Yearbook 2004/05

MSc/PhD Molecular Biology Program
at the University of Göttingen

International Max Planck Research School

Imprint

Publisher:	Coordination Office Molecular Biology of the Georg August University Göttingen
Text:	Dr. Steffen Burkhardt Dr. Simone Cardoso de Oliveira
Cover Design:	Rothe Grafik
Page Layout:	VIRTUALabs (M. Nolte)
Photographics:	E. Dierßen Reprostelle MPI bpc (P. Goldmann)

In 2000, the Georg August University of Göttingen, together with the Max Planck Society for the Advancement of Science established two international MSc/ PhD programs, namely *Molecular Biology* and *Neurosciences*.

Both programs met with immediate success: Some 500 students from more than 70 countries applied for the 40 study places available.

These intensive research-oriented programs are taught by internationally renowned scientists from five Göttingen University faculties, from the Max Planck Institutes for Biophysical Chemistry and for Experimental Medicine as well as from the German Primate Centre. International guest lecturers also participate in the programs. The Max Planck Society contributes through its newly established International Max Planck Research Schools.

Both programs keep close contacts with the relevant industries in order to also meet market requirements, thus enhancing the chances for successful graduates to find attractive professional careers.

I would very much like to thank all scientific bodies and institutions for their committed support in establishing our new international programs and, last but not least, the German Academic Exchange Service (DAAD) and the Lower Saxony Ministry of Science and Culture.

The Georg August University of Göttingen is proud of its long international experience and very much looks forward to offering two attractive and innovative programs within the setting of a lively urban cultural and social background, in itself a prerequisite for creative teaching and research.

Prof. Dr. Horst Kern
(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 1998 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, 29 International Max Planck Research Schools have been established involving 34 Max Planck Institutes and 26 German universities. More than 1200 (mostly PhD-) students from 85 countries are presently enrolled. Eight more schools have been initiated and will be established next year.

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

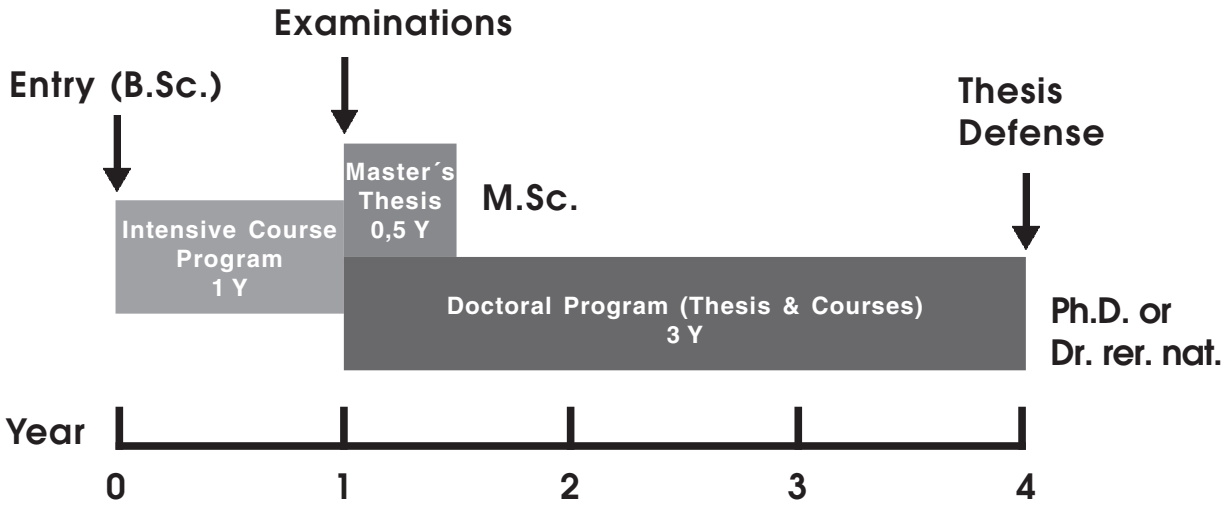
This yearbook is intended to provide information on the International MSc/PhD Molecular Biology Program in Göttingen, Germany, which was established in 2000. In addition to general information on the program, the yearbook introduces the current year's students, the faculty members, the program committee 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 and the Max Planck Institute for Experimental Medicine. 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
- Protein Structure, NMR, Crystallography
- Enzyme Mechanisms and Regulation
- Metabolic Networks

B. Molecular Genetics

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

C. Functional Organization of the Cell

- Membranes: Biophysics, Structure and Transport
- Protein Sorting, Vesicular Transport, Organelle Biogenesis
- Cytoskeleton
- Cell Adhesion
- Cell Cycle, Cancer, Apoptosis
- Infectious Diseases, Principles of Pathogenicity

D. Model Systems of Molecular Biology/Biotechnology

- Bacteria and *Archaea*
- Biotechnology
- Fungi
- *Arabidopsis*
- *Drosophila*
- *Xenopus*, Zebrafish
- Chicken, Mouse
- Human Genetics
- Immunology
- Nervous System

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
- cell biology
- developmental biology
- developmental physiology
- genetics
- microbiology
- molecular pharmacology
- neurobiology
- structural 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 2004

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 2004, the coordination office received 525 applications from 59 countries.

Continent	Applications	Admissions
Europe (total)	**109**	**13**
Germany	38	7
other West Europe	9	1
East Europe	62	5
America (total)	**21**	**1**
North America	2	0
Central/South America	19	1
Africa(total)	**56**	**0**
North Africa	15	0
Central/South Africa	41	0
Asia (total)	**339**	**6**
Near East	21	2
Central Asia/ Far East	318	4

Students 2004/2005

Name		Home Country
Alexandra	Andreou	Greece
Samira	Bina	Iran
Bijan	Boldajipour	Germany
Kalina	Dimova	Bulgaria
Benedikt	Frank	Germany
Florian	Hauer	Germany
Burkhard	Heisen	Germany
Chieh	Hsu	Taiwan
Gülsün Elif	Karagoz	Turkey
Damla Pinar	Karpinar	Turkey
Petranka	Krumova	Bulgaria
Gajula Balija	Madhu Babu	India
Ritika P.	Mahal	India
Gabriel	Mora Oberländer	Colombia
Yasser	Nejaty-Jahromy	Iran
Marc	Schneider	Germany
Kalpana	Singh	India
Christian	Stegmann	Germany
Charlotte	Weller	Germany
Larisa	Yurlova	Russian Federation

Alexandra Andreou

First Name
Alexandra

Last Name
Andreou

Date of Birth
16 September 1981

Country
Greece

EDUCATION

College / University
1999 - 2003 Aristotle University of Thessaloniki, Greece
Highest Degree
Diploma in Chemistry
Major Subjects
Biochemistry, Organic Chemistry
Lab Experience
Bacterial cultures, gene cloning, protein expression and purification, PCR, methylation-specific PCR, RT-PCR
Scholarships
2004 - 2005 Scholarship by the German Academic Exchange Service (DAAD)
2004 Award of Excellence by the Greek National Scholarship Foundation
1999 - 2000 Award of Excellence and Honorary Scholarship by the Greek National Scholarship Foundation
Publications
Grigoroudis AI, Lioliou EE, Andreou AS, Panagiotidis CA, Kyriakidis DA (2003) Cloning, overexpression, and study of the C-terminus of the response regulator AtoC/Az of the two component system AtoS- AtoC/Az. Proceedings of the 55th Meeting of the Hellenic Society of Biochemistry and Molecular Biology, Vol 50, Athens

Kouidou S, Kyrkou A, Agidou S, Andreou A, Katapodi T, Krikelis D, Georgiou E, Dimitriadou A, Tzimagiorgis G (2004) Aberrant methylation and abnormal transcription of p53 exon 5 in non-small cell lung carcinoma. Am Assoc Cancer Res Special Conference on Chromatin, Chromatin and Cancer Epigenetics, Nov 2004, Waikoloa, Hawaii

SCIENTIFIC INTERESTS AND GOALS

I am interested in studying signal transduction in mammals and carcinogenesis. I also find the field of developmental biology especially intriguing. Through this program I hope to obtain a solid theoretical background in molecular biology and an insight into diverse research areas.

Samira Bina

First Name
Samira

Last Name
Bina

Date of Birth
12 May 1982

Country
Iran

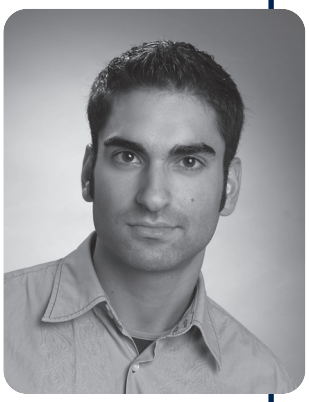
EDUCATION

College / University
2000 - 2004 University of Heidelberg, Germany
Highest Degree
B.Sc.
Major Subjects
Molecular Biotechnology
Lab Experience
Basic techniques in microbiology, molecular biology, biophysics and chemistry
Projects / Research
08/2003 - 10/2003 “Quality control of amino acid derivatives” at ORPEGEN Pharma in Heidelberg.
02/2004 - 04/2004 “Development of MRI contrast agents for the *in vivo* imaging of gene expression” at the chemistry laboratory of the École Normale Supérieure de Lyon (France)
Scholarships
2004 - 2005 Stipend International Max Planck Research School

SCIENTIFIC INTERESTS AND GOALS

With the help of this MSc/PhD Program I hope to get the best education in the wide ranging field of molecular biology in order to make the right decision for my future PhD project. At the moment, my interest focuses on the immune therapy of tumors.

Bijan Boldajipour



First Name
Bijan

Last Name
Boldajipour

Date of Birth
30 May 1982

Country
Germany

EDUCATION

College / University
2001 - 2004 University Lübeck, Germany
Highest Degree
B.Sc. (Molecular Biotechnology)
Major Subjects
Biochemistry, Molecular Biology, Biotechnology
Lab Experience
Various methods of biochemistry, molecular and cell biology, Fluorescence Microscopy, Surface Plasmon Resonance, Solid Phase DNA Sequencing
Projects / Research
2003 - 2004 Internship with Genovoxx GmbH, Lübeck, Germany
Development of highly parallel single molecule genomic sequencing using reversible termination, automatisation and optimisation of laboratory processes, solid phase DNA sequencing
Scholarships
2004 - 2005 Stipend International Max Planck Research School

SCIENTIFIC INTERESTS AND GOALS

Since my late high school years I have been interested in the molecular aspects of life. The function and interaction of molecules that make life possible has fascinated me since that time and has driven me to become a researcher in the life sciences. My goal for this program is to gain a broad overview and understanding of the biological sciences in order to make a good contribution to biological and medical research in an interdisciplinary and international working environment.

Kalina Dimova

First Name
Kalina

Last Name
Dimova

Date of Birth
02 January 1982

Country
Bulgaria

EDUCATION

College / University
2000 - 2004 Smith College, Northampton, MA, USA
Highest Degree
B.A. cum laude
Major Subjects
Biochemistry, highest departmental honors / German Studies
Lab Experience
SDS-PAGE, Western blotting, ELISA, protein purification, chromatography, enzyme kinetics, cloning, bacterial transformation and induced overexpression, PCR, agarose gel electrophoresis, cell and mycelial cultures and lab animals
Projects / Research
2004 “Nondestructive regioselective modification of laccase by linear-dendritic copolymers”, SUNY-ESF.
2003 - 2004 Honors Thesis Project: “Exercise-induced activation of MAPK signaling cascades in murine skeletal muscle”, Smith College.
2002 - 2003 “Cloning, targeted mutagenesis, bacterial overexpression, purification and enzymatic tests of human inositol 1,4,5 – trisphosphate 3-kinase isoform A”, University Hospital Hamburg – Eppendorf.
Scholarships
2004 - 2005 Stipend International Max Planck Research School
2002 Howard Hughes Medical Institute Fellowship for undergraduate research
2001 - 2002 Smith College International Scholar
Sigma Xi, The Scientific Research Society

SCIENTIFIC INTERESTS AND GOALS

I am interested in deciphering the convoluted map of cellular signaling cascades and the ways molecular mechanisms influence these cascades in health and disease.

Benedikt Frank

First Name
Benedikt

Last Name
Frank

Date of Birth
31 December 1982

Country
Germany

EDUCATION

College / University
2001 - 2004 University of Cambridge, Great Britain

Highest Degree
B.A. (Hons.)

Major Subjects
Molecular Biology

Lab Experience
Biochemical and molecular biology techniques, including molecular cloning and mutagenesis, expression and purification of recombinant proteins in bacteria, establishment of *in vitro* assays, mammalian cell culture techniques and transfection methods, microscopic imaging techniques, RNA extraction, RT-PCR and microarray probe synthesis, microarray hybridisations and scanning

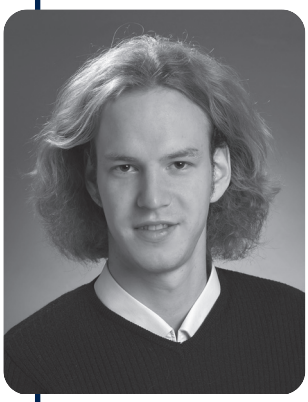
Projects/Research
2004 Microarray analysis of greening *Nicotiana tabacum*. University of Cambridge, Plant Sciences
2003 Post-translational modification of histones with the ubiquitin-like protein modifier SUMO *in vitro* and *in vivo*. Max Planck Institute for Biochemistry, Martinsried, Germany

Scholarships
2004 - 2005 Stipend International Max Planck Research School

SCIENTIFIC INTERESTS AND GOALS

Despite the rapid advances in biosciences during the past decades there are a myriad of Nature's mysteries yet to be understood. I am particularly interested in multidisciplinary approaches, many of which have only recently begun to evolve; and projects bridging several fields of science in order to reveal new perspectives and prospects.

