting in onion bulb formation. The CMT rat allows a better understanding of the cellular disease mechanism operating in human CMT1A, and is helpful in the analysis of modifier genes, epigenetic factors, and in the evaluation of experimental treatment strategies. In an attempt to translate findings from the animal model to humans we were able to identify biomarkers of disease severity in the skin of CMT1A patients, which could already be validated in patients from across Europe. Currently, within CMT-NET, a national BMBF funded network on rare diseases coordinated by Prof. Sereda, we aim at transferring our results from skin to easily accessible blood samples from CMT patients, which would facilitate the performance of clinical trials in the near future.

Selected Recent Publications

Fledrich R, Abdelaal T, Rasch L, Bansal V, Schütza V, Brügger B, Lüchtenborg C, Prukop T, Stenzel J, Rahman RU, Hermes D, Ewers D, Möbius W, Ruhwedel T, Katona I, Weis J, Klein D, Martini R, Brück W, Müller WC, Bonn S, Bechmann I, Nave KA, Stassart RM, Sereda MW (2018) Targeting myelin lipid metabolism as a potential therapeutic strategy in a model of CMT1A neuropathy. *Nat Commun* 9(1): 3025

Fledrich R, Mannil M, Leha A, Ehbrecht C, Solari A, Pelayo-Negro AL, Berciano J, Schlotter-Weigel B, Schnizer TJ, Prukop T, Garcia-Angarita N, Czesnik D, Haberlová J, Mazanec R, Paulus W, Beissbarth T, Walter MC, Triaal C, Hogrel JY, Dubourg O, Schenone A, Baets J, De Jonghe P, Shy ME, Horvath R, Pareyson D, Seeman P, Young P, Sereda MW (2017) Biomarkers predict outcome in Charcot-Marie-Tooth disease 1A. *J Neurol Neurosurg Psychiatry* 88: 941-9522

Quintes S, Brinkmann BG, Ebert M, Fröb F, Kungl T, Arlt FA, Tarabykin V, Huylebroeck D, Meijer D, Suter U, Wegner M, Sereda MW*, Nave KA* (2016) Zeb2 is essential for Schwann cell differentiation, myelination and nerve repair. *Nat Neuro* 9: 1050-9 *Co-corresponding

Epplen DB, Prukop T, Nientiedt T, Albrecht P, Arlt FA, Stassart RM, Kassmann CM, Methner A, Nave KA, Werner HB, Sereda MW (2015) Curcumin therapy in a Plp1 transgenic mouse model of Pelizaeus-Merzbacher disease. *Ann Clin Transl Neurol* 2: 787-796

Pehlivan D, Beck CR, Okamoto Y, Harel T, Akdemir ZH, Jhangiani SN, Withers MA, Goksungur MT, Carvalho CM, Czesnik D, Gonzaga-Jauregui C, Wiszniewski W, Muzny DM, Gibbs RA, Rautenstrauss B, Sereda MW, Lupski JR (2016) The role of combined SNV and CNV burden in patients with distal symmetric polyneuropathy. *Genet Med* 18(5): 443-51



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Marion Silies

Group Leader Visual Processing

- PhD in Biology, University of Münster, 2009
- Postdoctoral Fellow, Stanford University, 2009 - 2014
- Group leader, European Neuroscience Institute Göttingen, since 2014

Major Research Interests

We aim to understand how neural networks perform critical computations. In sensory systems, a variety of computations extract information from the environment to guide behavior. Our understanding of these processes remains fragmentary: in some systems, specific neurons have been identified that respond to distinct sensory cues; in others, specific behavioral outputs or computational models that predict physiology or behavior are known. We want to get a complete understanding of how neurons gain specific physiological properties, how they are organized in circuits and how these circuits guide distinct behaviors.

Animals ranging from insects to humans use visual motion to navigate through the environment, capture prey, or escape predators. Because motion vision requires circuits to integrate visual information over both space and time it has long been considered a paradigmatic computation for understanding brain function and models that describe how motion information can be extracted have long existed. However, the neural circuits that implement these models are still incompletely understood. Moreover, many molecular and cellular mechanisms regulate synaptic activity or modulate cellular properties in identified neurons, but they have only rarely been associated with specific, behaviorally relevant computations. My lab intends to achieve this by studying motion detection in a genetic model organism, the fruit fly *Drosophila*. In flies, motion-guided behaviors have been studied in detail and described computationally. We use cell biological and genetic approaches to manipulate critical neurons in motion detecting circuits. In combination with physiology and quantitative behavioral analysis, we hope to identify the mechanisms by which a nervous system can integrate molecular, cellular and circuit mechanisms to compute behaviorally critical outputs from specific inputs.

