Yearbook 2005/06

MSc/PhD Molecular Biology Program
at the University of Göttingen

International Max Planck Research School

Imprint

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Letter from the University

The international Master's / PhD Programs Molecular Biology and Neurosciences were established by the Georg August University Göttingen, together with the Max Planck Society for the Advancement of Science, in the year 2000 to attract excellent students from all over the world and provide them with an outstanding, research-oriented graduate program. Both programs are taught in English by internationally renowned scientists and offer a high level of services and individual support.

The two programs met with immediate success. By now, some 800 students from more than 70 countries apply for the 20 study places available in each of the programs every year. Over the past five years, both programs have introduced and combined elements of international recruitment, competitive admission procedures, advanced curricula, research training, social integration programs, extracurricular support and evaluation procedures into successful working structures. They have both achieved excellent recommendations in several external evaluations and have recently been awarded the 2004 prize for excellent support services for foreign students by the German Federal Foreign Office. For the newly established Georg August University School of Science (GAUSS) and two other graduate schools in Göttingen, the Molecular Biology and Neuroscience Programs are considered exemplary and serve as best practice models.

Five Göttingen University faculties, three Göttingen Max Planck Institutes as well as the German Primate Center participate in the programs. International guest lecturers are also involved. The Max Planck Society contributes through its newly established International Max Planck Research Schools. Both programs keep close contacts with the relevant industries to further enhance the chances of the graduates for a successful professional career.

I would very much like to thank all scientific bodies and institutions for their committed support in establishing 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 sponsors.

The Georg August University of Göttingen is proud of its long-standing international experience the two attractive and innovative programs have already become an integral part of. The university will continue to support these programs within the setting of Göttingen's lively urban, cultural and social life, in itself a prerequisite for creative teaching and research.

Prof. Dr. Kurt von Figura
(President of the Georg August University Göttingen)

Letter from the Max Planck Society

The mission of the Max Planck Society is to conduct basic research in science and humanities at the highest level. More than 80 Max Planck Institutes are located on scientific campuses across Germany, most of them close to universities.

Scientific ties between Max Planck Institutes and universities are traditionally strong. In 1998, during the 50th year celebration of the Max Planck Society in Göttingen, the Max Planck Society - together with the Hochschulrektorenkonferenz - launched the International Max Planck Research Schools as a new joint program to further intensify cooperation.

The goals of the International Max Planck Research Schools are

- to attract excellent students from all around the world to intensive Ph.D. training programs in Germany, preparing them for careers in science,
- to integrate Max Planck scientists in top-level scientific training of junior scientists,
- to intensify the ties to the Universities owing to the participation of internationally renowned Max Planck scientists in joint teaching activities, 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, 43 International Max Planck Research Schools have been established involving 54 Max Planck Institutes, 55 German universities and 15 universities abroad. More than 1700 (mostly PhD-) students from 86 countries are presently enrolled. Approximately 350 PhD students have graduated to date from an International Max Planck Research School.

The success of the Göttingen International Max Planck Research Schools in Molecular Biology and Neurosciences is evident from the high quality of the students and from the hundreds of applications the programs receive each year. The Schools have also re-shaped the local scientific community, strengthened the ties between the participating institutions, and initiated new scientific collaborations that augment the international reputation of Göttingen as a center for scientific excellence. We hope that in the years to come the students of the International Max Planck Research Schools will be successful in their professional careers. We also hope that they will remember their training period in Göttingen as an exciting and stimulating phase in their lives.

Peter Gruss
President
Max Planck Society
for the Advancement
of Science

Reinhard Jahn
Dean of the IMPRS
Molecular Biology

Overview

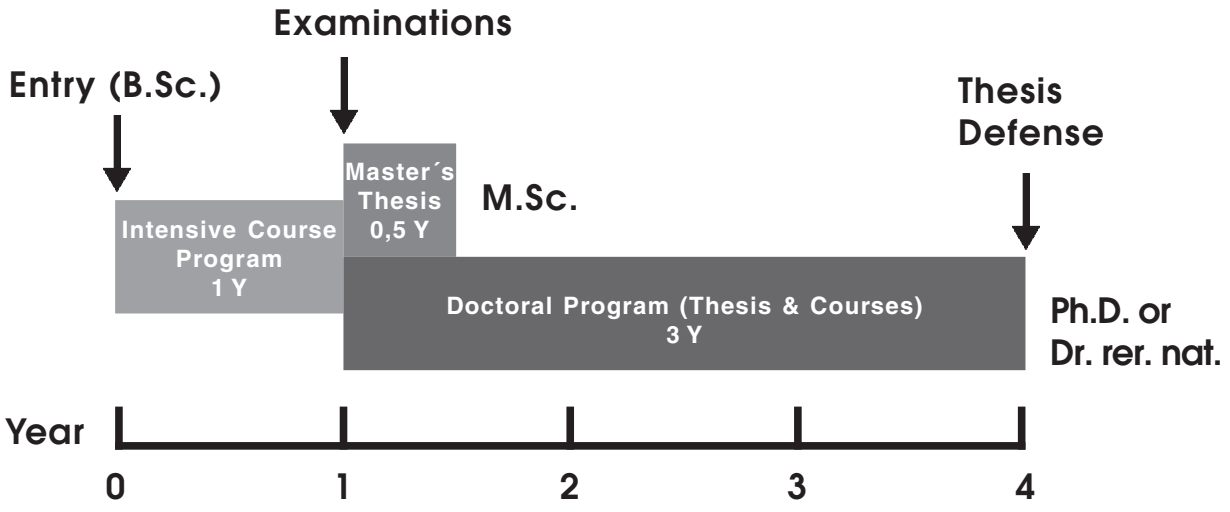
This yearbook is intended to provide information on the International MSc/PhD Molecular Biology Program in Göttingen, Germany, which was established in 2000. In addition to general information on the program, the yearbook introduces the current year's students, the faculty members, the program committee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

The program is conducted jointly by the Göttingen Center for Molecular Biosciences (GZMB), a newly established scientific center of excellence at the University of Göttingen, the Max Planck Institute for Biophysical Chemistry, the Max Planck Institute for Experimental Medicine, and the German Primate Center. Further to their active participation in the Molecular Biology Program and the research activities of the GZMB, the above-mentioned partners closely cooperate in four collaborative research centers (Sonderforschungsbereiche, SFB), six interdisciplinary doctoral programs (Graduiertenkollegs, GK) and in the recently established DFG Research Center for Molecular Physiology of the Brain (CMPB).

The intensive, research-oriented curriculum of the International MSc/PhD Molecular Biology Program qualifies students for professional work in the fields of molecular and cellular biosciences. The program is open to students from Germany and from abroad, who hold a Bachelor's degree (or equivalent) in the biosciences, chemistry, medicine, or related fields. All courses are held in English. Tuition fees are waived and scholarships are available. The academic year starts in October and is preceded by three week orientation program. Applications may be submitted until January 31 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 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 3 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.
- **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 (MSc) is awarded upon successful completion of the Master's thesis.



Funding of the Program

The following institutions and funding initiatives contributed to the success of the Molecular Biology Program:

DAAD

German Academic Exchange Service (DAAD), Bonn, Germany, http://www.daad.de

International Degree Programs - Auslandsorientierte Studiengänge (AS)

IPP made in Germany

International Postgraduate Programs – Internationale Promotionsprogramme (IPP)

Max Planck Society for the Advancement of Science, Munich, Germany, http://www.mpg.de

International Max Planck Research Schools

Niedersächsisches Ministerium für Wissenschaft und Kultur

Ministry of Lower Saxony for Science and Culture, Hannover, Germany, http://www.mwk.niedersachsen.de/home/

Innovationsoffensive

Doctoral Programs - Promotionsprogramme

Stifterverband für die Deutsche Wissenschaft

Stifterverband für die Deutsche Wissenschaft, Essen, Germany, http://www.stifterverband.org

The following companies contributed stipends:

Bayer AG, Leverkusen, Germany
http://www.bayer.com/en/index.php

Carl Zeiss Lichtmikroskopie, Göttingen, Germany
http://www.zeiss.de

Degussa AG, Düsseldorf, Germany
http://www.degussa.com

DeveloGen AG, Göttingen, Germany
http://www.develogen.com

Heka Elektronik GmbH, Lambrecht / Pfalz, Germany
http://www.keka.com

Hellma GmbH & Co. KG, Müllheim / Baden, Germany
http://www.hellma-worldwide.com

KWS Saat AG, Einbeck, Germany
http://www.kws.com

Leica Microsystems GmbH, Bensheim, Germany
http://www.leica-microsystems.com

Luigs & Neumann, Ratingen, Germany
http://www.luigs-neumann.com

Roche Diagnostics GmbH, Penzberg, Germany
http://www.roche.de

Sartorius AG, Göttingen, Germany
http://www.sartorius.com

Solvay Pharmaceuticals, Hannover, Germany
http://www.solvay.com

Springer Verlag, Heidelberg, Germany
http://www.springer.de

Vossius & Partner, München, Germany
http://www.vossiusandpartner.com

Intensive Course Program (First Year)

Throughout the first year, current topics in molecular biology are covered by

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

Lectures and Tutorials

A comprehensive lecture series is organized into a sequence of 8-12 week units. The following topics are taught on an advanced level throughout the first year (36 weeks, 4 hours per week):

A. Biochemistry and Structural Biology

- The Prokaryotic and Eukaryotic Cell
- Introduction to Metabolism
- Energy Metabolism, Lipid Metabolism
- Metabolic Networks
- Enzyme Mechanisms and Regulation
- Protein Structure, NMR, Crystallography

B. Molecular Genetics

- DNA and Chromatin Structure
- DNA Replication and Repair
- Transcription
- Signal Transduction
- RNA-processing and Translation
- Genomics, Bioinformatics

C. Functional Organization of the Cell

- Membranes: Structure and Transport
- Protein Sorting and Processing
- Vesicular Transport, Organelle Biogenesis
- Cytoskeleton
- Cell Adhesion
- Nervous Systems, Sensory Systems
- Cell Cycle, Apoptosis, Cancer
- Immunology
- Infectious Diseases, Principles of Pathogenicity

D. Model Systems of Molecular Biology/Biotechnology

- Prokaryotes
- Biotechnology
- Fungi
- *Arabidopsis*
- *Drosophila*
- *Xenopus*, Zebrafish
- Chicken, Mouse
- Human Genetics

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

During the first months of the Molecular Biology 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 methods comprise 18 two-day experiments in small groups.

A. Proteins

- Protein preparation and characterization by gel electrophoresis and Western blot
- Chromatographic protein separation
- NMR spectroscopy
- Structural analysis of proteins and protein structure validation
- Proteomics
- Microarrays
- Analysis of protein-protein and nucleic acid-protein interaction

B. Nucleic Acids

- Purification and electrophoresis of nucleic acids
- Polymerase chain reaction I
- cDNA-synthesis, cloning
- DNA sequence analysis and bioinformatics
- Chemical and enzymatic analysis of RNA structure
- Spectroscopic characterization of nucleic acids

C. Cell Biology and Genetics

- Light microscopy
- Electron microscopy
- Biochemical cell fractionation
- Cell culture
- Expression analysis

Laboratory Rotations

Starting in January, every student conducts three independent research projects (laboratory rotations) in the participating departments. Each project is individually supervised. These involve 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 three different subjects.

Seminars

Seminars start in March. The class meets weekly for two hours to discuss two 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. Each oral examination investigates the qualification in two of the following disciplines:

- biochemistry
- structural biology
- genetics
- microbiology
- cell biology
- immunology
- developmental biology

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 on the part of the students. Doctoral students select three faculty members as their doctoral committee which closely monitors progress and advises students in their research project. Laboratory work is accompanied by seminars, training in scientific writing and oral presentation skills, elective courses, and participation in international conferences or workshops.

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 PhD or, alternatively, Dr. rer. nat. will be awarded after the successful defense of the doctoral thesis.

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 member of the Molecular Biology Program.

Orientation, Language Courses, Social Activities

A three-week orientation prior to the program provides assistance and advice for managing day-to-day life in Germany, 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 *Lektorat Deutsch als Fremdsprache* to facilitate the first weeks in Göttingen. Additional language courses and social activities accompany the program.

Application, Selection and Admission 2005

Applicants must hold a Bachelor's degree or equivalent in biology, biochemistry, chemistry, medicine, agriculture, or related fields. They are required to document their proficiency in English and should not be older than 27 years.

In the year 2005, the coordination office received 568 applications from 68 countries.

Continent	Applications	Admissions
Europe (total)	**130**	**17**
Germany	39	10
other West Europe	11	0
East Europe	80	7
America (total)	**33**	**0**
North America	3	0
Central/South America	30	0
Africa(total)	**48**	**0**
North Africa	18	0
Central/South Africa	30	0
Asia (total)	**357**	**3**
Near East	43	2
Central Asia/ Far East	314	1

Students 2005/2006

Name		Home Country
Sina-Victoria	Barysch	Germany
Christoph	Biesemann	Germany
Monika	Bug	Germany
Ieva	Gailite	Latvia
Homa	Ghalei	Iran
Bettina	Görner	Germany
Katharina	Hoff	Germany
Georgi	Hristov	Bulgaria
Sohail	Khoshnevis	Iran
Anja	Krauss	Germany
Konstantina	Marinoglou	Greece
Magdalena	Morawska	Poland
Adema	Ribic	Bosnia & Herzegovina
Adrian	Schomburg	Germany
Iryna	Shnitsar	Ukraine
Hannes	Uchtenhagen	Germany
Polya	Vutova	Bulgaria
Achim	Werner	Germany
Martina	Wirth	Germany
Yanan	Zhao	P.R. China

Sina-Victoria Barysch

First Name
Sina-Victoria

Last Name
Barysch

Date of Birth
5 January 1983

Country
Germany

EDUCATION

College / University
2002 - 2005 Dresden University of Technology, Germany

Highest Degree
B.Sc.

Major Subjects
Molecular Biotechnology

Lab Experience
Various techniques in molecular biology, including realtime-PCR, cloning, protein purification and folding, cell and tissue culture, microscopy

Projects / Research
03/2005 - 09/2005 (Bachelor's thesis): "Characterization of mammary epithelial cells HC11 during different stages of development on estrogenic effects". Molecular Physiology and Endocrinology, Dresden University of Technology, Dresden, Germany
04/2004 - 08/2005: "Influences of temperature change on the motility of keratocytes." Light Microscopy Facility, Max Planck Institute for Cell Biology and Genetics, Dresden, Germany
08/2004 - 10/2004: "Generation of novel DNA vaccines for immunotherapy". Tumor Immunotherapy, Hanson Institute, Adelaide, Australia
06/2002 - 09/2002: "Protein folding *in vitro*" Protein Technology, Martin-Luther University, Halle, Germany

Scholarships
2005 - 2006 Stipend International Max Planck Research School

SCIENTIFIC INTERESTS AND GOALS

I am very interested in the holistic understanding of proteins, cells, tissues and signaling pathways. In particular, my main scientific interest focuses on applied medical research. Through this program I hope to obtain an insight into different research areas.

Christoph Biesemann

First Name
Christoph

Last Name
Biesemann

Date of Birth
19 July 1982

Country
Germany

EDUCATION

College / University
2002 - 2005 University of Lübeck, Germany
08/2004 - 12/2004 University of New Mexico, Albuquerque, NM, USA

Highest Degree
B. Sc.

Major Subjects
Molecular Biology, Biochemistry, Cell Biology

Lab Experience
Various methods in biochemistry and molecular biology. Animal tissue culture, fluorescence microscopy, TEM

Projects / Research
02/2005 - 08/2005 Bachelor's thesis: "Fibroblast seeding on woven Dacron fabric - A contribution to the optimization of the blood contact surface of biomechanical hearts". Lübeck, Germany
10/2004 - 12/2004 Undergraduate Research: "Introduction to use of microscopy to study protein-protein and protein-RNA interactions". Dept. of Cell Biology and Physiology, University of New Mexico, NM, USA
06/2003 - 07/2003 Expression and purification of recombinant in *E. coli*. Dept. of Biology, University of Lübeck, Germany

Scholarships
2005 - 2006 Stipend International Max Planck Research School
08/2004 - 12/2004 Student exchange scholarship at the University of New Mexico

SCIENTIFIC INTERESTS AND GOALS

There are many aspects of molecular and cellular biology which interest me, especially the processes underlying cellular migration and differentiation, but also the molecular basis of disease. Through this program I would like to deepen my theoretical and practical knowledge in molecular and cellular biology and hope to gain an insight into different areas of research.

Monika Bug

First Name
Monika

Last Name
Bug

Date of Birth
12 September 1982

Country
Germany

EDUCATION

College / University
2002 - 2005 University of Lübeck
08/2004 - 12/2004 University of New Mexico, Albuquerque, NM, USA

Highest Degree
B.Sc. (Molecular Life Sciences)

Major Subjects
Cell Biology, Biochemistry, Molecular Biology, Biophysical Chemistry

Lab Experience
Biochemical, cell biological and molecular biological techniques

Projects / Research
01/2005 - 07/2005 Bachelor's thesis: "Characterization of the binding of the cytosolic protein p97 to the membrane of the endoplasmic reticulum", Institute of Biology, University of Lübeck

Scholarships
2005 - 2006 Stipend International Max Planck Research School
2004 Student Exchange Scholarship at the University of New Mexico (Albuquerque, USA)
since 2002 Scholarship from the SDW (Stiftung der Deutschen Wirtschaft)

SCIENTIFIC INTERESTS AND GOALS

I am interested in cell biological processes, such as signal transduction and carcinogenesis. I hope to deepen my knowledge in biological sciences in order to work on biological and medical research in an international and interdisciplinary environment. Through this program I hope to obtain a practical insight into various fields in molecular biology and into diverse research areas.

Ieva Gailite

First Name
Ieva

Last Name
Gailite

Date of Birth
28 March 1984

Country
Latvia

EDUCATION

College / University
2002 - 2005 University of Latvia, Riga, Latvia

Highest Degree
B.Sc.

Major Subjects
Biochemistry, Microbiology, Cell Biology

Lab Experience
Basic techniques in molecular biology and microbiology

Projects / Research
2003 - 2005 "Factors influencing viability in state of anhydrobiosis of yeast *Saccharomyces cerevisiae* grown under aerobic and anaerobic conditions", Institute of Microbiology and Biotechnology, University of Latvia, Riga, Latvia

Scholarships
2005 - 2006 Stipend International Max Planck Research School
2004 - 2005 K. Morbergs Scholarship, University of Latvia
2004 - 2005 M. Petkevica Memorial Scholarship, University of Latvia

SCIENTIFIC INTERESTS AND GOALS

In my opinion, the central question in biology is the origin and evolution of life, therefore I am particularly interested in evolutionary aspects of cell and molecular biology, e.g. evolution of organelles. I am also interested in mechanisms that endow cells with the ability to survive under extreme environments. However, I also find other areas of biology, such as neurobiology and developmental biology, intriguing. Through my participation in this program I would like to broaden and deepen my knowledge of molecular biology and become acquainted with new molecular biology techniques.

Homa Ghalei

First Name
Homa

Last Name
Ghalei

Date of Birth
18 September 1983

Country
Iran

EDUCATION

College / University
2001 - 2005 University of Tehran, Tehran, Iran

Highest Degree
B.Sc. (Cellular & Molecular Biology)

Major Subjects
Structural biology, biophysical chemistry, biochemistry and molecular biology

Lab Experience
Major techniques in biochemistry, cell and molecular biology and protein purification methods

Projects / Research
Mar 2003 - Sep 2004 Purification of cellulase from *T. reesei*, Department of Biology, Faculty of Science, University of Tehran, Tehran, Iran
Oct 2004 - Jul 2005 The effect of glycation on cellulase activity and structure, Department of Biology, Faculty of Science, University of Tehran, Tehran, Iran

Scholarships
2005 - 2006 Stipend International Max Planck Research School
2005 University of Tehran award for the first rank in graduates of Cellular & Molecular Biology

SCIENTIFIC INTERESTS AND GOALS

I am eager to understand the principles of physical chemistry and mathematics from the viewpoint of their applications to biochemical systems. I am also interested in the prediction of protein structures, understanding the structure-function relationships of biomolecules and the computational analysis of biological systems.

Bettina Görner

First Name
Bettina

Last Name
Görner

Date of Birth
16 May 1983

Country
Germany

EDUCATION

College / University
2002 - 2005 Eberhard-Karls-Universität Tübingen

Major Subjects
Biochemistry

Lab Experience
Basic techniques in biochemistry and molecular biology. Synthesis and analysis of organic and inorganic substances.

Projects / Research
4/2005 - 7/2005 "Acute renal failure in zebrafish", Brigham and Women's Hospital, Harvard Institutes of Medicine, Boston
10/2004 - 3/2005 "Detection of wingless in early development of the Crustacean *Parhyale*", Max Planck Institute for Developmental Biology, Tübingen

Scholarships
2005 - 2006 Stipend International Max Planck Research School
2002 - present Studienstiftung des deutschen Volkes (German National Academic Foundation)
2002 - 2004 Fonds des Verbandes der Chemischen Industrie (Association of Chemical Industry)

SCIENTIFIC INTERESTS AND GOALS

The sophisticated organisation of organisms and their complexity fascinate me. I want to achieve a deep understanding of the molecular mechanisms leading to human diseases and contribute to the development of therapies in the future.

Katharina Hoff

First Name
Katharina

Last Name
Hoff

Date of Birth
7 April 1983

Country
Germany

EDUCATION

College / University
10/2002 - 09/2005 University of Hannover
09/2004 - 09/2005 Swedish University of Agricultural Sciences Alnarp (SLU)

Highest Degree
B.Sc.

Major Subjects
Bioinformatics/Biometry, Molecular Biology

Lab Experience
Extraction of various biochemical compounds from plant material, chromatography, PCR, agarose gel electrophoresis, semi-quantitative RTPCR, cloning, transformation of bacteria and plants, plant tissue culture.

Projects / Research
2005 "An investigation of PDAT2 in *Arabidopsis thaliana*", SLU
2005 "R-Manual for Biometry - an introduction for students of horticulture and plant biotechnology", University of Hannover
2004 - 2005 "Silencing DAGAT2 and CPT1 in *Arabidopsis thaliana* with RNAi", SLU
2004 "Cumarin content in *Rubia tinctorum*", Semmelweis University Budapest

Scholarships
2005 - 2006 Stipend International Max Planck Research School
2005 Scholarship by the Swedish University of Agricultural Sciences Alnarp
2004 - 2005 ERASMUS stipend, Stipend by Stiftung der Deutschen Wirtschaft
2003 - 2005 e-fellows.net online stipend

SCIENTIFIC INTERESTS AND GOALS

I am interested in metabolic pathways, especially in plant lipid formation. In my opinion, genetically modified seed oil is the future replacement of mineral oil in the sector of industrial oils. I want to improve my theoretical knowledge as well as my practical skills in the course of this program. I am very much looking forward to meeting people with other scientific and cultural backgrounds.

