

MOLECULAR BIOLOGY NEWSLETTER

Georg-August-Universität Göttingen · International Max Planck Research School



JAN
2010

A message from the Dean

Last fall, the 10th class of Master's students enrolled in our Molecular Biology program and the associated International Max Planck Research School. When we started in the year 2000, integrated MSc/PhD programs were novel

350 doctoral students are enrolled in GGNB and enjoy the benefits of structured PhD education including supervision by thesis committees and a rich choice of advanced courses.

We all hope that the combination of rigorous scientific standards and personal commitment, a hallmark of the program during its 10-year history, will keep the program successful in the future.



Reinhard Jahn

in Germany, and we had set our goals very high. Ten years later, the program won several awards, is internationally recognized, and serves as model for a successful collaboration between the University and Max Planck Institutes. We are very proud of our students. The dropout rate is below one percent, and most of our alumni are successful in their career.

The educational concepts, which we developed jointly with our "twin" program in Neuroscience, served as blueprint for the new Göttingen Graduate School for Neurosciences and Molecular Biosciences (GGNB), and were the key to its success in the German Excellence Initiative. Presently, more than

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Greetings from the program speaker

Welcome to the first newsletter of our MSc/PhD Molecular Biology program. This first issue addresses all alumni, students, faculty members and friends of the graduate program who will celebrate its 10th anniversary this fall. The newsletter summarizes the scientific achievements by our PhD students in the year 2009, and introduces new students, graduates and faculty members. It honors leaving faculty members, and provides a forum now for our students, faculty, and more than 100 alumni, who are spread all around the world.

In addition to regional reports by alumni in Singapore and Stockholm, alumni contribute essays on topics such as views on scientific issues, the challenges for young families, careers outside the academic world, reports from meetings, or globetrotter's experiences.

We intend to issue the newsletter annually to keep everyone informed

about the activities of our program and the achievements by our students. We are grateful for the exciting and often personal contributions made by the various authors and invite everyone to contribute thoughts, ideas and opinions on their/our scientific future making this newsletter as successful as our whole program.



Ivo Feußner

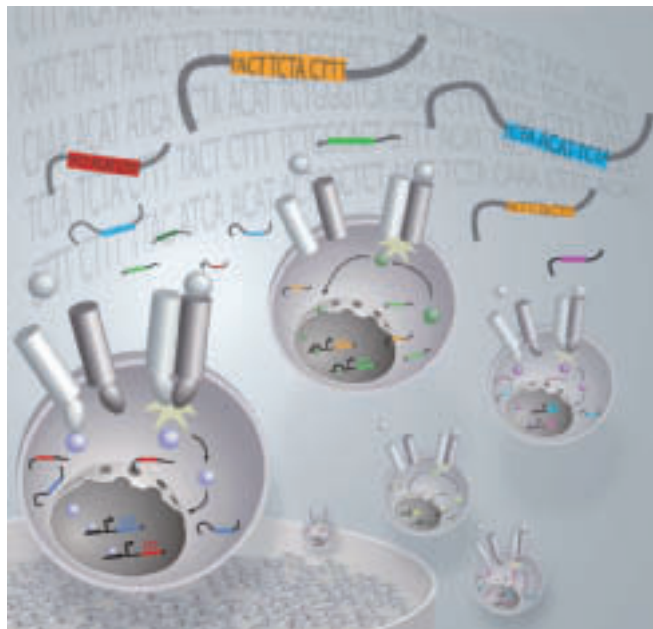
Seeing new dimensions with EXTassay

Integrated analysis of ERBB receptor activation and downstream signaling

Internal and external signals received by the cells are processed through signal transduction pathways in a cell-type specific manner. The adequate and cell-type specific response is finally integrated at the level of gene transcription. Patterns of gene expression can be reliably measured at a global scale with DNA microarray technology

and help to define physiological or pathological cell states. However, this knowledge is not sufficient to explain cellular behavior, since gene expression changes represent the endpoint of highly complex integrative intra-cellular processes. Even prediction of transcription factor activity profiles based on microarray data is a very difficult task.

but lack dynamic quantitative information about their function. Therefore, the principles underlying cell-type specific signal processing remain largely unknown. To unravel these principles there is a great demand for novel approaches to allow high throughput quantitative measurement of multiple cellular events beyond gene expression in living cells.



Different techniques used for mapping of protein-protein interaction networks allow reconstructing network backbones

In the past four years we have been working towards development of a novel technique for quantitative and highly parallel measurement of multiple signaling events in a single experiment.

Fig. 1: For a highly multiplexed measurement the cells are transfected with a panel of reporter constructs carrying unique Expressed oligonucleotide Tags (EXTs) under the control of different *cis*-regulatory elements. Depending on the *cis*-element each unique EXT serves as a reporter for a different cellular assay such as measurement of a corresponding transcription factor activity, a Split TEV protein-protein interaction assay or other reporter gene coupled assays. Expressed EXTs are isolated from the cells, amplified and quantified by hybridization to a custom made microarray or by high throughput sequence analysis. The composition of the EXT mixture serves as a quantitative readout for all assays in question

PhD-related Publications 2009 (PhD students of the Molecular Biology program in bold type)

Andreou A, Brodhun F, Feussner I (2009) Biosynthesis of oxylipins in non-mammals. *Prog Lipid Res* 48(3-4):148-70

Andreou A, Feussner I (2009) Lipoxygenases - Structure and reaction mechanism. *Phytochemistry* 70(13-14):1504-10

Andreou AZ, Hornung E, Kunze S, Rosahl S, Feussner I (2009) On the substrate binding of linoleate 9-lipoxygenases. *Lipids* 44(3):207-15

Arthur PK, Claussen M, Koch S, **Tarbashevich K**, Jahn O, Pieler T (2009) Participation of *Xenopus* Elr-type proteins in vegetal mRNA localization during oogenesis. *J Biol Chem* 284(30):19982-92

Barysch SV, **Aggarwal S**, Jahn R, Rizzoli SO (2009) Sorting in early endosomes reveals connections to docking- and fusion-associated factors. *Proc Natl Acad Sci U S A*. 106(24):9697-702

Bethani I, **Werner A**, **Kadian C**, Geumann U, Jahn R, Rizzoli SO (2009) Endosomal fusion upon SNARE knockdown is maintained by residual SNARE activity and enhanced docking. *Traffic* 10(10):1543-59

Bina S, Zeidler M (2009) JAK/STAT pathway signalling in *Drosophila melanogaster*. In Stephanou A (ed) JAK-STAT pathway in disease. Landes Bioscience, Austin

Bina S, Wright VM, Fisher KH, Milo M, Zeidler MP (in press) Transcriptional targets of *Drosophila* JAK/STAT pathway signalling as effectors of haematopoietic tumour formation. *EMBO Rep*

Our approach is based on various classical as well as novel reporter gene assay formats that cover different types of molecular events involved in signal transduction from the plasma membrane to the level of gene expression. Multiplexed analysis was achieved through a barcoding strategy where each individual assay was coupled to the expression of a defined unique oligonucleotide sequence. We have designed a library of expressed oligonucleotide tags (EXTs) to serve as unique identifiers and quantitative reporters for multiple cellular assays. We termed complex EXT reporter based measurement 'EXTassay'.

A set of control experiments has revealed that high complexity of the EXT library allows measurement of at least 10^7 different assays within a single EXTassay. For such an experiment the cells are transfected with multiple reporter constructs and other assay components. EXT-reporter expression is then monitored either by microarray hybridization or by high throughput sequence analysis. Specific structure and optimized base pair composition of the

EXT reporters ensures their homogeneous amplification and optimal hybridization properties as demonstrated by rigorous control experiments.