Selected Recent Publications

Fischer YE, Leong JCS, Sporar K, Ketkar MD, Gohl DM, Clandinin TR, Silies M (2015) A visual pathway with wide field properties is required for elementary motion detection. *Current Biology* 22: 3178-3189

Fisher YE*, Silies M* and Clandinin TR (2015) Orientation selectivity sharpens correlation based elementary motion detection in *Drosophila*. *Neuron* 88: 390-402. *equal contribution

Silies M*, Gohl DM*, Fisher YE, Freifeld L, Clark DA and Clandinin TR (2013) Modular use of peripheral input channels tunes motion-detecting circuitry. *Neuron* 79: 111-127 *equal contribution

Gohl DM, Silies MA, Gao XJ, Bhalerao S, Luongo FJ, Lin CC, Potter CJ and Clandinin TR (2011) A genetically convertible enhancer trap for directed combinatorial dissection of gene expression patterns. *Nature Methods* 8: 231-237

Silies M, Klämbt C (2010) APC/C-Fzr/Cdh1 dependent regulation of cell adhesion controls glial migration in the *Drosophila* PNS. *Nature Neuroscience* 13: 1357-1364



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Jochen Staiger

Professor of Neuroanatomy

- 1993 Graduation as Dr. med. at the Medical Faculty of the Justus-Liebig-University Giessen; grade: summa cum laude
- 1994 – 2000 Post-doc at the C. & O. Vogt-Institute for Brain Research, Düsseldorf, (Head: Prof. Dr. K. Zilles); Leader of the research group „Cortical microcircuits“
- 2000 Habilitation and Venia legendi for Anatomy at the Medical Faculty of the Heinrich-Heine-University Düsseldorf
- 2006 Appointment as W3 Univ.-Professor for Cell Biology at the Albert-Ludwigs-University Freiburg
- Since 2010 Full professor and director of the Department of Neuroanatomy at the Georg-August-University Göttingen

Major Research Interests

- Developmental plasticity induced by early postnatal deprivation of sensory stimulation in mice with intact or genetically altered thalamocortical projections
- Thalamo-cortical interactions as the first stage of cortical information processing
- Microcircuits in columnar modules – examining the Bauplan of synaptic connectivity of neocortex
- Tactile learning: Genomic regulation of experience-dependent plasticity in the trigeminal somatosensory system

Selected Recent Publications

Walker F, Möck M, Feyerabend M, Guy J, Wagener RJ, Schubert D, Staiger JF*, Witte M* (2016) Parvalbumin- and vasoactive polypeptide-expressing neocortical interneurons impose differential inhibition on Martinotti cells. *Nature Communications* 7: 13664

Wagener RJ, Witte M, Guy J, Mingo-Moreno N, Kugler S, Staiger JF (2016) Thalamocortical Connections Drive Intracortical Activation of Functional Columns in the Mislaminated Reeler Somatosensory Cortex. *Cereb Cortex* 26: 820-837

Guy J, Wagener RJ, Mock M, Staiger JF (2015) Persistence of Functional Sensory Maps in the Absence of Cortical Layers in the Somatosensory Cortex of Reeler Mice. *Cerebral Cortex* 25: 2517-2528

Prönneke A, Scheuer B, Wagener RJ, Mock M, Witte M, Staiger JF (2015) Characterizing VIP Neurons in the Barrel Cortex of VIPcre/tdTomato Mice Reveals Layer-Specific Differences. *Cerebral Cortex* 25: 4854-4868