Georgi Hristov

First Name
Georgi

Last Name
Hristov

Date of Birth
4 November 1983

Country
Bulgaria

EDUCATION

College / University
2002 - 2005 International First Level Degree "Job Creation Oriented Biotechnology" Universita degli Studi di Perugia (Perugia, Italy)

Highest Degree
B.Sc.

Major Subjects
Biotechnology

Lab Experience
Major techniques in molecular biology, genetics and biochemistry

Projects / Research
01/2005 - 06/2005 Bachelor's thesis: "Identification of SHOX interacting proteins relevant to bone formation and development", Institute of Human Genetics, University of Heidelberg, Germany
06/2004 - 08/2004 "Optimization of the expression of HSV-1 ICP27 regulatory protein by using Baculovirus expression systems", Institute of Virology, University of Glasgow, UK
06/2003 - 08/2003 "Promoter analysis of the ARIADNE gene family", Center for Applied Genetics, BOKU University, Vienna, Austria

Scholarships
2005 - 2006 Stipend International Max Planck Research School
2003 - 2004 Erasmus scholarship

SCIENTIFIC INTERESTS AND GOALS

I am particularly interested in the fields of molecular genetics and gene therapy and their applications in the treatment of human diseases. During this course, however, I hope to deepen my knowledge in other interesting and promising research areas and make the right decision for my future scientific career.

Sohail Khoshnevis

First Name
Sohail

Last Name
Khoshnevis

Date of Birth
7 February 1983

Country
Iran

EDUCATION

College / University
2001 - 2005 University of Tehran, Tehran, Iran

Highest Degree
B.Sc. (Cellular & Molecular Biology)

Major Subjects
Structural biology, biophysical chemistry, biochemistry and molecular biology

Lab Experience
Major techniques in biochemistry, cell and molecular biology and protein purification methods

Projects / Research
Mar 2003 - Sep 2004 Purification of cellulase from *T. reesei*, Department of Biology, Faculty of Science, University of Tehran, Tehran, Iran
Oct 2004 - Jul 2005 The effect of glycation on cellulase activity and structure, Department of Biology, Faculty of Science, University of Tehran, Tehran, Iran

Scholarships
2005 - 2006 Stipend International Max Planck Research School
2001 - 2005 University of Tehran Stipend for Exceptional Talented Students

SCIENTIFIC INTERESTS AND GOALS:

I am keen to understand the physical and mathematical laws which govern the world of biomolecules. This helps me to study the relationship between structure and function of biomolecules, to use the computational modeling for biological systems and to predict the structure of proteins.

Anja Krauss

First Name
Anja

Last Name
Krauss

Date of Birth
8 October 1983

Country
Germany

EDUCATION

College / University
2002 - 2005 International First Level Degree "Job Creation-Oriented Biotechnology", Universita degli Studi di Perugia, Italy

Highest Degree
B.Sc.

Major Subjects
Biotechnology

Lab Experience
Tissue culture, microscopy, DNA and RNA isolation, gene cloning, gel electrophoresis, PCR, RT-PCR, recombinant protein expression and purification, SDS-PAGE, Western blot, ELISA, transfection, transduction, Southern blot, FACS

Projects / Research
06/2003 - 08/2003 "Teagasc National Survey for Strobilurin-resistant strains of *Septoria*". Teagasc - Oak Park Research Center, Carlow, Ireland
06/2004 - 08/2004 "Transcriptional analysis, cloning and expression of genes/proteins belonging to the flagellar apparatus of *Chlamydia pneumoniae*". Hygiene Institute, Dep. of Medical Microbiology, Göttingen, Germany
01/2005 - 06/2005 "Lentiviral vectors for marking undifferentiated or differentiated stem cells". Hospital for Sick Children, Dept. of Developmental Biology, Toronto, Canada

Scholarships
2005 - 2006 Stipend International Max Planck Research School

SCIENTIFIC INTERESTS AND GOALS

My goal for this program is to improve my practical skills and to further broaden my knowledge in molecular biology in order to find the scientific field that interests me the most. During my previous education I found myself particularly interested in topics dealing with immunology, cellular signaling pathways and gene therapy.

Konstantina Marinoglou

First Name
Konstantina

Last Name
Marinoglou

Date of Birth
2 September 1982

Country
Greece

EDUCATION

College / University
University of Athens, Greece

Highest Degree
B.Sc.

Major Subjects
Biology

Lab Experience
Basic molecular techniques, bacteria and phage cultures, DNA-RNA-protein extraction from insects, working with radioactive phosphorus, PCR

Projects / Research
Jun 2003 - Feb 2005 Diploma thesis: "Structure and organization of the *Bactrocera olea* sex determining gene sex-lethal.", Molecular Genetics laboratory of Biology Department, University of Athens, Greece

Scholarships
2005- 2006 Stipend International Max Planck Research School

SCIENTIFIC INTERESTS AND GOALS

Biomedical research, especially in cancer, genetic diseases and gene expression control. I wish to further improve my knowledge and gain more practical experience in order to put this to use later as a researcher.

Magdalena Morawska

First Name
Magdalena

Last Name
Morawska

Date of Birth
27 June 1983

Country
Poland

EDUCATION

College / University
2002 - 2005 Intercollegiate Faculty of Biotechnology, Gdansk University-Medical University of Gdansk, Poland / International First Level Degree: "Job Creation Oriented Biotechnology" at Universita degli Studi di Perugia, Italy

Highest Degree
B.Sc.

Major Subjects
Biotechnology

Lab Experience
Various biochemical and molecular biology techniques, cell culture, nucleic acids and protein methods

Projects / Research
01/2005 - 06/2005 "Isolation of novel chimpanzee adenovirus and development of vector transfer system". IRBM Merck Research Laboratories, Roma (Italy)
06/2004 - 08/2004 "Parvoviruses: role of infection with adeno-associated virus (AAV) of human heart tissue, addressing a possible role of this virus in cardiomyopathies". German Cancer Research Center, Heidelberg, Germany
06/2003 - 08/2003 "The lamda pR promoter activity in *Escherichia coli* cgtA mutant". Institute of Biochemistry and Biophysics of Polish Academy of Science, Gdansk, Poland

Scholarships
2005 - 2006 Stipend International Max Planck Research School
2003 - 2005 Scholarship for academic excellence, Dept. of Biotechnology, Gdansk, Poland
09/2004 - 12/2004 Socrates/Erasmus Scholarship

SCIENTIFIC INTERESTS AND GOALS

I am fascinated by viruses. Through the MSc program I hope to obtain a solid theoretical background and an insight into diverse research areas.

Adema Ribic

First Name
Adema

Last Name
Ribic

Date of Birth
15 February 1983

Country
Bosnia & Herzegovina

EDUCATION

College / University
2000 - 2005 Faculty of Science, University of Sarajevo, Bosnia and Herzegovina

Highest Degree
Diploma in Biology

Major Subjects
Genetic Engineering and Biotechnology

Lab Experience
Basic techniques in various biological disciplines

Projects / Research / Publications
11/2004 - 07/2005 Diploma thesis project: "Comparative analysis of three different approaches in DNA extraction from various blood stains", Institute for Genetic Engineering and Biotechnology, Sarajevo, Bosnia and Herzegovina: Expertus Forensis 3(5): 27-33 and poster: 4th European-American School in Forensic Genetics and Mayo Clinic Course in Advanced Molecular and Cellular Medicine, Dubrovnik, Croatia
10/2002 - 07/2003 "Analysis of haemolymph proteins of *Eobania vermicularia* Muller" and "Biochemical and haematological typisation of Bosnian mountain pony", Department of Biology, Faculty of Sciences, University of Sarajevo

Scholarships
2005 - 2006 Stipend International Max Planck Research School
April 2004 The Federal Ministry of Education of Bosnia and Herzegovina Grant

SCIENTIFIC INTERESTS AND GOALS

Through this program, I hope to gain good theoretical and practical background, in molecular biosciences and subsequently make a decision on further educational/research activities. At the moment, I am very much interested in signal transduction, but I also find behavioural genetics rather challenging and intriguing.

Adrian Schomburg

First Name
Adrian

Last Name
Schomburg

Date of Birth
22 June 1983

Country
Germany

EDUCATION

College / University
2002 - 2005 University of Göttingen

Major Subjects
Biology, Biochemistry

Lab Experience
DNA & RNA isolation and visualisation methods, PCR, restriction mapping, cell culture, transfection, HPLC, GC, GC/MS, Western Blot, antibody staining, ELISA, Flow Cytometry (FACS) and major microbiological techniques

Projects / Research
2003 - 2005 "Lipid metabolism and role of oxylipins in plant development and stress response". Department of Plant Biochemistry, University of Göttingen
2005 "Role of STAT3 and the JAK/STAT pathway in B-Cell Lymphoma pathogenesis". Department of Hematology and Oncology, University of Göttingen

Scholarships
2005 - 2006 Stipend International Max Planck Research School

Publications
Göbel C, Schomburg A, Feußner I (2005) "Oxylipin Database - A tool for browsing the plant oxylipin pathway and downloading profiling results". Poster presentation, 2nd European Symposium on Plant Lipids. www.oxylipins.uni-goettingen.de

SCIENTIFIC INTERESTS AND GOALS

My particular interests lie in the regulation of gene expression and metabolism, membrane trafficking, immunology and developmental biology and their role in malignancy, especially carcinogenesis. The explicit understanding of the molecular processes involved in disease will lead to new approaches of healing and that is what I am eager to work on.

Iryna Shnitsar

First Name
Iryna

Last Name
Shnitsar

Date of Birth
25 September 1981

Country
Ukraine

EDUCATION

College / University
09/1998 - 06/2004 The University of Kyiv-Mohyla Academy (UKMA)
Highest Degree
M.Sc.
Major Subjects
Biochemistry and Molecular Biology
Lab Experience
Basic techniques in biochemistry, molecular biology, microbiology, and cell culture
Projects / Research / Publications
06/2003 - 04/2004 Characterization of monoclonal antibodies against human beta-defensin-2 (hBD-2) antimicrobial peptide; protein-protein interaction studies of hBD-2 targets in eukaryotic cells.
10/2002 - 03/2003 Purification of recombinant hbD-2 from *E. coli* cultures and study of its antimicrobial activities; investigation of anti-hBD-2 antibody levels in the sera of cancerous patients. With relevant contributions to Exp Oncol (2002) 124: 36-41 and Exp Oncol (2003) 126: 40-42
09/2001 - 09/2002 Participation in a study of defensin genes expression in human tumors.
Scholarships
2005 - 2006 Stipend International Max Planck Research School

SCIENTIFIC INTERESTS AND GOALS

Signal transduction and changes in gene expression during the processes of organism's development. Spatial organization of cells and its role in cell functioning. differentiation and malignant transformation processes. Cell signaling and the role of protein modifications (sumoylation, mono-ubiquitinilation, ADP-ribosylation) in it. Development of new methods, allowing us to study the cell as a holistic and highly organized system.

Hannes Uchtenhagen

First Name
Hannes

Last Name
Uchtenhagen

Date of Birth
2 April 1982

Country
Germany

EDUCATION

College / University
2002 - 2005 Friedrich-Schiller-University Jena, Germany
Major Subjects
Molecular Biology / Biochemistry
Lab Experience
Basic molecular biology, biochemistry and biophysical chemistry techniques
Projects / Research
2005 Internship at the Zentrum für molekulare Neurobiologie Hamburg (ZMNH): Receptor transport and scaffolding at the postsynaptic site at inhibitory synapses
2004 - 2005 Expression analysis of herbivory-induced genes of *Medicago truncatula* and Lima Bean and isolation of an (*E*)-ß-Ocimene-Synthase from Lima Bean's cDNA. MPI for Chemical Ecology in Jena, Germany
Scholarships
2005 - 2006 Stipend International Max Planck Research School
Publications
Maffei M, Mithöfer A, Arimura G, Uchtenhagen H, Bossi S, Bertea C, Starvaggi Cucuzza L, Novero M, Volpe V, Quadro S, Boland W (2005) Effects of feeding *Spodoptera littoralis* on Lima beans leaves. III. Membrane depolarization and involvement of hydrogen peroxide (Submitted)
Arimura G, Mithöfer A, Maffei M, Uchtenhagen H, Bossi S, Starvaggi-Cucuzza L, Garms S, Schulze B, Leitner M, Boland W (2005) Synergistic and antagonistic cross-talks within signaling networks mediating herbivory-induced terpenoid formation in *Medicago truncatula* (Submitted)

SCIENTIFIC INTERESTS AND GOALS

I am very interested in getting to know a broad range of projects in different fields such as immunology, NMR or gene regulation and protein expression to expand my horizon and find out where my strengths and weaknesses lie.

Polya Vutova

First Name
Polya

Last Name
Vutova

Date of Birth
22 October 1983

Country
Bulgaria

EDUCATION

College / University
2002 - 2005 International First Level Degree "Job Creation Oriented Biotechnology", Universita degli Studi di Perugia, Perugia, Italy

Highest Degree
B.Sc.

Major Subjects
Biotechnology

Lab Experience
Techniques in cell and molecular biology, microbiology and immunology

Projects / Research
2003 Three-month summer project on the identification of possible PARP interactors via yeast two-hybrid screening, Centre of Applied Genetics, BOKU, Vienna, Austria.
2004 Three-month summer project on the interference of *Toxoplasma gondii* with the NF-kappaB signaling system of its host cell, Institute for Medical Microbiology, Georg-August University, Göttingen, Germany.
2005 Six-month project on the inhibition of death receptor-induced apoptosis in type I cells by *Toxoplasma gondii*, Department of Medical Microbiology, Georg August University Göttingen, Germany.

Scholarships
2005 - 2006 Stipend International Max Planck Research School
2003 - 2005 Erasmus scholarship

Publications
Vutova P, Gross U, Lüder CG (2005) Inhibition of death receptor-induced apoptosis in type I cells by *Toxoplasma gondii*. Abstract. Second Joint Conference of DGHM and VAAM, 25th - 28th September, Göttingen, Germany

SCIENTIFIC INTERESTS AND GOALS

Host-pathogen interactions, immunomodulation and signaling interference both in infection and different pathological situations.

Achim Werner

First Name
Achim

Last Name
Werner

Date of Birth
11 January 1982

Country
Germany

EDUCATION

College / University
2002 - 2005 University of Lübeck

Highest Degree
B. Sc. (Molecular Life Science)

Major Subjects
Biochemistry, Molecular Biology, Biophysical Chemistry

Lab Experience
Various techniques in biochemistry and molecular biology, (STD) NMR spectroscopy

Projects / Research
08/2004 - 08/2005 Bachelor's thesis: "Purification and functional characterization of rat ST3Gal II", Institute of Chemistry, University of Lübeck

Scholarships
2005 - 2006 Stipend International Max Planck Research School
Since 2005 Studienstiftung des Deutschen Volkes (German National Academic Foundation)
Since 2002 Scholarship of the SDW (Stiftung der Deutschen Wirtschaft)
1998 - 1999 Scholarship of the German Bundestag and the American Congress: Participation in the 15th German - American Youth Exchange

Publications
Blume A, Werner A, Benie AJ, Angulo J, Peters H, Wakarchuk WW, Palcic M, Peters T (2005) Binding of different ligands to sialyltransferases and the human blood group B galactosyltransferase reveal common features of these glycosyltransferases. Glycoconj J, in press

SCIENTIFIC INTERESTS AND GOALS

I am interested in structural and functional analysis of biomolecules, in particular, the study of ligand-receptor interactions and the transfer of this understanding to signaling pathways. I think this program will enable me to deepen and broaden my practical and theoretical knowledge of molecular and structural biology.

Martina Wirth

First Name
Martina

Last Name
Wirth

Date of Birth
17 January 1982

Country
Germany

EDUCATION

College / University
2002 - 2005 Technical University of Munich
Highest Degree
B.Sc.
Major Subjects
Biochemistry
Lab Experience
Basic techniques in biochemistry and molecular and cell biology
Projects / Research
08/2003 - 09/2003 "Purification and crystallization of DegP (HtrA) of *E. coli*", Department of Structural Research, Max-Planck-Institute of Biochemistry, Martinsried
03/2004 - 06/2004 "Site-directed mutagenesis of lumazine protein of *Photobacterium leiognathi*", Department of Organic Chemistry and Biochemistry, Technical University of Munich
08/2004 - 09/2004 and 05/2005 - 07/2005 "ChIP analysis of STATs in macrophages", Department of Medical Microbiology, Immunology and Hygiene, Technical University of Munich
Scholarships
2005 - 2006 Stipend International Max Planck Research School

SCIENTIFIC INTERESTS AND GOALS

I am very interested in signal transduction and gene expression analysis. For example, in immunology cytokines activate diverse gene expression programs in immune cells and are essential for a successful response to a pathogen. It is intriguing to understand signaling and transcriptional gene regulation processes leading to inflammation or differentiation of cells.
Several fields of molecular biology, such as developmental biology, are still new for me. Through this program I hope to gain a strong base of knowledge in preparation for future specialized research.

Yanan Zhao

First Name
Yanan

Last Name
Zhao

Date of Birth
3 March 1983

Country
P.R. China

EDUCATION

College / University
2001 - 2005 Peking University, P.R. China
Highest Degree
B.Sc.
Major Subjects
Biotechnology
Lab Experience
Basic techniques in molecular biology and biochemistry. Protein expression and purification, cell culture, etc.
Projects / Research
2004 "Cloning, expression and purification of heat shock protein gp96's C-terminal domain segments and the co-relational research", Biotechnology and Virology Lab, Institute of Microbiology, Chinese Academy of Sciences, Beijing, China
2003 - 2004 "CD40 Ligand expression and cell inducement", Molecular and Microbiology Lab, Institute of Microbiology, CAS, Beijing, China
Scholarships
2005 - 2006 Stipend International Max Planck Research School

SCIENTIFIC INTERESTS AND GOALS

Now my interest lies in mechanisms of development and signaling, especially in developmental neuroscience and synaptic transmission. I think that structure-function relationships and the dynamics of biomolecules will play an important role in my study. I also hope to conduct some research with an interdisciplinary background.

Donna J.	Arndt-Jovin	Molecular Biology	MPI bpc
Mathias	Bähr	Neurology	U Göttingen
Botho	Bowien	Microbiology	U Göttingen
Gerhard H.	Braus	Molecular Microbiology	U Göttingen
Bertram	Brenig	Molecular Biology of Livestock	U Göttingen
Nils	Brose	Molecular Neurobiology	MPI em
Matthias	Dobbelstein	Molecular Oncology	U Göttingen
Detlef	Doenecke	Biochemistry	U Göttingen
Wolfgang	Engel	Human Genetics	U Göttingen
Ivo	Feußner	Plant Biochemistry	U Göttingen
Ralf	Ficner	Molecular Structural Biology	U Göttingen
Kurt	Figura, von	Biochemistry	U Göttingen
Wolfgang	Fischle	Chromatin Biochemistry	MPI bpc
Christiane	Gatz	General and Developmental Physiology of the Plant	U Göttingen
Christian	Griesinger	NMR-based Structural Biology	MPI bpc
Uwe	Groß	Bacteriology	U Göttingen
Heidi	Hahn	Human Genetics	U Göttingen
Herbert	Jäckle	Molecular Developmental Biology	MPI bpc
Reinhard	Jahn	Neurobiology	MPI bpc
Thomas	Jovin	Molecular Biology	MPI bpc
Michael	Kessel	Molecular Biology	MPI bpc
Dieter	Klopfenstein	Biochemistry	U Göttingen
Willhart	Knepel	Molecular Pharmacology	U Göttingen
Wilfried	Kramer	Molecular Genetics	U Göttingen
Kerstin	Krieglstein	Neuroanatomy	U Göttingen
Wolfgang	Liebl	Microbiology	U Göttingen
Reinhard	Lührmann	Cellular Biochemistry	MPI bpc
Ahmed	Mansouri	Molecular Developmental Genetics	MPI bpc
Frauke	Melchior	Biochemistry	U Göttingen
Burkhard	Morgenstern	Bioinformatics	U Göttingen
Klaus-Armin	Nave	Neurogenetics	MPI em
Erwin	Neher	Membrane Biophysics	MPI bpc
Tomas	Pieler	Developmental Biochemistry	U Göttingen
Erez	Raz	Developmental Biology	MPI bpc
Markus	Rudolph	Structural Biology	U Göttingen
Reinhard	Schuh	Molecular Organogenesis	MPI bpc
George Michael	Sheldrick	Structural Chemistry	U Göttingen
Jörg	Stülke	General Microbiology	U Göttingen
Michael	Thumm	Molecular Cell Biology	U Göttingen
Markus	Wahl	X-Ray Crystallography	MPI bpc
Lutz	Walter	Primate Genetics	DPZ
Jürgen	Wienands	Immunology	U Göttingen
Ernst	Wimmer	Developmental Biology	U Göttingen
Andreas	Wodarz	Stem Cell Biology	U Göttingen
Axel	Zeeck	Biomolecular Chemistry	U Göttingen
Martin	Zeidler	Developmental Biology	MPI bpc

U Göttingen = Georg August University, MPI bpc = Max Planck Institute for Biophysical Chemistry, MPI em = Max Planck Institute for Experimental Medicine, DPZ = German Primate Center

Donna J. Arndt-Jovin

Professor, Group Leader at the Max Planck Institute for Biophysical Chemistry

- A.B., Chemistry, Hiram College, 1963
- Ph.D., Biochemistry, Yale University, 1969
- Fellow of the Jane Coffin Childs Memorial Fund for Medical Research, Department of Biochemistry, Stanford University School of Medicine, 1969 - 1971
- Research Scientist, Max Planck Institute for Biophysical Chemistry, 1971 - 1993
- Senior Research Scientist, Max Planck Institute for Biophysical Chemistry, 1993 - present

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Further Information

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Major Research Interests

Chromatin structure and function *in vivo*,

(a) the study of nuclear architecture using immunochemistry, *in situ* hybridization, and *in vivo* 3-D image microscopy

(b) the role of epigenetic regulation in gene expression and development of Dipteran embryos with focus on polycomb group proteins

Signal transduction processes: cell surface antigen-receptor proximities and mobilities focused on the erb B receptor family in living tissue culture cells.