Florian Hauer



First Name
Florian

Last Name
Hauer

Date of Birth
06 May 1980

Country
Germany

EDUCATION

College / University
Technical University Dresden

Highest Degree
B.Sc. (Molecular Biotechnology)

Major Subjects
Classical and Molecular Biology, Biochemistry

Lab Experience
Various techniques in Molecular Biology (e.g. DNA/RNA processing, cell and tissue culture, bioseparation, immunohistochemical applications)

Projects / Research
2004 “Comparative metabolite profiling of tasar silk worm *Antheraea mylitta* and medical host plant *Terminalia arjuna*.”
2003 Bachelor's degree project: “Expression of embryonic stem cell markers Oct4 and Rex1 and *de-novo*-methyltransferases DNMT1, DNMT3a and DNMT 3b in adult stem cells derived from blood and bone marrow upon *in-vitro*-differentiation.”

Scholarships
2004 - 2005 Stipend International Max Planck Research School
2004 DAAD fellowship for short-term research exchange

SCIENTIFIC INTERESTS AND GOALS

I am very much interested in the way nature acquires, stores and processes information in biochemical, biological and morphological processes such as regulation in metabolisms and gene or protein expression, cell differentiation and development of whole organisms. An understanding of these mechanisms will not only permit insight in biological and pathological processes, but also provide methods and algorithms which may be useful in other fields of science.

Burkhard Heisen

First Name
Burkhard

Last Name
Heisen

Date of Birth
30 July 1980

Country
Germany

EDUCATION

College / University
2001 - 2003 University of Lübeck, Germany
01/2004 - 07/2004 Stockholm University, Sweden

Highest Degree
B.Sc.

Major Subjects
Biochemistry, Molecular Biology, Informatics

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

Projects / Research
03/2004 - 07/2004 “Transmembrane helix prediction using a genetic programming approach”, Stockholm Bioinformatics Center, Sweden
07/2003 - 01/2004 Bachelor’s thesis: “Expression, purification and activity determination of the main proteinase of SARS coronavirus”, Dept. of Biochemistry, University of Lübeck
08/2002 - 10/2002 “Kinetical researches of complex formation between antisense-oligodeoxyribonucleotides and target-RNA”, Dept. of Molecular Medicine, University of Lübeck

Scholarships
2004 - 2005 Stipend International Max Planck Research School

SCIENTIFIC INTERESTS AND GOALS

During my previous education I became aware that topics which intersect between biology and technology are a special interest of mine. With the help of this program I would like to gain a solid background in molecular biology and combine it later with my skills in computer sciences. This expertise seems to me to be best integrated in areas such as microarray techniques or high throughput procedures in order to do rapid diagnostics, for example.

Chieh Hsu

First Name
Chieh

Last Name
Hsu

Date of Birth
08 February 1980

Country
Taiwan

EDUCATION

College / University
National Taiwan University

Highest Degree
B.Sc.

Major Subjects
Botany

Lab Experience / Projects
2004 Research on “Transcriptional control of rice small heat-shock proteins”, advised by Dr. Chu-Yung Lin, Institute of Plan Biology, National Taiwan University
2001 - 2002 Research on “Agricultural application of animal protease inhibitor gene in transgenic plants”, advised by Dr. Tsung-Luo Jinn, Institute of Plant Biology, National Taiwan University; sponsored by the “Research Program for Undergraduate Students”, National Science Council
2000 - 2002 Research on “Genetics of leaf morphology with t-DNA tagging”, advised by Dr. Tsung-Luo Jinn, Institute of Plant Biology, National Taiwan University

Scholarships
2004 - 2005 Stipend International Max Planck Research School

SCIENTIFIC INTERESTS AND GOALS

My main interest is to discover the higher order structure of protein interactions in a cell. Because of the progress of massive data acquisition technologies, interpretation of the rapidly accumulating information becomes the very problem of biological sciences. A new theory describing the intermediate level between cell physiology and molecular interaction should be constructed. I would be enthusiastic to confront this challenge and to make a contribution to the human being’s deeper and deeper understanding of life.

Gülsün Elif Karagoz

First Name
Gülsün Elif

Last Name
Karagoz

Date of Birth
24 July 1982

Country
Turkey

EDUCATION

College / University
2000 - 2004 Middle East Technical University (METU), Ankara, Turkey
Highest Degree
B.Sc.
Major Subjects
Molecular Biology and Genetics
Lab Experience
Basic techniques in molecular biology, genetics and biochemistry. Major methods in tissue engineering.
Projects / Research
2003 Generation of Ski7 deletion strains in *S. cerevisiae*. Max Planck Research Unit for Enzymology of Protein Folding, Halle, Germany
2002 - 2004 Nano-fibrous PHBV scaffolds for tissue engineering, Biotechnology Research Unit and Biomaterials Research Lab, METU, Ankara, Turkey
Scholarships
2004 - 2005 Stipend International Max Planck Research School
2003 - 2004 Scholarship of the Scientific and Technical Research Council of Turkey (TUBITAK)
Publications
Karagoz GE, Tezcaner A, Hasirci V (2004) Nano-fibrous PHBV scaffolds for tissue engineering, Poster, BIOMED 2004, International Symposium on Biomedical Science and Technology, September 6-7, Ankara, Turkey

SCIENTIFIC INTERESTS AND GOALS:

The complex organization and functioning of cells fascinate me very much. Molecular processes that take place in cells, including nuclear transport and protein sorting, are my main areas of interest. Moreover, I am highly interested in signal transduction pathways which regulate cellular metabolism, function and development, especially pathways that activate cell migration and cellular differentiation.

Damla Pinar Karpinar

First Name
Damla Pinar

Last Name
Karpinar

Date of Birth
21 April 1982

Country
Turkey

EDUCATION

College / University
2000 - 2004 Istanbul Technical University, Istanbul, Turkey
Highest Degree
B. Sc.
Major Subjects
Molecular Biology and Genetics
Lab Experience
Major techniques in molecular biology and biochemistry, flow cytometry, techniques of directed evolution
Projects / Research
2003 - 2004 Genetically engineering small peptides specific for particular inorganic surfaces. Istanbul Technical University, Dept. of Molecular Biology and Genetics, Istanbul
2003 Determination of immunological deficiencies by flow cytometry. DETAE, Dept. of Immunology, Istanbul
2003 Engineering the enzyme L-LDH from *Bacillus stearothermophilus* by site-directed mutagenesis in order to prevent its substrate inhibition. Istanbul Technical University, Dept. of Molecular Biology and Genetics, Istanbul.
Scholarships
2004 - 2005 Stipend International Max Planck Research School
Publications
Cebeci A, Kacar T, Karpinar DP, Cetinel S, Dincer S, Karaguler N, Tamerler C, Sarikaya M (2004) Site-directed mutagenesis in understanding the binding mechanism of inorganic specific polypeptides, Poster, BIOMED 2004, Ankara, Turkey

SCIENTIFIC INTERESTS AND GOALS

I am mainly interested in structural and functional aspects of biomolecules, especially proteins. I want to deepen my knowledge about protein folding, protein sorting, molecular recognition mechanisms and structure-function relationships.

Petranka Krumova

First Name
Petranka

Last Name
Krumova

Date of Birth
14 October 1981

Country
Bulgaria

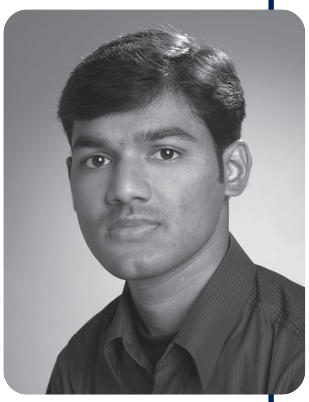
EDUCATION

College / University
Sofia University „St. Kliment Ohridsky“, Faculty of Biology, Sofia, Bulgaria
Highest Degree
B.Sc. (first class honours) July 2004
Major subjects
Molecular Biology
Lab experience
Major techniques in cell and molecular biology, genetics, biochemistry and immunology
Projects / Research
2003 - 2004 “Molecular events leading to antibiotic resistance in different types of enterobacteria”, University Hospital and Sofia University “St. Kl. Ohridsky”, Sofia, Bulgaria
2002 - 2003 “Breast cancer and ovarian cancer – effect of BRCA 1 and BRCA2 genes on both cancer diseases”, Sofia University “St. Kl. Ohridsky” and Bulgarian Medical University
Scholarships
2004 - 2005 Stipend International Max Planck Research School
2000 - 07/2004 Scholarship for academic excellence, Sofia University “St. Kliment Ohridsky”, Sofia, Bulgaria

SCIENTIFIC INTERESTS AND GOALS

My particular interests are in the field of molecular signaling pathways and mechanisms in the context of drug treatment of human diseases. I also find the area of molecular genetics of carcinogenesis a very promising area and particularly the various interaction between oncogenes and tumor-suppressor genes, the pathways leading to malignancy. I am eager to improve my practical and theoretical skills in immunology too, since it is an essential and challenging field of study and research.

Gajula Balija Madhu Babu



First Name
Gajula Balija

Last Name
Madhu Babu

Date of Birth
01 July 1982

Country
India

EDUCATION

College / University
University of Hyderabad, Hyderabad, India
Highest Degree
M.Sc.
Major Subjects
Biochemistry and Molecular Biology
Lab Experience
Techniques in Molecular Biology, Biochemistry, Immunology and rDNA technology
Projects / Research
“Generation of point mutants of Eco.P15I.Mod (modification subunit of Eco.P15I type III restriction enzyme) by PCR based site directed mutagenesis” (Indian Institute of Sciences, Bangalore)
“Elucidation of activities of lysomal glycosidases from Xiphophorous fish embryonic cell line (A 2)” (Master´s thesis at the University of Hyderabad)
Scholarships
2004 - 2005 Stipend International Max Planck Research School
2003 Summer Research Fellowship from Jawaharlal Nehru Centre for Advanced Scientific Research
2003 - 2004 Merit Scholarship from the University of Hyderabad
2002 - 2003 Merit cum means scholarship from the University of Hyderabad

SCIENTIFIC INTERESTS AND GOALS

I am keenly interested in developing effective strategies for Gene Therapy which defend dreadful and debilitant genetic disorders. My other interests include unravelling the secrets of developmental regulation of gene expression and understanding the core mechanism of action of death genes in human beings. Ultimately, I want to dedicate myself to the field of Gene Therapy by doing something that is watershed in that field and leaves my foot prints in the sands of time.

Ritika Mahal

First Name
Ritika

Last Name
Mahal

Date of Birth
29 October 1982

Country
India

EDUCATION

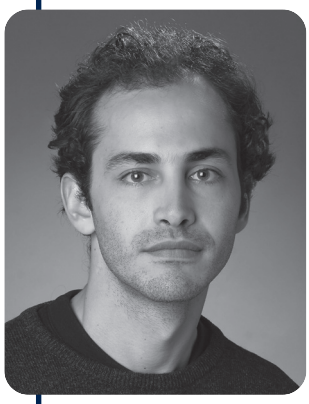
College / University
Guru Gobind Singh Indraprastha University, Delhi
Highest Degree
B. Tech.
Major Subjects
Biotechnology
Lab Experience
Animal tissue culture, plant tissue culture, basic molecular biological and immunological techniques
Projects / Training
30 days training at All India Institute of Medical Sciences, New Delhi in the Department of Transplantation Immunology and Immunogenetics: Serological and DNA based HLA tissue typing techniques like PCR-SSP, PCR-SSOP and RLS. Cross match and PRA testing procedures required for organ transplantation

B.Tech Final Semester Project: Anti-inflammatory and anti-oxidant activities of Curcumin and crude aqueous extract of *Calotropis procera* using con A stimulated splenocytes as the *in-vitro* model.
Scholarships
2004 - 2005 Stipend International Max Plank Research Scholarship
Qualified GATE (Graduate Aptitude Test in Engineering)

SCIENTIFIC INTERESTS AND GOALS

The field of immunology is of particular interest to me and I would like to use the knowledge received through this course to explore the molecular mechanisms underlying immunodeficiency syndromes and autoimmune disorders.

Gabriel Mora Oberländer



First Name
Gabriel

Last Name
Mora Oberlaender

Date of Birth
13 June 1977

Country
Colombia

EDUCATION

College / University
National University of Colombia, Bogota, Colombia
Highest Degree
B.Sc. (Chemistry)
Major Subjects
Biochemistry, Theoretical Chemistry
Lab Experience
DNA extraction, protein extraction, PCR, enzymatic determinations
Projects / Research
2001 - 2004 Diverse problems related to ISR and to sustainable agriculture (Biotechnology Group, International Physics Centre)
2000 Evaluation of AP-PCR viability for the characterization of *Giardia lamblia* strains (Biochemistry Laboratory, National Health Institute)
Scholarships
2004 - 2005 Stipend International Max Planck Research School
1996 - 2003 BSG Scholarship, National University of Colombia

SCIENTIFIC INTERESTS AND GOALS

My main scientific interest is focused on biological interactions at the molecular level and on structure-to-function relations of the molecular machinery underlying biological processes. I am, however, also interested in deepening my knowledge in other areas of biological phenomena, particularly genetics.