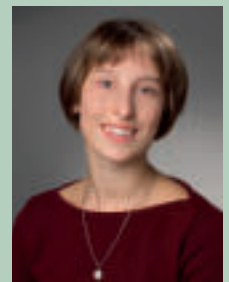
In the first 'proof-of-principle' experiment we have applied EXTassays coupled to microarray readout to measure growth factor signaling through ERBB receptor tyrosine kinase family members. Within this experiment we have addressed activation of three different receptor complexes, recruitment of several phosphotyrosine adaptor proteins and downstream signaling at the level of activated transcription factors. Additionally, we have used deep-sequencing as an EXTassay readout to compare

transcription factor activity profiles in different cell lines.

Our first results provide a proof-of-principle for the technical feasibility of EXTassays and the basis for further development of the technology towards high throughput applications. EXTassays can easily be upscaled by integration of additional reporter gene based assays and, therefore, have the potential to become a useful tool for the quantitative and integrated profiling of cellular signaling networks.

Anna Botvinnik worked on her doctoral thesis in the research group „Gene Expression“ of Dr. Moritz Rossner at the Max Planck Institute for Experimental Medicine. She defended her PhD thesis in June 2009.

These results were published in *Nature Methods* in December 2009 (Epub ahead of print).



Botvinnik A, Wichert SP, Fischer TM, Rossner MJ (2010) Integrated analysis of receptor activation and downstream signaling with EXTassays. *Nat Methods* 7(1):74-80. Epub 2009 Dec 13

Chanana B, Steigemann P, Jäckle H, Vorbrüggen G (2009) Reception of Slit requires only the chondroitin-sulphate-modified extracellular domain of Syndecan at the target cell surface. *Proc Natl Acad Sci USA* 106(29):11984-8

Denker A, Kröhnert K, Rizzoli SO (2009) Revisiting synaptic vesicle pool localization in the *Drosophila* neuromuscular junction. *J Physiol* 587(Pt 12):2919-26

Dimova K, Kalkhof S, Pottratz I, Ihling C, **Rodriguez-Castaneda F**, Liepold T, Griesinger C, Brose N, Sinz A, Jahn O (2009) Structural insights into the calmodulin-Munc13 interaction obtained by cross-linking and mass spectrometry. *Biochemistry* 48(25):5908-21

Farès C, Lakomek NA, Walter KF, **Frank BT**, Meiler J, Becker S, Griesinger C (2009) Accessing ns-micros side chain dynamics in ubiquitin with methyl RDCs. *J Biomol NMR* 45(1-2):23-44

Herold N, Will CL, Wolf E, Kastner B, Urlaub H, Lüthmann R (2009) Conservation of the protein composition and electron microscopy structure of *Drosophila melanogaster* and human spliceosomal complexes. *Mol Cell Biol* 29(1):281-301

Hoff KJ (2009) The effect of sequencing errors on metagenomic gene prediction. *BMC Genomics*. 10:520

Hoff KJ, Lingner T, Meinicke P, Tech M (2009) Orphelia: predicting genes in metagenomic sequencing reads. *Nucleic Acids Res* 37(Web

Water molecules doing time

The thermodynamic influence of trapped water molecules on a protein–ligand interaction

The design of protein-binding substances requires a solid understanding of the energetics involved in the interactions. An often overlooked thermodynamic parameter is the change of heat capacity at constant pressure (ΔC_p) upon binding. Usually, the ΔC_p

of binding can be correlated with the burial of surface areas of the interacting species. The effects of water molecules buried upon complex formation were mostly neglected in these considerations; yet it is well known that water can form non-covalent bonds to both

the protein and the ligand. An experimental estimate for the size of this effect in a protein–ligand interaction was lacking. We investigated the thermodynamic consequences of trapping water molecules in the interaction of human cyclophilin G (CypG; an enzyme exhi-

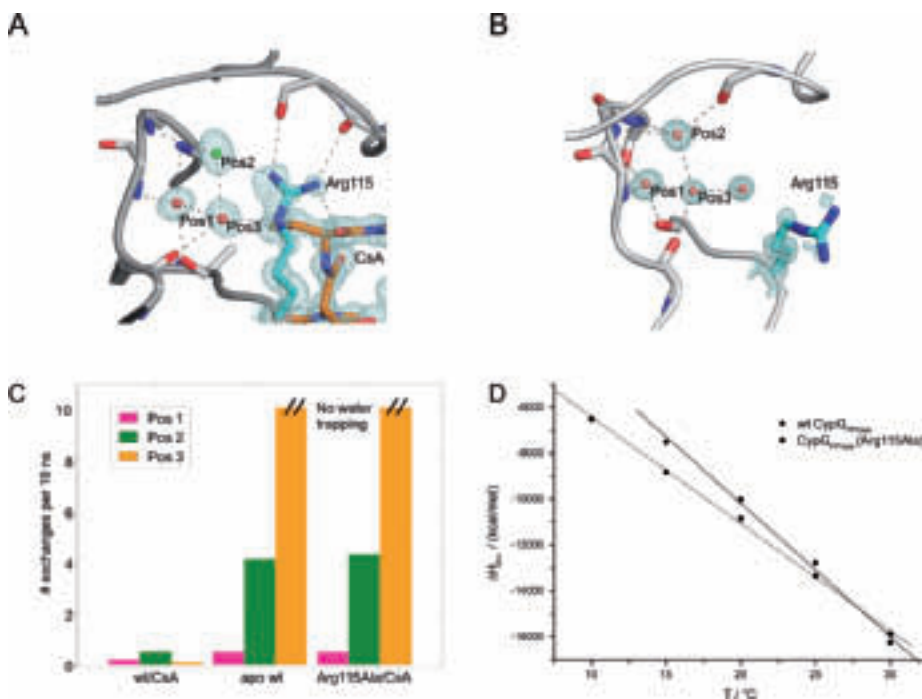


Fig. 1: (A) Structure of CypG_{PP1ase} (grey) bound to CsA (orange). In the complex, the Arg115 side chain (cyan) adopts a closed conformation and buries two waters (red; positions 1 and 3) and a chloride ion (green; position 2). (B) In the apo structure, Arg115 is in an open conformation. (C) Residence times of waters at the three sites. Waters at position 2 (green, chloride in the crystal structure) and 3 (orange) show increased exchange rates upon mutation of Arg115 to Ala (i.e. removal of the ‘lid’ of the pocket) and in the absence of CsA (i.e. upon ‘unlocking’ the lid). (D) Enthalpies (ΔH_{obs}) plotted against the temperature (T) for the wild-type CypG_{PP1ase}-CsA and the CypG_{PP1ase}(Arg115Ala)-CsA interaction. Modified from Stegmann et al., *Angewandte Chemie Int Ed.* 2009

Server issue):W101-5

Hsiao HH, Meulmeester E, **Frank BT**, Melchior F, Urlaub H (2009) ChopNspice[™], a mass-spectrometric approach that allows identification of endogenous SUMO-conjugated peptides. *Mol Cell Proteomics* 8(12):2664-75

Kardash E, Reichman-Fried M, Maître JL, **Boldajipour B**, Pappusheva E, Messerschmidt EM, Heisenberg CP, Raz E (2010) A role for Rho GTPases and cell-cell adhesion in single-cell motility *in vivo*. *Nat Cell Biol* 12(1):47-53; sup pp 1-11 - Epub 2009 Dec 13