De Felipe J, Lopez-Cruz PL, Benavides-Piccione R, Bielza C, Larranaga P, Anderson S, Burkhalter A, Cauli B, Fairen A, Feldmeyer D, Fishell G, Fitzpatrick D, Freund TF, Gonzalez-Burgos G, Hestrin S, Hill S, Hof PR, Huang J, Jones EG, Kawaguchi Y, Kisvarday Z, Kubota Y, Lewis, DA, Marin O, Markram H, McBain CJ, Meyer HS, Monyer H, Nelson SB, Rockland K, Rossier J, Rubenstein JL, Rudy B, Scanziani M, Shepherd GM, Sherwood CC, Staiger JF, Tamas G, Thomson A, Wang Y, Yuste R, Ascoli GA (2013) New insights into the classification and nomenclature of cortical GABAergic interneurons. *Nature Reviews Neuroscience* 14: 202-16



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Anastassia Stoykova

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- 1972 M.D., Institute of Medicine, Plovdiv, Bulg. Medical Academy
- 1973 – 1988 Research Associate, Bulgarian Academy of Sciences, Sofia
- 1987 Ph.D., Neurobiology, Institute Molecular Biology, Bulg.Acad.Sci, Sofia
- 1989 Habilitation (neurochemistry), Sofia
- 1989 – 1991 Assistant Research Professor, Inst. Mol. Biol., Bulg. Acad. Sci., Sofia
- 1991 – 2002 Senior Research Scientist, Max Planck Institute for Biophysical Chemistry, Dept. Molecular Cell Biology, Göttingen
- 1989 Habilitation (developmental biology), Faculty of Medicine, University Göttingen
- 2002 – 2008 Research Group Leader, Dept. Mol Cell Biol, MPIPBC, Göttingen
- since 2008 Independent Research Group Leader MPI-bpc (W2, MPG Minerva Program)
- since 2010 Adj. Professor at the University of Göttingen

Major Research Interests

Our research interest is focused on molecular mechanisms of patterning and neurogenesis in developing and adult brain with an emphasis on the mammalian corticogenesis. In mammalian cortex billions of neurons are ordered in six layers and multiple functional domains, acting as integrative and executive centers. The complex organization of the cortex arises during embryogenesis from a limited number of neural stem cells through processes, controlled by cell-type specific and temporally distinct transcriptional programs. We are interested to understand genetic mechanisms, controlled by transcription factors, for the specification of neuronal subtype identity, layer, and area formation in developing cortex. In another line of studies we are addressing epigenetic control mechanisms of cortical neurogenesis through the chromatin remodeling BAF-complex (mSWI/SNF) in developing and adult brain. The main niche for neurogenesis in the adult brain is the subventricular zone (SVZ) of the forebrain. In ongoing collaborative effort, we aim to elucidate at a genomic level the differential gene expression in SVZ upon ischemic injury of the primate (monkey) brain. The generated data base is useful in providing primate brain specific gene candidates, possibly involved in determining the limited reparative capacity of the damaged human brain.

Selected Recent Publications

Doepfner TR, Herz J, Bähr M, Tonchev AB, Stoykova A (2018) Zbtb20 regulates developmental neurogenesis in the olfactory bulb and gliogenesis after adult brain injury. *Molecular Neurobiology*, May 11

Nguyen H, Kerimoglu C, Pirouz M, Pham L, Kiszka KA, Sokpor G, Sakib MS, Rosenbusch J, Teichmann U, Seong RH, Stoykova A, Fischer A, Steiger J, Tuoc T (2018) Epigenetic regulation of BAF complexes limits neural stem cell proliferation by suppressing Wnt signaling in late embryonic development. *Stem Cell Report* 10: 11734-1750

Tuoc T, Dere E, Radyushkin K, Pham L, Nguyen H, Tonchev AB, Sun G, Ronnenberg A, Shi Y, Steiger JF, Ehrenreich H, Stoykova A (2017) Ablation of BAF170 in developing and postnatal dentate gyrus affects neural stem cell proliferation, differentiation, and learning. *Molecular Neurobiology* 56: 4618-4635

Tonchev AB, Tuoc TC, Rosenthal EH, Studer M, Stoykova A (2016) Zbtb20 modulates the sequential generation of neuronal layers in developing cortex. *Molecular Brain* (9) 65

Narayanan R, Pirouz M, Kerimoglu C, Pham L, Wagener RJ, Kiszka KA, Rosenbusch J, Seong RH, Kessel M, Fischer A, Stoykova A, Staiger JF, Tuoc T (2015) Loss of BAF (mSWI/SNF) complexes causes global transcriptional and chromatin state changes in forebrain development. *Cell Reports* 13: 1842 -1854