DNA structure and function. Biological roles of unusual helical DNA structures.

Development of new fluorescence imaging modalities for rapid, *in vivo* cell and organism imaging.

Selected Recent Publications

Ficz G, Heintzmann R, Arndt-Jovin DJ (2005) Polycomb group protein complexes exchange rapidly in living *Drosophila*. Development 132: 3963-3976

Hanley QS, Lidke KA, Heintzmann R, Arndt-Jovin DJ, Jovin TM (2005) Fluorescence lifetime imaging in an optically sectioned Programmable Array Microscope (PAM). Cytometry 67A: 112-118

Lidke DS, Lidke KA, Rieger B, Jovin TM, Arndt-Jovin DJ (2005) Reaching out for signals: filopodia sense EGF and respond by directed retrograde transport of activated receptors. J Cell Biol 170: 619-626

Post JN, Lidke KA, Rieger B, Arndt-Jovin DJ (2005) One- and two-photon photoactivation of a paGFP-fusion protein, a phototoxicity study in live Drosophila embryos. FEBS Lett 579: 325-330

Lidke DS, Nagy P, Heintzmann R, Arndt-Jovin DJ, Post JN, Grecco H, Jares-Erijman EA, Jovin TM (2004) Quantum dot ligands provide new insights into erbB/HER receptor-mediated signal transduction. Nat Biotechnol 22: 198-203

Shchyolkina A, Kaluzhny DN, Borisova OF, Hawkins ME, Jernigan RL, Jovin TM, Arndt-Jovin DJ, Zhurkin VB (2004) Formation of an intramolecular triple-stranded DNA structure monitored by fluorescence of 2-aminopurine or 6-methylisoxanthopterin. Nucl Acids Res 32: 432-440

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

We are interested to understand 2 basic questions in cellular and molecular neurobiology:
1. Which factors support survival of adult CNS neurons?
2. What kills these cells under pathological conditions?

Up to now, only little is known about the mechanisms that support survival of a postmitotic cell like a human neuron for eventually more than 100 years under physiological conditions. However, by examining the molecular regulation of cell survival and cell death during development and in the lesioned adult CNS, one may get some clues to answer this question.

In our group, several *in vitro* and *in vivo* model systems are used which allow examination of neuronal de- and regeneration. Our basic model is the rodent retino-tectal projection. Here, we can study development, de- and regeneration of the respective projection neurons, the retinal ganglion cells (RGCs) in single cell cultures, explants or *in vivo*. Transection or crush-axotomy of the optic nerve induces retrograde death more than 80% of RGCs within two weeks. This secondary cell loss is mainly apoptotic and involves specific changes in gene expression pattern of transcription factors (e.g. c-jun or ATF-2), pro- and anti-apoptotic genes (e.g. bcl-2 or bax) and growth-associated genes (like GAP-43). Thus, long term survival and initiation of regeneration programmes of RGCs critically depends on inhibition of apoptotic cell death. To that end, we have used a variety of techniques to interfere with the cell death cascades that follow lesions of the optic nerve in adult rats. Inhibition of neuronal apoptosis can be afforded by pharmacological administration of trophic factors or by gene therapy approaches using adeno- or adeno-associated virus vectors that can deliver neurotrophic or anti-apoptotic factors directly into neurons or into surrounding glial cells. These, and other new strategies like using peptide-transduction-domains to deliver anti-apoptotic proteins across the blood-brain-barrier are now used to develop new experimental therapy strategies in animal models of human neurological disorders like stroke, trauma, multiple sclerosis or neurodegenerative diseases (e.g. Alzheimer´s or Parkinson´s disease).

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e-mail: mbaehr@gwdg.de

Further Information

http://www.baehr-lab.med.uni-goettingen.de/

Selected Recent Publications

Meyer R, Weissert R, de Graaf K, Diem R, Bähr M (2001) Acute neuronal apoptosis in a rat model of multiple sclerosis. J Neurosci 21: 6214-6220

Kilic E, Dietz GPH, Herrmann DM, Bähr M (2002) Intravenous TAT-Bcl-XL is protective when delivered before and after middle cerebral artery occlusion in mice. Ann Neurol 52(5): 617-22

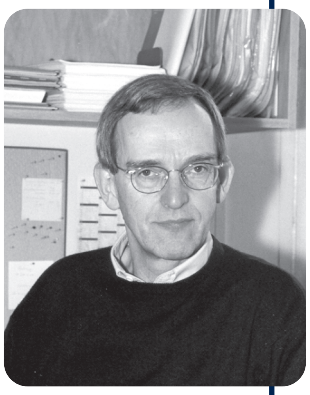
Diem R, Hobom M, Maier K, Weissert R, Storch MK, Meyer R, Bähr M (2003) Methyprednisolone increases neuronal apoptosis during autoimmune CNS inflammation by inhibition of an endogenous neuroprotective pathway. J Neurosci 23(18): 6993-7000

Dietz GPH, Bähr M (2004) Delivery of Bioactive Molecules into the Cell: The Trojan Horse Approach. Mol Cell Neurosci 27(2): 85-131

Diem R, Sättler MB, Merkler D, Demmer I, Maier K, Stadelmann C, Ehrenreich H, Bähr M (2005) Combined therapy with methylprednisolone and erythropoietin in a model of multiple sclerosis. Brain 128: 375-85

Lingor P, Koeberle P, Kügler S, Bähr M (2005) Downregulation of apoptosis mediators by RNA interference inhibits axotomy-induced retinal ganglion cell death *in vivo*. Brain 128: 550-558

Botho Bowien



Professor of Microbiology

- Dr. rer. nat., Georg-August-Universität Göttingen, 1970
- Postdoc, Case Western Reserve University, Cleveland, Ohio, USA, 1973 - 1975
- Habilitation (Microbiology), Georg-August-Universität Göttingen, 1978
- Professor of Microbiology, Georg-August-Universität Göttingen, 1983

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Further Information

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Major Research Interests

Carbon dioxide (CO_2) is an essential gas for all organisms. Assimilation of CO_2 by autotrophs such as the photosynthetic higher plants, algae and cyanobacteria constitutes the primary biosynthetic activity in the biosphere. In addition to these organisms there is a great diversity of photo- and/or chemoautotrophic bacteria and archaea. Such organisms are often facultative autotrophs, i.e. they are able to grow either autotrophically or heterotrophically. The mutual shift between autorophy and heterotrophy requires a sophisticated regulation on the metabolic as well as genetic level.

Ralstonia eutropha is an aerobic, facultatively chemoautotrophic bacterium that assimilates CO_2, like the majority of autotrophs, via the Calvin-Benson-Bassham (CBB) carbon reduction cycle. A main interest of our laboratory concerns the transcriptional control of the *cbb* operons encoding most of the CBB enzymes in *R. eutropha*. The regulatory components of the *cbb* system, their response to metabolic signals and the interlocking of the *cbb* control with larger regulatory networks are the prime research subjects.

Besides hydrogen, formate serves as an energy source during organoautotrophic growth of *R. eutropha*. Formate is oxidized to CO_2 by formate dehydrogenases which are molybdo- or tungstoenzymes in this organism. Another research topic addresses the genetic organization and transcriptional regulation of the formate dehydrogenases. We are also interested in the biosynthesis of the molybdo-/tungstopterin cofactor.

The third field of research is the basal CO_2 metabolism in *R. eutropha* and *Escherichia coli*. It focusses on the physiological role(s) of carbonic anhydrase(s) and potential CO_2/bicarbonate uptake systems.

Selected Recent Publications

Pötter M, Müller H, Reinecke F, Wieczorek R, Fricke F, Bowien B, Friedrich B, Steinbüschel A (2004) The complex structure of polyhydroxybutyrate (PHB) granules: four orthologous and paralogous phasins occur in *Ralstonia eutropha*. Microbiology 150: 2301-2311

Kusian B, Sültemeyer D, Bowien B (2002) Carbonic anhydrase is essential for growth of *Ralstonia eutropha* at ambient CO_2 concentrations. J Bacteriol 184: 5018-5026

Bowien B, Kusian B (2002) Genetics and control of CO_2 assimilation in the chemoautotroph *Ralstonia eutropha*. Arch Microbiol 178: 85-93

Burgdorf T, Bömmer D, Bowien B (2001) Involvement of an unusual mol operon in molybdopterin cofactor biosynthesis in *Ralstonia eutropha*. J Mol Microbiol Biotechnol 3: 619-629

Gerhard H. Braus

Professor of Microbiology and Genetics

- Diploma (Biology), Albert-Ludwig University, Freiburg i. Br. (Germany), 1983
- Dr.sc.nat., Swiss Federal Institute of Technology (ETH), Zürich (Switzerland), 1987
- Habilitation (Microbiology), Swiss Federal Institute of Technology (ETH), Zürich (Switzerland), 1991
- Associate Professor of Biochemistry, Friedrich Alexander University, Erlangen (Germany), 1993 - 1996
- Since 1996 Professor of Microbiology (since 2001 Professor of Microbiology and Genetics) in Göttingen

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Major Research Interests

Metabolism and Development in Filamentous Fungi and Yeasts.
Amino acids are essential precursors of translation and their biosynthesis is carefully regulated at multiple levels. In fungi, amino acid starvation activates a complex genetic network including a signal transduction pathway and the transcriptional activator Gcn4p/CpcAp. This network co-ordinately regulates hundreds of genes in numerous biosynthetic pathways.
We are interested in the components of this genetic system, the crosstalk to other metabolic genetic networks in the cell (N-metabolism, purine biosynthesis), the transcriptional regulation and the chromatin structure of target genes. The stability of the transcription factor is controlled in the nucleus in an amino acid dependent degradation pathway which is analysed.
The amino acid network interacts with developmental fungal programs. Amino acid starvation induces adhesion to surfaces in yeast or arrests the formation of fruitbodies in the filamentous fungus *A. nidulans*. The control of protein degradation is a key feature of fruitbody formation and requires the COP9 signalosome, a highly conserved multienzyme complex which is characterized. We are interested in analysing the control points and the molecular switches which connect metabolism and development.
Another interest of the laboratory is the construction of amino acid biosynthetic enzymes with altered regulatory response. Therefore we analyse the intramolecular signal transduction pathway within regulated allosteric enzymes from the regulatory site to the catalytic center. The crystal structures of several mutant chorismate mutases and DAHP synthases served as example which gave us first hints how different effectors act on this enzyme.

Selected Recent Publications

Braus GH, Grundmann O, Brückner S, Mösch HU (2003) Amino acid starvation and cn4p regulate adhesive growth and FLO11 expression in *Saccharomyces cerevisiae*. Mol Biol Cell 14: 4272-4284

Busch S, Eckert SE, Krappmann S, Braus GH (2003) The COP9 sigalosome is an essential regulator of development in the filamentous fungus *Aspergillus nidulans*. Mol Microbiol 49: 717-730

Galagan JE, …, Braus GH (18th of 50 authors), …Birrer B (2005) Sequencing of *Aspergillus nidulans* and comparative analysis with *A. fumigatus* and *A. oryzae*. Nature (in press)

Hartmann M, Schneider TR, Pfeil A, Heinrich G, Lipscomb WN, Braus GH (2003) Evolution of feedback-inhibited b/a barrel isoenzymes by gene duplication and a single mutation. Proc Natl Acad Sci USA 100: 862-867

Helmstaedt K, Strittmatter A, Lipscomb WN, Braus GH (2005) Evolution of 3-deoxy-D-arabino-heptulosonate-7-phosphate synthase-encoding genes in the yeast *Saccharomyces cerevisiae*. Proc Natl Acad Sci USA 102: 9784-9789

Krappmann S, Bignell EM, Reichhard U, Rogers T, Hynes K, Braus GH (2004) The *Aspergillus fumigatus* transcriptional activator CpcA contributes significantly to virulence of this fungal pathogen. Mol Microbiol 52: 785-799

Bertram Brenig

Full Professor of Molecular Biology of Livestock

- Director of the Institute of Veterinary Medicine
- Dr. med. vet., University of Munich, Munich 1987

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e-mail: bbrenig@gwdg.de

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Major Research Interests

The main interest of the laboratory is in the structural and functional analysis of mammalian genes and genomes. We are investigating the cause of different economical important genetic defects in livestock and other domesticated animals. So far our main focus was on porcine genes and their function, e.g. we are currently analysing the molecular origin of porcine hernia inguinalis and scrotalis. Using a whole genome scan we have identified several chromosomal regions that are linked to this disorder. Fine mapping, positional cloning and candidate gene analysis are used for further elucidation. However, in recent years we have also started to look at genes in other species, e.g. cattle, dog, sheep, and buffalo. Especially, in cattle, we are interested in the molecular analysis of bovine spongiform encephalopathy (BSE). The differences in oral uptake of prion protein between cattle and pig is studied *in vivo* and *in vitro*. We have identified humoral microvesical encapsulated nucleic acids that are altered during a prion infection and can be used as diagnostic tool. Humoral nucleic acids are also studied in several other diseases, e.g. liver carcinoma in dog and pancreatic neoplasias in cat.

Selected Recent Publications

Brenig B (2005) Prions. In "Encyclopedia of Analytical Science 2nd" (Worsfold PJ, Townshend A, Poole CF, Eds), p 287-298, Elsevier Science Ltd

Pfeiffer I, Brenig B, Kutschera U (2004) The occurrence of an Australian leech species (genus Helobdella) in German freshwater habitats as revealed by mitochondrial DNA sequences. Mol Phylogenet Evol 33: 214-219

Ren J, Knorr C, LuSheng H, Brenig B (2004) Isolation and molecular characterization of the porcine stearoyl-CoA desaturase gene. Gene 340: 19-30

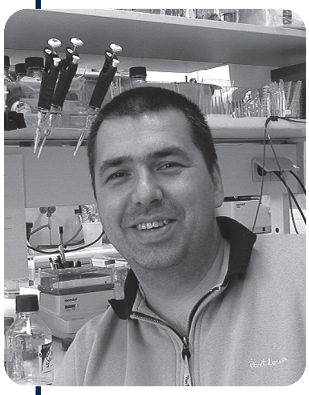
Sander P, Hamann H, Pfeiffer I, Wemheuer W, Brenig B, Groschup MH, Ziegler U, Distl O, Leeb T (2004) Analysis of sequence variability of the bovine prion protein gene (PRNP) in German cattle breeds. Neurogenetics 5: 19-25

Schütz E, Urnovitz HB, Iakoubov L, Schulz-Schaeffer W, Wemheuer W, Brenig B (2005) Bov-tA short interspersed nucleotide element sequences in circulating nucleic acids from sera of cattle with bovine spongiform encephalopathy (BSE) and sera of cattle exposed to BSE. Clin Diagn Lab Immunol 12: 814-820

Nils Brose

Professor, Director at the Max Planck Institute for Experimental Medicine

- Dr. rer. nat. (Ph.D.) 1990, Ludwig Maximilians University Munich
- Appointed as Director at the Max Planck Institute for Experimental Medicine 2001



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Major Research Interests

Research in the Department of Molecular Neurobiology focuses on the molecular mechanisms of synapse formation and function in the vertebrate central nervous system. Typically, synapses are formed between cellular processes of a sending and a receiving nerve cell. They are the central information processing units in the vertebrate brain where some 10^{12} nerve cells are connected by 10^{15} synapses to form an elaborate and highly structured neuronal network that is the basis for all forms of behaviour. Signal transmission at synapses is mediated by the regulated release of signal molecules (neurotransmitters) which then diffuse to the receiving nerve cell and change its physiological state. In the Department of Molecular Neurobiology, we combine biochemical, morphological, mouse genetic, behavioural, and physiological methods to elucidate the molecular basis of synapse formation and transmitter release processes. Our synaptogenesis research concentrates on synaptic cell adhesion proteins and their role in synapse formation. 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

Rhee J-S, Betz A, Pyott S, Reim K, Varoqueaux F, Augustin I, Hesse D, Südhof TC, Takahashi M, Rosenmund C, Brose N (2002) β Phorbol ester- and diacylglycerol-induced augmentation of transmitter release is mediated by Munc13s and not by PKCs. Cell 108: 121-133

Roßner S, Fuchsbrunner K, Lange-Dohna C, Hartlage-Rübsamen M, Bigl V, Betz A, Reim K, Brose N (2004) Munc13-1-mediated vesicle priming contributes to secretory APP processing. J Biol Chem 279: 27841-27844

Junge H, Rhee J-S, Jahn O, Varoqueaux F, Spiess J, Waxham MN, Rosenmund C, Brose N (2004) Calmodulin and Munc13 form a Ca^{2+}-sensor/effector complex that controls short-term synaptic plasticity. Cell 118: 389-401

Dresbach T, Neeb A, Meyer G, Gundelfinger ED, Brose N (2004) Synaptic targeting of Neuroligin is independent of Neurexin and SAP90/PSD95 binding. Mol Cell Neurosci 27: 227-235

Reim K, Wegmeyer H, Brandstätter, JH, Xue M, Rosenmund C, Dresbach T, Hofmann K, Brose N (2005) Structurally and functionally unique Complexins at retinal ribbon synapses. J Cell Biol 169: 669-680

Matthias Dobbelstein

Professor of Molecular Oncology

- Dr. med., University of Munich, 1993
- Postdoctoral fellow, Princeton University, USA, 1993 - 1996
- Group leader, University of Marburg, 1997 - 2004
- Professor of Molecular Oncology, University of Southern Denmark, Odense, since 2004
- Head of the Department of Molecular Oncology, Georg-August-Universität Göttingen, since 2005

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Major Research Interests

We are focussing our research on the tumor suppressor p53, trying to elucidate its mechanisms of action, its regulation and its suitability as a target for cancer therapy. p53 operates as a transcription factor and prevents uncontrolled cell proliferation. This activity is regulated through a sophisticated regulatory network that responds to DNA damage. Despite our knowledge concerning the molecular biology of p53, an integrated concept of its regulation, and its translation into rational diagnostics and therapy, are still in their infancy. The tumor suppressor gene TP53 is mutated or deleted in approximately 50% of malignant tumors. However, this does not mean that p53 is active in the remaining cases. It appears that in the vast majority of the remaining 50% of tumors, p53 is inactivated through malfunction of its modulators, such as Mdm2, p14ARF, deltaNp73, and others. We are therefore pursuing the unique opportunity to re-establish p53‘s “dormant” tumor-suppressive activity by targeting its modulators as a potential avenue to therapy.

Selected Recent Publications

Dobbelstein M*, Roth J*, Kimberly WT, Levine AJ, Shenk T (1997) Nuclear export of the adenoviral oncoproteins E1B-55 kD and E4-34 kD. EMBO Journal 16: 4276-4284 (*equal contributors)

Roth J*, Dobbelstein M*, Freedman D, Shenk T, Levine AJ (1998) Nucleo-cytoplasmic shuttling of the hdm2-oncoprotein regulates the levels of the p53 protein via a pathway used by the human immunodeficiency virus rev protein. EMBO Journal 17: 554-564 (*equal contributors)

Koch P, Gatfield J, Löber C, Hobom U, Lenz-Stöppler C, Roth J, Dobbelstein M (2001) Efficient replication of adenovirus despite the overexpression of active and nondegradable p53. Cancer Research 61: 5941-5947

Contente A, Dittmer A, Koch MC, Roth J, Dobbelstein M (2002) A polymorphic microsatellite that mediates induction of PIG3 by p53. Nature Genetics 30: 315-320

Contente A, Zischler H, Einspanier A, Dobbelstein M (2003) A promoter that acquired p53-response during primate evolution. Cancer Research 63: 1756-1758

Roth J, Lenz-Stöppler C, Contente A, Löhr K, Koch P, Dobbelstein M (2003) Reactivation of mutant p53 by a one-hybrid adaptor protein. Cancer Research 63: 3904-3908

Detlef Doenecke

Professor of Biochemistry

- MD, 1967, University Saarland Medical School
- Postdoc at the Universities of San Francisco (UCSF) and Marburg
- Professor of Biochemistry, 1987, University of Göttingen
- Head of the Department of Molecular Biology at the Institute of Biochemistry and Molecular Cell Biology

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Major Research Interests

The main interest of the laboratory is in the structure, function and regulation of synthesis of nuclear proteins including chromosomal proteins and other protein factors involved in the control of transcription. DNA replication during the S-phase of the cell cycle requires the coordinate synthesis of histones (H1, H2A, H2B, H3 and H4) in stoichiometric amounts for the assembly of chromatin on replicated DNA. The major human histone gene cluster has been mapped to chromosome 6p21.1-6p22.2, and more than 50 histone genes were identified and sequenced within that gene cluster. Several S-phase independent histone genes (replacement histone genes) map as solitary genes to other chromsomes. Current work in this project area deals with the function and regulation of expression of individual histone subtype genes. A second major project deals with the factors mediating the transport of histones and histone-related transcriptional regulators from the cytoplasm to the cell nucleus. This work concentrates on the differential role of nuclear import receptors and specific protein-protein interactions during the nuclear transport of these proteins. The third topic of research deals with the structural transitions of chromatin during programmed cell death and with the regulation of factors involved in apoptotic chromatin cleavage and histone modification.