Karpinar DP, **Balija MB**, Kügler S, Opazo F, Rezaei-Ghaleh N, Wender N, Kim HY, Taschenberger G, Falkenburger BH, Heise H, Kumar A, Riedel D, Fichtner L, Voigt A, Braus GH, Giller K, Becker S, Herzig A, Baldus M, Jäckle H, Eimer S, Schulz JB, Griesinger C, Zweckstetter M (2009) Pre-fibrillar alpha-synuclein variants with impaired beta-structure increase neurotoxicity in Parkinson’s disease models. *EMBO J* 28(20):3256-68

Khoshnevis S, Gross T, Rotte C, Baierlein C, Ficner R, Krebber H (2010) The iron-sulphur protein RNase L inhibitor functions in translation termination. *EMBO Rep* 2010 Jan 8. [Epub ahead of print] PubMed PMID: 20062004

Kim S, **Gailite I**, Moussian B, Luschnig S, Goette M, Fricke K, Honemann-Capito M, Grubmüller H, Wodarz A (2009) Kinase-activity-independent functions of atypical protein kinase C in *Drosophila*. *J Cell Sci* 122(Pt 20):3759-71

Lammers CR, **Flórez LA**, Schmeisky AG, Roppel SF, Mäder U, Hamoen L, Stülke J (2009) Connecting parts with processes: SubtiWiki

biting peptidyl-prolyl *cis/trans* isomerase activity) and the immunosuppressive drug cyclosporine A (CsA).

In a first step, we obtained atomic insight into the interaction of the PPIase domain of CypG (Cyp_{GPPIase}) and CsA with the help of crystal structures at 0.75 Å resolution of Cyp_{GPPIase} alone and in complex with CsA. Interestingly, in the complex one particular amino acid (Arg115) seals a pocket, in which two water molecules (at positions 1 and 3) and a chloride ion (at position 2) become trapped (Fig. 1A). In the apo form, the Arg115 side-chain is partially disordered (Fig. 1B), leaving the pocket open. Here, all three positions are occupied by water molecules. Thus, Arg115 seems to act like a lid that closes upon CsA-binding.

Since crystallography cannot distinguish between site occupancy and residence time, we performed molecular dynamics (MD) simulations. The simulations show that the reduced flexibility of Arg115 in the wild-type Cyp_{GPPIase}-CsA complex has a major effect on the residence times of two of the three trap-

ped water molecules, whereas the water molecule in position 1 appears to be structurally relevant and is neither affected by CsA-binding nor by mutation of Arg115 (Fig 1C). To quantify this effect thermodynamically, we performed calorimetric titrations at a range of temperatures with wild-type Cyp_{GPPIase} and the Cyp_{GPPIase}(Arg115Ala) point mutant. A plot of the interaction enthalpies versus the temperature reveals that the ΔC_p of binding of CsA to Cyp_{GPPIase} is decreased by 114 cal mol⁻¹ K⁻¹ compared to the ΔC_p of binding of CsA to the mutant (Fig. 1D).

Our results, therefore, provide an experimental value of -57 ± 21 cal mol⁻¹ K⁻¹ for the average heat capacity change

due to the sequestration of one water molecule upon formation of a protein-ligand complex. This estimate agrees well with theoretical figures and studies of model compounds.

Thus, by combining atomic resolution X-ray crystallography, MD simulations, site-directed mutagenesis and thermodynamic measurements, we were able to single out the influence of trapped solvent molecules on the heat capacity change while excluding a significant differential contribution from buried surface areas.

Christian Stegmann worked on his doctoral thesis in the group of Prof. Markus Wahl, X-Ray Crystallography Group, at the Max Planck Institute for Biophysical Chemistry. He defended his PhD thesis in January 2010.

These results were published in *Angewandte Chemie International Edition Engl*, 2009, 48(28):5207-10



and SubtiPathways integrate gene and pathway annotation for *Bacillus subtilis*. *Microbiology* 2009 Dec 3. [Epub ahead of print] PubMed PMID: 19959575

Liavonchanka A, Rudolph MG, Tittmann K, Hamberg M, Feussner I (2009) On the mechanism of a polyunsaturated fatty acid double bond isomerase from *Propionibacterium acnes*. *J Biol Chem* 284(12):8005-12

Loeber J, **Pan FC**, Pieler T (2009) Generation of transgenic frogs. *Methods Mol Biol* 561:65-72

Maritzen T, **Schmidt MR**, Kukhtina V, Higman VA, Strauss H, Volkmer R, Oschkinat H, Dotti CG, Haucke V. A novel subtype of AP-1 binding motif within the palmitoylated TGN/ endosomal accessory protein gadkin/ gamma-BAR. *J Biol Chem* 2009 Dec 3. [Epub ahead of print] PubMed PMID: 19965873.

Ouertatani-Sakouhi H, El-Turk F, Fauvet B, Roger T, Le Roy D, **Karpinar DP**, Leng L, Bucala R, Zweckstetter M, Calandra T, Lashuel HA. A new class of isothiocyanate-based irreversible inhibitors of macrophage migration inhibitory factor. *Biochemistry* 48(41):9858-70

Padmanabhan N, Fichtner L, Dickmanns A, Ficner R, Schulz JB, Braus GH (2009) The yeast HtrA orthologue Ynm3 is a protease with chaperone activity that aids survival under heat stress. *Mol Biol Cell* 20(1):68-77

PhD-related Publications 2009 (Molbio PhD students in bold type)

Pirngruber J, **Shchebet A**, Johnsen SA (2009) Insights into the function of the human P-TEFb component CDK9 in the regulation of chro-

Why flies are worth investing in

Identification of *Drosophila* JAK/STAT pathway target genes effecting tumor formation

"Sometimes these dollars go to projects that have little or nothing to do with the public good, things like fruit fly..." is one of Sarah Palin's greatest hits. To the naked eye, the fruit fly *Drosophila melanogaster* looks like any other fly and it is hard to justify why it is worth

investing tax money in studying them. However, since the early 20th century research carried out by the most famous geneticist Thomas H Morgan demonstrated that genes are carried on chromosomes and are the basis of heredity. Since then, there has been an

explosion in *Drosophila* research focusing on modeling human genetic disorders including cancer, Alzheimer's and Parkinson's. This research emphasis was supported by genome projects which discovered an enormous level of conservation of these disease-causing genes in the *Drosophila* genome.