Yasser Nejaty-Jahromy

First Name
Yasser

Last Name
Nejaty-Jahromy

Date of Birth
01 August 1981

Country
Iran

EDUCATION

College / University
1999 - 2004 University of Tehran, Dept. of Biotechnology, Faculty of Science, Tehran, Iran

Highest Degree
B.Sc.

Major Subjects
Basic Sciences, Molecular Biology, Biochemistry and Biotechnology

Lab Experience
Acquaintance with basic techniques in molecular biology, biochemistry, and biotechnology

Projects / Publications
Nejaty-Jahromy Y, Behroozi R, Sharifi-Zarchi A (2003) Computer modeling of DNA reassociation kinetics, oral presentation in 10th Iranian Researchers' Seminar in Europe (IRSE2003), 31 May 2003, Gonville and Caius College, University of Cambridge, Cambridge, UK.

Scholarships
2004 - 2005 Stipend International Max Planck Research School
2001 - 2004 Ministry of Science, Research and Technology Stipend for Exceptional Talents
1999 - 2004 University of Tehran Stipend (for Scientific Olympiad Awardees and high ranking students in national Entrance Exam)

SCIENTIFIC INTERESTS AND GOALS

Theoretical and experimental investigation of the structure of biological organizations and molecules. Theoretical and experimental design of biochemical reaction networks and circuits of coupled biochemical reactions. Physical aspects and mathematical modelling of biological systems.

Marc Schneider

First Name
Marc

Last Name
Schneider

Date of Birth
06 February 1981

Country
Germany

EDUCATION

College / University
2001 - 2004 Friedrich-Alexander University Erlangen-Nürnberg

Highest Degree
B.Sc.

Major Subjects
Molecular Science

Lab Experience
Basic techniques in Molecular Biology. Experience in organic and anorganic synthesis: NMR, FT-IR, UV/Vis Spectroscopy

Projects / Research
03/2004 - 05/2004 Isolation of highly purified "lambda tet50" Bacteriophage DNA

Scholarships
2004 - 2005 Stipend International Max Planck Research School

SCIENTIFIC INTERESTS AND GOALS

Life is one of the most fascinating things for me. I am especially interested in the regulation of metabolism which helps organisms to sometimes differentiate and of course to survive. Taking part in this program is a great opportunity to improve my theoretical knowledge and practical skills in molecular biology, but also a chance to meet new friends from all over the world.

Kalpana Singh

First Name
Kalpana

Last Name
Singh

Date of Birth
24 May 1982

Country
India

EDUCATION

College / University
Guru Gobind Singh Indraprastha University, Delhi

Highest Degree
B.Tech

Major Subjects
Biotechnology

Lab Experience
Developed working hand on techniques such as DNA isolation, gel electrophoresis, PCR technologies, tissue culture (animal and plant), basic molecular biological techniques including, in vitro mutagenesis, induced gene expression basic immunological techniques

Projects / Training Experience
6-month project on generating *in vitro* mutants of a particular subunit of RNA Pol II and to test the *in vitro* interaction of these mutants with another subunit of RNA Pol II
2003 Two-month summer project on biosensors; Institute of Nuclear Medicine and Allied Sciences
2002 Two-month summer training on the DNA polymorphism studies in Buffaloes using RAPD molecular marker; National Dairy Research Institute

Scholarships
2004 - 2005 Stipend International Max Planck Research School
Qualified GATE (Graduate aptitude test in engineering)

SCIENTIFIC INTERESTS AND GOALS

I am interested in medical research and would like to employ the knowledge offered by this course for the better understanding of human diseases.

Christian Stegmann

First Name
Christian

Last Name
Stegmann

Date of Birth
04 December 1980

Country
Germany

EDUCATION

College / University
2001 - 2004 University of Freiburg, Germany

Highest Degree
Vordiplom

Major Subjects
Molecular Medicine

Lab Experience
Basic techniques in biochemistry, molecular biology, genetics, protein engineering and fluorescence spectroscopy

Scholarships
2004 - 2005 Stipend International Max Planck Research School
2004 Studienstiftung des Deutschen Volkes (German National Academic Foundation)

Publications
Schermer B, Höpker K, Rapka M, Keil A, Stegmann C, Otto E, Hildebrandt F, Walz G, Benzing T (2003) The nephrocystin protein complex interacts with beta-tubulin and is localized to primary cilia of kidney cells. 36th Annual Meeting & Scientific Exposition/Renal Week of the American Society of Nephrology (ASN), San Diego, Poster, November 2003

Huber TB, Reinhard C, Schermer B, Stegmann C, Mueller RU, Zahn A, Gerke P, Walz G, Benzing T (2004) Phosphorylation regulates binding of PDZ domains to Neph proteins at the glomerular slit diaphragm. 37th Annual Meeting & Scientific Exposition/Renal Week of the American Society of Nephrology (ASN), St. Louis, Poster, October 2004

SCIENTIFIC INTERESTS AND GOALS

My primary goal is to obtain insights into protein structure and function, especially in the area of cellular signaling processes. Thereby I seek to enhance our understanding of pathogenesis on the molecular level. In my opinion, this can contribute to new concepts in biology and medicine, and may even give rise to new options for therapeutic intervention.

Charlotte Weller

First Name
Charlotte

Last Name
Weller

Date of Birth
09 May 1982

Country
Germany

EDUCATION

College / University
2001 - 2004 Georg-August-University Göttingen
Highest Degree
Physikum
Major Subjects
Medicine
Lab Experience
Basic techniques in molecular and cell biology and biochemistry
Scholarships
2004 - 2005 Stipend International Max Plank Research School

SCIENTIFIC INTERESTS AND GOALS

I am interested in applying biological research and knowledge to the pathogenesis of human diseases at the molecular level in order to contribute to the improvement of early diagnoses and therapy. Being convinced that this program will offer both excellent education and cultural diversity on top of preparing me for a scientific career, I hope to do the best out of this great opportunity.

Larisa Yurlova

First Name
Larisa

Last Name
Yurlova

Date of Birth
01 October 1981

Country
Russian Federation

EDUCATION

College / University
1998 - 2004 St. Petersburg State University, Russia
Highest Degree
B.Sc. (Biology)
Major Subjects
Biochemistry, Neurochemistry
Lab Experience
Induction of rat forebrain ischemia (2-vessel occlusion with hypotension), subcellular fractionation of nervous tissue, determination of neuronal Na^+, K^+-ATPase activity, free Ca^{2+} concentration, malonic dialdehyde and protein contents, $^{45}Ca^{2+}$ entry into synaptosomes, PC12 cell culture
Projects / Research
Bachelor's degree project: “The influence of glutamate and mitochondrial inhibitors on the activity of Na^+, K^+-ATPase and accumulation of lipid peroxidation products in rat brain cortex synaptosomes”
Scholarships
2004 - 2005 Stipend International Max Plank Research School
2002 - 2003, 2003 - 2004 Orbeli scholarships (research scholarship of the Sechenov Institute of Evolutionary Physiology and Biochemistry, Russian Academy of Sciences)
2003 Research grant for graduate students, postgraduate students and young scientists of Saint-Petersburg
Publications
2 journal papers in press, 7 conference papers.

SCIENTIFIC INTERESTS AND GOALS

I am interested in biochemical mechanisms involved in brain ischemia and neurodegenerative diseases. However, I would also like to familiarise myself with diverse research areas and to gain experience in new molecular biology and bioengineering techniques.

Graduate Program Committee

Prof. Dr. Gerhard Braus
Prof. Dr. Reinhard Jahn
Prof. Dr. Wolfgang Liebl
Prof. Dr. Tomas Pieler
Prof. Dr. Christiane Gatz
Dr. Wilfried Kramer
Kalina Dimova
Roland Graf
Ralf Jauch
Daniel Zwilling

GZMB Board Members

Prof. Dr. Tomas Pieler
(executive director)
Prof. Dr. Gerhard Braus
Prof. Dr. Ivo Feußner
Prof. Dr. Axel Zeeck
Dr. Christian Knorr
Marco Winkler
Katja Bensmann

Program Coordination

Molecular Biology Program

Dr. Steffen Burkhardt
(Program Coordinator)

Nina McGuinness
(Program Assistant)

Neuroscience Program

Dr. Simone Cardoso de Oliveira
(Program Coordinator)

Sandra Drube
(Program Assistant)

Coordination Office
Molecular Biology
Georg-August-Universität
Justus-von-Liebig-Weg 11

37077 Göttingen
Germany

phone:
+49 – 551 – 39 12110 / 12111
fax:
+49 – 551 – 39 3811
e-mail:
gpmolbio@gwdg.de

Further Information:
http://www.gpmolbio.
uni-goettingen.de

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
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
Gabriele	Fischer-v.-Mollard	Biochemistry	U Göttingen
Hans-Joachim	Fritz	Molecular Genetics	U Göttingen
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
Volker	Haucke	Biochemistry and Molecular Cell Biology	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
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
Hans-Ulrich	Mösch	Microbiology and Genetics	U Göttingen
Erwin	Neher	Membrane Biophysics	MPI bpc
Mary	Osborn	Biochemistry and Cell Biology	MPI bpc
Tomas	Pieler	Developmental Biochemistry	U Göttingen
Erez	Raz	Developmental Biology	MPI bpc
Christian	Rosenmund	Membrane Biophysics	MPI bpc
Markus	Rudolph	Structural Biology	U Göttingen
Ruth A.	Schmitz-Streit	Microbiology	U Göttingen
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
Ernst	Wimmer	Developmental 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

Address

Dept. of Molecular Biology
Max Planck Institute for Biophysical Chemistry
Am Fassberg 11
37077 Göttingen

Germany

phone: + 49-551-201 1393
fax: + 49-551-201 1467
e-mail: djovin@gwdg.de

Further Information

http://www.mpibpc.gwdg.de/abteilungen/060/people/donna/index.html

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

Buchenau P, Hodgson J, Strutt H, Arndt-Jovin DJ (1998) The distribution of Polycomb-group proteins during cell division and development in *Drosophila* embryos: impact on models for silencing. J Cell Biol 141: 469-481

Gemkow MJ, Dichter J, Arndt-Jovin DJ (2001) Developmental regulation of DNA-topoisomerases during *Drosophila* embryogenesis. Exp Cell Res 262: 114-121

Heintzmann R, Hanley QS, Arndt-Jovin DJ, Jovin TM (2001) A dual path programmable array microscope (PAM): simultaneous acquisition of conjugate and non-conjugate images. J Microsc 204: 119-135

Hanley QS, Arndt-Jovin DJ, Jovin TM (2002) Spectrally resolved fluorescence lifetime imaging microscopy. Appl Spectrosc 56: 155-166

Clayton AHA, Hanley QS, Arndt-Jovin DJ, Subramaniam V, Jovin TM (2002) Dynamic fluorescence anisotropy imaging microscopy in the frequency domain (rFLIM). Biophys J 83: 1631-1649

Shchyolkina A, Kaluzhny DN, Borisova OF, Arndt-Jovin DJ, Jovin TM, Zhurkin VB (2003) Formation of the parallel recombination-type triplex by human telomeric sequences. J Biomol Struct Dyn 20: 868-869

Nagy P, Arndt-Jovin DJ, Jovin TM (2003) Small interfering RNAs suppress the expression of endogenous and GFP-fused epidermal growth factor receptor (erbB1) and induce apoptosis in erbB1-overexpressing cells. Exp Cell Res 285: 39-49

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

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

Address

Center for
Neurological Medicine
Neurology
University of Göttingen
Robert-Koch-Str. 40

37075 Göttingen
Germany

phone: + 49-551-39 6603
fax: + 49-551-39 8405
e-mail: mbaehr@gwdg.de

Further Information

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

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 adenovirus vectors that can deliver neurotrophic factors directly into neurons or into surrounding glial cells. These, an other new strategies like using 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 od neurodegenerative diseases (e.g. Alzheimer 's or Parkinson's disease).

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

Dietz GPH, Kilic E, Bähr M (2002) Inhibition of apoptosis *in vitro* and *in vivo* using TAT-mediated protein transduction. Mol Cell Neurosci 21 (1): 29-37

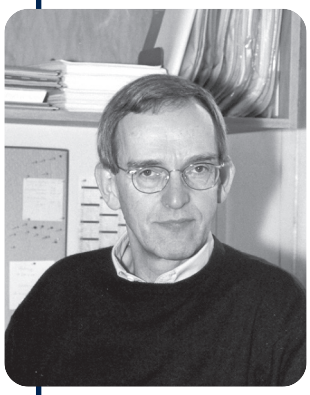
Kilic E, Dietz GPH, Herrmann DM, Bähr M (2002) Intravenous TAT-Bcl-XL is protective when delivered before and after middle cerebral artery occlusion in mice. Ann Neurol 52(5): 617-22

Kilic E, Herrmann DM, Kügler S, Kilic Ü, Holzmüller H, Schmeer C, Bähr M (2002) Adenovirus-mediated Bcl-Xl expression using a neuron-specific promoter protects against disseminated neuronal injury and brain infarction following focal cerebral ischemia in mice. Neurobiol Dis 11: 275-284

Kügler S, Kilic E, Bähr M (2003) Human synapsin 1 gene promoter confers highly neuron pecific long-term transgene expression from an adenoviral vector in the adult rat brain depending on the transduced area. Gene Therapy 10(4): 337-47

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

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

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.

Apart from 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.

Address

Institute for Microbiology
and Genetics
University of Göttingen
Grisebachstr. 8

37077 Göttingen
Germany

phone: +49-551-39 3815
fax: +49-551-39 9842
e-mail: bbowien@gwdg.de

Further Information

http://www.gwdg.de/~molmibio

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

Address

Department of Molecular Microbiology and Genetics
University of Göttingen
Grisebachstr. 8

37077 Göttingen
Germany

phone: +49-551-39 3771
fax: +49-551-39 3820
e-mail: gbraus@gwdg.de

Further Information

http://www.gwdg.de/~molmibio

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

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

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.