Selected Recent Publications

Jäkel S, Albig W, Kutay U, Bischoff FR, Schwamborn K, Doenecke D, Görlich D (1999) The importin ß/importin 7 heterodimer is a functional import receptor for histone H1. EMBO J 18: 2411-2423

Kratzmeier W, Albig W, Hänecke K, Doenecke D (2000) Rapid dephosphorylation of H1 histones after apoptosis induction. J Biol Chem 275: 30478-30486

Baake M, Doenecke D, Albig W (2001) Characterization of nuclear localisation signals of the four human core histones. J Cell Biochem 81: 333-346

Bäuerle M, Doenecke D, Albig W (2002) The requirement of H1 histones for a heterodimeric nuclear import receptor. J Biol Chem 277: 32480-32489

Schliephake T, Meinl A, Kratzmeier M, Doenecke D, Albig W (2004) The telomeric region is excluded from nucleosomal fragmentation during apoptosis, but the bulk nuclear chromatin is randomly degraded. Cell Death Differ 11: 693-703

Kahle J, Baake M, Doenecke D, Albig W (2005) Subunits of the heterotrimeric transcription factor NF-Y are imported into the nucleus by distinct pathways involving importin β and importin 13. Mol Cell Biol 25: 5339-5354

Wolfgang Engel

Professor of Human Genetics

- Dr. med., Universität Freiburg, 1967
- Physician, Hospital Schorndorf, 1966 - 1968
- Postdoc, Institute of Human Genetics and Anthropology, Universität Freiburg, 1968 - 1977
- Habilitation (Human Genetics), Universität Freiburg, 1974
- Professor of Human Genetics and Director of the Institute, Universität Göttingen, 1977

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Major Research Interests

Our research is focussed on the molecular analysis of normal human variability and genetic disturbances of development and differentiation.
Isolated genes are being analysed in detail with respect to their functional properties by animal models (transgenic and knock-out-mice). For suitable genetic diseases therapeutic strategies (substitution; gene therapy) are being developed and initial evaluation of such strategies is done in the mouse. - We are working on the genotype – phenotype correlations in neurological and cardiovascular diseases (e. g. Spastic paraplegia, Rett syndrome, mental retardation by subtelomeric microdeletions, molybdenum cofactor deficiency; cardiomypathies, Noonan syndrome) and several genetically determined malformation syndromes (e.g. Townes-Brocks syndrome, Okihiro syndrome, Morbus Osler).We are also engaged in the molecular and cellular basis of initiation events of cancer, specifically in prostate cancer, medulloblastoma and rhabdomyosarcoma. - One main interest in our institute is the analysis of structure, expression and function of genes involved in differentiation of male gametes. The knowledge of the function of those genes can help us to clarify the genetic causes of male infertility.
We have started to study differentiation capacity of tumor cells, e.g. teratocarcinoma cells, and succeeded to differentiate these cells into spermatogonial stem cells. When transplanted into tubuli of the testis, these cells differentiate into functional spermatozoa.

Selected Recent Publications

Trappe R, Laccone F, Cobilanschi J, Meins M, Huppke P, Hanefeld F, Engel W (2001) MECP2 mutations in sporadic cases of Rett-syndrome are almost exclusively of paternal origin. American Journal of Human Genetics 68: 1093-1101

Mendoza-Lujambio I, Burfeind P, Dixkens C, Meinhardt A, Hoyer-Fender S, Engel W, Neesen J (2002) The Hook 1 gene is non-functional in the abnormal spermatozoon head shape (azh) mutant mouse. Human Molecular Genetics 11: 1647-1658

Lee H-J, Adham IM, Schwarz G, Kneussel M, Sass JO, Engel W, Reiss J (2002) Molybdenum cofactor-deficient mice resemble the phenotype of human patients. Human Molecular Genetics 26: 3309-3317

Böhm D, Schwelger H, Kotthaus L, Nayernia K, Rickmann M, Köhler M, Rosenbusch J, Engel W, Flügge G, Burfeind P (2002) Disruption of PLC -b1-mediated signal transduction in mutant mice causes age-dependent hippocampal mossy fiber sprouting and neurodegeneration. Molecular and Cellular Neuroscience 21: 584-601

Tascou S, Kang TW, Trappe R, Engel W, Burfeind P (2003) Identification and characterization of NIF3L1 BP1, a novel cytoplasmic interaction partner of the NIF3L1 protein. Biochemical and Biophysical Research 309: 440-448

Nayernia K, Li M, Jaroszynski L, Khusainow R, Wulf G, Schwandt I, Korbiowska M, Michelmann HW, Meinhardt A, Engel W (2004) Stem cells based therapeutical approach of male infertility by teratocarcinoma derived germ cells. Human Molecular Genetics 13: 1451-1460

Ivo Feußner

Professor of Biochemistry

- Diploma (Chemistry), Philipps-University, Marburg (Germany), 1990
- Dr. rer. nat., Philipps-University, Marburg (Germany), 1993
- Leader of an independent research group at the Institute for Plant Biochemistry (IPB), Halle/Saale (Germany), 1997 - 1999
- Habilitation (Biochemistry), Martin-Luther-University, Halle/Saale (Germany), 2000
- Leader of an independent research group at Institute for Plant Genetics and Crop Plant Research (IPK), Gatersleben (Germany), 2000 - 2002
- Since 2002 Professor for Biochemistry, Georg-August-University, Göttingen (Germany)
- Award: Habilitation-Prize of the Ernst Schering Research Foundation (2001)

Major Research Interests

Plant Metabolic Pathways: Our laboratory is currently studying the primary metabolism of plants with main focus on the metabolism of lipids. For this purpose, different approaches ranging from analytical
chemistry to biochemistry and molecular biology were used.
Plant Lipid Metabolism: We are interested in physiological functions of specific lipoxygenases, i.e. their involvement in the degradation of storage lipids during germination and in the destruction of organellar membranes during stress. Another research topic is the analysis of their catalytic mechanism. In addition, lipid peroxidation reactions were analysed in general by metabolomic approaches and by studying the biosynthesis of aldehydes (fruit aromas), hydroxy fatty acids and divinyl ether fatty acids (plant defence). Moreover, enzymes which introduce new functionalities (i.e. conjugated double bonds) in the fatty acid backbone were isolated and characterized in order to obtain new seed oils for biotechnological and medical purposes. In relation to that we are manipulating the primary metabolism and organelle development of seeds in order to increase the oil content of seeds.
Metabolic transport processes: Another research topic is the analysis of the mechanism and regulation of transport processes across the peroxisomal membrane. The biochemistry of phosphoinositides and the transfer of enzymes facilitate the metabolic pathways for lcPUFAs from donor organisms into plants.

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Selected Recent Publications

Weichert H, Kolbe A, Kraus A, Wasternack C, Feussner I (2002) Metabolic profiling of oxylipins in germinating cucumber seedlings – lipoxygenase-dependent degradation of triacylglycerols and biosynthesis of volatile aldehydes. Planta 215: 612-619

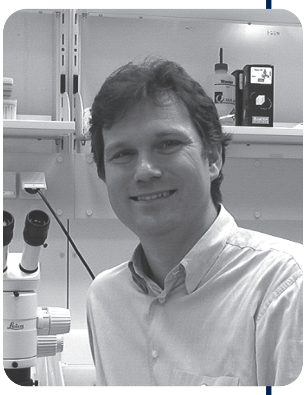
Feussner I, Wasternack C (2002) The lipoxygenase pathway, Ann Rev Plant Biol 53: 275-297

Hornung E, Pernstich C, Feussner I (2002) Formation of conjugated Δ^{11}, Δ^{13}-double bonds by Δ^{12}-linoleic acid (1,4)-acyl-lipid-desaturase in pomegranate seeds. Eur J Biochem 269: 4852-4859

Göbel C, Feussner I, Rosahl S (2003): Lipid peroxidation during the hypersensitive response in potato in the absence of 9-lipoxygenases, J Biol Chem 278: 52834-52840

Senger T, Wichard T, Kunze S, Göbel C, Lerchl J, Pohnert G, Feussner I (2005) A multifunctional lipoxygenase with fatty acid hydroperoxide cleaving activity from the moss *Physcomitrella patens*. J Biol Chem 280: 7588-7596

Ralf Ficner



Professor of Structural Biology

- Dr. rer. nat. (1992) and Postdoc (1993), Max Planck Institute for Biochemistry, Martinsried
- Postdoctoral fellow, EMBL Heidelberg, 1994 - 1996
- Junior Group Leader, University of Marburg, 1997 - 2000
- Appointed 2001 as Head of the Department of Molecular Structural Biology at the University of Göttingen

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Major Research Interests

In order to understand the relationship between the three-dimensional structure and the cellular function of biological macromolecules we determine the structures of proteins and protein-RNA complexes by means of X-ray crystallography. Our current projects concern proteins involved in the splicing and modification of RNA and, as well, proteins required for the nucleocytoplasmic transport, and enzymes of the polysialic acid metabolism.

Selected Recent Publications

Strasser A, Dickmanns A, Lührmann R, Ficner R (2005) Structural basis for m3G-cap-mediated nuclear import of spliceosomal UsnRNPs by snurportin1. EMBO J 24: 2235-43

Dierks T, Dickmanns A, Preusser-Kunze A, Schmidt B, Mariappan M, von Figura K, Ficner R, Rudolph MG (2005) Molecular basis for multiple sulfatase deficiency and catalytic mechanism for formylglycine generation of the human formylglycine generating enzyme. Cell 121 541-552

Stummeyer K, Dickmanns A, Mühlenhoff M, Gerardy-Schahn R, Ficner R (2005) Crystal structure of endosialidase NF - the polysialic acid degrading tailspike of bacteriophage K1F. Nature Struct Mol Biol 12: 90-96

Rudolph MG, Kraus I, Dickmanns A, Eickmann M, Garten W, Ficner R (2003) Crystal structure of the Borna Disease Virus nucleoprotein. Structure 11, 1219-1226

Vidovic I, Nottrott S, Hartmuth K, Lührmann R, Ficner R (2000) Crystal structure of the spliceosomal 15.5kD protein bound to a U4 snRNA fragment. Mol Cell 6: 1331-1342

Kurt von Figura

Professor of Biochemistry

- M.D., University of Tübingen, 1970
- Appointed 1986 as head of the Department of Biochemistry II in the Center of Biochemistry and Molecular Cell Biology, Georg August University Göttingen
- Since January 2005 president of the Georg August University Göttingen

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Major Research Interests

The interest of our group in the biogenesis of lysosomes is stimulated by the existence of a spectrum of congenital disorders in man that affect the function of lysosomes. Our work includes the identification of new molecular defects in human congenital disorders. Transgenic mice are generated to study the function of lysosomal proteins and proteins involved in lysosome biogenesis and used as models for human congenital disorders for the study of the pathophysiology and the effectiveness of new therapeutic approaches. A number of studies have focussed on the identification of lysosomal trafficking signals in membrane proteins, and their recognition by the transport machinery. Current projects focus on the regulation of the interaction of cytoplasmic adaptors with the lysosomal transport signals in membrane proteins, the function of several major lysosomal membrane proteins, a novel protein modification that is required for the catalytic activity of sulfatases and deficient in a human disease and the molecular defects and pathophysiology of a new group of human congenital disorders in which the N-glycosylation of glycoproteins is defective.

Selected Recent Publications

Dierks T, Dickmanns A, Preusser-Kunze A, Schmidt B, Mariappan M, von Figura K, Ficner R, Rudolph MG (2005) Molecular basis for multiple sulfatase deficiency and catalytic mechanism for formylglycine generation of the human formylglycine generating enzyme. Cell 121(4): 541-552

Preusser-Kunze A, Mariappan M, Schmidt B, Gande SL, Mutenda K, Wenzel D, von Figura K, Dierks T (2005) Molecular characterization of the human C_α-formylglycine generating enzyme. J Biol Chem 280: 14900-14910

Mariappan M, Preusser-Kunze A, Balleininger M, Eiselt N, Schmidt B, Gande SL, Wenzel D, Dierks T, von Figura K (2005) Expression, localization, structural and functional characterization of pFGE, the paralog of the C_α-formylglycine generating enzyme. J Biol Chem 280: 15173-15189

Prieto Roces D, Lüllmann-Rauch R, Peng J, Balducci C, Andersson C, Tollersurd O, Fogh J, Orlacchio A, Beccari T, Saftig P, von Figura K (2004) Efficacy of enzyme replacement therapy in α-mannosidosis mice. A preclinical animal study. Human Mol Genetics 13: 1979-1988

Schwarz M, Thiel C, Lübbehusen J, Dorland B, de Koning T, von Figura K, Lehle L, Körner C (2004) Deficiency of GDP-Man:$GlcNAc_2$-PP-dolichol mannosyltransferase causes Congenital Disorder of Glycosylation-Ik. Am J Hum Genet 74: 472-481

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Group Leader at the MPI for Biophysical Chemistry

- Dr. rer. nat. (PhD), University of Tübingen, Germany, 2001
- Graduate Research Fellow, The J. David Gladstone Institute (UCSF), San Francisco, CA, USA, 1997 - 2001
- Postdoctoral Fellow, The Rockefeller University, New York, NY, USA, 2001 - 2005
- Damon Runyon Cancer Research Fellow, 2002 - 2005
- Independent Group Leader, Max Planck Institute for Biophysical Chemistry, Göttingen, Germany, since 2005

Major Research Interests

Chromatin is the physiological template of genetic information controlling the capacity of a cell's genome to store, release, and inherit biological information. The fundamental unit of chromatin is the nucleosome: a stretch of DNA wrapped around a core of histone proteins (H2A, H2B, H3 and H4). Post-translational modifications of histones have emerged as key for regulating chromatin structure and are thought to crucially control chromatin dynamics and genome activity. Whereas more and more histone modification marks are being identified that alone or in combination could mediate distinct biological conditions of a cell and while correlative studies have begun to establish unambiguous links between several states of chromatin, various histone modifications, and diverse biological processes, our knowledge of how certain histone modifications exert their biological effects on a molecular/biochemical level is still very limited.

Due to their long-term stability, histone lysine methyl-marks are of particular interest to us, since they might be involved in establishing and maintaining durable and inheritable gene expression profiles (so called 'epi-genetic' regulation). Current projects include the study of Polycomb, HP1, and MBT proteins that bind to and act as effectors of distinct histone lysine methyl-marks. We are especially interested in the interplay of these factors and their cognate histone marks in regulating chromatin organization and dynamics. Furthermore, we are trying to identify and characterize novel binding proteins of various other histone modifications.

The long-term goal of our research is to gain mechanistic insight(s) into the signaling mechanisms and biological role of single but also combinations of histone modification marks and to understand how certain states of chromatin regulate the functionality of a cells genome. To this end, we aim to reconstitute chromatin-signaling pathways in recombinant and cell free systems and study their epi-genetic regulatory circuits in various biological model systems (i.e. *Xenopus laevis*, mice, tissue culture).

Selected Recent Publications

Fischle W, Tseng BS, Dormann H, Ueberheide BM, Garcia BA, Shabanowitz J, Hunt DF, Funabiki H, Allis CD (2005) Regulation of HP1-chromatin binding by histone H3 methylation and phosphorylation. Nature Oct 12; [Epub ahead of print]

Yamada T, Fischle W, Allis CD, Grewal SIS (2005) The nucleation and maintenance of heterochromatin by a histone deacetylase in fission yeast. Molecular Cell 20: 1-13

Fischle W, Wang Y, Allis CD (2003) Binary switches and modification cassettes in histone biology and beyond. Nature 425: 475-479

Fischle W, Wang Y, Jacobs SA, Kim Y, Allis CD, Khorasanizadeh S (2003) Molecular basis for the discrimination of repressive methyl-lysine marks in histone H3 by Polycomb and HP1 chromodomains. Genes & Development 17: 687-698

Fischle W, Dequiedt F, Hendzel M, Guenther MG, Lazar MA, Voelter W, Verdin E (2002) Enzymatic activity associated with class II HDACs is dependent on a multiprotein complex containing HDAC3 and SMRT/N-CoR. Molecular Cell 9: 45-57

Chen Lf, Fischle W, Verdin E, Greene WC (2001) Duration of nuclear NF-kappaB action regulated by reversible acetylation. Science 293: 1653-1657

Christiane Gatz

Professor of Plant Molecular Biology

- Dr. rer.nat. (1985) at the Institute for Biochemistry, Technical University Darmstadt
- Postdoctoral fellow at the University of Wisconsin, Madison, USA (1985 - 1987)
- Habilitation in Molecular Genetics at the Freie Universität Berlin in 1992
- Professor at the University of Bielefeld (1993 – 1995)
- Alfried Krupp von Bohlen und Halbach-Award for young university professors (1994)
- Professor at the University of Göttingen since 1996

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Major Research Interests

Plants are constantly exposed to attack by pathogenic microorganisms like fungi, viruses and bacteria. To combat these infections, plants have evolved efficient defense responses, many of them requiring induction of gene expression. A particularly interesting phenomenon is the systemic acquired resistance (SAR). If a pathogen is recognized by a specific plant resistance machinery, hypersensitive cell death occurs at the site of the infection, which limits spread of the pathogen. Subsequently, levels of salicylic acid (SA) rise throughout the plant. SA is sufficient and necessary to induce a subset of defense gene, which leads to resistance against a broad range of pathogens, which would normally be highly infectious. We are interested in the transcriptional regulation of defense genes by SA. We have isolated transcription factors whose activity is regulated by SA by a yet unknown mechanism. We are addressing the question of regulation using genetic, molecular and biochemical tools.

The second project deals with "indirect defense" mechanisms of plants against insects. When insects feed on plants, plants emit volatiles to attract the enemies of the insect. We are interested in the transcriptional regulation of biosynthetic genes leading to the synthesis of volatiles.

Selected Recent Publications

Niggeweg R, Thurow C, Weigel R, Pfitzner U, Gatz C (2000) Tobacco TGA factors differ with respect to interaction with NPR1, activation potential and DNA-binding properties. Plant Mol Biol 42: 775-788

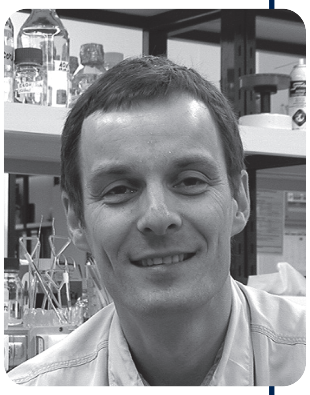
Niggeweg R, Thurow C, Kegler C, Gatz C (2000) Tobacco transcription factor TGA2.2 is the main component of ASF-1/SARP and is involved in salicyclic acid- and auxin-inducible expression of as-1-containing target promoters. J Biol Chem 275: 19897-19905

Krawczyk S, Thurow C, Niggeweg R, Gatz C (2001) Analysis of the spacing between the two palindromes of activation sequence-1 with respect to binding to different TGA factors and transcriptional activation potential. Nucleic Acids Res 30: 775-781

Thurow C, Schiermeyer A, Krawczyk S, Butterbrodt T, Nickolov K, Gatz C (2005) Tobacco bZIP transcription factor TGA2.2 and related factor TGA2.1 have distinct roles in plant defense responses and plant development. Plant J 44: 100-113

Weigel RR, Pfitzner UM, Gatz C (2005) Interaction of NIMIN1 with NPR1 modulates PR gene expression in *Arabidopsis*. Plant Cell 17: 1279-1291

Christian Griesinger



Professor, Director at the Max Planck Institute for Biophysical Chemistry, Göttingen

- Dr. phil. nat. University of Frankfurt (1986, Prof. Dr. H. Kessler)
- Postdoctoral Fellow at Lab. for Physical Chemistry, ETH Zürich (1986 - 1989, Prof. Dr. R. R. Ernst)
- Full Professor for Organic Chemistry at the University of Frankfurt (1990 - 2000)
- Appointed as Director at the Max Planck Institute for Biophysical Chemistry (1999)

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030

Major Research Interests

Our group focuses on the structure and dynamics of biomolecules and their complexes. We use to this end nuclear magnetic resonance (NMR) spectroscopy as well as X-ray crystallography. We apply solution state and solid state NMR spectroscopy to biomolecules and their complexes in their physiological environment, be it water for cytosolic proteins or lipids for membrane proteins. The methods developments are pursuing the following goals:
Relaxation compensated methods to increase the molecular weight of biomolecules that are amenable for NMR investigations. This is tackled by new NMR pulse techniques, novel schemes for labelling the biomolecules with isotopes and the usage of optimized expression schemes. New NMR derived parameters that allow to define biomolecular structure and dynamics better are derived and applied e.g. to DNA binding proteins, spliceosomal RNA, a bacterial sensor and proteins involved in signal transduction and apoptosis and for the investigation of enzyme mechanisms.
Development of NMR methods to assign and determine the structure of isotopically labeled membrane-proteins and peptides with solid state NMR spectroscopy on oriented samples or using magic angle sample spinning on several systems including a 150 kD membrane-Protein and the complex of a peptide and a G-protein coupled receptor.

Selected Recent Publications

Reif B, Hennig M, Griesinger C (1997) Direct measurement of angles between bond vectors in high resolution NMR. Science 276: 1230-1233

Marino JP, Schwalbe H, Griesinger C (1999) J-coupling restraints for structural refinements of RNA. Acc Chem Res 32: 614-632

Bartoschek S, Johannson M, Geierstanger BH, Okun JG, Lancaster CRD, Humpfer E, Yu L, Yu CA, Griesinger C, Brandt U (2001) Three molecules of ubiquinone bind specifically to mitochondrial cytochrome bc1 complex. J Biol Chem 276: 35231-35234

Peti W, Meiler J, Brüschweiler R, Griesinger C (2002) Model free analysis of protein backbone motion from residual dipolar couplings. J Am Chem Soc 124: 5822-5833

Carlomagno T, Blommers MJJ, Meiler J, Jahnke W, Schupp T, Petersen F, Schinzer D, Altmann K-H, Griesinger C (2003) The high-resolution solution structure of epothilone a bound to tubulin: An understanding of the structure-activity relationships for a powerful class of antitumor agents. Angew Chem 115: 2615-2619, Angew Chem Int Ed 42: 2511-2515

Pappalardo L, Janausch IG, Vijayan V, Zientz E, Junker J, Peti W, Zweckstetter M, Unden G, Griesinger C (2003) The NMR structure of the sensory domain of the membrancous two-component fumarate sensor (histidine protein kinase) DcuS of *Escherichia coli*". J Biol Chem 278: 39185 - 39188

Uwe Groß

Professor of Medical Microbiology

- M.D., University of Hamburg 1987
- Postdoctoral fellow, UC Los Angeles, California, 1987 - 1989
- Professor of Medical Parasitology, University of Würzburg 1998/1999
- Appointed 1999 as head of the Department of Medical Microbiology, University of Göttingen

Major Research Interests

The protozoan parasite *Toxoplasma gondii* usually causes asymptomatic infections in immunocompetent adults leading to lifelong persistence especially in the brain and in muscle tissue. Life-threatening reactivation of such infection might occur in immunocompromised individuals (i. e. patients suffering from AIDS). This parasite serves as a model organism for studying evasion mechanisms of intracellular pathogens.

We are interested in the cross-talk between the parasite and its host cell on a molecular level. We could demonstrate that the parasite (i) modulates the host cell capacity for MHC-restricted antigen presentation and (ii) inhibits apoptosis of the infected cell. Both mechanisms allow intracellular persistence. Vice versa, the host's immune response determines the fate of the parasite by direct interference with differentiation processes of *Toxoplasma gondii*. The precise molecular events for these strategies of intense interplay between both partners are currently under our investigation.