Drosophila genetics contributed a tremendous amount of knowledge in signalling pathways involved in oncogenesis. In contrast to humans, *Drosophila* contains simpler 'streamlined' pathways whose core components and functional roles are nevertheless

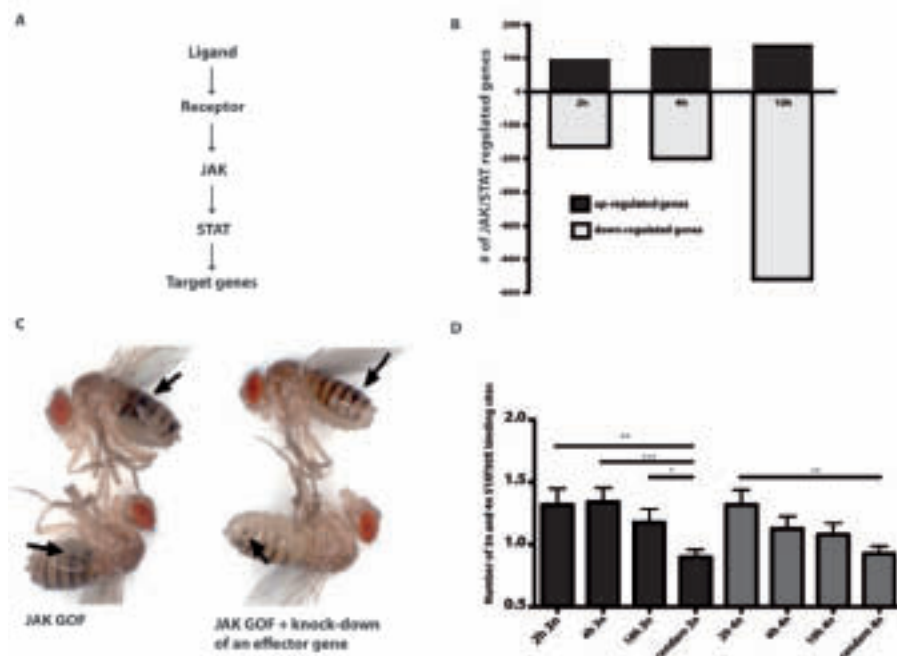


Fig. 1: A) Canonical JAK/STAT pathway signalling. B) JAK/STAT pathway activation causes repression of a number of genes at different time points. C) JAK gain of function mutation causes tumour formation (arrow). This phenotype is rescued by knock down of a downstream JAK/STAT pathway effector identified by transcript profiling. D) For up-regulated genes, 4n STAT binding sites are only enriched in promoter regions of early target genes.

matin modifications and co-transcriptional mRNA processing. *Cell Cycle* 8(22):3636-42

Pirngruber J, **Shchebet A**, Schreiber L, Shema E, Minsky N, Chapman RD, Eick D, Aylon Y, Oren M, Johnsen SA (2009) CDK9 directs H2B monoubiquitination and controls replication-dependent histone mRNA 3'-end processing. *EMBO Rep* 10(8):894-900

Poulopoulos A, Aramuni G, Meyer G, **Soykan T**, Hoon M, Papadopoulos T, Zhang M, Paarmann I, Fuchs C, Harvey K, Jedlicka P, Schwarzacher SW, Betz H, Harvey RJ, Brose N, Zhang W, Varoqueaux F (2009) Neuroligin 2 drives postsynaptic assembly at perisomatic inhibitory synapses through gephyrin and collybistin. *Neuron* 63(5):628-42

Rodríguez-Castañeda F, Coudeville N, Becker S, Brose N, Carlomagno T, Griesinger C. (1)H, (13)C and (15)N resonance assignments of the Calmodulin-Munc13-1 peptide complex. *Biomol NMR Assign*. [Epub ahead of print] PubMed PMID: 20013162.

Rodríguez-Castañeda F, Maestre-Martínez M, Coudeville N, **Dimova K**, Junge H, Lipstein N, Lee D, Becker S, Brose N, Jahn O, Carlomagno T, Griesinger C. Modular architecture of Munc13/calmodulin complexes: dual regulation by Ca(2+) and possible function in short-term synaptic plasticity. *EMBO J*. [Epub ahead of print] PubMed PMID: 20010694

Schmeisser M, **Heisen BC**, Luettich M, Busche B, **Hauer F**, Koske T, Knauber KH, Stark H. Parallel, distributed and GPU computing technologies in single-particle electron microscopy (2009) *Acta Crystallogr D Biol Crystallogr* 65(Pt 7):659-71

Schmidt MR, Maritzen T, Kukhtina V, Higman VA, Doglio L, Barak NN, Strauss H, Oschkinat H, Dotti CG, Haucke V (2009) Regulation of

well conserved. The constitutive activation of the JAK/STAT pathway leads to a wide range of human cancers, including blood malignancies (leukemias, lymphomas and myelomas) and solid tumours (such as brain, breast, lung cancers). In 80% of individuals affected by a polycythaemia vera, a chronic myeloproliferative disease (MPD), a conserved mutation in the regulatory pseudokinase domain of JAK2 has been identified. A similar gain-of-function mutation in the *Drosophila* JAK homolog induces overproliferation of blood cells (hemocytes) which go on to form melanotic tumours.

While the regulatory machinery of the JAK/STAT pathway has been identified and extensively studied, the downstream effectors mediating tumourigenesis remained elusive. In *Drosophila* the JAK/STAT signalling pathway consists of three ligands, which bind to a transmembrane receptor that is associated with JAK kinases. Stimulation of the receptor/JAK complex leads to tyrosine phosphorylation of the transcription factor STAT92E and thereby its translocation to the nucleus. Two consensus

DNA binding sites have been identified to be bound by STAT92E. One is separated by three nucleotides (3n sites), generating a high affinity site, the other by four nucleotides (4n sites), which is bound with lower affinity. Transcript profiling of *Drosophila* hemocyte-like cells after activation with the major JAK/STAT pathway ligand UPD led to identification of key effectors required for hematopoietic tumour formation. In order to extend the relevance of these findings in humans, putative human homologues were identified and their misregulation led to increased cellular proliferation. Furthermore, the promoter regions of downstream target genes of the *Drosophila* JAK/STAT pathway showed a differential distribution of 3n

and 4n binding sites. For up-regulated genes, 3n sites were significantly enriched through all time points after JAK/STAT pathway activation, while the low affinity 4n sites were only enriched in immediate early response target genes. Given that JAK/STAT pathway stimulation is the strongest at early time points, it is plausible that lower affinity 4n binding sites require higher levels of transcription factor activity in order to induce transcription. While these genetic approaches are a powerful way to identify genes responsible for mediating human diseases, the detailed mechanistic analysis of effectors and their role in disease progression remains the ultimate goal.

Samira Bina worked on her doctoral thesis in the group of Prof. Martin Zeidler, formerly at the Max Planck Institute for Biophysical Chemistry and now Dept. of Biomedical Science, The University of Sheffield. She defended her PhD thesis in May 2009.

These results were accepted for publication in EMBO Reports in December 2009.



endosomal membrane traffic by a Gadkin/AP-1/kinesin KIF5 complex. Proc Natl Acad Sci USA 106(36):15344-9

Schneider M, Hsiao HH, Giet R, Will CL, Urlaub H, Lührmann R (in press) Human Prp4 kinase is required for stable tri-snRNP association during spliceosomal B complex formation. Nat Struct Mol Biol

Stankovic-Valentin N, **Kozaczkiwicz L**, Curth K, Melchior F (2009) An *in vitro* FRET-based assay for the analysis of SUMO conjugation and isopeptidase cleavage. Methods Mol Biol 497:241-51. Review.