Pries R, Irniger S, Bömeke K, Grundmann O, Braus GH (2002) Amino acid dependent Gcn4p stability regulation occurs exclusively in the yeast nucleus. Euk Cell 1: 663-672

Valerius O, Brendel C, Wagner C, Krappmann S, Thoma F, Braus GH (2003) Different transcriptional activators regulate yeast HIS7 expression by different nucleosome-mediated activation mechanisms. Euk Cell 2: 876-885

Bertram Brenig

Full Professor of Molecular Biology of Livestock

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

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.

Address

Institute of Veterinary Medicine
Dept. Molecular Biology of Livestock
University of Göttingen
Groner Landstr. 2

37073 Göttingen
Germany

phone: +49-551-39 3383
or 39 3381
fax: +49-551-39 3392
e-mail: bbrenig@gwdg.de

Further Information

http://www.gwdg.de/~bbrenig/

Selected Recent Publications

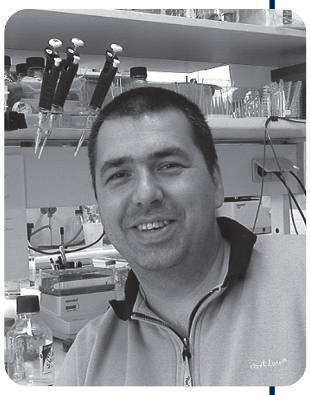
Gatphayak K, Knorr C, Chen K, Brenig B (2004) Structural and expression analysis of the porcine FUS2 gene. Gene 337: 105-11

Kierstein G, Vallinoto M, Silva A, Schneider MP, Iannuzzi L, Brenig B (2004) Analysis of mitochondrial D-loop region casts new light on domestic water buffalo (*Bubalus bubalis*) phylogeny. Mol Phylogenet Evol 30: 308-24

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: 214-9

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

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

Address

Dept. of Molecular Neurobiology
Max Planck Institute for Experimental Medicine
Hermann-Rein-Str. 3

37075 Göttingen
Germany

phone: +49-551-38 99725
fax: +49-551-38 99715

Further Information

http://www.em.mpg.de/User/Brose/index.html

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

Betz A, Thakur P, Junge HJ, Ashery U, Rhee JS, Scheuss V, Rosenmund C, Rettig J, Brose N (2001) Functional interaction of the active zone proteins Munc13-1 and RIM1 in synaptic vesicle priming. Neuron 30: 183-196

Rhee JS, 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

Wojcik SM, Rhee J-S, Herzog E, Sigler E, Jahn R, Takamori S, Brose N, Rosenmund C (2004) An essential role for VGLUT1 in postnatal development and control of quantal size. Proc Natl Acad Sci USA 101: 7158-7163

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, in press

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 Dept. Molecular Biology at the Institute of Biochemistry and Molecular Cell Biology

Address

Dept. Molecular Biology
Biochemistry and Molecular Cell Biology
University of Göttingen
Humboldtallee 23

37073 Göttingen
Germany

phone: +49-551-39 5972
fax: +49-551-39 5960
e-mail: ddoenec@gwdg.de

Further Information

http://www.uni-bc.gwdg.de/Doenecke.htm

Major Research Interests

The main interest of the laboratory is in mammalian histones and histone genes, and in the multiple subtypes of individual histone classes. 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. It was isolated and more than 50 histone genes were identified and sequenced. In contrast to these clustered, S phase-dependent genes, several S phase-independent histone genes (replacement histone genes) map as solitary genes to other chromosomes. Current work in this project is focused on the regulation of individual histone gene subtypes. A second major project deals with the factors mediating the transport of histone proteins from the cytoplasm to the nucleus. This work concentrates on the differential role of nuclear import receptors and specific protein-protein interactions during the nuclear transport of linker and core histone proteins and of histone related proteins. The third topic of research deals with the structural transitions of chromatin during programmed cell death. The focus of this project is on the role of histone modifications and on the control of DNA fragmentation during the apoptotic process.

Selected Recent Publications

Albig W, Doenecke D (1997) The human histone gene cluster at the D6S105 locus. Hum Genet 101: 284-294

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

Olins AL, Herrmann H, Lichter P, Kratzmeier M, Doenecke D, Olins DE (2001) Retinoic acid and phorbol ester induced changes in nuclear components of HL-60 cells. Exp Cell Res 268: 115-127

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

Frank D, Doenecke D, Albig W (2003) Differential expression of human replacement and cell cycle dependent H3 histone genes. Gene 312: 135-143

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

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

Address

Institute for Human Genetics
University of Göttingen
Heinrich-Düker-Weg 12

37073 Göttingen
Germany

phone: +49-551-39 7590
fax: +49-551-39 9303
e-mail: wengel@gwdg. de

Further Information

http://www.
humangenetik.gwdg.de/

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 Melecular 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. Other studies deal with transport processes involved in the loading of the phloem for long-distance transport of photoassimilates. Moreover, transport processes in root nodules in the course of symbiotic nitrogen fixation by plants and the mechanism of the induction of root nodules are investigated at the molecular level. The biochemistry of phosphoinositides and the transfer of enzymes facilitate the metabolic pathways for lcPUFAs from donor organisms into plants.

Address

Albrecht-von-Haller-Institute
for Plant Sciences
Dept. of Plant Biochemistry
University of Göttingen
Justus-von-Liebig-Weg 11

37077 Göttingen
Germany

phone: +49-551-39 5743
fax: +49-551-39 5749
e-mail: ifeussn@gwdg.de

Further Information

http://www.plant-biochem.uni-goettingen.de

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

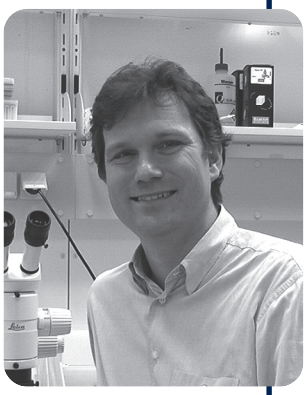
Feussner I, Wasternack C (2002) The lipoxygenase pathway, Ann Rev Plant Biol 53: 275-297

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

Wichard T, Göbel C, Feussner I, Pohnert G (2004): Unprecedented lipoxygenase / hydroperoxide lyase pathways in the moss *Physcomitrella patens*. Angew Chem, in press

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

Address

Dept. of Molecular
Structural Biology
Institute for Microbiology
and Genetics & GZMB
University of Göttingen
Justus-von-Liebig-
Weg 11

37077 Göttingen
Germany

phone: +49-551-39 14072
fax: +49-551-39 14082
e-mail: rficner@gwdg.de

Further Information

http://www.img.bio.uni-goettingen.de/ms-www/index.html

Major Research Interests

Our major interest is the structure – function relationship of biological macromolecules. We determine the three-dimensional structure of proteins and protein-RNA complexes by means of X-ray crystallography in order to understand their function at atomic level. Besides the crystal structure analysis, the overexpression, purification and crystallization of proteins is an important aspect of our work. We are currently working on proteins involved in the splicing and modification of RNA and, as well, on proteins required for the nucleocytoplasmic transport.

Selected Recent Publications

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

Reidt U, Wahl MC, Fasshauer D, Horowitz DS, Lührmann R, Ficner R (2003) Crystal structure of a complex between human spliceosomal cyclophilin H and a U4/U6 snRNP-60K peptide. J Mol Biol 331: 45-56

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

Grimm C, Maser E, Möbus E, Klebe G, Reuter K, Ficner R (2000) The crystal structure of α-hydroxysteroid dehydrogenase/carbonyl reductase from *Comamonas testosteroni* shows a novel oligomerisation pattern within the short chain dehydrogenase/reductase family J Biol Chem 275: 41333-41339

Reuter K, Mofid M R, Marahiel M A, Ficner R (1999) Crystal structure of the surfactin synthetase activating enzyme Sfp: a prototype of the 4'-phosphopantetheinyl transferase superfamily. EMBO J 18: 6823-6831

Reuter K, Nottrott S, Fabrizio P, Lührmann R, Ficner R (1999) Identification, characterization and crystal structure analysis of the human spliceosomal U5 snRNP-specific 15kD protein. J Mol Biol 294: 515-525

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.

Address

Dept. Biochemistry II
University of Göttingen
Heinrich-Dueker-
Weg 12

37073 Göttingen
Germany

phone: +49-551-39 5948
fax: +49-551-39 5979
e-mail: kfigura@gwdg.de

Further Information

http://www.uni-bc.gwdg.de/bio_2/bio_2.htm

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

Lübke T, Marquardt T, Etzioni A, Hartmann E, von Figura K, Körner C (2001) Complementation cloning identifies CDG-IIc, a new type of congenital disorders of glycosylation, as a GDP-fucose transporter deficiency. Nature Genetics 28: 73-76

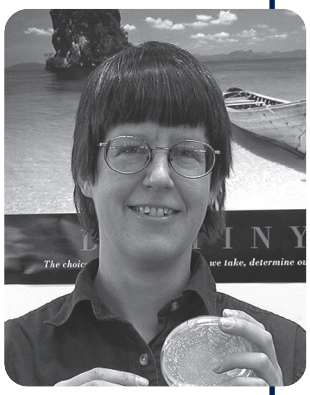
Hanßke B, Thiel C, Lübke T, Hasilik M, Höning S, Peters V, Heidemann PH, Hoffmann GF, Berger EG, von Figura K, Körner C (2002) Deficiency of UDP-galactose: N-acetylglucosamine β-1,4-galactosyltransferase I causes the congenital disorder of glycosylation type IId. J Clin Invest 109: 725-733

Ricotta D, Conner SD, Schmid SL, von Figura K, Höning S (2002) Phosphorylation of the AP2 μ-subunit by AAK1 mediates high-affinity binding to membrane protein sorting signals. J Cell Biol 156: 791-795

Marquordt C, Fang Q, Will E, Peng J, von Figura K, Dierks T (2003) Posttranslational modification of serine to formylglycine in bacterial sulfatases: Recognition of the modification motif by the iron sulfur protein AtsB. J Biol Chem 278: 2212-2218

Dierks T, Schmidt B, Borissenko LV, Peng J, Preusser A, Mariappan Malaiyalam, von Figura K (2003) Multiple Sulfatase Deficiency is caused by mutations in the gene encoding the human Ca-formylglycine generating enzyme. Cell 113: 435-444

Gabriele Fischer von Mollard



Junior Group Leader at the Department of Biochemistry II

Dr. rer. nat. (Ph.D.) 1992, Freie Universität Berlin
Postdoctoral fellow, University of Oregon, Eugene (USA), 1994 - 1998
Junior group leader in the Department of Biochemistry II, Medical Faculty, Universität Göttingen since 8/1998

Address

Biochemistry II
University of Göttingen
Heinrich-Düker Weg 12

37073 Göttingen

phone: +49-551-39 5983
fax: +49-551-39 5979
e-mail: gfische1@gwdg.de

Further Information

http://www.uni-bc.gwdg.de/bio_2/mollard/fvmweb200.html

Major Research Interests

One of the fundamental questions in cell biology is how proteins are transported between different organelles. This transport requires transport vesicles which bud from the donor and fuse with the target organelle. Our group is interested in the family of SNARE proteins which are required for recognition between transport vesicle and target membrane and for their subsequent fusion. Different SNARE proteins are found on transport vesicle and target membranes and form specific complexes. We focus on SNAREs which are required in transport between the Golgi, endosome and lysosome/vacuole. As these proteins are conserved in evolution we can study similar processes in yeast and mammals.

We use baker's yeast as one model system because of powerful genetic approaches. Mutant genes can be generated easily and defects analyzed. Genes required in the same step can be identified by genetic interactions. Using these techniques we demonstrated that two SNAREs act in several different transport pathways and found a novel SNARE acting in retrograde traffic from the Golgi to the ER.

Our second focus are endosomal SNAREs in mouse. We are studying their subcellular distribution using immunofluorescence and are identifying SNARE partners by co-immunoprecipitation. Currently, we are using the yeast two hybrid system to identify new binding proteins for SNAREs. We generated SNARE knock out mice and are studying their phenotypes as well as cell lines derived from these mice.