Recently, we as well have started to analyse host-pathogen crosstalk of *Chlamydia pneumoniae* in order to compare the pathogenesis of intracellular eukaryotes with those of procaryotes. In this respect, we concentrate on the type III secretion system of *Chlamydia* which by injecting effector proteins into the cytosol of its host cell is able to modulate important functions such as antigen presentation and apoptosis.

In addition, we are appointed the *National Reference Center for Systemic Mycoses*. In this respect, we are inverstigating fungal factors and mechanisms that are involved in pathogenesis of mycoses; i.e. cell wall structure and differentiation processes.

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Selected Recent Publications

Lüder CGK, Groß U (2005) Apoptosis and its modulation during infection with *Toxoplasma gondtii*: molecular mechanisms and role in pathogenesis. Curr Topics Microbiol Immunol 289: 219-238

Schmidt-Ott R, Burghard S, Pohl S, Weig M, Groß U (2005) Identification and characterization of a major subgroup of *Campylobacter jejuni* plasmids. J Infect 50: 12-21

Fasshauer V, Groß U, Bohne W (2005) The parasitophorous vacuole membrane of Encepalitozoon cuniculi lacks host cell membrane proteins immediately after invasion. Eukaryot Cell 4: 221-224

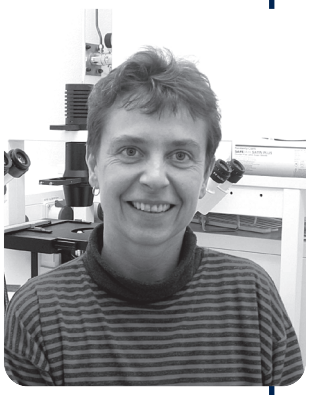
Gail M, Groß U, Bohne W (2004) Transferrin receptor induction in *Toxoplasma gondii* – infected HFF is associated with increased iron-responsive protein 1 activity and is mediated by secreted factors. Parasitol Res 94: 233-239

Weig M, Jäntsch L, Groß U, de Koster CG, Klis FM, de Groot PWJ (2004) Systematic identification in silico of covalently bound cell wall proteins and analysis of protein-polysaccharide linkages of the human pathogen *Candida glabrata*. Microbiology 150: 3129-3144

Lugert R, Kuhns M, Polch T, Groß U (2004) Expression and localization of type III secretion- related proteins of *Chlamydia pneumoniae*. Med Microbiol Immunol 193: 163-171

Lüder CGK, Algner M, Lang C, Bleicher N, Groß U (2003) Reduced expression of the inducible nitric oxide synthase after infection with *Toxoplasma gondii* facilitates parasite replication in activated murine macrophages. Int J Parasitol 33: 833-844

Heidi Hahn



Professor of Molecular Developmental Genetics

- Dr. med., University of Würzburg, 1992
- Postdoctoral Fellow, National Institutes of Health, Bethesda, Maryland, USA (1993 - 1998)
- Junior Group Leader (BioFuture), Technical University of Munich (1999 - 2000)
- Professor of Molecular Developmental Genetics, University of Göttingen since 2001

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Major Research Interests

Hedgehog (Hh) signaling molecules play a key role in the patterning of numerous tissues during development. Hh signaling is initiated by binding of Hh to its receptor Patched (Ptch). This binding suspends the inhibitory action of Ptch on its signaling partner Smo. Smo is activated and the signaling pathway is turned on. The pathway can also be activated by mutational inactivation of Ptch or by activating mutations in either Hh or Smo and we were able to show that this pathological activation results in developmental defects and in tumor formation in humans and mice.

The goal of our group is to characterize the role of the Hh signaling pathway in the diseased state by identification of its cellular targets and by characterization of its interaction with other signaling pathways. This is achieved by the application of modern genetic techniques (e.g. microarray analysis) to human and murine tumors and cell lines with mutations in one or more components of the pathway. This approach should help to develop molecular diagnostics for Hh-related malignancies as well as to identify targets for therapeutic interventions.

Selected Recent Publications

Chang-Claude J, Dunning A, Schnitzbauer U, Galmbacher P, Tee L, Wjst M, Chalmers J, Zemzoum I, Harbeck N, Pharoah PDP, Hahn H (2003) The Patched Polymorphism Pro1315Leu (C3944T) may modulate the association between use of oral contraceptives and breast cancer risk. Int J Cancer 103(6): 779-83

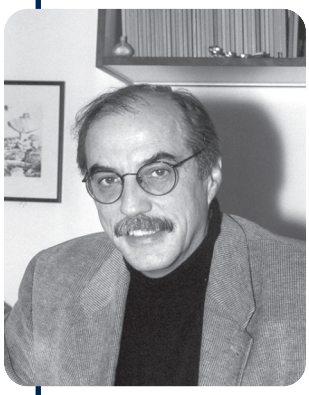
Pazzaglia S, Mancuso M, Tanori M, Atkinson MJ, Merola P, Rebessi S, Di Majo V, Covelli V, Hahn H, Saran A (2004) Modulation of Patched-associated susceptibility to radiation induced tumorigenesis by genetic background. Cancer Research 64(11): 3798-806

Kappler R, Bauer R, Calzada-Wack J, Rosemann M, Hemmerlein B, Hahn H (2004) Profiling the molecular difference between Patched1- and p53-dependent rhabdomyosarcoma. Oncogene 23(54): 8785-95

Koleva M, Kappler R, Vogler M, Herwig A, Fulda S, Hahn H (2005) Pleiotropic effects of sonic hedgehog on muscle satellite cells. Cell Mol Life Sci 62(16): 1863-1870

Pazzaglia S, Tanori M, Mancuso M, Rebessi S, Leonardi S, Di Majo V, Covelli V, Atkinson MJ, Hahn H, Saran S (in press) Linking DNA damage to medulloblastoma tumorigenesis in Patched heterozygous mice. Oncogene

Herbert Jäckle



Professor, Director at the Max Planck Institute for Biophysical Chemistry

- Faculty member at the EMBL, Heidelberg (1980 - 1982)
- Head of the group (associate professor), Max Planck Institute for Developmental Biology, Tübingen (1982 - 1988)
- Professor and Chairman, Dept. of Genetics and Microbiology, Univ. of Munich (1988 - 1991)

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Major Research Interests

How is the embryo generated from a single cell, the egg? We address this question by using the *Drosophila* embryo as an experimental system, applying the combined tools of classical embryology, genetics, molecular biology and biochemistry. We have focussed our efforts to isolate and characterize the factors underlying early pattern formation along the anterior-posterior axis of the embryo. We sought to unravel their mode of action und the molecular mechanism in which they function.
Many of the factors required to establish the basic body plan are also necesssary for organ formation, a process which involves local inductive interactions between groups of cells and/or epithelial cell layers. We have started to identify the genetic components and regulatory circuitries involved in organogenesis as well as in neural conductivity and function. We also use the fly to identify the components of novel biochemical pathways and cellular key components that control and maintain homeostasis and energy balance, and we initiated a gene discovery program to systematically characterize the function of genes on the *Drosophila* X-chromosome.

Selected Recent Publications

Peter A, Schöttler P, Werner M, Beinert N, Dowe G, Burkert P, Mourkioti F, Dentzer L, He Y, Deak P, Benos PV, Gatt MK, Murphy L, Harris D, Barrell B, Ferraz C, Vidal S, Brun C, Demaille J, Cadieu E, Dreano S, Gloux S, Lelaure V, Mottier S, Galibert F, Borkova D, Miñana B, Kafatos FC, Bolshakov S, Sidén-Kiamos I, Papagiannakis G, Spanos L, Louis C, Madueño E, de Pablos B, Modolell J, Bucheton A, Callister D, Campbell L, Henderson NS, McMillan PJ, Salles C, Tait E, Valenti P, Saunders RDC, Billaud A, Pachter L, Klapper R, Janning W, Glover DM, Ashburner M, Bellen HJ, Jäckle H, Schäfer U (2002) Mapping and identification of essential gene functions on the X chromosome of *Drosophila*. EMBO reports 3: 34-38

Carrera P, Moshkin YM, Grönke S, Silljé HHW, Nigg EA, Jäckle H, Karch F (2003) Tousled-like kinase functions with the chromatin assembly pathway regulating nuclear divisions. Genes Dev 17: 2578-2590

Steigemann P, Molitor A, Fellert S, Jäckle H, Vorbrüggen G (2004) Heparan sulfate proteoglycan Syndecan promotes axonal and myotube guidance by Slit/Robo signaling. Curr Biol 14: 225-230

Grönke S, Mildner A, Fellert S, Tennagels N, Petry S, Müller G, Jäckle H, Kühnlein RP (2005) Brummer lipase is an evolutionary conserved fat storage regulator in *Drosophila*. Cell Metabolism 1: 323-330

Reinhard Jahn

Professor, Director at the Max Planck Institute for Biophysical Chemistry

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

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Major Research Interests

Our group is interested in the mechanisms of membrane fusion, with the main emphasis on regulated exocytosis in neurons. Since recent years it is known that 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. The neuronal SNAREs are among the best characterized. They are the targets of the toxins responsible for botulism and tetanus. To understand how these proteins make membranes fuse, we studied their properties in detail using biochemical and biophysical approaches. We found that they assemble into a tight complex which ties the membrane closely together and thus probably initiates bilayer mixing.

In our current approaches, we study membrane fusion at the level of isolated proteins as well as in semi-intact and intact cells. Thus, we are investigating conformational changes of the SNARE proteins before and during fusion. Furthermore, we use reconstitution of membrane fusion in cell-free assays and in proteoliposomes. Other projects of the group include the study of neurotransmitter uptake by synaptic vesicles and the function of Rab-GTPases in neuronal exocytosis.

Selected Recent Publications

Takamori S, Rhee JS, Rosenmund C, Jahn R (2000) Identification of a vesicular glutamate transporter that defines a glutamatergic phenotype in neurons. Nature 407: 189-194

Fasshauer D, Antonin W, Subramaniam V, Jahn R (2002) SNARE assembly and disassembly exhibit a pronounced hysteresis. Nature Struct Biol 9: 144-151

Holroyd P, Lang T, Wenzel D, De Camilli P, Jahn R (2002) Imaging direct, dynamin-dependent recapture of fusing secretory granules on plasma membrane lawns from PC12 cells. Proc Natl Acad Sci USA 99: 16806-16811

Jahn R, Lang T, Südhof TC (2003) Membrane fusion. Cell 112: 519-533

Schuette CG, Hatsuzawa K, Margittai M, Stein A, Riedel D, Küster P, König, M., Seidel, C.A.M., Jahn, R. (2004) Determinants of liposome fusion mediated by synaptic SNARE proteins. Proc Natl Acad Sci 101: 2858-2863

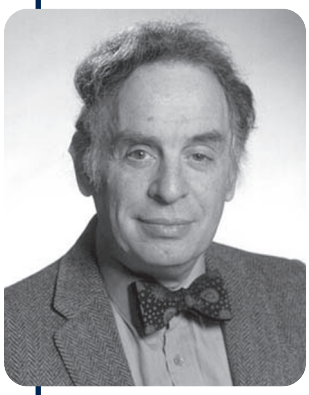
Graf C, Riedel D, Schmitt HD, Jahn R (2005) Identification of functionally interacting SNAREs using complementary substitutions in the conserved '0' layer. Mol Biol Cell 16: 2263-2274

Sakaba T, Stein A, Jahn R, Neher E (2005) Cleavage of the three SNARE-proteins synaptobrevin, syntaxin, and SNAP-25 leads to distinct kinetic changes in neurotransmitter release. Science, in press

Thomas M. Jovin

Chairman, Department of Molecular Biology and Director at the Max Planck Institute for Biophysical Chemistry

- B.S. California Institute of Technology, Pasadena, CA 1960
- M.D. Johns Hopkins Medical School, Baltimore, MD 1964
- Scientific Member, Max Planck Society 1969



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Current Research Interests

Structural studies of nucleic acids; complexes with proteins and ligands
Exotic helical structures: parallel-stranded DNA; triple helices; Z-DNA. Protein–DNA interactions: p53, α-synuclein, snRNPs.

Signal transduction of eukaryotic cells
Receptor tyrosine kinase activation, transport, and internalization; downstream signaling (MAPK cascade); and mechanism of antibody-based tumor therapy. Further development of Fluorescence Resonance Energy Transfer (FRET) as a probe of protein-protein interactions in the cellular application of quantitative microscopy. Quantum dot ligands and functional expression probes for proteins and nucleic acids in the microscopy of live cells.

Optical and scanning-probe microscopy
Development and application of novel microscopes for cellular and molecular studies: temperature-controlled atomic force (AFM), fluorescence lifetime (FLIM), fluorescence correlation (FCM), (programmable optical sectioning, PAM), and single molecule dynamics.

Structure and function of α-synuclein (protein involved in Parkinson's disease)
Biochemical, biophysical, spectroscopic, and cell biological studies: intrinsic structure, ligand binding, and mechanism of aggregation.

Selected Recent Publications

Bertoncini CW, Jung Y-S, Fernández CO, Hoyer W, Griesinger C, Jovin TM, Zweckstetter M (2005) Release of long-range tertiary interactions potentiates aggregation of natively unstructured α-synuclein. Proc Natl Acad Sci USA 102: 1430-1435

Cojocaru V, Nottrott S, Klement R, Jovin TM (2005) The snRNP 15.5K protein folds its cognate K-Turn RNA. A combined theoretical and biochemical study. RNA 11: 197-209

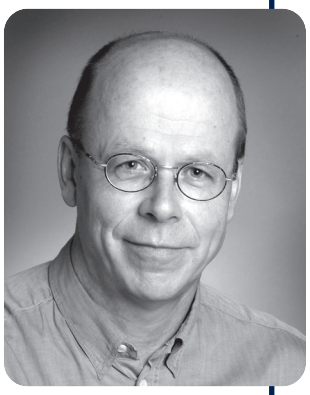
Hanley QS, Lidke KA, Heintzmann R, Arndt-Jovin DJ, Jovin TM (2005) Fluorescence lifetime imaging in an optically sectioned Programmable Array Microscope (PAM). Cytometry 67A: 112-118

Lidke DS, Lidke KA, Rieger B, Jovin TM, Arndt-Jovin DJ (2005) Reaching out for signals: filopodia sense EGF and respond by directed retrograde transport of activated receptors. J Cell Biol 170: 619-626

Lidke KA, Rieger B, Jovin TM, Heintzmann R (2005) Superresolution by localization of quantum dots using blinking statistics. Opt. Express 13: 7052-7062

Nagy P, Friedländer E, Tanner M, Kapanen AI, Carraway KL, Isola J, Jovin TM (2005) Decreased accessibility and lack of activation of erbB2 in JIMT-1, a Herceptin-resistant, MUC-4-expressing breast cancer cell line. Cancer Res. 65: 473-482

Michael Kessel



Professor of Molecular Biology

- Until 1981 Biochemical Institute, Kiel University
- 1981 - 1983 National Cancer Institute, NIH, Bethesda,USA
- 1983 - 1986 Center for Molecular Biology (ZMBH), Heidelberg University
- Since 1987 Max Planck Institute for Biophysical Chemistry, Göttingen

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Major Research Interests

The group studies patterning processes in early chick and mouse embryos, in particular during gastrula and neurula stages. The primitive embryonic ectoderm, the epiblast, gives rise to the three germ layers, the definitive ecto-, endo- and mesoderm, which interact during the transition from pattern formation to organogenesis. We study these processes by applying molecular and embryological techniques, including expression analysis, transplantation in embryo culture, large scale screening of expressed sequence tags, *in vivo* gene transfer by electroporation, and gene knock-out technology.

We identified the Geminin protein as a mediator between cell cycle progression and the control of axial specification. Geminin interacts with homeodomain proteins of the Hox family and inhibits their binding to DNA and their function as transcriptional activators. In addition, Geminin is a transient member of the Polycomb complex, where it is involved in the maintenance of Hox gene repression. Our goal is an understanding of the coordination between proliferation and pattern formation.

Selected Recent Publications

Boettger T, Wittler L, Kessel M (1999) FGF8 functions in the specification of the right body side of the chick. Current Biology 9: 277-280

Pera E, Stein S, Kessel M (1999) Ectodermal patterning in the avian embryo: epidermis versus neural plate. Development 126: 63-73

Roeser T, Stein S, Kessel M (1999) Nuclear beta-catenin and the development of bilateral symmetry in normal and LiCl-exposed chick embryos. Development 126: 2955-2965

Luo L, Kessel M (2004) Geminin coordinates cell cycle and developmental control. Cell Cycle 3: 711-714

Luo L, Yang X, Takihara Y, Knoetgen H, Kessel M (2004) The cell-cycle regulator geminin inhibits Hox function through direct and polycomb-mediated interactions. Nature 427: 749-53

Spieler D, Baumer N, Stebler J, Koprunner M, Reichman-Fried M, Teichmann U, Raz E, Kessel M, Wittler L (2004) Involvement of Pax6 and Otx2 in the forebrain-specific regulation of the vertebrate homeobox gene ANF/Hesx1. Developmental Biology 269: 567-79

Wittler L, Kessel M (2004) The acquisition of neural fate in the chick. Mechanisms of Development 121: 1031-42

Pitulescu M, Kessel M, Luo L (2005) The regulation of embryonic patterning and DNA replication by Geminin. Cellular and. Molecular. Life Science 62: 1425-1433

Dieter Klopfenstein

Junior Group Leader at the Centre for Molecular Physiology of the Brain, University of Göttingen

- Dr. phil. nat. (Ph.D.) University of Basel, 1999
- Postdoctoral fellow at the University of California San Francisco, 1999 - 2003
- Since 2003 head of an independent Junior Research Group

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Major Research Interests

The long-range transport of membrane organelles in neurons depends primarily upon microtubules and motor proteins that move unidirectionally along these tracks. One type of microtubule-based motor proteins powering membrane transport is the kinesin superfamily. We are interested in how these motors achieve specificity in cargo binding, elicit membrane transport, and the regulation of transport activity. One example of a kinesin motor is UNC-104/KIF1A, which specifically transports presynaptic vesicle to the synaptic terminal and binds with its tail domain directly to membrane lipids in vitro. This unique cargo-interaction mechanism help us to understand how lipids and their membrane environment contribute to cargo transport, how motor-lipid interaction could be regulating transport, and how accessory proteins contribute to membrane motility. Using fluorescently tagged motor and vesicle markers we investigate these questions in the nervous system of the nematode *C. elegans* serves us as a model system for microscopic tools (confocal, TIRF, FRET FLIM) and biochemical transport assays *in vitro*.

Selected Recent Publications

Klopfenstein DR, Vale RD (2004) The Lipid Binding Pleckstrin Homology Domain in UNC-104 Kinesin is Necessary for Synaptic Vesicle Transport in *Caenorhabditis elegans*. Mol Biol Cell 15(8): 3729-39

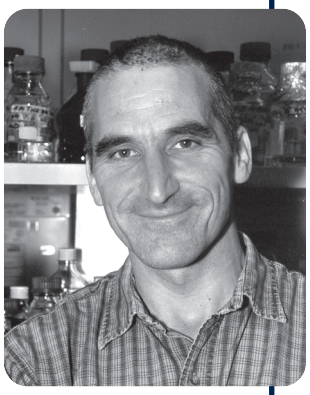
Al-Bassam J, Cui Y, Klopfenstein D, Carragher BO, Vale RD, Milligan RA (2003) Distinct conformations of the kinesin Unc104 neck regulate a monomer to dimer motor transition. J Cell Biol 163(4): 743-53

Tomishige M, Klopfenstein DR, Vale RD (2002) Dimerization triggers fast, processive movement of single Unc104/KIF1A kinesin motor along microtubules. Science 297(5590): 2263-2267

Klopfenstein DR, Tomishige M, Stuurman N, Vale RD (2002) Role of phosphatidylinositol(4,5)bisphosphate organization in membrane transport by the Unc104 kinesin motor. Cell 109(3): 347-58

Klopfenstein DR, Vale RD, Rogers SL (2000) Motor protein receptors: Moonlighting on other jobs. Cell 103(4): 537-40

Willhart Knepel



Professor of Molecular Pharmacology

- Dr. rer. nat., University of Freiburg i. Br., Germany, 1980
- Habilitation, University of Freiburg i. Br., Germany, 1985
- Research Fellow, Laboratory of Molecular Endocrinology, Harvard Medical School, Boston, MA, USA, 1987 - 1990
- Joined Medical Faculty of the University of Göttingen 1991

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Major Research Interests

The main interest of the laboratory is in the molecular mechanisms of gene transcription. Transient transfections of reporter fusion genes, transgenic mice, and other molecular biology techniques are used to study the mechanisms of cell-specific and signal-induced gene transcription, and how drugs interfere with these mechanisms to produce pharmacological effects. 1. The pancreatic islet hormone glucagon is a biological antagonist of insulin and regulates blood glucose levels. Enhanced synthesis and secretion of glucagon contributes to increased hepatic glucose output and hyperglycemia in diabetes mellitus. We study the mechanisms which activate the glucagon gene in pancreatic islet a cells as well as signaling pathways to the glucagon gene induced by cAMP, membrane depolarization, and insulin. 2. We study the regulation of glucagon gene transcription by the new group of oral antidiabetic drugs, the thiazolidinediones. These so-called 'insulin sensitizers' may improve insulin action in part through an effect on glucagon. 3. The ubiquitously expressed, cAMP- and calcium-regulated transcription factor CREB is affected by several classes of drugs. We study how the immunosuppressive drugs cyclosporin A and FK506 (tacrolimus) inhibit CREB-mediated transcription. This effect may underlie their pharmacological effects, both desired and undesired. Using transgenic mice and an animal model of depression, we also study whether treatment with antidepressants alters CREB-mediated transcription in order to better understand the molecular mechansims of action of antidepressant drugs.