Stegmann CM, Seeliger D, Sheldrick GM, de Groot BL, Wahl MC (2009) The thermodynamic influence of trapped water molecules on a protein-ligand interaction. Angew Chem Int Ed Engl 48(28):5207-10

Werner A, Moutty MC, Möller U, Melchior F (2009) Performing *in vitro* sumoylation reactions using recombinant enzymes. Methods Mol Biol 497:187-99. Review

Wirth M, Jedrusik-Bode MA (2009) Interplay between histone deacetylase SIR-2, linker histone H1 and histone methyltransferases in heterochromatin formation. Epigenetics 4(6):353-6

Wirth M, Paap F, Fischle W, Wenzel D, Agafonov DE, Samatov TR, Wisniewski JR, Jedrusik-Bode M (2009) HIS-24 linker histone and SIR-2.1 deacetylase induce H3K27me3 in the *Caenorhabditis elegans* germ line. Mol Cell Biol 29(13):3700-9

Students

Master's class 2009/10

Ahmed Abdel Samad, Egypt
BSc from Cairo University, Egypt

Maximilian Fünfgeld, Germany
BSc from Swiss Federal Institute of
Technology (ETH) Zurich, Switzerland

Kevser Gencalp, Turkey
BSc from Middle East Technical
University, Ankara, Turkey

Akanksha Goyal, India
BSc from Sri Venkateswara College,
University of Delhi, India

Christian Hoffmann, Germany
BSc from Dresden University of
Technology, Germany

Lena Hyatt, USA
BSc from University of Carolina at
Chapel Hill, USA

Veena Jagannathan, India/USA
BSc from Sri Venkateswara College,
University of Delhi, India

Seol-hee Joo, South Korea
MSc from Sogang University, Seoul,
South Korea

Samir Karaca, Turkey
BSc from Middle East Technical
University, Ankara, Turkey

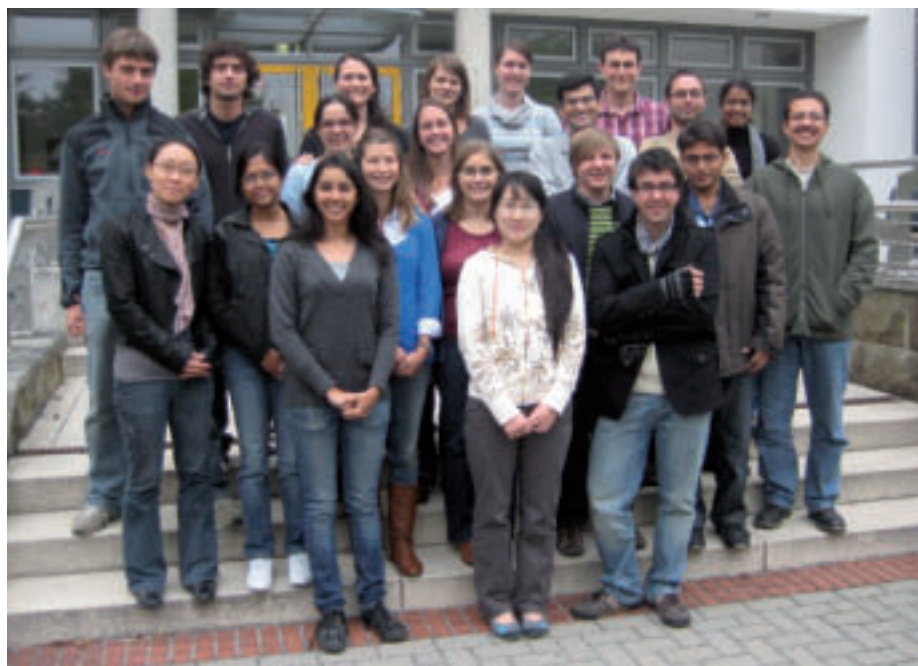
Simone Mayer, Germany
BSc from University of Cambridge,
Sidney Sussex College, UK

Jonathan Melin, USA
BSc from University of California,
Irvine, USA

Danesh Moradi Garavand, Iran,
MSc from University of Tehran, Iran

Rafik Tarek Neme Garrido, Colombia
BSc from Universidad Nacional de
Colombia, Bogotá, Colombia

Miriam Weiss, Germany
BSc from University of Rostock, Ger-
many



Momchil Ninov, Bulgaria
BSc from Sofia University "St. Klement
Ohridsky", Sofia, Bulgaria

Halenur Yavuz, Turkey
BSc from Middle East Technical Uni-
versity, Ankara, Turkey

Reejuana Parveen, India
MSc from University of Hyderabad,
India

Paula Perin, Brazil
BSc from University of Sao Paulo,
Brazil

Jennifer Seefeldt, Germany
BSc from University of Göttingen,
Germany

Upadhayula Sai Srinivas, India
MSc from University of Hyderabad,
India

Congwei Wang, P. R. China
BSc from Capital Normal University,
Beijing, P.R. China

Applications 2009

In the year 2009, the Molecular
Biology program received 418
applications from 57 countries.

Germany 41
other Western Europe 14
Eastern Europe 52
North America 5
Central/South America 22
North Africa 21
Central/South Africa 18
Asia / Near East 26
Central Asia / Far East 219

PhD projects started in 2009



Shweta Aggarwal

Mechanisms of myelin membrane assembly
Mikael Simons, Peter Rehling, Dirk Görlich



Neva Caliskan

Programmed ribosomal frameshifting in bacteria
Marina Rodnina, Holger Stark, Ralf Ficner



Hema Chug

Assembly and structural characterization of the NUP62 and NUP107 subcomplexes of nuclear pore complexes
Dirk Görlich, Reinhard Lührmann, Peter Rehling



Carlos Eduardo da Cunha

Dynamics of tRNA translocation through the ribosome
Marina Rodnina, Kai Tittmann, Holger Stark



Aliaksandr Dzementsei

Functional dynamics of cell-cell contact formation and cell polarity in the context of germ cell migration in *Xenopus* embryos
Tomas Pieler, Andreas Wodarz, Michael Kessel



Iris Finci

Isolation and characterization of acyl-CoA reductases and their involvement in lipid metabolism
Ivo Feußner, Michael Thumm, Henning Urlaub



Mandy Hannemann

Regulation of dense core vesicle biogenesis at the Golgi-endosomal interface
Stefan Eimer, Nils Brose, Reinhard Jahn



Fatemeh Javadi Zarnaghi

In vitro selection of bifunctional deoxyribonucleases
Claudia Höbartner, Reinhard Lührmann, Kai Tittmann



Oleksandra Karpiuk

Histone modifications in the development and metastasis of cancer
Steven Johnsen, Halyna Shcherbata, Heidi Hahn



Koray Kirli

Sequence requirements of FG-repeats to form a functional permeability barrier
Dirk Görlich, Reinhard Jahn, Kai Tittmann



Wen-ti Liu

3D structure determination of human spliceosomal complexes B and C by single particle cryo-EM
Holger Stark, Marina Rodnina, Kai Tittmann



Helena Magliarelli

The role and regulation of Dystrophin glycoprotein complex in muscular dystrophy development in *Drosophila*
Halyna Shcherbata, Jörg Großhans, Andreas Wodarz



Sinem Saka

Functional characterization of the *Arabidopsis* LysM-RLK CERK1 and its interactors
Volker Lipka, Ivo Feußner, Dirk Görlich



Christian Schulz

Protein interactions during protein import along the presequence pathway
Peter Rehling, Dirk Görlich, Kai Tittmann

External MSc projects

Julia Cajan,

supervised by Prof. Gian-Paolo Dotto, University of Lausanne, Switzerland

David Haselbach,

supervised by Prof. Matthias Rief, Technical University Munich, Germany

Olena Steshenko,

supervised by Dr. Cahir O'Kane, University of Cambridge, United Kingdom

Hanno Sjuts,

supervised by Prof. Gideon Schreiber, Weizmann Institute of Science, Rehovot, Israel

Christopher Spencer,

supervised by Peter A. Cohen, MD, Ass. Professor, Mayo Clinic, Scottsdale, AZ, USA

Students

Graduated

The Masters of 2009

Alwaleed Alkhaja (P. Rehling)
Investigating the role of Mss51 in cytochrome c oxidase biogenesis and assembly