Selected Recent Publications

Antonin W, Riedel D, Fischer von Mollard G (2000) The SNARE Vti1α-β is localized to small synaptic vesicles and participates in a novel SNARE complex. J Neuroscience 20: 5724-5732

Dilcher M, Köhler B, Fischer von Mollard G (2001) Genetic interactions with the yeast Q-SNARE *VTI1* reveal novel functions for the R-SNARE *YKT6*. J Biol Chem 276: 34537-34544

Kreykenbohm V, Wenzel D, Antonin W, Atlachkine V, Fischer von Mollard G (2002) The SNAREs vti1a and vti1b have different localization and SNARE complex partners. Eur J Cell Biol 81: 273-280

Atlashkin V, Kreykenbohm V, Eskelinen EL, Wenzel D, Fayyazi A, Fischer von Mollard G (2003) Deletion of the SNARE vti1b in mice results in loss of a single SNARE partner, syntaxin 8. Mol Cell Biol 23: 5198-5207

Dilcher M, Veith B, Chidambaram S, Hartmann E, Schmitt HD, Fischer von Mollard G (2003) Use1p is a yeast SNARE protein required for retrograde traffic to the ER. EMBO J 14: 3664-3674

Chidambaram S, Müllers N, Wiederhold K, Haucke V, Fischer von Mollard G (2004) Specific interaction between SNAREs and ENTH domains of epsin-related proteins in TGN to endosome transport. J Biol Chem 279: 4175-4179

Hans-Joachim Fritz

Professor of Molecular Genetics

Diplomchemiker Degree, University of Stuttgart 1969
Dr. rer. nat., University of Stuttgart 1972
Massachusetts Institute of Technology 1974 - 1976
Institute of Genetics, University of Cologne 1977 - 1984
Max-Planck-Institute of Biochemistry, Martinsried 1984 - 1988

Address

Dept. of Molecular Genetics
and Preparative Molecular
Biology
University of Göttingen
Grisebachstr. 8

37077 Göttingen
Germany

phone: +49-551-39 3801
fax: +49-551-39 3805
e-mail: hjfritz@gwdg.de

Further Information

http://www.img.bio.uni-goettingen.de/molgen.html

Major Research Interests

Pathways of Spontaneous Mutation, DNA Repair and the Stability of Genetic Information:
The integrity of genetic information is constantly challenged by thermal noise in a variety of different ways; consequently, numerous mechanisms have evolved to protect the genome by DNA repair. For a number of years, we have been studying various endogenous sources of spontaneous mutation and their respective DNA repair pathways - in most recent years with emphasis on thermophilic microorganisms and hydrolytic deamination of cytosine and 5-methylcytosine residues.

Conformational Stability of Proteins and their Interactions with other Macromolecules and with Ligands:
One of the major impacts genomic research has on molecular biology as a whole is the growing appreciation of protein function as a consequence of a complex web of macromolecular interactions. We have developed and are using genetic tools to detect and to analyze protein/protein and protein/ligand interactions as well as the conformational stability of proteins.

Selected Recent Publications

Usón I, Bes MT, Sheldrick GM, Schneider TR, Hartsch T, Fritz H-J (1997) X-ray crystallography reveals stringent conservation of protein fold after removal of the only disulfide bridge from a stabilized immunoglobulin variable domain. Folding and Design 2: 357-361

Drotschmann K, Aronshtam A, Fritz H-J, Marinus MG (1998) The *Escherichia coli* MutL protein stimulates binding of Vsr and MutS to heteroduplex DNA. Nucleic Acids Research 26: 948-953

Dziejman M, Kolmar H, Fritz H-J, Mekalanos JJ (1999) ToxR co-operative interactions are not modulated by environmental conditions or periplasmic domain conformation. Molecular Microbiology 31: 305-317

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

Address

Albrecht-von-Haller Institute
for Plant Sciences, Dept.
General and Developmental
Physiology of the Plant
University of Göttingen
Untere Karspüle 2

37073 Göttingen
Germany

phone: +49-551-39 7843
fax.: +49-551-39 7820
e-mail: cgatz@gwdg.de

Further Information

http://www. ubpb.gwdg.de/

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

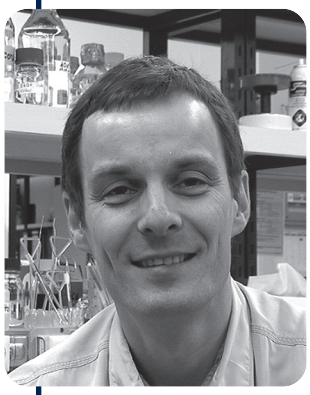
Niggeweg R, Thurow C, Kegler C, Gatz C (2000) Tobacco transcription factor TGA2.2 is the main component of ASF-1/ SARP and is involved in salicyclic acid- and auxin-inducible expression of as-1-containing target promoters. J Biol Chem 275: 19897-19905

Böhner S, Gatz C (2001) Characterisation of novel target promoters for the dexamethasone-inducible/tetracycline-inactivatable regulator TGV using luciferase and isopentenyl transferase as sensitive reporter genes. Mol Gen Gen 264: 860-870

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

Schiermeyer A, Thurow C, Gatz C (2003) Tobacco bZIP factor TGA10 is a novel member of the TGA family of transcription factors. Plant Mol Biol 51: 817-829

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)

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.

Address

Dept. of NMR
Based Structural Biology (Abt. 030), Max Planck Institute for Biophysical Chemistry
Am Faßberg 11

37077 Göttingen
Germany

phone: +49-551-201 2201
+49-551-201 2200
fax: +49-551-201 2202
email: cigr@nmr.mpibpc.mpg.de

Further Information

http://www.mpibpc.mpg.de/abteilungen/030

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

Address

Department of Medical Microbiology
Medical Faculty of the University of Göttingen
Kreuzbergring 57

37075 Göttingen
Germany

phone: +49-551-39 5801/ 5806
fax: +49-551-39 5861
e-mail: ugross@gwdg.de

Further Information

http://www.gwdg.de/~sekbak02/

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.

Selected Recent Publications

Schmidt-Ott R, Burghard S, Pohl S, Weig M, Groß U (2004) Identification and characterization of a major subgroup of /Campylobacter jejuni/ plasmids. J Infect, in press

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, in press

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

Lüder CGK, Lang C, Giraldo-Velasquez M, Algner M, Gerdes J, Groß U (2003) *Toxoplasma gondii* inhibits MHC class II expression in neural antigen-presenting cells by down-regulating the class II transactivator CIITA. J Neuroimmunol 134: 12-24

Lugert R, Kuhns M, Polch T, Groß U (2003) Expression and localization of type III secretion-related proteins of *Chlamydia pneumoniae*. Med Microbiol Immunol, in press.

Lüder CGK, Groß U, Lopes MF (2001) Intracellular protozoan parasites and apoptosis: diverse strategies to modulate parasite-host interactions. Trends Parasitol 17: 480-486

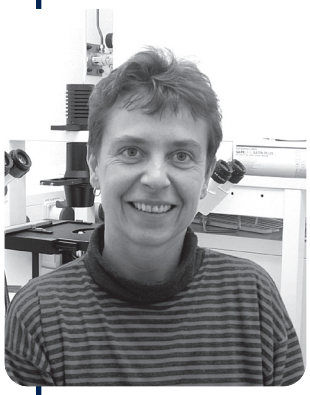
Goebel S, Groß U, Lüder CGK (2001) Inhibition of host cell apoptosis by *Toxoplasma gondii* is accompanied by reduced activation of the caspase cascade and alterations of poly(ADP-ribose) polymerase expression. J Cell Science 114: 3495-3505

Lüder CGK, Walter W, Beuerle B, Maeurer MJ, Groß U (2001) *Toxoplasma gondii* down-regulates MHC class II gene expression and antigen presentation by murine macrophages via interference with nuclear translocation of STAT1 alpha. Eur J Immunol 31: 1475-1484

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



Address

Institute of Human Genetics
University of Göttingen
Heinrich-Düker-Weg 12

37073 Göttingen
Germany

phone: +49-551-39 14010
fax: +49-551-39 9303
e-mail: hhahn@gwdg.de

Further information

http://www.humangenetik.gwdg.de

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

Hahn H, Wojnowski L, Specht K, Kappler R, Calzada-Wack J, Potter D; Zimmer AM, Müller U, Samson E, Quintinilla-Martinez, Zimmer A (2000) Patched target IGF2 is indispensable for the formation of medulloblastoma and rhabdomyosarcoma. JBC 275 (37): 28341-4

Calzada-Wack J, Kappler R, Schnitzbauer U, Richter T, Nathrath M, Rosemann M, Wagner SN, Hein R, Hahn H (2002) Unbalanced overexpression of the mutant allele in murine Patched mutants. Carcinogenesis 23(5): 727-734

Kappler R, Calzada-Wack J, Schnitzbauer U, Piontek G, Graedler F, Adamski J, Heinzmann U, Schlegel J, Hemmerlein B, Quintanilla-Martinez L, Hahn H (2003) Molecular characterisation of Patched-associated rhabdomyosarcoma. J of Pathology, 200(3): 348-56

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, in press

Volker Haucke

Professor of Biochemistry

Dr. phil. (Ph.D.) 1997, University of Basel, Switzerland
Postdoctoral Fellow at Yale University School of Medicine, New Haven, CT, USA 1997 - 2000
Head of an independent Junior Research Group at the Zentrum für Biochemie & Molekulare Zellbiologie 2000-2003
Since 2003 Professor of Biochemistry (FU Berlin)

Address

Freie Universität Berlin
Institute of Chemistry-Biochemistry
Takustraße 6

14195 Berlin-Dahlem
Germany

phone: +49-30-838 56 922
fax: +49-30-838 56 919
e-mail: vhaucke@chemie.fu-berlin.de

Further Information

http://userpage.chemie.fu-berlin.de/biochemie/aghaucke/AGHaucke_g.html

Major Research Interests

Our laboratory is interested in the molecular mechanisms of endocytosis and synaptic vesicle formation in neurons. Synaptic vesicles are small membrane-bounded organelles that store and secrete non-peptide neurotransmitters. Following exocytosis and the concomitant insertion of synaptic vesicle proteins and lipids into the presynaptic plasmalemma synaptic vesicles are retrieved by clathrin-mediated endocytosis. During this process the clathrin adaptor complex AP-2 is recruited to the presynaptic plasmamembrane along with a growing number of accessory proteins which assist in the formation and maturation of clathrin-coated pits. These coated pits eventually pinch off in a dynamin-dependent reaction giving rise to free clathrin-coated vesicles which become refilled with neurotransmitter and finally shed their coat resulting in the regeneration of synaptic vesicles.
We are interested in how the endocytic process is regulated at the molecular level both by proteins and lipids and how synaptic vesicles are formed in differentiating neuronal precursor cells. We have identified hStnB/ stonin 2, a novel component of the endocytic machinery which we hypothesize to negatively regulate the interaction of clathrin/AP-2 with the membrane. How this protein precisely acts at the synapse is currently under intense investigation by the combined use of molecular biological, biochemical, and physiological techniques. Other projects are directed towards dissecting the role of phosphoinositides, a certain class of membrane lipids which interact with several components of the endocytic machinery, in clathrin-mediated endocytosis at the synapse.
Finally, we are trying to understand the biogenesis pathway of synaptic vesicles during neuronal differentiation by establishing an *in vitro* system that allows the formation of neurons from differentiating non-neuronal precursor cells.

Selected Recent Publications

Krauss M, Kinuta M, Wenk MR, De Camilli P, Takei K, Haucke V (2003) ARF6 stimulates clathrin/AP-2 recruitment to synaptic membranes by activating phosphatidylinositol phosphate kinase type Iγ. J Cell Biol, 162: 113-124

Rohde G, Wenzel D, Haucke V (2002) A phosphatidylinositol (4,5)-bisphosphate binding site within μ2-adaptin is required for clathrin-mediated endocytosis. J Cell Biol 158: 209-214

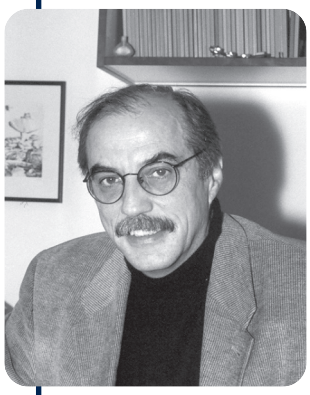
Takei K, Haucke V (2001) Clathrin-mediated endocytosis: membrane factors pull the trigger. Trends Cell Biol 11: 385-391

Walther K, Krauss M, Diril MK, Lemke S, Ricotta D, Höning S, Kaiser S, Haucke V (2001) Human stoned B interacts with AP-2 and synaptotagmin and facilitates clathrin-coated vesicle uncoating. EMBO Rep 2: 634-640

Haucke V (2000) Dissecting the ins and outs of excitement: glutamate receptors on the move. Nature Neurosci 3: 1230-1232

Haucke V, De Camilli P (1999) AP-2 recruitment to synaptotagmin stimulated by tyrosine-based endocytic motifs. Science 285: 1268-1271

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)

Address

Dept. of Molecular Developmental Biology,
Max-Planck-Institute for Biophysical Chemistry
Am Fassberg 11

37077 Göttingen
Germany

phone: +49-551-201 1482
fax: +49-551-201 1755
e-mail: hjaeckl@gwdg.de

Further Information

http://www.mpibpc.gwdg.de/abteilungen/170/

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

Schöck F, Reischl J, Wimmer E, Taubert H, Purnell BA, Jäckle H (2000) Phenotypic supression of *empty spiracles* is prevented by buttonhead. Nature 405: 351-354

Piepenburg O, Vorbrüggen G, Jäckle H (2000) *Drosophila* segment borders result from unilateral repression of hedgehog activity by Wingless signaling. Molecular Cell 6: 203-209

Niessing D, Sprenger F, Driever W, Taubert H, Jäckle H, Rivera-Pomar R (2000) Homeodomain position 54 specifies transcriptional versus translational control by Bicoid. Mol. Cell 5: 595-401

Linder B, Gerlach N, Jäckle H (2001) The *Drosophila* homolog of the human AF10 is a HP1-interacting suppressor of position effect variegation. EMBO reports 2: 211-216

Benos PV *et al*. (2001) From first base: The sequence of the tip of the *X*-chromosome of *Drosophila melanogaster*, a comparison of two sequencing strategies. Genome Research 11: 710-730

Reinhard Jahn

Professor, Director at the Max Planck Institute for Biophysical Chemistry

Dr. rer. nat. (Ph.D.) 1981, University of Göttingen
Professor (since 1997 Adjunct Professor) of Pharmacology, Yale University School of Medicine
Appointed as Director at the Max-Planck-Institute for Biophysical Chemistry 1997