Selected Recent Publications

Beimesche S, Neubauer A, Herzig S, Grzeskowiak R, Diedrich T, Cierny I, Scholz D, Alejel T, Knepel W (1999) Tissue-specific transcriptional activity of a pancreatic islet cell-specific enhancer sequence/Pax6-binding site determined in normal adult tissues *in vivo* using transgenic mice. Mol Endocrinol 13: 718-728

Siemann G, Blume R, Grapentin D, Oetjen E, Schwaninger M, Knepel W (1999) Inhibition of cyclic AMP response element-binding protein/cyclic AMP response element-mediated transcription by the immunosuppressive drugs cyclosporin A and FK506 depends on the promoter context. Mol Pharmacol 55: 1094-1100

Herzig S, Füzesi L, Knepel W (2000) Heterodimeric Pbx-Prep1 homeodomain protein binding to the glucagon gene restricting transcription in a cell type-dependent manner. J Biol Chem 275: 27989-27999

Grzeskowiak R, Amin J, Oetjen E, Knepel W (2000) Insulin responsiveness of the glucagon gene conferred by interactions between proximal promoter and more distal enhancer-like elements involving the paired-domain transcription factor Pax6. J Biol Chem 275: 30037-30045

Schinner S, Dellas C, Schröder M, Heinlein C, Chang C, Fischer J, Knepel W (2002) Repression of glucagon gene transcription by peroxisome proliferator-activated receptor γ through inhibition of Pax6 transcriptional activity. J Biol Chem 277: 1941-1948

Wilfried Kramer

Privatdozent Molecular Biology and Genetics

- Diploma (Biology), University of Cologne, Germany, 1982
- Dr. rer. nat., University of Cologne, Germany, 1986
- Postdoctoral Fellow, University of California, Berkeley, USA, 1986 - 1989
- Habilitation in Molecular Biology and Genetics, University of Göttingen, Germany, 2000
- At the Dept. of Molecular Genetics since 1989

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Major Research Interests

Besides being fast and highly accurate, the most important demand on replication of DNA is that is has to be completed. While this may sound trivial on first glance, many obstacles like protein-DNA complexes and damaged nucleotides on the template strand can prevent replication fork progression. It is estimated that at least one fork arrest occurs per replication round in *E. coli*. Therefore, all organisms analysed so far in detail possess several pathways to reactivate stalled replication forks. We discovered that the baker´s yeast Mph1 protein defines a hitherto unknown pathway for replication restart, which is apparently also operating in higher eukaryotes including humans. One question we are interested in is the exact mechanism, by which this pathway works. We are also interested in positioning this pathway within the complex cellular network of replication reinitiation mechanisms, where two principle possibilities for fork reactivation can be found: one being quite safe, but acting on the expense of replicational fidelity, whereas the other is error-free, but bears the inherent danger of genomic rearrangements. Therefore, we are also interested in the regulatory mechanisms that guide the choice of the cell for one or the other possibility as well as the conditions that are sensed by the regulatory proteins.

Selected Recent Publications

Rudolph C, Schürer KA, Kramer W (2005) Facing stalled replication forks: The intricacies of doing the right thing. In: Genome Dynamics and Stability: Facets of Genome Integrity. Lankenau DH (Ed). Springer Verlag Heidelberg. in press (Review)

Prakash R, Krejci L, van Komen S, Schürer KA, Kramer W, Sung P (2005) *Saccharomyces cerevisiae* MPH1 gene, required for homologous recombination-mediated mutation avoidance, encodes a 3' to 5' DNA helicase. J Biol Chem 280: 7854-7860

Schürer KA, Rudolph C, Ulrich HD, Kramer W (2004) Yeast MPH1 gene functions in an error-free DNA damage bypass pathway that requires genes from homologous recombination, but not from postreplicative repair. Genetics 166: 1673-1686

Laging M, Lindner E, Fritz H-J, Kramer W (2003) Repair of hydrolytic DNA deamination damage in thermophilic bacteria: Cloning and characterization of a Vsr endonuclease homolog from *Bacillus stearothermophilus*. Nucl Acids Res 31: 1913-1920

Meyer C, Scheller J, Kramer W (2001) Transcription of mutS- and mutL-homologous genes during meiosis in S*accharomyces cerevisiae* and identification of a regulatory cis-element for meiotic induction of MSH2. Mol Gen Genomics 265: 826-836

Kerstin Krieglstein

Professor of Anatomy/Neuroanatomy

- Dr. rer. nat., University of Gießen, Germany, 1990
- Postdoctoral fellow, University of California, Irvine, 1990 - 1992
- Professor of Anatomy, University of Saarland, 1999 - 2001
- Appointed 2001 as head of the Department of Anatomy/Neuroanatomy, University of Göttingen

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Major Research Interests

The nervous system is a complex network of billions of neurons building appropriate connections and transmitting the information required. Although the nervous system has a lifelong synaptic plasticity, it is essentially built just once with very little regenerative capacity, meaning that neurons have to survive and function for lifetime. Loss of neurons will eventually lead to functional impairments such as those found in Alzheimer's, Parkinson's or ALS patients.

We are interested in the understanding of the regulation of neuronal survival and death. Recent advancements in the field have provided clear evidence that neuronal survival is caused by synergistic actions of neurotrophic factors along with other cytokines most prominently from the TGF-ß superfamily. Synergisms of TGF-ß in combination with neurotrophic factors, like GDNF or NGF, will be studied to establish their role in nervous system development and their therapeutic potential in brain repair. Specifically, we shall investigate such synergisms by utilising mouse mutants to understand the developmental role and by emplying genomic screens to identify new target genes for the establishment of new therapeutic strategies for human neurodegenerative disorders. Furthermore, as growth factors function not only in the decision of neuron survival or death, we shall explore their morphogenetic and differentiation capacities employing the powerful potential of embryonic (ES) and CNS stem cells.

Selected Recent Publications

Krieglstein K, Henheik P, Farkas L, Jaszai J, Galter D, Krohn K, Unsicker K (1998) GDNF requires TGF-ß for establishing its neurotrophic activity. J Neurosci 18: 9822-9834

Schober A, Hertel R, Arumäe U, Farkas L, Jaszai J, Krieglstein K, Saarma M, Unsicker K (1999) GDNF rescues target-deprived spinal cord neurons but requires TGF-ß as co-factor *in vivo*. J Neurosci 19: 2008-2015

Krieglstein K, Richter S, Farkas L, Schuster N, Dünker N, Oppenheim R W, Unsicker K (2000) Reduction of endogenous transforming growth factor beta prevents ontogenetic neuron death. Nature Neuroscience 3: 1085-1091

Peterziel H, Unsicker K, Krieglstein K (2002) TGFbeta induces GDNF responsiveness in neurons by recruitment of GFRalpha1 to the plasma membrane, J Cell Biol 159: 157-167

Farkas L, Dünker N, Roussa E, Unsicker K, Krieglstein K (2003) Transforming growth factor-beta(s) are essential for the development of midbrain dopaminergic neurons *in vitro* and *in vivo*. J Neurosci 23: 5178-5186

v Bohlen und Halbach O, Schober A, Krieglstein K (2004) Genes, proteins, and neurotoxins involved in Parkinson's disease. Prog Neurobiol 73: 151-177

Wolfgang Liebl

Professor of Microbiology

- 1984 Diploma (Biology), Technische Universität München
- 1986 Ph.D. (Dr. rer. nat.), Technische Universität München
- 1986 - 1988 Postdoctoral Fellow, Massachusetts Institute of Technology, Cambridge, MA, USA
- 1997 Habilitation (Microbiology), Technische Universität München
- 1997 - 2003 Associate Professor of Microbiology, Georg-August-Universität, Göttingen
- Since 2003 Full Professor (Applied Microbiology), Georg-August-Universität, Göttingen

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Major Research Interests

One of the main interests of our group is the analysis of polysaccharide and oligosaccharide breakdown and utilization by microorganisms adapted to extreme habitats. In particular, we are interested in cellulose, xylan and starch degrading enzyme systems from hyperthermophiles, i. e. organisms that grow optimally at 80°C or higher. These organisms represent very deep branches within the prokaryotic lineages of the phylogenetic tree of organisms. We are interested in the biochemical properties, the molecular structure and catalytic mechanism, the function(s) of non-catalytic domains, and the cellular localization of unusual glycosyl hydrolases and transferases from *Thermotoga maritima*, the model organism of hyperthermophilic bacteria. Other projects in the field of extremophilic microorganisms deal with the enzymology and molecular biology of thermoalkaliphiles and thermoacidophiles. We have completed the genome sequence of the extreme thermoacidophilic archaeon *Picrophilus torridus* with the objective to better understand the evolutionary, metabolic and molecular mechanisms that allow this organism to thrive at up to 65°C at pH values close to pH 0.
Another group of bacteria studied in the laboratory are the Gram-positive bacteria with a high G+C content. We employ molecular biological techniques to study and modify physiological traits of amino acid-producing corynebacteria and micrococci.
Also, the group is interested in the characterization of genome (metagenome) structures of various microbial habitats (PD Dr. R. Daniel). DNA libraries are constructed from microbial consortia and biofilms in order to explore the genetic diversity of the different environments. Also, classical activity-based screens are used for the isolation of novel enzymes useful for biotechnology.

Selected Recent Publications

Angelov A, Fütterer O, Valerius O, Braus GH, Liebl W (2005) Properties of the recombinant glucose/galactose dehydrogenase from the extreme thermoacidophile, *Picrophilus torridus*. FEBS J (Eur J Biochem) 272:1054-1062

Daniel R (2005) The metagenomics of soil. Nature Rev Microbiol 3: 470-478

Fütterer O, Angelov A, Liesegang H, Gottschalk G, Schleper C, Schepers B, Dock C, Antranikian G, Liebl W (2004) Genome sequence of *Picrophilus torridus* and its implications for life around pH 0. Proc Natl Acad Sci USA 101: 9091-9096

Liebl W (2004) Genomics taken to the extreme. Nature Biotechnology 22: 524-525

Tzvetkov M, Klopprogge C, Zelder O, Liebl W (2003) Genetic dissection of trehalose biosynthesis in *Corynebacterium glutamicum*: inactivation of trehalose production leads to impaired growth and an altered cell wall lipid composition. Microbiology 149: 1659-1673

Lodge JA, Maier T, Liebl W, Hoffmann V, Sträter N (2003) Crystal structure of *Thermotoga maritima* α-glucosidase AglA defines a new clan of NAD^+-dependent glycosidases. J Biol Chem 278: 19151-19158

Reinhard Lührmann

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Professor, Director at the Max Planck Institute for Biophysical Chemistry

- Dr. rer. nat (Ph. D.), University of Münster (1975)
- Research group leader, Max Planck Institute for Molecular Genetics, Berlin (1981 - 1988)
- Professor of Biochemistry and Molecular Biology at the University of Marburg (1988 - 1999)
- Director, Dept. of Cellular Biochemistry, Max Planck Institute for Biophysical Chemistry, Göttingen (since 1999)

Major Research Interests

Pre-mRNA splicing, the excision of non-coding introns to generate mature mRNA, is an essential step in gene expression. The human genome is much smaller than expected based on the complexity of the human proteome, and alternative splicing, whereby different mRNAs (and thus functionally distinct proteins) are generated from a single pre-mRNA, plays a critical role in expanding our genetic capacity. Splicing is catalysed by the spliceosome, a large ribonucleoprotein complex formed by the interaction small nuclear ribonucleoproteins (snRNPs U1, U2, U4/U6 and U5) and more than 100 proteins with the pre-mRNA. Spliceosome assembly and catalytic activation proceed sequentially via several intermediate complexes that differ in composition and in the interactions between their components. The spliceosome is thus highly dynamic, undergoing major structural changes during its assembly and catalytic action. We are pursuing two major goals: (i) to understand how spliceosomes specifically recognize and bind introns, and discriminate them from exons, and (ii) to structurally and mechanistically dissect the catalytic core of the spliceosome to determine whether it is a ribozyme or whether proteins also function in catalysis.
As a prerequisite, we have established novel affinity-based methods to isolate and study spliceosomal complexes at defined functional stages (e.g. pre-catalytic and catalytically activated spliceosomes). These methods, as well as RNA structure probing and site-directed crosslinking techniques, combined with high throughput mass spectrometry are being used to chart the dynamics of the RNA-RNA, RNA-protein and protein-protein network of the spliceosome during its action cycle. The role of spliceosomal proteins in spliceosome assembly and in promoting the formation of the catalytic core is being investigated by RNA interference and biochemical methods. In addition, we are investigating the 3D structure of spliceosomal complexes using high resolution cryo-electron microscopy and x-ray crystallography.
My group is also interested in the cell biology of the splicing machinery. Specifically we are investigating the role of sub-nuclear compartments such as "cajal bodies" in the assembly, transport and recycling of spliceosomal snRNPs, using microinjection together with RNA interference, and high resolution light microscopy techniques.

Selected Recent Publications

Watkins NJ, Segault V, Carpentier B, Nottrott S, Fabrizio P, Bachi A, Wilm M, Rosbash M, Branlant C, Lührmann R (2000) A common core RNP structure shared between the small nuclear box C/D RNPs and the spliceosomal U4 snRNP. Cell 103: 457- 466

Makarov EM, Makarova OV, Urlaub H, Gentzel M, Will CL, Wilm M, Lührmann R (2002) Small nuclear ribonucleoprotein remodeling during catalytic activation of the spliceosome. Science 298: 2205-2208

Schaffert N, Hossbach M, Heintzmann R, Achsel T, Lührmann R (2004) U4/U6 di-snRNPs accumulate in Cajal bodies upon RNAi knockdown of hPrp31 (61K), indicating a role of Cajal bodies in U4/U6.U5 tri-snRNP assembly. EMBO J 23: 3000-3009

Watkins NJ, Lemm I, Ingelfinger D, Schneider C, Hoßbach M, Urlaub H, Lührmann R (2004) Assembly and maturation of the U3 snoRNP in the nucleoplasm in a large dynamic multi-protein complex. Mol Cell 16: 789-798

Golas MM, Sander B, Will CL, Lührmann R, Stark H (2005) Major conformational change in the complex SF3b upon Integration into the spliceosomal U11/U12 di-snRNP as revealed by electron cryomicroscopy. Mol Cell 17: 869-883

Will CL, Lührmann R (2005) Spliceosome structure and function. RNA World III. Gesteland RF, Cech TR, Atkins JF Eds, CSH Laboratory Press, p 369-400

Ahmed Mansouri

Molecular Developmental Genetics

- Diploma (Chemistry), Technical University, Braunschweig (Germany) 1975
- Dr. rer. nat. Chemical Technology Institute, Technical University, Braunschweig (Germany), 1978
- Postdoc at the Institute of Human Genetics in Göttingen (1982 - 1986)
- Postdoc at the Miescher Institute in Tübingen (MPI) and at the Max Planck
- Institute of Immunbiology in Freiburg (Germany) (1986 - 1989)
- Since 1989 Dept of Molecular Cell Biology at the MPI for Biophysical Chemistry in Göttingen
- Habilitation (Molecular Developmental Genetics), University of Göttingen, Germany, 1999
- Since 2005: Dr. Helmut Storz Stiftungsprofessur for “dopaminerge Stammzelltherapie”, Dept. of Clinical Neurophysiology at the University of Göttingen

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Major Research Interests

Molecular mechanisms of mammalian development and stem cell biology

In order to understand the molecular mechanisms governing mammalian development, we are using the mouse as a model system. We are focusing on the role of transcription factors in development. Using embryonic stem cells mouse loss-of-function mutants were generated. Specifically, we have shown that Pax and homeobox-containing genes are required for early decisions in organogenesis and cell differentiation. In addition, we are currently taking advantage of the *in vitro* differentiation potential of embryonic stem cells to search for molecules that are involved in dopaminergic neuron induction, differentiation, and/or survival.

Selected Recent Publications

Schindehütte J, Fukumitsu H, Collombat P, Griesel G, Brink C, Baier PC, Capecchi MR, Mansouri A (2005) *In vivo* and *in vitro* tissue-specific expression of GFP using the Cre-lox system in mouse embryonic stem cells. Stem Cells 23: 10-15

Collombat P, Hecksher-Soerensen J, Broccoli V, Krull J, Ponte I, Mundiger T, Smith J, Gruss P, Serup P, Mansouri A (2005) The simultaneous loss of Arx and Pax4 genes promotes a somatostatin-producing cell fate specification at the expense of the alpha- and beta-cell lineages in the mouse endocrine pancreas. Development 132 (13): 2969-80

Thinyane K, Baier PC, Schindehütte J, Mansouri A, Paulus W, Trenkwalder C, Flügge G, Fuchs E (2005) Fate of pre-differentiated mouse embryonic stem cells transplanted in unilaterally 6-hydroxydopamine lesioned rats: histological characterization of the grafted cells. Brain Res 1045 (1-2): 80-87

Relaix F, Rocancourt D, Mansouri A, Buckingham M (2005) A Pax3/Pax7-dependent population of skeletal muscle progenitor cells. Nature 435: 948-953

Baier PC, Schindehütte J, Thinyane K, Flugge G, Fuchs E, Mansouri A, Paulus W, Gruss P, Trenkwalder C (2004) Behavioral changes in unilaterally 6-hydroxy-dopamine lesioned rats after transplantation of differentiated mouse embryonic stem cells without morphological integration. Stem Cells 22(3): 396-404

Frauke Melchior

Professor of Biochemistry

- 1990 Dr. rer. nat., University of Marburg, Germany
- 1990 - 1992 Postdoctoral fellow at the Max-Planck Institute for Biophysical Chemistry, Göttingen
- 1992 - 1998 Postdoctoral fellow at the Scripps Research Institute, La Jolla, CA, USA
- 1998 - 2004 Independent group leader at the Max-Planck Institute of Biochemistry, Martinsried
- 1998 BioFUTURE young investigator award Since 2004 Professor of Biochemistry, Georg-August University Göttingen

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Major Research Interests

Research in our group centers around posttranslational modification with small ubiquitin-related proteins of the SUMO family. SUMO proteins are ubiquitously expressed in eukaryotic cells, and are essential for life. They are reversibly coupled to a large number of cellular targets, and thereby modulate protein / protein or protein / DNA interactions, alter intracellular localization, or protect from ubiquitin mediated degradation. Higher organisms often express several distinct SUMO proteins (e.g., three in humans). Those are conjugated to different targets under normal growth conditions, or conjugated preferentially upon stress. Most of the known targets for sumoylation can be associated with a few specific pathways: signal transduction, transcription, chromatin remodelling, DNA repair, mitosis, viral infection, and nucleocytoplasmic trafficking. Projects in the lab aim to understand basic mechanisms, regulation, and function of SUMOylation in mammalian cells. This involves, e.g., characterization of SUMO enzymes, analysis of SUMO conjugation under stress conditions, and the identification and characterization of novel SUMO targets. Special emphasis is also given to the interplay between SUMOylation and nucleocytoplasmic trafficking.

Selected Recent Publications

Melchior F (2000) SUMO-1 - Non-Classical Ubiquitin. Annu Rev Cell Dev Biol 16: 591-626

Pichler A, Gast A, Seeler JS, Dejean A, Melchior F (2002) The nucleoporin RanBP2 is a SUMO1 E3 Ligase. Cell 108: 109-120

Lin X, Sun B, Liang M, Liang YY, Gast A, Hildebrand J, Brunicardi FC, Melchior F, Feng XH (2003) Opposed Regulation of Corepressor CtBP by SUMOylation and PDZ Binding. Mol Cell 11: 1389-1396

Swaminathan S, Kiendl F, Körner R, Lupetti R, Hengst L, Melchior F (2004) RanGAP1*SUMO-1 is phosphorylated at the onset of mitosis and remains associated with RanBP2 upon NPC disassembly. J Cell Biol 164: 965-971

Pichler A, Knipscher P, Saitoh H, Sixma T, Melchior F (2004) SUMO E3 ligase is neither Hect nor Ring type. Nat Struct Mol Biol, in press

Professor of Bioinformatics

- 1993 Diploma (Mathematics), LMU München
- 1996 PhD (Dr. Math.), Universität Bielefeld
- 1997 - 1998 Visiting Scientist, North Carolina State University, Raleigh, NC, USA
- 1998 - 2000 RPR/Aventis, Dagenham, Essex, UK
- 2000 - 2001 MIPS, MPI fuer Biochemie, Martinsried and GSF, Neuherberg
- 2001 - 2002 Group leader and faculty member at International Graduate
- School in Bioinformatics and Genome Research, Univertität Bielefeld
- Since 2002 Professor of Bioinformatics, Universität Göttingen

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Major Research Interests

The focus of our work is on algorithm development for nucleic acid and protein sequence analysis. We are particularly interested in multiple sequence alignment and gene prediction; the software programs DIALIGN and AUGUSTUS are developed and maintained by our department.

In recent years, alignment of large genomic sequences became a powerful tool for genome analysis and annotation. Cross-species alignment of genomic sequences has been used for gene prediction, to detect regulatory sites or to identify signature sequences for pathogen microorganisms. We are developing novel alignment approaches that combine sensitivity and speed for long-range genomic alignment. These approaches are also used to improve our gene-finding software tools.

Other areas of interest include phylogeny reconstruction, RNA structure analysis and motif discovery using machine-learning approaches.

Selected Recent Publications

Stanke M, Steinkamp R, Waack S, Morgenstern B (2004) AUGUSTUS: a web server for gene finding in eukaryotes Nucleic Acids Res 32: W309-W312

Taher L, Rinner O, Garg S, Sczyrba A, Morgenstern B (2004) AGenDA: Gene Prediction by Cross-Species Sequence Comparison. Nucleic Acids Res 32: W305-W308

Brudno M, Chapman M, Göttgens B, Batzoglou S, Morgenstern B (2003) Fast and sensitive multiple alignment of large genomic sequences. BMC Bioinformatics 4: 66

Morgenstern B (2002) A simple and space-efficient fragment-chaining algorithm for alignment of DNA and protein sequences. Appl Math Lett 15: 11-16

Morgenstern B, Atchley WR (1999) Evolution of bHLH transcription factors: modular evolution by domain shuffling? Mol Biol Evol 16: 1654-1663

Morgenstern B (1999) DIALIGN 2: improvement of the segment-to-segment approach to multiple sequence alignment. Bioinformatics 15: 211-218

Klaus-Armin Nave

Professor of Molecular Biology, Director at the Max Planck Institute of Experimental Medicine

- PhD 1987, University of California, San Diego, Postdoc, The Salk Institute, La Jolla, California
- 1991 Junior Group Leader, ZMBH,University of Heidelberg
- 1998 Professor of Molecular Biology (C4), ZMBH
- 2000 Director, Department of Neurogenetics Max Planck Institute for Experimental Medicine, Göttingen, and Professor of Biology, University of Heidelberg

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Major Research Interests

We are interested in the mechanisms of neuron-glia interactions in the higher nervous system, and in the genes that are required for normal glial cell function. Here, transgenic and mutant mice have become important to study developmental processes as well as genetic diseases. For example, oligodendrocytes are glial cells highly specialized for enwrapping CNS axons with multiple layers of membranes, known to provide electrical insulation for rapid impulse propagation. We found that oligodendrocytes are also essential for maintaining the long-term integrity of myelinated axons, independent of the myelin function itself. The mechanisms by which oligodendrocytes support long-term axonal survival are still under investigation. The importance of glial cells as the "first line of neuroprotection", however, is illustrated by several myelin-associated diseases in which axonal neurodegeneration contribute to progressive disability. These range in humans from peripheral neuropathies (CMT1) to spastic paraplegia (SPG2), and presumably multiple sclerosis (MS) and certain forms of psychiatric disorders. We are developing transgenic animal models for some of these diseases, in order to dissect the underlying disease mechanisms and, in the case of CMT1A, have used these models to design novel therapeutic strategies.
The glial "decision" to myelinate an axonal segment is partly controlled by the axon itself, but the signaling mechanism is not understood. We have found that axonal neuregulin-1 (NRG1) is the major determinant of myelination in the peripheral nervous system. We are now investigating NRG1 dysregulation also in CNS myelination, using quantifiable behavioural functions in mice. By combining genetics with enviromental risk factors for schizophrenia (in collaboration with H. Ehrenreich) we will explore the hypothesis that NRG1, a known human schizophrenia susceptibility gene, points to an important role of myelinating glia in some psychiatric disorders.