Paul V, Tonchev AB, Henningfeld KA, Pavlakis E, Rust B, Pieler T, Stoykova A (2014) Scratch2 modulates neurogenesis and cell migration through antagonism of bHLH proteins in the developing neocortex. *Cerebral Cortex* 24 (3): 754-772



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Stefan Treue

Professor, Director of the German Primate Center Head of the Cognitive Neuroscience Laboratory

- 1992: Ph.D. Massachusetts Institute of Technology
- 1992 – 1993: Postdoctoral Fellow, MIT
- 1993 – 1995: Postdoctoral Fellow, Baylor College of Medicine, Houston, Texas
- 1995 – 2001: Work Group Leader, Laboratory of Cognitive Neuroscience, University of Tübingen
- 2000 – 2001: Professor of Animal Physiology, University of Tübingen
- 2001: Professor of Cognitive Neuroscience and Biological Psychology, University of Göttingen

Major Research Interests

Research at the Cognitive Neuroscience Laboratory is aimed at understanding the neural basis of visual perception. Vision is an active process that is far more than a passive registration of our environment. Rather, on its way from the eyes to and through the cortex, visual information is modulated by numerous processes that enhance some aspects while diminishing others. One of these processes is attention, i.e. the ability to filter out unwanted information and concentrate the brain's processing abilities on relevant information.

The accurate representation of visual motion in the environment is one of the most important tasks of the visual system. Correspondingly, research in the laboratory concentrates on this ability as a model for sensory information processing in general.

We use various techniques. While our emphasis is on electrophysiology, i.e. the recording of the activity of neurons in the visual cortex of macaque monkeys and measuring human perceptual abilities with psychophysical methods, we also use theoretical approaches and functional brain imaging.

Using these techniques, we have been able to elucidate how motion information is represented in primate cortical area MT and how attention changes that representation and correspondingly the percept of the visual environment.

Selected Recent Publications

Yao T, Treue S, Krishna BS (2018) Saccade-synchronized rapid attention shifts in macaque visual cortical area MT. *Nature Communications* 9: 958

Yao T, Treue S, Krishna BS (2016) An attention-sensitive memory trace in macaque MT following saccadic eye movements. *PLoS Biol* 14:e1002390

Niebergall R, Khayat PS, Treue S, Martinez-Trujillo J (2011) Multifocal attention filters out distracter stimuli within and beyond receptive field boundaries of primate MT neurons. *Neuron* 72:1067-1079

Anton-Erxleben K, Stephan VM, Treue S (2009) Attention reshapes center-surround receptive-field structure in macaque cortical area MT. *Cerebral Cortex* 19: 2466-2478

Busse L, Katzner S, Treue S (2008) Temporal dynamics of neuronal modulation during exogenous and endogenous shifts of visual attention in macaque area MT. *Proceedings of the National Academy of Sciences* 105(42): 16380-16385

Womelsdorf T, Anton-Erxleben K, Pieper F, Treue S (2006) Dynamic shifts of visual receptive fields in cortical area MT by spatial attention. *Nature Neuroscience* 9 (19): 1156-1160

Martinez-Trujillo JC, Treue S (2004) Feature-based attention increases the selectivity of population responses in primate visual cortex. *Current Biology* 14: 744-751

Martinez-Trujillo JC, Treue S (2002) Attentional modulation strength in cortical area MT depends on stimulus contrast. *Neuron* 35: 365-370

Treue S, Hol K, Rauber HJ (2000) Seeing multiple directions of motion – Physiology and psychophysics. *Nature Neuroscience* 3 (3): 270-276



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Melanie Wilke

Professor of Cognitive Neurology

- 1997-2001: M.A. in Psycholinguistics, Neuropsychology and Neurobiology, Ludwig-Maximilians-University, Munich, Germany
- 2001-2005: PhD student at the Max Planck Institute for Biological Cybernetics, Tübingen, Advisor: Dr. D.A. Leopold
- 2005-2008: Postdoctoral Fellow in the Laboratory of Neuropsychology, NIMH, Bethesda, Advisor: Dr. D.A. Leopold
- 2008-2010: Postdoctoral Fellow in the Division of Biology, Caltech, Pasadena; Advisor: Prof. R.A. Andersen
- since 2011: Co-Investigator in the “Decision and Awareness” group (DAG) at the German Primate Center (DPZ)
- since 2011: Schilling Foundation Professor (W3), Director of the department of Cognitive Neurology and Head of the MR-Research Unit, UKG, Georg August University Göttingen