Adi Bar-Schalom (D. Görlich)
Globular and non-globular protein-protein interactions among nucleoporins

Janina Berghoff (Y. Yarden, WIS)
hLst2, an endosomal effector of EGF receptor downregulation, is regulated by monoubiquitination

Neva Caliskan (M. Kessel)
The role of Geminin in mouse ES cells

Annette Denker (S. Rizzoli)
Ultrastructural investigation of synaptic vesicle pools in *Drosophila melanogaster*

Aliaksandr Dzementsei (T. Pieler)
Mapping of xKIF13B domains in the context of the primordial germ cell migration in *Xenopus laevis* embryos

Liudmila Filonava (M. Rodnina)
The kinetic studies of GTPase reactions in translation initiation

Mandy Hannemann (S. Eimer)
Dissecting the role of the ARF guanine nucleotide exchange factor GBF-1 for Golgi transport in *C. elegans*

Sebastian Hogl (G.J.S. Cooper, NZ)
Effects of diabetes and copper (II) selective chelator treatment on the expression in heart and kidney of genes that regulate glutathione metabolism

Chandini Kadian (D. Görlich)
Assembly of stable and homogenous tRNA export complexes for subsequent structural analysis

Frederik Köpper (M. Dobbstein)
The kinase MK2 in the mediation of DNA damage-induced histone H2AX phosphorylation

Andrius Krasauskas (H. Stark)
Analysis of EFTEM distortions and aberrations

Cornelius Schneider (R. Lührmann)
The generation of site modified U2 snRNAs for introduction into spliceosomal complexes by ways of complementation of U2 snRNP-depleted nuclear extracts



Nadya Mitova (S. Rizzoli)
Investigation of the Mouse Neuromuscular Junction by Double-Immunofluorescence and STED Microscopy

Miroslav Nikolov (H. Urlaub)
Analysis of HP1-Chromatin Interactions by Mass Spectrometry

Doris Petroi (G. Braus)
Analysis of ATG7 in the context of alpha-synuclein toxicity in *Saccharomyces cerevisiae*

The Doctors of 2009



Sina-Victoria Barysch

Investigation of early endosomal sorting and budding
Reinhard Jahn, Nils Brose, Michael Thumm



Samira Bina

Identification and analysis of JAK/STAT pathway target genes in *Drosophila melanogaster*
Martin Zeidler, Ernst Wimmer, Michael Kessel



Bijan Boldajipour

Molecular mechanisms controlling guided germ cell migration in zebrafish
Erez Raz, Tomas Pieler, Ivo Feußner



Anna Botvinnik

Combining induced protease fragment assembly and microarray analysis to monitor signaling in living cells
Klaus-Armin Nave, Frauke Melchior, Ernst Wimmer



Kalina Dimova

Characterization of the Munc13-calmodulin interaction
Nils Brose, Christian Griesinger, Frauke Melchior



Benedikt Frank

Investigation of protein structure and dynamics
Christian Griesinger, George Sheldrick, Erez Raz



Florian Hauer

Three-dimensional electron microscopy of structurally heterogeneous biological macromolecules
Holger Stark, Ralf Ficner, Reinhard Jahn



Burkhard Heisen

New algorithms for macromolecular structure determination
Holger Stark, George Sheldrick, Markus Wahl



Katharina Hoff

Gene prediction in metagenomic sequencing reads
Burkhardt Morgenstern, Wolfgang Liebl, Lutz Walter



Lukasz Kozackiewicz

USPL1, a novel SUMO isopeptidase
Frauke Melchior, Gerhard Braus, Detlef Doenecke



Petranka Krumova

SUMOylation modulates α -synuclein toxicity and fibril formation
Mathias Bähr, Frauke Melchior, Klaus-Armin Nave



Magdalena Morawska-Onyszczyk

Protein-protein interactions involving Adenovirus 5 E1B-55-kDa oncoprotein
Matthias Dobbstein, Frauke Melchior, Markus Wahl



Adema Ribic

Expression and properties of neuronal MHC class I molecules in the brain of the common marmoset monkey
Lutz Walter, Nils Brose, Jürgen Wienands



Marc Schneider

Investigations on structural and functional requirements of the formation of human pre-catalytic spliceosomes
Reinhard Lührmann, Christian Griesinger, Gerhard Braus



Iryna Shnitsar

Analyzing the signaling mechanism of PTK-7 in neural crest migration
Annette Borchers, Michael Kessel, Andreas Wodarz

Singapore - R & Ding a Tiger

How it comes that Göttingen MolBio veterans are continuously flocking to a small and steamy tropical island that is not quite on the beaten path of fresh graduates on the hunt for great discoveries and faculty positions? Do you need the mentality of an adventurer, dropout or surfer to come here?

Not necessarily, because Singapore is boldly moving towards creating one of the world's leading research hubs capable of challenging the established centers such as those in the Boston area. And the pockets of the Singapore government are deep. Singapore will soon be hitting its target of spending 3% of GDP towards R&D. In 2007 alone, more than 3 billion euros were invested in R&D, which is roughly twice the annual budget of the Max-Planck society. A substantial fraction of this investment comes from the private sector.

By engineering a knowledge-based economy and by diminishing its dependency on manufacturing and trade, Singapore strives to retain its competitiveness especially when facing growing economic pressure coming from the Asian giants. In the late 90s / early 2000, the Agency for Science, Technology and Research (A*STAR) was created to establish a world-class research environment with a life sciences and engineering as key components. In recent years, A*STAR has also started to embark on interdisciplinary research, envisioned in the twin research campuses of Biopolis and Fusionopolis. In contrast to the scattered distribution of Max-Planck Institutes the 14 A*STAR research institutes are clustered at two futuristic science cities with restaurants, shops and gyms named Biopo-

lis and Fusionopolis. They are located only a stone's throw away from each other and house outlets of multinational corporations such as Glaxo-Smith Kline, Ely Lilly, Novartis and Schering-Plough.



Kasim Diril, Ajaybabu Pobbati and Ralf Jauch (from left to right) on the Biopolis high-tech biomedical park in Singapore

The idea is to nurture synergies by having academic geeks, engineers and pharma managers in close proximity. A*STAR's work force includes a few dinosaurs in science and about 2300 PhD level scientists. Foreigners constitute a large portion of the work force, thereby creating a cosmopolitan environment.

Unlike the local universities which are funded by the Ministry of Education, A*STAR reports to the Ministry of Trade and Industry. This already provides a clue that A*STAR's emphasis is to translate science and to create intellec-

tual capital. As of now, funding within A*STAR is largely intramural, RI's receive a generous bloc funding and grants are distributed internally among the principal investigators.

So grant writing is a relatively exotic activity, but there are signs that this might change.

All right, let's talk about some everyday aspects and how we feel about working here. A fantastic effect of working in a cluster is that there are many symposia and continuous visits of high-profile scientists delivering lectures just a sky bridge away.

There is also a large pool of students and young graduates eager to start their scientific careers through attachment projects and work as research technician. It's therefore not uncommon that

Post-Docs enjoy the luxury of having a small gang of students and technicians to look after. But, sometimes intensive training needs to be provided. Scientific collaborations within and between institutes are encouraged but can occasionally be somewhat more formal compared to what we were accustomed to in our previous research environments. At times we are reminded that we are located remote from the production centers of most of the biotech providers since reagent orders can take a bit longer than we would like.