Future Projects and Goals
Mechanisms of neuron-glia signalling; function of myelin proteins and lipids; transcriptional profiling of single cells *in vivo*; novel mouse models of neuropsychiatric disorders.

Selected Recent Publications

Schwab M H, Bartholomä A, Heimrich B, Feldmeyer D, Druffel-Augustin S, Goebbels S, Naya F J, Frotscher M, Tsai M-J, Nave K-A (2000) Neuronal bHLH proteins (NEX and BETA2/NeuroD) regulate terminal granule cell differentiation in the hippocampus. J Neurosci 20: 3714-3724

Niemann S, Sereda MW, Suter U, Griffiths IR, Nave K-A (2000) Uncoupling of myelin assembly and Schwann cell differentiation by transgenic overexpression of PMP22. J Neurosci 20: 4120-4128

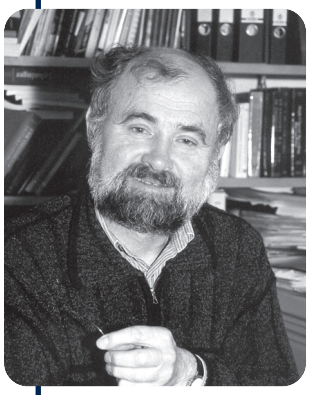
Lappe-Siefke C, Göbbels S, Gravel M, Nicksch E, Lee J, Braun P E, Griffiths I, Nave K-A (2003) Disruption of Cnp1 uncouples oligodendroglial functions in axonal support and myelination. Nature Genetics 33: 366-374

Sereda MW, Meyer zur Hörste G, Suter U, Uzma N, Nave K-A (2003) Therapeutic administration of anti-progesterone in a PMP22-transgenic model of Charcot-Marie-Tooth disease (CMT1A). Nature Medicine 9: 1533-1537

Michailov GV, Sereda MW , Brinkmann BG, Fischer TM, Haug B, Birchmeier C, Role L, Lai C, Schwab MH, Nave K-A (2004) Axonal neuregulin-1 regulates myelin sheath thickness. Science 304: 700-703

Saher G, Brügger B, Lappe-Siefke C, Möbius W, Tozawa R, Wehr M, Wieland F, Ishibashi S, Nave K-A (2005) Cholesterol is essential and rate-limiting for myelin membrane growth. Nature Neurosci 8: 468-475

Erwin Neher



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Professor, Director at the Max Planck Institute for Biophysical Chemistry

- M.Sc. (Physics), University of Wisconsin, (1967)
- Ph.D. (Physics), Institute of Technology, Munich (1970)
- Research associate at the Max Planck Institute for Biophysical Chemistry in Göttingen, Germany (1972 - 1975 and 1976 - 1982) and as a guest in the
- laboratory of Dr. Ch.F. Stevens at Yale University, Dept. of Physiology, New Haven, Conn. (1975 - 1976)
- Fairchild Scholar, California Institute of Technology; Pasadena, USA (1989)
- Director of the Membrane Biophysics Department at the Max Planck Institute for Biophysical Chemistry, Göttingen, Germany, since 1983

Major Research Interests

Molecular Mechanisms of Exocytosis, Neurotransmitter Release, and Short Term Synaptic Plasticity

In order to understand how the brain handles its information flow and adjusts synaptic connections on the second and subsecond timescale, one has to understand all aspects of synaptic transmission ranging from availability of vesicles for exocytosis, presynaptic electrophysiology, Ca^{++} signalling, the process of exocytosis, and postsynaptic neurotransmitter action. Our work concentrates on presynaptic aspects. We study the basic mechanisms of exocytosis, using adrenal chromaffin cells as a model system and the patch-clamp method. This work, in which intracellular Ca^{++} is manipulated (caged Ca^{++}) and measured on the single cell level aims at understanding the role of specific synaptic proteins in the maturation and exocytosis of secretory vesicles. We use neuronal cell cultures and brain slices for studying mechanisms of short term plasticity, such as depression and paired pulse facilitation. The Calyx of Held, a specialized synapse in the auditory pathway, offers unique possibilities for simultaneous pre- and postsynaptic voltage clamping. This allows a quantitative analysis of the relationship between $[Ca^{++}]$ and transmitter release.

Selected Recent Publications

Klingauf J, Neher E (1997) Modeling buffered Ca^{2+} diffusion near the membrane: Implications for secretion in neuroendocrine cells. Biophys J 72: 674-690

Neher E (1998) Vesicle pools and Ca^{2+} microdomains: new tools for understanding their roles in neurotransmitter release. Neuron 20: 389-399

Schneggenburger R, Neher E (2000) Intracellular calcium dependence of transmitter release rates at a fast central synapse. Nature 406: 889-893

Rettig J, Neher E (2002) Emerging roles of presynaptic proteins in Ca^{++}-triggered exocytosis. Science 298: 781-785

Sakaba T, Neher E (2003) Direct modulation of synaptic vesicle priming by $GABA_B$ receptor activation at a glutamatergic synapse. Nature 424: 775-778

Soerensen J, Nagy G, Varoqueaux F, Nehring RB, Brose N, Wilson MC, Neher E (2003). Differential control of the releasable vesicle pools by SNAP-25 splice variants and SNAP-23. Cell 114: 75-86

Sakaba T, Stein A, Jahn R, Neher E (2005) Distinct kinetic changes in neurotransmitter release after SNARE protein cleavage. Science 309: 491-494

Tomas Pieler

Professor of Biochemistry

- Dr. rer. nat. Biochemistry, Freie Universität Berlin, 1984
- Guest Investigator, Rockefeller University, New York (1985/86)
- Heisenberg fellow, Freie Universität Berlin and Rockefeller University, New York (1986/87)
- Junior group leader, Max-Planck-Institut für Molekulare Genetik, Berlin (1988 - 92)
- Professor of Biochemistry, Georg-August-Universität Göttingen (since 1992)
- Head of the Department of Developmental Biochemistry, Georg-August-Universität Göttingen

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Major Research Interests

The differentiation of complex organisms has its origin in the asymmetric distribution of regulatory proteins or of the corresponding mRNAs in the egg, as well as in a complex system of cell/cell communication events via extracellular signalling molecules during early stages of embryogenesis. The genes that encode for these different activities form functional networks which provide the basis for the genetic programming of embryonic development. Our primary research interest is in the identification of such regulatory genes and networks in vertebrates, as well as in the definition of their regulation and function on the molecular level. For this purpose, we use *Xenopus laevis*, a frog from South Africa, as a model system. As a traditional object in experimental embryology and in comparison with other experimental systems such as the mouse, use of *Xenopus* offers a number of practical advantages. Oocytes and embryos are easy to collect in large numbers, they are easy to manipulate by relatively simple techniques, also because embryonic development proceeds in the petridish, and, more recently, it has even become possible to generate hundreds of transgenic frogs within a single experimental day. The research topics that we are focussing on are:

Transport and function of vegetally localized maternal mRNAs
Organogenesis: formation of pancreas and liver in vertebrate embryos
Early neural development: primary neurogenesis

Selected Recent Publications

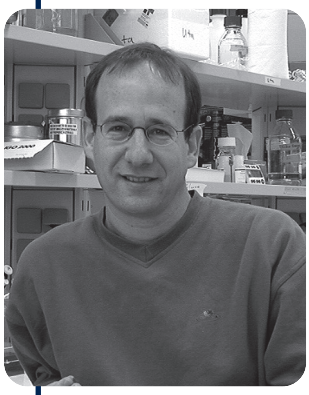
Boy S*, Souopgui J*, Arnato MA, Wegnez M, Pieler T, Perron M (2004) XSEB4R, a novel RNS binding protein involved in retinal cell differentiation downstream of bHLH proneural genes. Development 131: 851-862 *equal contribution

Chen Y*, Pan FC*, Brandes N, Afelik S, Sölter M, Pieler T (2004) Retinoic Acid signaling is essential for pancreas development and promotes endocrine at the expense of exocrine cell differentiation in *Xenopus*. Dev Biol 271: 144-160 *equal contribution

Claußen M, Horvay K, Pieler T (2004) Evidence for overlapping but not identical protein mechineries to operate in vegetal localisation along early and late pathways in *Xenopus* oocytes. Development 131: 4263-4273

Loop S, Katzer M, Pieler T (2005) mPer1 mediated nuclear export of Cry ½ is an important element in establishing the circadian rhythm. EMBO reports 4: 341-347

Erez Raz



Group Leader at the Max Planck Institute for Biophysical Chemistry

- Ph.D. 1994, The Weizmann Institute of Science, Rehovot, Israel
- Group leader at the University of Freiburg, Department of Developmental Biology, Freiburg, 1997
- Group leader at the at the Max Planck Institute for Biophysical Chemistry

Major Research Interests

We are using the zebrafish system to study the molecular mechanisms of cell migration and cell fate maintenance, two processes that are central for animal development (e.g. organogenesis) and are highly relevant for pathological conditions (e.g. cancer and inflammation).
Similar to other organisms, the primordial germ cells (PGCs) of zebrafish originate at positions that are distinct from the position where the gonad develops. Therefore, during early development the cells migrate through the embryo towards their target where they differentiate into sperm and eggs. During their migration the cells have to obtain directional cues from surrounding tissues and maintain their cellular identity. The molecular nature of the directional signals was revealed in a screen in which the chemokine receptor CXCR4b and its ligand SDF-1a were identified. SDF-1a is expressed in tissues towards which the PGCs migrate. Conversely, knocking down CXCR4b or SDF-1a leads to loss of directional migration resulting in random distribution of the PGCs within the embryo. Currently, we are analyzing the molecular mechanisms downstream and upstream of the receptor that transform the signal into directional cell movement. In addition, we are studying the molecular mechanisms of PGC fate maintenance and motility by analysing the function of a number of molecules whose function is essential for normal PGC behaviour and development.

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Selected Recent Publications

Blaser H, Eisenbeiss S, Neumann M, Reichman-Fried M, Thisse B, Thisse C, Raz E (2005) Transition from non-motile behaviour to directed migration during early PGC development in zebrafish. J Cell Science 118: 4027-4038

Slanchev K, Stebler J, de la Cueva-Mendez G, Raz E (2005) Development without germ cells: The role of the germ line in zebrafish sex differentiation. Proc Nat Acad Sci USA 102: 4074-4079

Dumstrei K, Mennecke R, Raz E (2004) Signaling pathways controlling primordial germ cell migration in zebrafish. Journal of Cell Science 117: 4787-4795

Stebler J, Spieler D, Slanchev K, Molyneaux KA, Richter U, Cojocaru V, Tarabykin V, Wylie C, Kessel M, Raz E (2004) Primordial germ cell migration in the chick and mouse embryo: the role of the chemokine SDF-1/CXCL12. Developmental Biology 272: 351-361

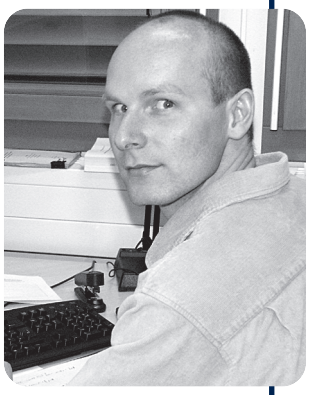
Raz E (2004) Guidance of primordial germ cell migration. Current Opinions in Cell Biology 16: 169-173

Reichman-Fried M, Minina S, Raz E (2004) Autonomous Modes of Behavior in Primordial Germ Cell Migration. Developmental Cell 6: 589-596

Raz E (2003) Primordial germ-cell development: the zebrafish perspective. Nature Reviews Genetics 4: 690-700

Weidinger G, Stebler J, Slanchev K, Dumstrei K, Wise C, Lovell-Badge R, Thisse C, Thisse B, Raz E (2003) dead end, a Novel Vertebrate Germ Plasm Component, Is Required for Zebrafish Primordial Germ Cell Migration and Survival. Current Biology 13: 1429-1434

Markus Rudolph



Junior Group Leader within the SFB 523

- 1995 Biochemistry Diploma, University of Bayreuth
- 1998 PhD, Max Planck Institute for Molecular Physiology, Dortmund & University of Bayreuth
- 1998 - 1999 Postdoc, Max Planck Institute for Molecular Physiology, Dortmund
- 1999 - 2002 Research Associate, The Scripps Research Institute, La Jolla, CA, USA
- 2002 Postdoc, Dept. of Molecular Structural Biology, Göttingen
- Since 2003 independent junior group leader

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Major Research Interests

Structural Aspects of Vesicular Transport

The research focus of the lab is on the structure and function of proteins involved in the
regulation of vesicular transport of proteins in eukaryotic cells. X-ray crystallography is used to accurately determine the static structure of these proteins and their complexes. In addition, steady-state fluorescence and absorption spectroscopy are employed to gain thermodynamic and kinetic insight into the system under study. Both, structural and thermodynamic methods complement each other ideally to yield a more complete picture of the regulation processes involved in protein sorting than is possible from either approach alone. To accomplish our goals, a broad knowledge in molecular biology, biochemistry, spectroscopy, crystallography, and computational biology is vital.

Selected Recent Publications

Roeser D, Dickmanns A, Gasow K, Rudolph MG (2005) *De novo* calcium/sulfur SAD phasing of the human formylglycine generating enzyme using in-house data. Acta Cryst D61: 1057-1066

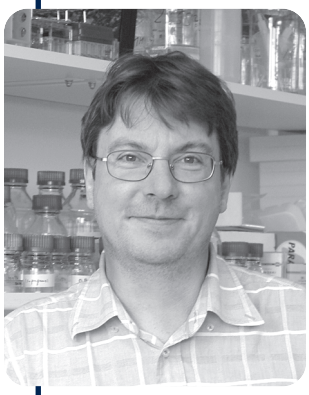
Dierks T, Dickmanns A, Preusser-Kunze A, Schmidt B, Mariappan M, von Figura K, Ficner R, Rudolph MG (2005) Molecular basis for multiple sulfatase deficiency and catalytic mechanism for formylglycine generation of the human formylglycine generating enzyme. Cell 121: 541-552

Dickmanns A, Schmidt B, Rudolph MG, Mariappan M, Dierks T, von Figura K, Ficner R (2005) Crystal structure of human pFGE, the paralogue of the Ca-formylglycine generating enzyme. J Biol Chem 280: 15180-15187

Wittmann JG, Rudolph MG (2004) Crystal structure of Rab9 complexed to GDP reveals a dimer withan active conformation of switch II. FEBS Lett 568: 23-29

Rudolph MG, Wingren C, Crowley MP, Chien Y-H, Wilson IA (2004) Combined pseudo-merohedral twinning, non-crystallographic symmetry and pseudo-translation in a monoclinic crystal form of the gd T cell ligand T10. Acta Cryst D60: 656-664

Reinhard Schuh



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Research Group Leader at the MPI for Biophysical Chemistry

- Dr. rer. nat., University of Tübingen, Germany, 1986
- Postdoctoral Fellow at the Max Planck Institute for Developmental Biology, Tübingen, Germany, 1986 - 1988
- Postdoctoral Fellow at the University of Munich, Germany, 1989 - 1991
- Group leader in the Department of Molecular Developmental Biology at the Max Planck Institute for Biophysical Chemistry, Göttingen, Germany, 1992 - 2004
- Habilitation in Cellular and Molecular Biology, Technical University of Braunschweig, Germany, 2001
- Leader of the Research Group Molecular Organogenesis at the Max Planck Institute for Biophysical Chemistry, since 2005

Major Research Interests

Branched tubular networks are a fundamental structural design of many organs including lung, vascular system and kidney. Critical for organ function, i.e. the transport of fluids or gases, is the proper size and diameter of the tubular branches as well as an elaborated network formation. How do these networks develop? How do the branches grow out, detect their fusion partners and interconnect? How are tube size and diameter controlled? How can the system respond to different physiological needs? How do epidermal sheets control the paracellular passage of solutes?
We investigate the development of the *Drosophila* tracheal (respiratory) system since it provides an ideal model to address such questions, because of its simple stereotypic architecture, accessible genetics and molecular tools.

Selected Recent Publications

Adryan B, Schuh R (2004) Gene ontology-based clustering of gene expression data. Bioinformatics 20: 2851-2852

Behr M, Riedel D, Schuh R (2003) The claudin-like megatrachea is essential in septate junctions for the epithelial barrier function in *Drosophila*. Dev Cell 5: 611-620

Wolf C, Gerlach N, Schuh R (2002) *Drosophila* tracheal system formation involves FGF-dependent cell extensions contacting bridge-cells. EMBO Reports 3: 563-568

Wolf C, Schuh R (2000) Single mesodermal cells guide outgrowth of ectodermal tubular structures in *Drosophila*. Genes Dev 14: 2140-2145

George M. Sheldrick

Professor of Structural Chemistry and part-time programming technician at the University of Göttingen

- PhD (1966) University of Cambridge with E.A.V. Ebsworth; thesis entitled "NMR Studies of Inorganic Hydrides"
- 1966 - 1978: University Lecturer and Fellow of Jesus College, Cambridge
- Since 1978 Professor at the University of Göttingen
- Author of more than 750 scientific papers and of a computer program called SHELX (http://shelx.uni-ac.gwdg.de/SHELX/)
- Director of the Institute of Inorganic Chemistry

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Major Research Interests

Interested in methods of solving and refining crystal structures (both small molecules and proteins) and in structural chemistry.
Holy Grail: the Crystallographic Phase Problem. If only there was an easy way of measuring the phases of X-ray reflections as well as their intensities, crystal structures could be determined directly. At resolutions of better than about 2.5A, there are more measured intensities than atomic coordinates, so the problem is overdetermined and there should be a solution. Recently we were able to increse the size of structures that can be solved from the intensity data alone by 'ab initio direct methods' from about 200 to 1000 unique atoms, given data to 'atomic resolution', but most interesting macromolecular structures are still out of the reach of such methods. Indirctly however the same techniques are proving very useful for the solution of large macromolecular structures when a little starting phase information is available, e.g. by incorporating heavy atoms into the crystal.

Selected Recent Publications

Schneider TR, Kärcher J, Pohl E, Lubini P, Sheldrick GM (2000) *Ab initio* structure determination of the lantiobiotic mersacidin. Acta Crystallogr. D56: 705-713

Lehmann C, Bunkóczi G, Vértesy L, Sheldrick GM (2002) Structures of glycopeptide antibiotics with peptides that model bacterial cell-wall precursors. J Mol Biol 318: 723-732

Sheldrick GM (2002) Macromolecular Phasing with SHELXE. Z Kristallogr 217: 644-650

Debreczeni JÈ, Bunkóczi G, Ma Q, Blaser H, Sheldrick GM (2003) In-house measurement of the sulfur anomalous signal and its use for phasing. Acta Crystallogr D59: 688-696

Debreczeni JÉ, Girmann B, Zeeck A, Krätzner R, Sheldrick GM (2003) Structure of viscotoxin A3: dislulphide location from weak SAD data. Acta Crystallogr D59: 2125-2132

Jörg Stülke

Professor of Microbiology

- 1990 Diploma (Biology), Ernst-Moritz-Arndt-Universität Greifswald
- 1994 Dissertation (Dr. rer. nat.), Ernst-Moritz-Arndt-Universität Greifswald
- 1994 - 1996 Postdoctoral Fellow at the Institut Pasteur, Paris
- 1996 - 2003 Group leader at the Chair of Microbiology, University Erlangen-Nürnberg
- 2000 Habilitation (Microbiology), University Erlangen-Nürnberg
- Since 2003 Professor of General Microbiology, Head of the Department of General Microbiology at the Institute of Microbiology and Genetics, University of Göttingen

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Major Research Interests

Our group is interested in the regulation of carbon and nitrogen metabolism in Gram-positive bacteria. We are following global ("post-genomic") and gene-specific approaches. Metabolism in *Bacillus subtilis* is studied by transcriptomics, protein arrays, and metabolome and fluxome analyses. Our specific interests are focussed on two key pathways: glycolysis and glutamate biosynthesis, the decisive link between carbon and nitrogen metabolism. We are studying three regulatory mechanisms of glycolysis: a controlled protein-RNA interaction, site-specific mRNA degradation and proteolysis. We discovered recently that genes for glutamate biosynthesis in *B. subtilis* are only expressed if rich carbon sources are available and we identified a regulatory protein-protein interaction that govern this sugar induction.
In another project, we study the regulation of gene expression in the pathogenic bacterium *Mycoplasma pneumoniae*. This is highly interesting because this bacterium is an important cause of pneumonia. Moreover, *M. pneumoniae* is one of the organisms with the smallest genetic equipment that is capable of independent life. Understanding *M. pneumoniae* means understanding life! So far, we have studied one of the few regulatory proteins of *M. pneumoniae* and determined its crystal structure. Interestingly, the mode of action of this protein is opposed to that of homologous proteins from other bacteria: a hint to the parasitic lifestyle of *M. pneumoniae*! We are now starting to study the metabolic responses of *M. pneumoniae* to the infection process. If we understand what happens upon infection, we may subsequently try to interrupt this chain of events.