Major Research Interests

The long-term goal of our research is to understand how neural activity gives rise to spatial awareness and how distributed information is integrated to guide the selection of movement goals. Furthermore we are dedicated to perform translational research from monkey models of cognitive disorders to human patients. Current research focuses on the question how thalamic nuclei and cortical areas interact during visual perception and decision making. Another line of research is concerned with the neural mechanisms underlying spatial neglect, which is a frequent and severe consequence of brain damage in humans. Specifically, we are investigating pathological and compensatory changes in large-scale brain networks in human stroke patients by means of imaging (DTI, fMRI) and stimulation (tACS, tDCS, TMS) methods. We develop and employ monkey models of spatial neglect to study the underlying neural mechanisms by means of fMRI, electrophysiological recordings, inactivation and stimulation techniques with the goal to develop new therapeutic interventions.

Selected Recent Publications

Storm F, Boly M, Casali M, Massimini M, Olcese M, Pennartz CMA, Wilke M (2017) Consciousness regained: disentangling mechanisms, brain systems, and behavioral responses. *J of Neuroscience*, (in press)

Wilke M, Dechent P, Bähr M (2017) Sarcoidosis manifestation centered on the thalamic pulvinar leading to persistent astasia. *Movement Disorders: Clinical Practice*, (in press)

Dominguez-Vargas A, Schneider L, Wilke M*, Kagan I* (2017) Electrical Microstimulation of the Pulvinar Biases Saccade Choices and Reaction Times in a Time-Dependent Manner. *J of Neuroscience* 37(8): 2234-2257. *equal contribution

Cabral-Calderin Y, Williams K, Dechent P, Opitz A, Wilke M (2016) Transcranial alternating current stimulation modulates spontaneous low frequency fluctuations as measured with fMRI. 2016. *Neuroimage* 141: 88-107

Cabral-Calderin Y, Weinrich C, Schmidt-Samoa C, Poland E, Dechent P, Bähr M, Wilke M (2016) Transcranial alternating current stimulation affects the BOLD signal in a frequency and task-dependent manner. *Hum Brain Map* 37(1): 94-121

Tsuchiya N, Wilke M, Frässle S, Lamme V (2015) No-report paradigms: Extracting the true neural correlates of consciousness. *Trends Cogn Sci* 19(12): 757-70

Hwang E, Hauschild M, Wilke M, Andersen RA (2014) Spatial and Temporal Eye-Hand Coordination Relies on the Parietal Reach Region. *J of Neuroscience* 34: 12884-92

Hwang EJ, Hauschild M, Wilke M, Andersen RA (2012) Inactivation of the parietal reach region causes optic ataxia, impairing reaches but not saccades. *Neuron* 76(5): 1021-9



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Sonja M. Wojcik

Group Leader at the Max Planck Institute for Experimental Medicine

- Diploma in Biology, RWTH Aachen, Germany (1994)
- Ph.D. in Molecular and Cellular Biology, Baylor College of Medicine, Houston, TX, USA (2000)
- Postdoctoral fellow, Department of Molecular Neurobiology, Max Planck Institute of Experimental Medicine, Göttingen, Germany (2001)
- Group leader, Max Planck Institute of Experimental Medicine, Göttingen, Germany (2008)
- Habilitation, Medical Faculty of the Georg August University Göttingen, Germany (2014)

Major Research Interests

We study the molecular processes underlying neurotransmitter release and the functional consequences of alterations in these processes at the cellular and network levels.

In the past, projects were mainly focused on analyzing the role of vesicular neurotransmitter transporters in neurons as determining factors in the establishment and maintenance of glutamatergic, GABAergic and glycinergic synaptic phenotypes.

Current projects include the analysis of regulatory mechanisms that control the release of non-classical neurotransmitters from large dense-core vesicles in neuroendocrine chromaffin cells and peptidergic neurons.