Work aside, life is sweet in Singapore. It is never cold unless you forget a sweater when going to the fiercely air-conditioned cinemas. The Southeast Asian beaches, jungles and other holiday destinations that Europeans dream of are all near. Singapore is clean, well-organized and the crime rate is low. Initially we were all a bit worried by Singapore's reputation of having a draconian judicial system which could disturb a staunch liberal – but in fact we have yet to come across a person who got caned for trivial offenses.

Culturally, Singapore increasingly offers more than Formula One, Chinese karaoke bars and Filipino cover bands. Singapore is a multicultural mix dominated by a Chinese majority but with a pronounced impact by ethnic Malays and Indians. English, Mandarin, Malay and Tamil are official languages. To add to the diversity, there is also a big population of foreigners working here that make up roughly 20% of all residents. They come from the surrounding Asian neighbours but the population of westerners is constantly increasing and they are leaving their stamp on life-style, culture and cuisine.

As a result, Singapore is really a fusion of Western and Eastern cultures, which makes it hard to experience a culture shock. There is Little India, Malay Village, Chinatown, the Colonial District and shopping malls that put New York into shame. The 150 years of colonial British rule is seen in a rather positive light, nobody had been conquered and oppressed as opposed to other countries in the region. In fact, Singapore made it from 3rd world to 1st in record times and enjoys a per capita income desired by many EU member states and certainly envied by other South East Asian countries.

Nevertheless, Singapore never intended to become a blueprint of the liberal western societies and reading local newspapers is not really an exciting pastime if you are seeking for hot debates and controversies. However, the biggest downside is that the beer in the average Singapore pub goes for about three times the prize than it does in downtown Goettingen – which, admittedly, gives us more time to commit to undisturbed hypothesis testing.

To conclude, we can wholeheartedly say in good old Singlish: 'Research here not bad what. Can try lah.'

Ajaybabu Pobbati
Kasim Diril
Ralf Jauch

Further Information, Study and Job opportunities visit:
www.a-star.edu.sg

Ajaybabu Pobbati did his PhD with Dirk Fasshauer and Reinhard Jahn. He graduated from the Molecular Biology program in March 2006. After his post-doctoral work in Cambridge, UK at the Medical Research Council, Laboratory of Molecular Biology, LMB PNAC, he joined the Institute of Molecular and Cell Biology of the Agency for Science, Technology and Research (A*STAR) in Singapore.

www.imcb.a-star.edu.sg

Kasim Diril did his PhD with Volker Haucke. He graduated from the Molecular Biology program in July 2005. Afterwards, he joined Philipp Kaldis' lab in the Mouse Cancer Genetics Program of the National Cancer Institute Frederick, Maryland, USA as a visiting fellow. One year later, he moved together with his group to Singapore and joined the Institute of Molecular and Cell Biology of A*STAR.

www.imcb.a-star.edu.sg

Ralf Jauch did his PhD with Herbert Jäckle and Markus Wahl. He graduated from the Molecular Biology program in October 2005. Afterwards, he joined the Genome Institute of Singapore (GIS), where he currently holds the position of a research scientist.

www.gis.a-star.edu.sg

Stockholm: Toxoplasma and „lagom“

As the plane I took from 25-degree-Spain successfully landed in Sweden, my first minute in Stockholm started - a late September day in 2006. It was so cloudy, foggy and grey that I could hardly see the waving of Anja who waited for me at the airport. Interestingly, the rest of September, October and November came and went by with exactly the same kind of weather.



Polya Rosin (former Vutova)

But who cared? I did not come to Stockholm for its beauty and neither for its weather. I came here to do research and in particular top-end *Toxoplasma* research. I joined the group of Antonio Barragan at Karolinska Institutet. I had worked on *Toxoplasma* before and considered the field of host-parasite interactions one of the most fascinating and cross-cutting areas of research. I got to know that Antonio was involved with new *in vivo* imaging techniques of *Toxoplasma* infection and alternative means of studying *Toxoplasma*-host interactions. I had just finished a lab

rotation in Paul Lingor's group at Göttingen University where I had the exciting opportunity to do *in vivo* imaging which I greatly enjoyed. Therefore, I did not think twice before contacting Antonio and asking him for the possibility to do my Master's thesis work in his lab.

Stockholm is definitely not an easy city to find cheap and cosy accommodation. However, once you manage to sort that out you can enjoy the benefit of beautiful city that offers more art, fashion and culture than one can manage to experience.

My Master thesis work in Antonio's group offered a range of challenges which I was more than happy to take. Importantly, these were challenges which I was prepared to take thanks to the knowledge and experience I acquired during the MolBio program in Göttingen (and I am not saying this to be nice but do sincerely mean it). The range of topics I was well aware of following the program served as a tool for me to take an active part in every Journal Club but also to successfully lay out the work plan for my future PhD.

Karolinska Institutet covers various fields of research and hosts numerous leading scientists. This offers excellent working conditions, opportunities for interactions and vivid research environment. The Institute has an outstanding tradition in teaching and training which contributes substantially to the dynamics and youthfulness of Karolinska. For those curious about the variety offered by this medical university, check out <http://ki.se/> (unless you do not want to experience the beauty of the Swedish language, you need to se-

lect "In English"). Of note is the fact that MSc and even more so PhD studies at Karolinska differ substantially from the corresponding ones in Germany.

Of note is also that if you think Swedes are (culturally speaking) very similar to Germans, you would be surprised to find out how wrong you are. Swedes are society-minded, authority-trusting and conflict-avoiding people. I love the "for the good of all" - paying tax - following rules attitude of the majority of Swedes and I pray this never changes. There are three things (at least) you are very likely to hear when you start living in Sweden:

- 1) "There is no bad weather - only bad clothes" - funny saying which took me a while to believe in.
- 2) "lagom" - hard to translate but close to "just right; not more not less". I still refuse to support this especially when it comes to schools where "lagom"

Polya Rosin (former Vutova) graduated from the Molecular Biology Master's program in March 2007. She did her external Master's thesis project with Antonio Barragan at the Center for Infectious Medicine of the Karolinska Institutet, Stockholm, Sweden. In 2007 she was awarded a Karolinska Institutet PhD student stipend (KID stipend) to continue her research on *Toxoplasma gondii* - dendritic cells interactions. During the first year of her PhD studies, her abstract was selected for an oral presentation at the Gordon Research Conference on Host-Parasite interactions in Boston.

Stockholm: Hard shells and soft cores

If you like it short: „Stockholm was a fantastic experience“! I can only warmly recommend performing a Master's thesis abroad. It must not necessarily be Stockholm, but can be any other place in a foreign country. It is the experience of organizing your internship abroad, settling in an unfamiliar environment and seeing and understanding life from another perspective, that all turn out to be extremely precious features.

continued from previous page

translates into trying to keep all students at the same level and thus could kill the competitive drive to be better than the rest (there is an interesting article on that lagom in Wikipedia so the ones who are curious are welcome to check it out).

3) "the ketchup effect" - Foreigners in Stockholm can sometimes be frustrated with the difficulties they face when trying to get close to the locals. However, once you manage to transform from just a colleague/someone I know into a close friend/loved family member you get it all --- you know you have a strong, real and warm support to lean on - hence, the ketchup effect.

Going back to science, Karolinska Institutet is without doubt an excellent choice for a scientific research career and Stockholm is such a lovely and lively city to live in. However, do not take this as a recommendation. All I can recommend is that one should follow his/her interests. One should live and work at the place where his/her source of enthusiasm and joy is.