Address

Dept. of Neurobiology
Max Planck Institute for Biophysical Chemistry
Am Fassberg 11

37077 Göttingen
Germany

phone: +49-551-201 1635
fax: +49-551-201 1639
e-mail: rjahn@gwdg.de

Further Information

http://www.mpibpc.gwdg.de/abteilungen/190/

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

Lang T, Bruns D, Wenzel D, Riedel D, Holroyd P, Thiele C, Jahn R (2001) SNAREs are concentrated in cholesterol-dependent clusters that define docking and fusion sites for exocytosis. EMBO J 20: 2202-2213

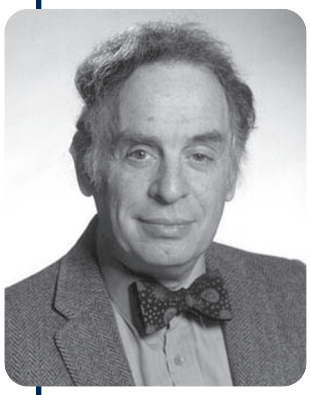
Antonin W, Fasshauer D, Becker S, Jahn R, Schneider TR (2002) Crystal structure of the endosomal SNARE complex reveals common structural principles of all SNAREs. Nature Struct Biol 9: 107-111

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

Jahn R, Grubmüller H (2002) Membrane fusion. Curr Opinion in Cell Biology 14: 488-495

Lang T, Margittai M, Hölzler, H, Jahn R (2002) SNAREs in native plasma membranes are active and readily form core complexes with endogenous and exogenous SNAREs. J Cell Biol 158: 751-760

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

Major Research Interests

- structural studies of nucleic acids; complexes with proteins and ligands
Interactions of the tumor-suppressor protein p53 with DNA: binding of p53 (wild-type and the DNA-binding core domain) with supercoiled closed circular plasmid DNA and linear fragments; scanning force microscopy (SFM) and electron microscopy
DNA binding of the homeodomain protein Bicoid involved in Drosophila development
parallel-stranded (ps) DNA: sequence-specific helical parameters and properties
ligand-DNA: binding of the actinomycin to single-stranded DNA

- signal transduction of eukaryotic cells
Receptor tyrosine kinase activation and internalization, downstream signaling (MAPR cascade), and the mechanism of antibody-based tumor therapy. Further development of Fluorescence Resonance Energy Transfer (FRET) as a probe of protein-protein interactions in the cell, application of the quantitative microscope, and fusions of green fluorescent protein (GFP) with the EGF recpetor, erbB2 (oncogene involved in most breast tumors), and erbB 3,4. Quantum dot ligands and functional probes.

- optical and scanning-probe microscopy
Development of novel microscopes for cellular and molecular studies: scanning force (SFM) and near-field optical (SNOM), fluorescence lifetime (FLIM), fluorescence correlation (FCM) and programmable array (PAM).

- structure and function of a-synuclein (protein involved in Parkinson's disease)
Biochemical, biophysical, spectroscopic, and cell biological studios. Intrinsic structure, ligand binding, and mechanism of aggregation.

Address

Max Planck Insitute for
Biophysical Chemistry,
Dept. Molecular Biology
Am Fassberg 11

37077 Göttingen
Germany

phone: +49-551-201 1382
fax: +49-551-201 1467
e-mail: tjovin@gwdg.de

Further Information

http://www.
mpibpc.gwdg.de/
abteilungen/060

Selected Recent Publications

Hoyer W, Cherny DI, Subramaniam V, Jovin TM (2004) Rapid self-assembly of a-synuclein observed by *in situ* atomic force microscopy. J Mol Biol 340: 127-139

Jares-Erijman EA, Jovin TM (2003) FRET imaging. Nat Biotechnol. 21: 1387-1395

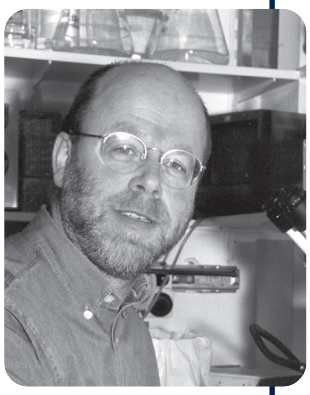
Fernández CO, Hoyer W, Zweckstetter M, Jares-Erijman EA, Subramaniam V, Griesinger C, Jovin TM (2004) NMR of a-synuclein complexes with polyamines elucidates the mechanism and kinetics of induced aggregation. EMBO J 23: 2039-2046

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

Nagy P, Arndt-Jovin DJ, Jovin TM (2003) Small interfering RNAs suppress the expression of endogenous and GFP-fused epidermal growth factor receptor (erbB1) and induce apoptosis in erbB1-overexpressing cells. Exp Cell Res 285: 39-49

Subramaniam V, Hanley QS, Clayton AHA, Jovin TM (2003) Photophysics of green and red fluorescent proteins: some implications for quantitative microscopy. Methods Enzymol 360: 178-201

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

Address

Max Planck Institute
for Biophysical Chemistry
Am Fassberg 11

37077 Göttingen
Germany

phone: +49-551-201 1560
fax: +49-551-201 1504
e-mail: mkessel1@gwdg.de

Further Information

http://www. mpibpc.gwdg.de/abteilungen/160

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. At present major lines of interest are

1. The analysis of a secreted factor that is highly restricted in the secondary heart field, which contributes cells to the outflow tract of the heart.

2. 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

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

Knoetgen H, Viebahn C, Kessel M (1999) Head induction in the chick by primitive endoderm of mammalian, but not avian origin. Development 126: 815-125

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

Roeser T, Stein S, Kessel M (1999) Nuclear localization of b-catenin in normal and LiCl exposed chick embryos. Development 126: 2955-2965

Knoetgen H, Teichmann U, Wittler L, Viehbahn C, Kessel M (2000) Anterior neural induction by nodes from rabbits and mice. Developmental Biology 225: 370-380

Boettger T, Knoetgen H, Wittler L, Kessel M (2001) The avian organizer. International Journal of Developmental Biology 45: 285-287

Wittler L, Spieler D, Kessel M (2003) Hensen's node: The embryonic organizer of the chick. In: Spemann's Organizer (Ed H Grunz) Springer, Heidelberg, in press

Richter U, Wittler L, Kessel M (2003) Restricted expression domains of Ezrin in developing epithelia of the chick. Mech Dev/GEP, in press

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

Address

Center for Molecular
Physiology of the Brain
Universität Göttingen
Humboldtallee 23

37073 Göttingen
Germany

phone: +49-551-39 13209
fax: +49-551-39 13208
email: dklopfe@gwdg.de

Further Information

http://www.cmpb.uni-goettingen.de/research/project.php?s=212

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

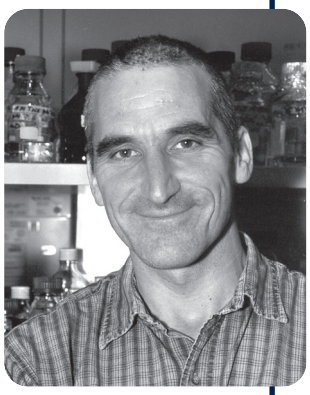
Al-Bassam J, Cui Y, Klopfenstein D, Carragher BO, Vale RD, Milligan RA (2003) Distinct conformations of the kinesin Unc104 neck regulate a monomer to dimer motor transition. J Cell Biol 163(4): 743-53

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

Address

Department of Molecular Pharmacology
Medical Faculty of the University of Göttingen
Robert-Koch-Str. 40

37075 Göttingen
Germany

phone: +49-551-39 5787
fax: +49-551-39 9652
e-mail: wknepel@med.uni-goettingen.de

Further Information

http://regulus. PharBP.med. Uni-Goettingen.DE/ internet.htm

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

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

Address

Center for Anatomy
Dept. Anatomy with main focus on Neuroanatomy
University of Göttingen
Kreuzbergring 36

37075 Göttingen
Germany

phone: +49-551-39 7051/ 7052
fax: +49-551-39 14016
email: kkriegl@gwdg.de

Further Information

http://www.neuroanatomie.uni-goettingen.de/

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 GFRalphal to the plasma membrane. J Cell Biology 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

Address

Institute for Microbiology
and Genetics
University of Göttingen
Grisebachstr. 8

37077 Göttingen
Germany

phone: +49-551-39 3795
fax: +49-551-39 4897
e-mail: wliebl@gwdg.de

Further Information

http://www.gwdg.de/~wliebl/

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

Major Research Interests

One of the main interests of our group is the analysis of polysaccharide and oligosaccharide breakdown and utilization by microorganisms. In the last few years, we have focussed our work on 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 unusual glycosyl hydrolases and transferases from *Thermotoga maritima*, the model organism of hyperthermophilic bacteria. Current projects are aimed at the elucidation of the biochemical properties, the molecular structure and catalytic mechanism, the function(s) of non-catalytic domains, and the cellular localization of selected enzymes of *T. maritima*. Other projects in the field of extremophilic microorganisms deal with the enzymology and molecular biology of thermoalkaliphiles and thermoacidophiles. We are presently engaged in the analysis of the genome sequence and of selected enzymes of the extreme thermoacidophilic archaeon *Picrophilus torridus*.
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. W. Streit, 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

Sterner R, Liebl W (2001) Thermophilic adaptation of proteins. Crit Rev Biochem Mol Biol 36: 39-106

Daniel R (2002) Construction of environmental libraries for functional screening of enzyme activity. In: Directed molecular evolution of proteins. K. Johnson, S. Brakmann (eds), pp. 63-78, Wiley-VCH, Weinheim

Liebl W, Kloos WE, Ludwig W (2002) Plasmid-borne macrolide resistance in *Micrococcus luteus*. Microbiology 148: 2479-2487

Raasch C, Armbrecht M, Streit W, Höcker B, Sträter N, Liebl W (2002) Identification of residues important for NAD^+-binding by the *Thermotoga maritima* α-glucosidase AglA, a member of glycoside hydrolase family 4. FEBS Lett 517: 267-271

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

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

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

Reinhard Lührmann

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)

Address

Max Planck Institute for Biophysical Chemistry,
Dept. Cellular Biochemistry
Am Fassberg 11

37077 Göttingen
Germany

phone: +49-551-201 1407
fax: +49-551-201 1197
e-mail: reinhard.luehrmann@mpi-bpc.mpg.de

Further Information

http://www.mpibpc.gwdg.de/abteilungen/100/

Major Research Interests

Introns are removed from nuclear pre-mRNAs by the spliceosome, a large ribonucleoprotein complex that is formed by interaction of the pre-mRNA with small nuclear ribonucleoproteins (snRNPs U1, U2, U4/U6 and U5) and more than 100 non-snRNP splicing factors. Assembly and subsequent dismantling of the spliceosome proceeds sequentially by way of several intermediate complexes that differ in their composition and in the interactions between their components. Thus the spliceosome is a highly dynamic molecular machine, undergoing major structural changes during its assembly and catalytic action. We are pursuing two major goals. The first one concerns the question of how the spliceosome specifically recognizes and binds introns and discriminates them from exons. Second, we aim at a structural and mechanistic understanding of the catalytic core of the spliceosome to answer the question whether the spliceosome is a ribozyme or whether proteins also function at the catalytic core.
As a prerequisite, we have established novel affinity-based methods to isolate and study spliceosomal complexes at defined functional stages (e. g. pre-catalytic as well as catalytically activated spliceosomes). These methods, as well as chemical 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 the spliceosomal proteins in the assembly of the spliceosome and in promoting the formation of the catalytic core is being investigated by RNA interference *in vivo* and *in vitro* in HeLa, nuclear splicing extracts, using biochemical methods. In addition, we are investigating the 3D structure of spliceosomal complexes using high resolution cryo-electron microscopy and X-ray crystallography.
A third interest of my group is related to the cell biology of the splicing machinery. Specifically we would like to understand the role of certain nuclear compartments such as “cajal bodies”and “speckles” in the assembly, transport and recycling of spliceosomal RNP complexes employing microinjection in combination with RNA interference, as well as 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

Will CL, Lührmann R (2001) Spliceosomal U snRNP biogenesis, structure and function. Current Op. in Cell Biol. 13: 290-301

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

Böhringer D, Makarov EM, Sander B, Makarova OV, Kastner B, Lührmann R, Stark H (2004) Three-dimensional structure of a pre-catalytic human spliceosomal complex B. Nature Struct Mol Biol 11: 463-468

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

Makarova OV, Makarov EM, Urlaub H, Gentzel M, Will CL, Wilm M, Lührmann R (2004) A subset of human 35S U5 proteins, including Prp19, functions prior to catalytic step 1 of splicing. EMBO J 23: 2381-2391

Ahmed Mansouri

Address

Dept. of Molecular
Cell Biology
Molecular Cell
Differentiation
Max Planck Institute for
Biophysical Chemistry
Am Fassberg 11

37077 Göttingen
Germany

phone: +49-551-201 1709
fax: +49-551-201 1504
e-mail: amansou@
gwdg.de

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

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

Friedrichsen S, Christ S, Heuer H, Schafer MK, Mansouri A, Bauer K, Visser TJ (2003) Regulation of iodothyronine deiodinases in the Pax8-/- mouse model of congenital hypothyroidism. Endocrinology. 144(3): 777-84

Collombat P, Mansouri A, Hecksher-Sorensen J, Serup P, Krull J, Gradwohl G, Gruss P (2003) Opposing actions of Arx and Pax4 in endocrine pancreas development. Genes & Dev 17(20): 2591-2603