Selected Recent Publications

Wüstefeld L, Winkler D, Janc OA, Hassouna I, Ronnenberg A, Ostmeier K, Muller M, Brose N, Ehrenreich H, Wojcik SM (2015) Selective expression of a constitutively active erythropoietin receptor in GABAergic neurons alters hippocampal network properties without affecting cognition. *J Neurochem* doi: 10.1111/jnc.13445. [Epub ahead of print]

Man KM, Imig C, Walter AM, Pinheiro PS, Stevens DR, Rettig J, Sorensen JB, Cooper BH, Brose N, Wojcik SM (2015) Identification of a Munc13-sensitive step in chromaffin cell large dense-core vesicle exocytosis. *eLife* 4, doi: 10.7554/eLife.10635

Rahman J, Besser S, Schnell C, Eulenburg V, Hirrlinger J, Wojcik SM, Hulsman S (2015) Genetic ablation of VIAAT in glycinergic neurons causes a severe respiratory phenotype and perinatal death. *Brain Struct Funct* 220: 2835-2849

Wojcik SM, Tantra M, Stepniak B, Man KN, Muller-Ribbe K, Begemann M, Ju A, Papiol S, Ronnenberg A, Gurchich A, Shin Y, Augustin I, Brose N, Ehrenreich H (2013) Genetic Markers of a Munc13 Protein Family Member, BAIAP3, Are Gender-Specifically Associated with Anxiety and Benzodiazepine Abuse in Mice and Humans? *Mol Med* 19: 135-148

Wojcik SM, Katsurabayashi S, Guillemin I, Friauf E, Rosenmund C, Brose N, Rhee JS (2006) A Shared Vesicular Carrier Allows Synaptic Corelease of GABA and Glycine. *Neuron* 50: 575-587

Herzog E, Takamori S, Jahn R, Brose N, Wojcik SM (2006) Synaptic and vesicular co-localization of the glutamate transporters VGLUT1 and VGLUT2 in the mouse hippocampus. *J Neurochem* 99: 1011-1018



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Fred Wolf

Group Leader Theoretical Neurophysics at the Max Planck Institute for Dynamics and Self-Organization

- 1999 Dr. phil. nat., J.W. Goethe Universität, Frankfurt
- 2000 Amos de Shalit Fellow, Racah Institute of Physics and Interdisciplinary Center for Neural Computation, Hebrew Univ., Jerusalem (Israel)
- 2001 – 2004 Research Associate, Max-Planck-Institut für Strömungsforschung, Göttingen
- Fall 2001, 2003, 2004 Visiting Scholar, Kavli Institute for Theoretical Physics, UC Santa Barbara (USA)
- Since 2004 Head of the Research Group “Theoretical Neurophysics”, Department of Nonlinear Dynamics, Max-Planck-Institut für Strömungsforschung, Göttingen

Major Research Interests

- Theoretical neuroscience and nonlinear dynamics
- Dynamics and synchronization in cortical neural networks
- Function and development of the visual cortex
- Sensory processing in the auditory system

The brains of humans and animals arguably are among the most complex systems in nature. Over the past decade, theoretical neuroscience - the use of quantitative theories, mathematical modelling and advanced quantitative data analysis methods for the study of brain function - has started to provide powerful new approaches for understanding the neuronal basis of perception, learning, memory, and other higher brain functions. This is because, even during the neuronal processing of the most elementary sensory stimulus large ensembles of interacting nerve cells distributed throughout the brain are activated, the collective operations of which are often hard to understand by means of purely qualitative reasoning.

The primary focus of our research in theoretical neuroscience is self-organization in the dynamics of cortical networks. In particular, we have developed novel approaches to model and predict the dynamics and neuronal plasticity of the visual cortex. To quantitatively connect theory and experiment in this system, we recently also designed methods that enable to quantify the organization of visual cortical functional architecture with high precision. Another important focus of our work is the mathematical analysis of the dynamics of large and complex networks of pulse-coupled neuron models. The concepts and tools for the representation of the dynamics of cortical circuits developed enable a rational and transparent design of models of higher cortical functions such as the processes underlying perceptual learning phenomena.