Selected Recent Publications

Steinhauer K, Jepp K, Hillen W, Stülke J (2002) A novel mode of control of *Mycoplasma pneumoniae* HPr kinase/phosphatase activity reflects its parasitic life style. Microbiology 148: 3277-3284

Allen GS, Steinhauer K, Hillen W, Stülke J, Brennan RG (2003) Crystal structure of HPr kinase/phosphatase from *Mycoplasma pneumoniae*. J Mol Biol 326: 1203-1217

Schmalisch M, Bachem S, Stülke J (2003) Control of the *Bacillus subtilis* antiterminator protein GlcT by phosphorylation: Elucidation of the phosphorylation chain leading to inactivation of GlcT. J Biol Chem 278: 51108-51115

Schilling O, Langbein I, Müller M, Schmalisch M, Stülke J (2004) A protein-dependent riboswitch controlling ptsGHI operon expression in *Bacillus subtilis*: RNA structure rather than sequence provides interaction specificity. Nucl Acids Res 32: 2853-2864

Hames C, Halbedel S, Schilling O, Stülke J (2005) MMR: A method for the simultaneous introduction of multiple mutations into the glpK gene of *Mycoplasma pneumoniae*. Appl Env Microbiol 71: 4097-4100

Michael Thumm

Professor of Molecular Cell Biology

- Center of Biochemistry and Molecular Cell Biology, University of Göttingen
- 1987 Dr. rer. nat., University of Stuttgart
- 1997 Habilitation (Biochemistry), University of Stuttgart

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Major Research Interests

We are studying the molecular mechanism of autophagy in the yeast *Saccharomyces cerevisiae*. Autophagy is a starvation induced transport pahway, which delivers cytosolic material for degradation to the lysosome (vacuole). It is highly conserved in all eukaryots from yeast to human and helps the cells to survive periods of nutrient limitation. Autophagy further plays an important role in ageing, the development of breast cancer and cardiomyopathy and it was linked to neurodegenerative diseases like Alzheimer´s, Huntington´s and Parkinson´s disease. Autophagy is mechanistically unique, since its transport intermediates, the autophagosomes, are surrounded by two individual membranes. It starts at the newly-discovered preautophagosomal structure, where autophagosomes are formed. Autophagosomes unspecifically enclose parts of the cytoplasm including organelles like mitochondria, peroxisomes and parts of the ER. When the autophagosomes reach the vacuole, their outer membrane-layer fuses with the vacuolar membrane and a still membrane-enclosed autophagic body is released into the vacuolar lumen. In the vacuole autophagic bodies are lysed and broken down together with their cytosolic content.
The intravacuolar breakdown of autophagic bodies requires the selective lysis of their limiting membrane. The intracellular lysis of a membrane is a very interesting feature of eukaryotic cells and implies a high risk for cellular integrity. In a genetic screen, we identified Aut5 as an essential component of this lysis process. We found that Aut5 is an integral membrane protein and that its lipase active site motive is essential for lysis of autophagic bodies.

Selected Recent Publications

Thumm M (2002) Hitchhikers guide to the vacuole-mechanisms of cargo sequestration in the Cvt and autophagic pathways. Mol Cell 10: 1257-1258

Epple UD, Eskelinen E-L, Thumm M (2003) Intravacuolar membrane lysis in *Saccharomyces cerevisae*: Does vacuolar targeting of Cvt17/Aut5p affect its function? J Biol Chem 278: 7810-7821

Regelmann J, Schüle T, Josupeit FS, Horak J, Rose M, Entian K-D, Thumm M, Wolf DH (2003) Catabolite degradation of fructose-1,6-bisphosphatase in the yeast *Saccharomyces cerevisiae*: A genome-wide screen identifies eight novel GID genes and indicates the existence of two degradation pathways. Mol Biol Cell 14: 1652-63

Meiling-Wesse K, Barth H, Voss C, Eskelinen EL, Epple UD, Thumm M (2004) Atg21 is required for effective recruitment of Atg8 to the preautophagosomal structure during the Cvt pathway. J Biol Chem 279: 37741-37750

Markus Wahl

Ph.D. - Group Leader at the Max Planck Institute for Biophysical Chemistry

- 1996 Ph.D., The Ohio State University, Columbus, OH, USA
- 1997 - 2002 Post-Doc, Max-Planck-Institute for Biochemistry, Martinsried, Germany
- 2002 Habilitation and Privatdozentur, Technical University München, Faculty of Chemistry, München, Germany
- Since 2002 group leader, Max Planck Institute for Biophysical Chemistry

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Major Research Interests

The three major steps of gene expression, transcription, pre-mRNA splicing and translation, are carried out by multi-component enzymes, which are, respectively, the RNA polymerases, the spliceosome and the ribosome. In addition, the catalytic cycles of these molecular machines are guided or modulated by large numbers of auxiliary factors. Our research group uses X-ray crystallography to study in atomic detail structures of proteins, RNAs and macromolecular complexes, which are part of these gene expression machineries. Along one strategy, we attempt to explore recombinantly produced individual components and lower order assemblies. Another goal is the investigation of natively purified spliceosomal small nuclear ribonucleoprotein particles (snRNPs), snRNP aggregates and multi-component sub-complexes of the snRNPs. The work on pre-mRNA splicing is conducted in close cooperation with the laboratory of R. Lührmann.

Selected Recent Publications

Jauch R, Jäkel S, Netter C, Schreiter K, Aicher B, Jäckle H, Wahl MC (2005) Crystal structures of the Mnk2 kinase domain reveal an inhibitory conformation and a zinc-binding site. Structure 13: 1559-1568

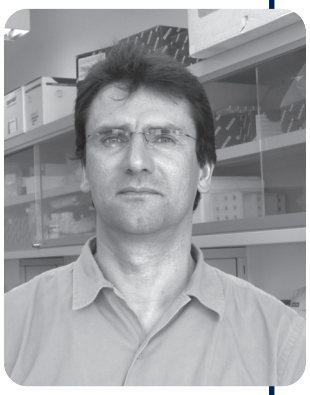
Diaconu M, Kothe U, Schlünzen F, Fischer N, Harms JM, Tonevitsky A, Stark H, Rodnina MV, Wahl MC (2005) Structural basis for the function of the ribosomal L7/12 stalk in factor binding and GTPase activation. Cell 121: 991-1004

Bonin I, Mühlberger R, Bourenkov GP, Huber R, Bacher A, Richter G, Wahl MC (2004) Structural basis for the interaction of *Escherichia coli* NusA with protein N of phage Lambda. Proc Natl Acad Sci USA 101: 13762-13767

Jauch R, Bourenkov GP, Chung HR, Urlaub H, Reidt U, Jäckle H, Wahl MC (2003) The zinc finger-associated domain of the *Drosophila* transcription factor Grauzone is a novel zinc-coordinating protein-protein interaction module. Structure 11: 1393-1402

Steiner T, Kaiser JT, Marinkovic S, Huber R, Wahl MC (2002) Crystal structures of transcription factor NusG in light of its nucleic acid- and protein-binding activities. EMBO J 21: 4641-4653

Lutz Walter



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Head of Department of Primate Genetics at the German Primate Center

- Dr. rer. nat. (PhD), University of Göttingen, 1994
- Postdoctoral fellow and group leader at the Division of Immunogenetics, University of Göttingen, 1994 - 2004
- Head of Department of Primate Genetics, German Primate Center, Göttingen, since 2004
- Habilitation (Immunology and Immunogenetics), Medical Faculty of the University of Göttingen, 2005

Major Research Interests

The main interests of the laboratory are immunology, the genetic control of immune responses, functional genomics, molecular evolution, and population genetics. The research is focussed on the functional, evolutionary, and genomic analysis of genes of the major histocompatibility complex (MHC) as well as the natural killer cell receptor and leukocyte receptor complexes (NKC, LRC). The analyses are carried out in various organisms that are used as models of human diseases such as certain nonhuman primates (rhesus macaque, common marmoset) and rodents (mouse, rat). Functional studies aim at elucidating the role of certain genes of the MHC, NKC, and LRC in innate and adaptive immunity.

In a further research focus, the molecular evolution and population genetics of various nonhuman primate taxa are analyzed on the basis of molecular data. These studies aim at clarifying the phylogenetic relationship of various primates (molecular phylogeny) and to determine their geographic distrubution (phylogeography), particularly of highly endangered primate species (conservation biology).

Selected Recent Publications

Ioannidu S, Walter L, Dressel R, Günther E (2001) Physical map and expression profile of genes of the telomeric class I gene region of the rat MHC. J Immunol 166: 3957-3965

Flügge P, Zimmermann E, Hughes AL, Günther E, Walter L (2002) Characterization and phylogenetic relationship of prosimian MHC class I genes. J Mol Evol 55: 768-775

Walter L, Hurt P, Himmelbauer H, Sudbrak R, Günther E (2002) Physical mapping of the major histocompatibility complex class II and class III regions of the rat. Immunogenetics 54: 268-275

Sudbrak R, Reinhardt R, Hennig S, Lehrach H, Günther E, Walter L (2003) Comparative and evolutionary analysis of the rhesus macaque extended MHC class II region. Immunogenetics 54: 699-704

Hurt P, Walter L, Sudbrak R, Klages S, Müller I, Shiina T, Inoko H, Lehrach H, Günther E, Reinhardt R, Himmelbauer H (2004) The genomic sequence and comparative analysis of the rat major histocompatibility complex. Genome Res 14: 631-639.

Jürgen Wienands

Professor of Cellular and Molecular Immunology

- 1982 - 89 Study of Biology at the University of Cologne; graduated at the Institute of Genetics, Dept. of Immunology
- 1989 - 92 Ph.D. poject at the Max Planck Institute for Immunobiology, Freiburg, Germany
- 1992 - 94 Postdoctoral fellow at the Dept. of Preclinical Research at Sandoz Pharma Ltd., Basel, Switzerland
- 1994 - 96 Postdoctoral fellow at the Max Planck Institute for Immunobiology, Freiburg, Germany
- 1996-2001 Group leader at the University of Freiburg, Institute of Biology III
- 2001 "Habilitation" and Venia Legendi in "Molecular Immunology and Biochemistry"
- 2001 - 2004 Full Professor for "Biochemistry and Molecular Immunology" at the University of Bielefeld
- since Aug 2004 Full Professor for "Molecular and Cellular Immunology" at the University of Göttingen

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Major Research Interests

The signature structure of B lymphocytes is their clonotypic antigen receptor (BCR). Our major research focuses on the elucidation of intracellular BCR signaling pathways that regulate the development and activation of B cells in health and disease. We have identified enzymatically inert adaptor proteins such as SLP-65 (for: SH2 domain-containing leukocyte adaptor of 65 kDa), which nucleate the formation of multi-molecular protein complexes to integrate and amplify BCR signals. A key function of these signaling modules is to orchestrate the mobilization of the second messenger Ca^{2+}. Interference with expression and/or function of one the signaling components can cause severe immunodeficiencies in mouse and man. Moreover, viruses such as the Epstein-Barr virus (EBV) abuse BCR effector proteins to reorganize signaling cascades for their own benefit. Biochemical and genetic methods, which are applied to study these events *in vitro* and *in vivo*, include protein purification by affinity chromatography and immunoprecipitation, analysis of protein interactions, flow cytometry, targeted gene disruption in cell culture and embryonic stem cells followed by reconstitution experiments using electroporation techniques or retroviral gene transfer.

Selected Recent Publications

Wienands J, Schweikert J, Wollscheid B, Jumaa H, Nielsen PJ, Reth M (1998) SLP-65: A new signaling component in B lymphocytes which requires expression of the antigen receptor for phosphorylation. J Exp Med 188:791-795

Wienands J (2000) The B cell antigen receptor: Formation of signaling complexes and the function of adaptor proteins. Current Topics Microbiol Immunol 245: 53-76

Engels N, Merchant M, Pappu R, Chan AC, Longnecker R, Wienands J (2001) Epstein-Barr virus LMP2A employs the SLP-65 signaling module. J Exp Med 194: 255-264

Wakabayashi C, Adachi T, Wienands J, Tsubata T (2002) A distinct signaling pathway used by the IgG-containing B-cell antigen receptor. Science 298: 2392-2395

Stork B, Engelke M, Frey J, Horesjsí V, Hamm-Baarke A, Schraven B, Kurosaki T, Wienands J (2004) Grb2 and the non-T cell activation linker NTAL constitute a Ca^{2+}-regulating signal circuit in B lymphocytes. Immunity 21: 681-691

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Professor of Developmental Biology

- 1991 Diplom (Biology), Ludwig Maximilians University, Munich (Germany)
- 1995 Dr. rer. nat., Max-Planck-Institute for Biophysical Chemistry, Göttingen (Germany) and Howard Hughes Medical Institute, Baylor College of Medicine, Houston (USA)
- 1995 - 1998 Postdoctoral Fellow and Associate, Howard Hughes Medical Institute, The Rockefeller University, New York (USA)
- 1998 - 2003 Assistant Professor and Robert Bosch Foundation 'Junior Professor' Department of Genetics, University of Bayreuth, Bayreuth (Germany)
- Since 2003 Professor of Developmental Biology at the Johann Friedrich Blumenbach Institute of Zoology and Anthropology, Georg August University, Göttingen (Germany)

Major Research Interests

A key question in developmental biology is how diverse animal body plans are specified. Early developmental decisions determine the coordinates of the embryo and activate the genetic circuitry that sequentially subdivides and regionalizes the animal body. For insects, only in *Drosophila* the early developmental events are known in molecular detail. However, insects with varied life histories must compensate different reproductive strategies by adjusting the regulatory networks within the developmental program. Therefore, phylogenetic differences between diverse species must be manifested in the genetic circuitries regulating embryogenesis.
To identify the plasticity in early developmental processes, we study their conservation and divergence in different arthropod species. Developmental regulatory genes code for signal transduction molecules and transcription factors. But of equal importance to the coding part of these genes are their cis-regulatory sequences, which serve as integration points for originally distinct signals. By insect transgenesis and functional genomics approaches, we analyze genetic interactions within the regulatory network of early embryogenesis in diverse insect species. This will help us to understand how animal evolution is based on changes in gene regulation governing early pattern formation.
Furthermore we apply our knowledge about developmental processes to insect pest management. Current control efforts rely mostly on insecticides, but the costs for developing new chemical products to overcome the problem of insecticide resistance are escalating. Genetic control based on the sterile-insect technique (SIT) uses the release of sterile males to cause infertile matings which reduce pest population levels. Due to the species specificity, SIT is considered an ecologically safe procedure. However, conventional sterilization by ionizing radiation also decreases the competitiveness of sterilized males. To overcome this problem, we design transgenic approaches to selectively produce vigorous and potent sterile males by generating conditional male sterility in combination with conditional female lethality.

Selected Recent Publications

Wimmer EA, Carleton A, Harjes P, Turner T, Desplan C (2000) Bicoid-independent formation of thoracic segments in *Drosophila*. Science 287: 2476-2479

Ito J, Ghosh A., Moreira LA, Wimmer EA, Jacobs-Lorena M (2002) Transgenic anopheline mosquitoes impaired in transmission of a malaria parasite. Nature 417: 452-455

Horn C, Wimmer EA (2003) A transgene-based embryo-specific lethality system for insect pest management. Nature Biotechnology 21: 64-70

Häcker U, Nystedt S, Padash-Barmchi M, Horn C, Wimmer EA (2003) piggyBac-based insertional mutagenesis in the presence of stably integrated P elements in *Drosophila*. PNAS 100: 7720-7725

Wimmer EA (2003) Applications of Iinsect transgenesis. Nature Reviews Genetics 4: 225-232

Andreas Wodarz

Professor of Stem Cell Biology

- Diploma Biology, University of Cologne, 1990
- Dr. rer. nat. Developmental Biology, University of Cologne, 1993
- Postdoc, Howard Hughes Medical Institute, Stanford University, 1994 - 1997
- Junior Group Leader, Heinrich Heine University Düsseldorf, 1997 - 2004
- Habilitation in Genetics, Heinrich Heine University Düsseldorf, 2001
- Appointed as Head of the Department of Stem Cell Biology at the University of Göttingen, 2004

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Major Research Interests

At the center of my research interests is the question of how neural stem cells divide asymmetrically to produce another stem cell and a progenitor cell that will differentiate and give rise to neurons and glia cells. One important aspect of asymmetric cell division is the establishment of an intrinsic polarity which is the prerequisite for the asymmetric localization of proteins and mRNAs that serve as cell fate determinants. Our model system for the asymmetric division of stem cells is the embryonic neuroblast of Drosophila. Here we study the function of genes that control cell polarity, asymmetric localization of cell fate determinants and orientation of the mitotic spindle. The knowledge obtained in the Drosophila system has stimulated intense research on the participation of the orthologous genes and proteins in the asymmetric division of vertebrate stem cells.

Selected Recent Publications

Wodarz A (2005) Molecular control of cell polarity and asymmetric cell division in *Drosophila* neuroblasts. Curr Opin Cell Biol 17: 475-481

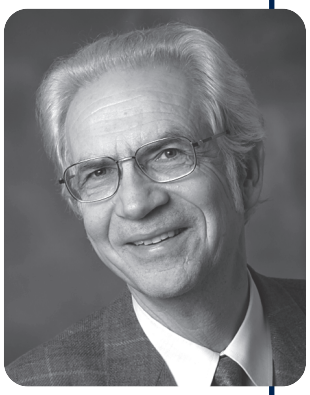
von Stein W, Ramrath A, Grimm A, Müller-Borg M, Wodarz A (2005) Direct association of Bazooka/PAR-3 with the lipid phosphatase PTEN reveals a link between the PAR/aPKC complex and phosphoinositide signaling. Development 132: 1675-1686

Yoshida S, Müller HAJ, Wodarz A, Ephrussi A (2004) PKA-RI spatially restricts Oskar expression for *Drosophila* embryonic patterning. Development 131: 1401-1410

Wodarz A, Ramrath A, Grimm A, Knust E (2000) *Drosophila* atypical protein kinase C associates with Bazooka and controls polarity of epithelia and neuroblasts. J Cell Biol 150: 1361-1374

Wodarz A, Ramrath A, Kuchinke U, Knust E (1999) Bazooka provides an apical cue for Inscuteable localization in *Drosophila* neuroblasts. Nature 402: 544-547

Axel Zeeck



Professor of Biomolecular Chemistry

- Dr. rer. nat. 1966
- Habilitation 1974
- Professor since 1980

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Major Research Interests

Natural products chemistry and biochemistry

Microorganisms are an important source for novel natural products, such as antibiotics and other active substances. For the isolation of chemically new and biologically active compounds we especially use actinomycetes and fungi imperfecti. In the search for new secondary metabolites two approaches have been applied successfully, both, the biological and chemical screening. For the latter we use TLC with different types of staining reagents or HPLC with varying detection methods (UV, MS, CD) to record all metabolites produced in the culture extracts. Most of the strains evaluated were isolated from earth samples and cultivated up to 50-litre fermenters in my group.

The chemical work starts with the isolation and structure elucidation of the novel natural products. Structural problems were solved by using modern spectroscopic methods (e.g. MS, high field 2D-NMR, X-ray analysis). We have established several hundreds of metabolites, which belong to different chemical classes (e.g. peptides, macrolides, quinones, glycosides, polyenes). Further investigations focus on the biosynthesis of the novel compounds, starting with feeding experiments with stable isotope precursors. We are interested in new biosynthetic pathways and try to modify the metabolites by applying the precursor-directed biosynthesis and by changing the cultivation conditions. The biological activity of our metabolites and derivatives is established in different test systems, mostly in cooperation with colleagues and industry.

Selected Recent Publications

Höfs R, Walker M, Zeeck A (2000) Hexacyclinic acid, a polyketide from *Streptomyces* with a novel carbon skeleton. Angew Chem Int Ed Engl 39: 3258-3261

Dröse S, Boddien C, Gassel M, Ingenhorst G, Zeeck A, Altendorf K (2001) Semisynthetic derivatives of concanamycin A and C, as inhibitors of V- and P-Type ATPases: Structure-activity investigations and developments of photoaffinity probes. Biochemistry 40: 2816-2825

Bode HB, Bethe B, Höfs R, Zeeck A (2002) Big effects from small changes: Possible ways to explore nature's chemical diversity. Chem Bio Chem 3: 619-627

Zlatopolskiy BD, Loscha K, Alvermann P, Kozhushkov SI, Nikolaev S.V, Zeeck A, de Meijere A (2004) Final elucidation of the absolute configuration of the signal metabolite hormaomycin. Chem Eur J 10: 4708-4717

Ströch K, Zeeck A, Antal N, Fiedler H-P (2005) Retymicin, Galtamycin B, Saquayamycin Z and Ribofuranosyllumichrome, novel secondary metabolites from *Micromonospora sp*. Tü 6368. II. Structure Elucidation. J Antibiot 58: 103-110

Martin Zeidler

Group Leader at the Max Planck Institute for Biophysical Chemistry

- DPhil, EMBL, Heidelberg, Germany 1995
- Postdoc Work with Prof. Norbert Perrimon, Harvard Medical School, Boston, USA
- Emmy Noether Prize Holder at the Max Planck Institute for Biophysical Chemistry since 2001

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Major Research Interests

The fruit fly *Drosophila melanogaster* is a model organism that combines sophisticated genetics and well understood development in a small, fast, easy to manipulate package. Our group is using this system to study the components and requirements for the JAK/STAT signal transduction pathway. The JAK/STAT pathway is involved in blood cell production and the immune response in vertebrates and its mis-activation has been implicated in a number of cancers and leukemias. We are following two complementary approaches to better understand this important pathway. Firstly, we are using the genetics of *Drosophila* to identify new components of the pathway and gene products that interact and regulate the pathway. Traditional "forward" genetic screens and tissue culture based RNAi screens are being undertaken. Secondly, the developmental processes that require JAK/STAT signalling are being investigated and characterised. In this way we can hope to better understand what the pathway does and with what other signal transduction pathways it interacts with. The results from this research is being integrated with what is already known to extend our understanding of the pathway.

Selected Recent Publications

Arbouzova NI, Bach EA, Zeidler MP (2005) Ken & Barbie selectively regulates the expression of a subset of JAK/STAT pathway target genes. Current Biology (in press)

Castelli-Gair Hombría J, Brown S, Häder S, Zeidler MP (2005) Characterisation of Upd2, a *Drosophila* JAK/STAT pathway ligand. Dev Biol (in press)

Müller P, Kuttenkeuler D, Gesellchen V, Zeidler MP, Boutros M (2005) Identification of JAK/STAT signalling components by genome-wide RNAi. Nature 436: 871-875

Mukherjee T, Castelli-Gair Hombría J, Zeidler MP (2005) Opposing roles for *Drosophila* JAK/STAT signalling during cellular proliferation. Oncogene 24: 2503-2511

Zeidler MP, Bach EA, Perrimon N (2000) The roles of the JAK/STAT pathway in *Drosophila.* Oncogene 19: 2589-2606

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