Treichel D, Schöck F, Jäckle H, Gruss P, Mansouri A (2003) mBtd is required to maintain signaling during murine limb development. Genes & Dev 17(21), in press

Treichel D, Schöck F, Jäckle H, Gruss P, Mansouri A (2003) mBtd is required to maintain signaling during limb development. Genes and Dev 17: 2630-2635

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

Address

Dept. Biochemistry I
Biochemistry and Molecular Cell Biology
University of Göttingen
Humboldtallee 23

37073 Göttingen
Germany

phone: +49-551-39 5962
fax: +49-551-39 5960
e-mail: melchior@biochem.mpg.de (until 12/04)

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

Burkhard Morgenstern

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

Address

Dept. of Bioinformatics
University of Göttingen
Goldschmidtstrasse 1

37077 Göttingen
Germany

phone: +49-551-39 14628
fax: +49-551-39 14929
e-mail: bmorgen@gwdg.de

Further Information

http://www.gobics.de/burkhard/

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

Hans-Ulrich Mösch

Professor of Genetics and Microbiology

1986 Diploma (Biochemistry & Molecular Biology), Swiss Federal Institute of Technology, Zürich, Switzerland
1991 Ph.D., ETH, Zürich, Switzerland
1991 - 1993 Postdoctoral fellow, ETH Zürich, Switzerland
1993 - 1996 Postdoctoral fellow, Whitehead Institute for Biomedical Research, Cambridge (MA), U.S.A.
2001 Habilitation (Microbiology & Genetics), Georg-August-University, Göttingen, Germany
Since 2003 Professor of Genetics and Microbiology, Georg-August-University, Göttingen, Germany

Address

Philipps-Universität Marburg
Fachbereich Biologie - Genetik
Karl-von-Frisch-Straße

37032 Marburg
Germany

phone: +49-6421-178 602
+49-6421-282 3014
+49-6421-178 640
fax: +49-6421-282 8971
e-mail: moesch@staff.uni-marburg.de

Major Research Interests

Signal Transduction and Cell Polarity in Fungal Development

The development of metazoa from unicellular organisms represents one of the landmarks in evolution. Many pathogenic fungi are able to perform a transition in life cycle - termed "dimorphism" - from a unicellular yeast-form to a multicellular filamentous form. In human fungal pathogens, dimorphism is a significant virulence factor. A clear understanding of the gene products involved in hyphal growth is a promising avenue to provide molecular targets for drug development.

We are studying dimorphism in the baker's yeast *Saccharomyces cerevisiae*, one of the most well studied model systems for molecular genetic analysis and genomics. Pseudohyphal growth of *S. cerevisiae* is initiated by the nutritional signal nitrogen starvation and is accompanied by changes in cell polarity and morphogenesis. The budding pattern of cells changes, resulting in linear filamentous chains of cells. Cell morphogenesis is altered from ellipsoidal shaped yeast form cells to long thin pseudohyphal cells. Therefore, yeast and pseudohyphal forms of *S. cerevisiae* are thought to be distinct cell types.

We are investigating the genes and gene products that constitute the signaling pathways transducing environmental stimuli and that establish and regulate cell polarity during pseudohyphal development. Specifically, we are interested in the role of small GTP-binding proteins of the Ras superfamily as molecular switches of intracellular signaling. We are analyzing the molecular mechansims, by which the Ras2p and Cdc42p GTPases control intracellular signaling cascades during pseudohyphal development. These pathways include a pseudohyphal-specific mitogen-activated protein kinase (MAPK) cacade and the cyclic AMP (cAMP) pathway of *S. cerevisiae*. In a further project, we investigate the identity and function of molecular landmarks that control selection of cell division sites. We are studying the molecular mechanisms, by which two asymmetrically localized proteins, Bud8p and Bud9p, regulate the function of Rsr1p, a small GTPase that acts as central regulator of yeast cell polarity.

Selected Recent Publications

Roberts R, Mösch HU, Fink GR (1997) 14-3-3 proteins are essential for RAS/MAPK cascade signaling during pseudohyphal development in *S. cerevisiae*. Cell 89: 1055-1065

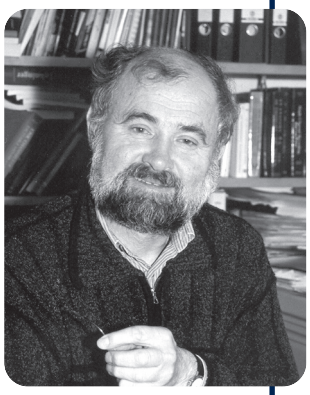
Mösch HU (2000) Pseudohyphal growth of *Saccharomyces cerevisiae*. Contrib Microbiol 5: 185-200

Taheri N, Köhler T, Braus GH, Mösch HU (2000) Asymmetrically localized Bud8p and Bud9p proteins control yeast cell polarity and development. EMBO J 19: 6686-6696

Mösch HU, Köhler T, Braus GH (2001) Different domains of the essential Rho-type GTPase Cdc42p required for growth and development of *S. cerevisiae*. Mol Cell Biol 21: 235-248

Köhler T, Wesche S, Taheri N, Braus GH, Mösch HU (2002) Dual role of the TEA/ATTS family transcription factor Tec1p in regulation of gene expression and development. Eukaryot Cell, in press

Erwin Neher



Address

Dept. Membrane Biophysics
Max Planck Institute for
Biophysical Chemistry
Am Fassberg 11

37077 Göttingen
Germany

phone: +49-551-201 1675
fax: +49-551-201 1688
e-mail: eneher@gwdg.de

Further Information

http://www.mpibpc.gwdg.de/abteilungen/140/

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

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 GABAB receptor activation at a glutamatergic synapse. Nature 424: 775-778

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

Voets T, Moser T, Lund P-E, Chow RH, Geppert M, Suedhof TC, Neher E (2001) Intracellular calcium dependence of large dense-core vesicle exocytosis in the absence of synaptotagmin I. PNAS 98: 11680-11680

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

Professor, Scientist at the Max Planck Institute for Biophysical Chemistry

PhD, Pennsylvania State University, State College, Pa, 1967
Postdoc: J.D. Watson, Harvard University, Cambridge, Mass, 1967 - 1969
Positions:
MRC Laboratory Molecular Biology, Cambridge, England, 1969 - 1972
Cold Spring Harbor Laboratory, CSH, NY, 1972 - 1975
Max Planck Institute for Biophysical Chemistry, 1975
Honorary Professor, University of Göttingen, 1989
Doctorate "honoris causa", Pomeranian Medical Academy, Sczeczin, Poland 1997

Address

Dept. of Biochemistry and Cell Biology
Max Planck Institute for Biophysical Chemistry
Am Fassberg 11

37077 Göttingen
Germany

phone: +49-551-201 1486
fax: +49-551-201 1578
e-mail: mosborn@gwdg.de

Further Information

http://www.mpibpc.gwdg.de/abteilungen/090/

Major Research Interests

Cellular organisation is based on a complex series of events involving gene expression, signal transduction, membrane traffic and the function of dynamic cytoskeletal networks. This department has pioneered the use of antibodies in immunofluorescence microscopy to understand the distribution and function of the two ubiquitous filament systems - microfilaments and microtubules - which have as their major proteins actin and tubulin respectively. Antibodies also allowed us to show that intermediate filaments in different cell types are built from distinct but related proteins. Applying this knowledge we showed that intermediate filament proteins are useful markers in differential tumor diagnosis, where they can distinguish the major tumor types
Certain antibodies also allow a particular cytoskeletal organisation to be manipulated. When microinjected into live cells they not only find their target but also disturb the organisation creating a new phenotype which can be detected by immunofluorescence microscopy. Fine analyses of complexes within particular supermolecular organisations have been helped by the use of recombinantly expressed proteins or their individual domains. These can be analysed *in vivo* by transfecting the corresponding cDNA constructs into cultured cells. A more recent way to disturb the function of proteins in cells is to use RNA interference.
One example of this approach is work on NuMA. NuMA is an insoluble protein during interphase and translates to the spindle poles at mitosis. Microinjection of a particular NuMA antibody causes the formation of aberrant spindles and mitotic arrest as well as resulting in the formation of micronuclei. Transient overexpression of NuMA in HeLa cells also induced the formation of a three-dimensional lattice that fills the nucleus of interphase cells. This lattice can be observed by electron microscopy and use of mutant constructs showed that the lattice spacing is dependent on the length of the rod domain. *In vitro* experiments show that recombinant NuMA builds multiarm oligomers. Computer modeling with a 12-arm oligomer as the structural unit can explain the observed nuclear lattices and suggests that the same mechanism might be used to build more restricted NuMA lattices in normal cells. Other experiments have shown that GAS 41 binds to NuMA, and that knockdown of NuMA by RNA interference leads to apoptosis.
Thus, the research interests of the group are in the general area of cell biology and pathology - more specifically in certain proteins of the cell nucleus, in the cytoskeleton, and in the use of antibodies in cancer diagnosis. Currently a major emphasis is directed towards using RNA interference to assay protein function.

Selected Recent Publications

Gueth-Hallonet C, Wang J, Harborth J, Weber K, Osborn M (1998) Induction of a regular nuclear lattice by overexpression of NuMA. Exp Cell Res 243: 434-452

Harborth J, Wang J, Gueth-Hallonet C, Weber K, Osborn M (1999) Self assembly of NuMA: multiarm oligomers as structural units of a nuclear lattice. EMBO J 18: 1689-1700

Harborth J, Weber K, Osborn M (2000) GAS41, a highly conserved protein in eukaryotic nuclei, binds to NuMA. J Biol Chem 275: 31979-31985

Osborn M (1998) Immunofluorescence microscopy of cultured cells. In: Cell Biology: A Laboratory Handbook, Academic Press, p 462-468

Harborth J, Elbashir S, Beckert K, Tuschl T, Weber K (2001) Identification of essential genes in cultured mammalian cells using small interfering RNAs. J Cell Sci 114: 4557-4565

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

Address

Dept. Developmental Biochemistry
University of Göttingen
Justus-von-Liebig-Weg 11

37077 Göttingen
Germany

phone: +49-551-39 5683
fax: +49-551-39 14614
e-mail: tpieler@gwdg.de

Further Information

http://www.uni-bc.gwdg.de/entwickl./pieler.htm

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

Souopgui J, Sölter M, Pieler T (2002) Xpak3 promotes cell cycle withdrawal during primary neurogenesis in *Xenopus laevis*. EMBO J 21: 6429-6439

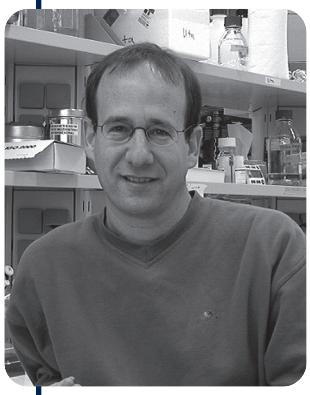
Perron M, Boy S, Arnato MA, Viczian A, Koebernick K, Pieler T, Harris WA (2003) A novel function for Hedgehog-signalling in retinal pigment epithelium differentiation. Development 130: 1565 -1577

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

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.

Address

Germ Cell Development
Max Planck Institute for Biophysical Chemistry
Am Fassberg 11

37077 Göttingen
Germany

phone: +49-551-201 1487
fax: +49-551-201 1504
e-mail: eraz@gwdg.de

Further Information

http://www. mpibpc.gwdg.de/abteilungen/165/

Selected Recent Publications

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

Doitsidou M, Reichman-Fried M, Stebler J, Köprunner M, Dörries J, Meyer D, Esguerra VC, Leung T, Raz E (2002) Guidance of primordial germ cell migration by the chemokine SDF-1. Cell 111: 647-659

Wolke U, Weidinger G, Köprunner M, Raz E (2002) Multiple levels of posttranscriptional control lead to germline-specific gene expression in the zebrafish. Current Biology 12: 289-294

Christian Rosenmund

Group Leader at the Max Planck Institute for Biophysical Chemistry

PhD Neurosciences, Vollum Institute, Portland, OR, USA 1993
Postdoctoral fellow Salk Institute, La Jolla, CA, USA 1993 - 1995
Helmholtz fellow, MPI for Biophysical Chemistry 1995 - 1997
Heisenberg fellow and independent group leader, Dept. Membrane Biophysics at the Max Planck Institute for Biophysical Chemistry, since 1998

Address

Max Planck Institute for
Biophysical Chemistry
Am Fassberg 11

37077 Göttingen
Germany

phone: +49-551-201 1672
fax: +49-551-201 1688
e-mail: crosenm@gwdg.de

Further Information

http://www.mpibpc.gwdg.de/abteilungen/140/groups/index.html

Major Research Interests

Neurotransmission at the central synapse involves a series of functional highly coordinated steps. On the presynaptic site, synaptic vesicles tether, prime to fusion competence, and fuse Ca^{2+} triggered with the plasma membrane to release the neurotransmitter in the synaptic cleft. Postsynaptically, ionotropic receptors respond to binding of the neurotransmitter with distinct conformational steps that shape the postsynaptic response. We characterize synaptic properties with standard patch-clamp electrophysiology and optical techniques from cultured primary hippocampal neurons of transgenic mice that bear deletions or mutations of pre- or postsynaptic proteins. We have identified and/or characterized the vesicular neurotransmitter transporters VGLUT and VGAT, the vesicle priming factor Munc13, and the core complex associated proteins synaptotagmin 1 and complexin. Furthermore, knock-out mice are used to examine protein-domain and -residue function by gain of function rescue experiments by viral overexpression of wildtype and mutant proteins. Postsynaptically, we examine structural principles that control the gating properties of AMPA-type glutamate receptors.