Selected Recent Publications

Palmigiano A, Geisel T, Wolf F, Battaglia D (2017) Flexible information routing by transient synchronization. *Nature Neurosci* doi: 10.1038/nn.4569

Chapochnikov N M, Takago H, Huang C-H, Pangrsic T, Khimich D, Neef J, Auge E, Göttfert F, Hell S W, Wichmann C, Wolf F, Moser T (2014) Uniquantal Release through a Dynamic Fusion Pore Is a Candidate Mechanism of Hair Cell Exocytosis. *Neuron* 83(6): 1389-1403, doi: 10.1016/j.neuron.2014.08.003

Kaschube M, Schnabel M, Löwel S, Coppola DM, White LE, and Wolf F (2010) Universality in the Evolution of Orientation Columns in the Visual Cortex. *Science* 330: 1113

Naundorf B, Wolf F, Volgushev M (2006) Unique features of action potential initiation in cortical neurons. *Nature* 440: 1060

Wolf F, Geisel T (1998) Spontaneous pinwheel annihilation during visual development. *Nature* 395: 73-78



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Fred Wouters

Professor for Molecular and Cellular Systems

- 1997 Dr. (Ph. D.), Faculty of Chemistry, University of Utrecht, The Netherlands
- 1997 – 2000 Postdoctoral fellow, Imperial Cancer Research Fund (ICRF), London UK
- 2000 – 2001 Postdoctoral fellow, European Molecular Biology laboratory (EMBL), Heidelberg
- 2001 Appointed as group leader at the European Neuroscience Institute, Göttingen
- 2006 PD (habilitation), Physiology, Göttingen University
- since July 2007 Professor

Major Research Interests

The focus of our research is the regulation and role of the neuronal cytoskeleton in the modulation of neuronal shape and motility during chemotactic processes. The growing neuronal growth cone probes its environment for the chemical composition of its substrate and the presence of neighbouring cells. The former information is sampled by cell adhesion receptors in focal adhesion structures that, next to their sensing function also perform a structural function in that they provide the cell with a means to exert force on its substrate. We are primarily interested in the signal transduction processes that regulate these effects and the cross-talk between the different motility systems.

The main interest areas in this question are; 1. The role and molecular mechanism of lipid raft-resident cell adhesion molecules in the remodelling of the membrane cytoskeleton, 2. Dynamic control of growth cone protein content by local proteolysis and chaperone function during chemotactic responses, 3. Role and mechanism of the neuronal exocyst complex as critical landmarks for dendritic/axonal neuritogenesis.

Our group has a related interest in the pathophysiological mechanism of neurodegeneration by intracellular aggregation of the tau protein, as occurs in Alzheimer's disease. As tau is an intrinsically unstructured protein that can undergo remarkable conformational changes upon binding to microtubules and in the Alzheimer-related aggregation condition, it presents an ideal model system for the biophysical analysis of protein conformational change and protein interactions.

Our research depends on the development and application of advanced microscopy techniques, primarily; fluorescence lifetime imaging microscopy (FLIM), and Förster resonance energy transfer (FRET) microscopy, in combination with a range of GFP-based optical biosensors and novel bioconjugation approaches for organic dyes, and protein biochemical/molecular biological techniques to resolve and quantify biochemical reactions and conditions in living cells.

Selected Recent Publications

de Castro MA, Bunt G, Wouters FS (2016) Cathepsin B launches an apoptotic exit effort upon cell death-associated disruption of lysosomes. *Cell Death Discov.* 2016 Feb 29;2:16012

Schmitz M, Wulf K, Signore SC, Schulz-Schaeffer WJ, Kermer P, Bähr M, Wouters FS, Zafar S, Zerr I (2014) Impact of the cellular prion protein on amyloid- β and 3PO-tau processing. *J Alzheimers Dis* 38(3): 551-65

Schulz O, Pieper C, Clever M, Pfaff J, Ruhlandt A, Kehlenbach RH, Wouters FS, Großhans J, Bunt G, Enderlein J (2013) Resolution doubling in fluorescence microscopy with confocal spinning-disk image scanning microscopy. *Proc Natl Acad Sci U S A* 2013 Dec 24;110(52): 21000-5

Deeg S, Gralle M, Sroka K, Bähr M, Wouters FS*, Kermer P* (2010) BAG1 restores formation of functional DJ-1 L166P dimers and DJ-1 chaperone activity. *J Cell Biol* 188(4): 505-13. *equal contribution.

van den Bogaart G, Holt MG, Bunt G, Riedel D, Wouters FS, Jahn R (2010) One SNARE complex is sufficient for membrane fusion. *Nature Struct Mol Biol* 17: 358-365

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