Selected Recent Publications

Varoqueaux F, Sigler A, Rhee SJ, Brose N, Enk C, Reim K, Rosenmund C (2002) Total arrest of spontaneous and evoked synaptic transmission but normal synaptogenesis in the absence of Munc13 mediated vesicle priming. PNAS 99: 9037-9042

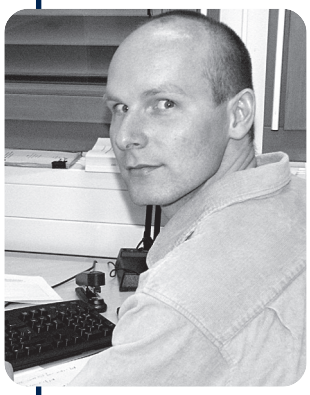
Rosenmund C, Sigler A, Augustin I, Reim K, Brose N, Rhee JS (2002) Differential control of vesicle priming and short term plasticity by Munc13 isoforms. Neuron 33: 411-424

Rhee JS, Betz A, Pyott S, Reim K, Varoqueaux F, Augustin I, Hesse D, Südhof TC, Takahashi M, Rosenmund C, Brose N: β-phorbol ester- and diacylglycerol-induced augmentation of neurotransmitter release from hippocampal neurons is mediated by Munc13s and not by PKCs. Cell 108: 121-133

Mansour M, Nagarajan N, Nehring R, Clements J, Rosenmund C (2001) Heteromeric AMPA receptors assemble with a preferred subunit stoichiometry and spatial arrangement. Neuron 32: 841-853

Takamori S, Rhee JS, Rosenmund C, Jahn R (2000) Identification of a vesicular glutamate transporter that defines a glutamatergic phenotype in neurons. Nature 407: 189-94

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

Address

Dept. of Molecular
Structural Biology
Institute for Microbiology
and Genetics & GZMB
University of Göttingen
Justus-von-Liebig-Weg 11

37077 Göttingen
Germany

phone: +49-551-39 14088
fax: +49-551-39 14082
e-mail: mrudolp2@gwdg.de

Further Information

http://www.img.bio.uni-goettingen.de/ms-www/index.html

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

Rudolph MG, Wittinghofer A, Vetter IR (1999) Nucleotide binding to the G12V-mutant of Cdc42 investigated by X-ray diffraction and fluorescence spectroscopy: Two different nucleotide states in one crystal. Protein Science 8: 778-787

Wolan DW, Teyton L, Rudolph MG, Villmow B, Bauer S, Busch DH, Wilson IA (2001) Crystal structure of the murine NK cell activating receptor NKG2D at 1.95 Å resolution. Nature Immunology 3: 248-254

Rudolph MG, Linnemann T, Grünewald P, Wittinghofer A, Vetter IR, Herrmann C (2001) Thermodynamics of Ras/Effector and Cdc42/Effector interactions probed by isothermal titration calorimetry. J Biol Chem 276: 23914-23921

Rudolph MG, Kelker MS, Schneider TR, Yeates TO, Oseroff V, Heidary DK, Jennings PA, Wilson IA (2003) Use of multiple anomalous dispersion to phase highly merohedrally-twinned crystals of Interleukin-1ß. Acta Cryst D59: 290-298

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

Ruth A. Schmitz-Streit

Privatdozent Microbiology

1989 Diploma (Biology), Philipps-University of Marburg, Germany
1992 Dr. rer. nat. (Microbiology) Philipps-University of Marburg, Germany
1993 Postdoctoral Fellow, Philipps-University Marburg, Germany
1994 - 1996 Postdoctoral Fellow, University of California, Berkeley, USA
Since 1996 group leader, Georg-August University of Göttingen, Department of Microbiology and Genetics
2001 Habilitation (Microbiology), Georg-August University of Göttingen

Address

Dept. General Microbiology,
Institute of Microbiology and Genetics,
Grisebachstr.8

37077 Göttingen
Germany

phone: +49-551-39 3796
fax: +49-551-39 3808
e-mail: rschmit@gwdg.de

Further Information

http://www.gwdg.de/~genmibio/lab214.html

Major Research Interests

The main interest of our group is the analysis of nitrogen metabolism in Prokarya. Our model organisms are the free-living nitrogen fixing bacterium *Klebsiella pneumoniae* and the methanogenic archaeon *Methanosarcina mazei* strain Gö1.
K. pneumoniae is able to reduce molecular nitrogen to ammonia under oxygen- and nitrogen-limitation. Synthesis of the key enzyme (nitrogenase) is regulated in response to environmental signals by the two regulatory proteins NifA and NifL. Our research is focused on the characterization of the oxygen and nitrogen signal transduction towards the two regulatory proteins by genetic, biochemical and molecular biological methods.
We further analyse the overall regulation of nitrogen metabolism in *M. mazei*. Besides classical genetic approaches our studies mainly concentrate on genome-wide transcription analysis using whole genome DNA-microarrays to analyze the regulatory network of nitrogen metabolism and potential cross talks between the nitrogen and carbon regulon in *M. mazei*.
Another interest of the laboratory together with the groups of Dr. Rolf Daniel and Dr. Wolfgang Streit is the construction of environmental libraries and screening for acquired abilities of the resulting recombinant organisms. It has been estimated that > 99 % of microorganisms observable in nature typically cannot be cultivated by using standard techniques. Thus, a large fraction of the diversity in an environment is still unknown. Our approach is to use the genetic diversity of the microorganisms in a certain environment as a whole to encounter new genes and gene products for various purposes. The genetic diversity is accessed by isolation of DNA followed by direct cloning of functional genes from environmental samples.

Selected Recent Publications

Ehlers C, Grabbe R, Veit K, Schmitz RA (2002) Characterization of $GlnK_1$ from *Methanosarcina mazei* strain Gö1: Complementation of an *Escherichia coli glnK* mutant strain by *M. mazei* $GlnK_1$. J Bacteriol 184: 1028 -1040

Klopprogge K, Grabbe R, Hoppert M, Schmitz RA (2002) Membrane association of *Klebsiella pneumoniae* NifL is affected by molecular oxygen and combined nitrogen. Archives of Microbiology 117: 223-234

Grabbe R, Schmitz RA (2003) Oxygen control of *nif* gene expression in *Klebsiella pneumoniae* is dependent on NifL reduction at the cytoplasmic membrane by electrons derived from the reduced quinone pool. European Journal of Biochemistry 270: 1555-1566

Stips J, Thummer R, Neumann M, Schmitz RA (2004) GlnK effects complex formation between NifA and NifL in *Klebsiella pneumoniae* transduction by GlnK'. European Journal of Biochemistry 271: 3379-3388

Streit WR, Schmitz RA, Perret X, Staehelin C, Deakin WJ, Raasch C, Liesegang H, Broughton WJ (2004) An Evolutionary Hot Spot: the pNGR234*b* Replicon of *Rhizobium sp.* Strain NGR234. J Bacteriology 186: 535-542

Streit WR, Schmitz RA (2004) Metagenomics - the key to the uncultured microbes. Review, Current Opinion in Microbiology 7, in press

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

Address

Institute of Inorganic Chemistry
University of Göttingen
Tammannstr. 4

37077 Göttingen
Germany

phone: +49-551-39 3021
fax: +49-551-39 2582
e-mail: gsheldr@shelx.uni-ac.gwdg.de

Further Information

http://shelx.uni-ac.gwdg.de/

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

Address

Dept.artment of General Microbiology,
University of Göttingen
Grisebachstr. 8

37077 Göttingen
Germany

phone: +49-551-39 3781
fax: +49-551-39 3808
e-mail: jstuelk@gwdg.de

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

Ludwig H, Homuth G, Schmalisch M, Dyka F. M., Hecker M, Stülke J (2001) Transcription of glycolytic genes and operons in *Bacillus subtilis*: Evidence for the presence of multiple levels of control of the *gapA* operon. Mol Microbiol 41: 409-422

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

Blencke H-M, Homuth G, Ludwig H, Mäder U, Hecker M, Stülke J (2003) Transcriptional profiling of gene expression in response to glucose in *Bacillus subtilis*: regulation of the central metabolic pathways. Metab Engn 5: 133-149

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

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

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.

Address

Center of Biochemistry and
Molecular Cell Biology
Dept. Biochemistry II
University of Göttingen
Heinrich-Düker-Weg 12

37073 Göttingen
Germany

phone: +49-551-39 5958
fax: +49-551-39 5979
e-mail: mthumm@uni-goettingen.de

Further Information:

http://www.uni-bc.gwdg.de/bio_2/Thumm/Start-Thumm.htm

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

Address

Department of X-Ray Crystallography (Division 104)
Max Planck Institute for Biophysical Chemistry
Am Fassberg 11

37070 Göttingen
Germany

phone: +49-551-201 1046
fax: +49-551-201 1197
e-mail: mwahl@gwdg.de

Further Information

http://www.mpibpc.gwdg.de/abteilungen/104/index.html

Major Research Interests

The three main 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. In particular the work on pre-mRNA splicing is conducted in close cooperation with the laboratory of R. Lührmann.

Selected Recent Publications

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

Zengel JM, Jerauld A, Walker A, Wahl MC, Lindahl L (2003) The extended loops of ribosomal proteins L4 and L22 are not required for ribosome assembly or L4-mediated autogenous control. RNA 9: 1188-1197

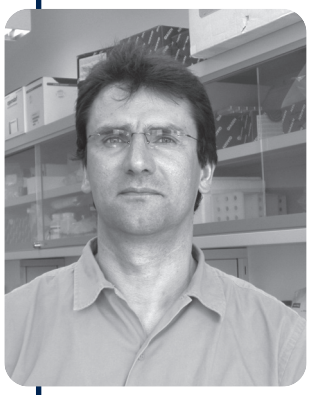
Reidt U, Wahl MC, Fasshauer D, Horowitz D, Lührmann R, Ficner R (2003) Crystal structure of a complex between human spliceosomal cyclophilin H and a U4/U6 snRNP-60k peptide. Journal of Molecular Biology 331: 45-56

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 Journal 21: 4641-4653

Gabashvili IS, Gregory ST, Valle M, Grassucci R, Worbs M, Wahl MC, Dahlberg AE, Frank J (2001) The polypeptide tunnel system in the ribosome and its gating in erythromycin resistance mutants of L4 and L22. Molecular Cell 8: 181-188

Worbs M, Bourenkov GP, Bartunik HD, Huber R, Wahl MC (2001) An extended RNA binding surface through arrayed S1 and KH domains in transcription factor NusA. Molecular Cell 7: 1177-1189

Lutz Walter



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

Address

Department of
Primate Genetics
German Primate Center
Kellnerweg 4

37077 Göttingen
Germany

phone: +49-551-38 51 161
fax: +49-551-38 51 228
e-mail: lwalter@gwdg.de

Further Information

http://www.dpz.gwdg.de/genetik/Neu/Genetik.htm

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.

Ernst Wimmer

Address

Dept. of Developmental Biology
Institute of Zoology, Anthropology and Developmental Biology
GZMB
University of Göttingen
Justus-von-Liebig-Weg 11

37077 Göttingen
Germany

phone: +49-551-39 2889
fax: +49-551-39 5416
e-mail: ewimmer@gwdg.de

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 Institute of Zoology, Anthropology and Developmental Biology, 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

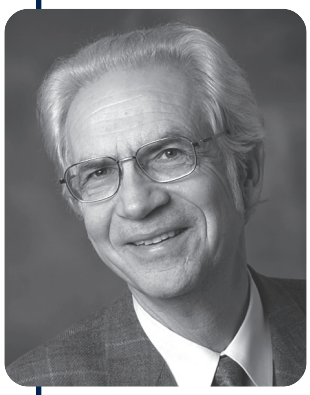
Ito J, Ghosh A., Moreira LA, Wimmer EA, Jacobs-Lorena M (2002) Transgenic anopheline mosquitoes impaired in transmission of a malaria parasite. Nature 417: 452-455

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

Axel Zeeck



Professor of Biomolecular Chemistry

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

Address

Institute for Organic Chemistry
University of Göttingen
Tammannstr. 2

37077 Göttingen
Germany

phone: +49-551-39 3263
fax: +49-551-39 12593
e-mail: azeeck@gwdg.de

Further Information

http://www.gwdg.de/~ucoc/zeeck/

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

Bode HB, Zeeck A (2000) Structure and biosynthesis of kendomycin, a carbocyclic ansa-compound from *Streptomyces*. J Chem Soc Perkin Trans 1: 323-328, 2665-2670

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

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

Address

Dept of Molecular Developmental Biology
Max Planck Institute for Biophysical Chemistry
Am Fassberg 11

37077 Göttingen
Germany

phone: +49-551-201 1671
fax: +49-551-201 1755
e-mail: mzeidle@gwdg.de

Further Information

http://www.mpibpc.gwdg.de/abteilungen/170/proj9.html

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

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

Zeidler MP, Perrimon N, Strutt DI (1999) Four-jointed is required in the *Drosophila* eye for ommatidial polarity specification. Current Biology 9: 1363-1372

Zeidler MP, Perrimon N, Strutt DI (1999) Polarity determination in the *Drosophila* eye: a novel role for Unpaired and JAK/STAT signalling. Genes & Develop 13: 1342-1353

Karsten P, Häder S, Zeidler MP (2002) Cloning and expression of *Drosophila* SOCS36E and its potential regulation by the JAK/STAT pathway. MOD 117: 343-346

Index

Notes