In my case, I chose the Karolinska Institute mainly because of its excellent reputation, but also because it offered me yet another internship abroad. After a few unsuccessful attempts I was finally invited to do a MSc project in the group of Angel Cedazo Minguez in the Alzheimer's Disease Research Center, which operates as an own department within the Karolinska Institute.

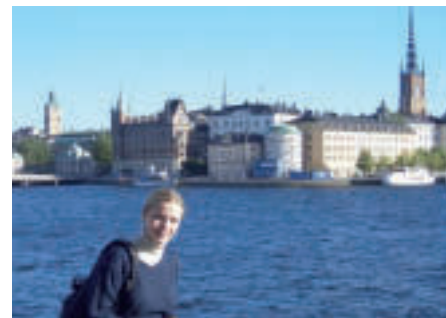
As in any other internship, if you are an open minded person, you easily get



accepted into the team quite fast. And after a week of organizational tumbling in every respect you are very ready to enjoy not only your independent research but also the city, the country, the language and the people. Stockholm offers a lot of leisure activities, beginning from the natural beauty of the archipelagos around the city, to the point of the huge variety of cultural opportunities Stockholm holds.

When it comes to people though, the Swedes are often described as people with a hard shell and a soft core. I must

admit this is a very accurate description of what I have experienced. They are extremely friendly and chatty to all



Anja Krauss

the new-comers. But you will stay at a surface level unless you manage to break through the hard shell to get part of the soft core and stay in their hearts irrevocably ... but this takes TIME!

In the end I successfully finished my Master's thesis ... not awarded a Nobel price for, but rather having gained a rucksack full of experiences making me look at my studies in good conscience that I completed them the best way I could.

Anja Krauss graduated from the Molecular Biology Master's program in March 2007. She did her external Master's thesis project with Angel Cedazo-Minguez, Alzheimer's disease and dementia research at the Karolinska Institutet, Stockholm, Sweden. Afterwards she moved to Munich, where she is currently pursuing her PhD studies at the Ludwig-Maximilians-Universität München in the Biochemistry department of Christian Haass.

Stockholm: Structural immunology in pink

Having just arrived in Stockholm on a December break from Israel, the first thing I could not help noticing was a roughly 25° C shift in temperature. Thus, my first impressions of this city were those of the beautiful force of the Northern European winter (though somewhat blurred by a terrible cold).

However, when I eventually decided to come back here for my PhD, it was not only because of my recently discovered love for change of seasons but - besides private reasons - for its great PhD opportunities (admittedly supported by the odd but firm German love for anything Swedish). So, shortly after finishing my thesis on molecular evolution at the Weizmann Institute of Science I moved to Stockholm and ultimately entered the proud and pink Karolinska Institutet for a PhD on structural immunology.

What started then has been very motivating and exciting mostly due to the great devotion, energy and not least temper of my young boss that is cushioned by the amassed excellence of the Karolinska in immunology around us. In retrospect though I feel I have been somewhat spoiled by scientific environments like the one we had in Göttingen or the science I found in Israel. Particularly it is the extreme commitment to and spirit for science we shared that I remember and sometimes miss. However, in Sweden it is impossible not to enjoy the things on the other side of that coin, such as the chance to a 'private life' in science and not to truly admire 'papa-frei' and the playgrounds full of young parents.

One should also keep in mind that this country's population is quite a bit

smaller than that of Paris, and even though the Karolinska can at large not match the financial leverage of a place like an MPI, Sweden is rightfully proud



of its exceptional R&D spending together with the quality, name and history of the Karolinska Institute. One feature which I found particularly interesting is the relatively open department structure and the possibilities for scientists to become truly independent and their own boss as soon as they have raised money on their own (that is, if they at least can afford their own salary). And some of the advantages of this feature reach down to me thanks to my boss' trust and his dedication to education as I have had the chance to join a team that is just in the exciting transition from a very small team to a real group.

Away from science but a final thing that I guess strikes every stranger coming to Stockholm is its proximity, beauty and just plain amount of nature and the red-house-by-the-lake-and-trees. Not only does it give the city its unique sights and quality of life but Swedish people

actually seem to do a lot of stuff with it. In combination with the Scandinavian passion for style, it gives a pretty exceptional and charming combination

of mud and make-up. In conclusion, I would say I have done a full turn from the non-existent winter in Israel to my first cold in Sweden and some years of motivating work at the pink mother ship. And so I am sitting in my flat in frozen Stockholm with a warming hat on, looking forward to my first skating trip on the lakes and of course to my next years at the Karolinska.

Hannes Uchtenhagen

graduated from the Molecular Biology Master's program in March 2007. After an external Master's thesis project with Dan S. Tawfik at the Weizmann Institute of Science in Rehovot, Israel, he moved to Stockholm to take up a PhD position at the Center for Infectious Medicine (CIM), Karolinska Institutet.

The way forward in neuroscience

Neuroscience today strides the twin boundaries of biology and imagination

The biological basis of personality is only now beginning to be touched by neuroscientists. Integration of data from cellular, systems, cognitive and network branches of neurosciences raises the exciting possibility of exploring questions that hitherto belonged to the domain of psychology. We may already be in a position to ask what the mind is, what the self is, how the brain defines personality, what consciousness is and what the biological bases of these notions are. In the near future, we will have a consensus on the synaptic basis of personality. We will be closer to defining 'mindedness'.

In the next decade, rodent and human brain will be mapped in exquisite detail, most important disorders will have compelling animal models and bold new sets of testable hypotheses about psychiatric illnesses will emerge. Neurodegenerative disorders will have treatments of remarkable efficacy and genetic and cellular bases of developmental defects will be much clearer with possible solutions.

An exciting avenue will open as precision targeting of drugs to sub-cellular compartments in specified cell-types will begin to be explored ensuring mi-

Evolutionary neuroscience will make great strides as we may be able to define the precise differences between our closest ancestors and us. We will begin to appreciate that information has a physical basis, enabling the development of ever more sophisticated mind-machine interfaces.

Yet the most outstanding contribution that neuroscience could make is on the shaping of public policy and ethics of governments around the world. Neuroethics could set the boundaries of judicial actions, ensuring that retrograde policies such as torture and solitary confinement are done away with. Neuroscience will continue to rise to these and numerous other challenges of human society.

In the words of Wilder Penfield, "the brain is the organ of destiny. It holds within its humming mechanism secrets that will determine the future of the human race."



Tabrez J. Siddiqui

Rodolfo R. Llinas, in the "I of the vortex" says "the brain's control of organized movement gave birth to the generation and nature of the mind", suggesting that it is motor control and synchronous activity that provided that crucial evolutionary space. However, the biological bases of morality will perhaps continue to elude us.

animal or no drug-induced toxicity. An under-studied area in neuroscience is the footprint of environmental pollutants and synthesised chemicals on brain function and epigenetics. This area will doubtless gain momentum as public opinion is more sensitised.

Tabrez J. Siddiqui did his PhD with Reinhard Jahn in the Department of Neurobiology at the Max Planck Institute for Biophysical Chemistry. He graduated from the Molecular Biology program in June 2006. Afterwards, he joined the Brain Research Centre at the University of British Columbia Hospital in Vancouver, Canada, where he is currently holding a position as a post-doctoral research fellow.

Pharmacovigilance

Alle Ding' sind Gift, und nichts ohn' Gift; allein die Dosis macht, daß ein Ding kein Gift ist; or "All things are poison and nothing is without poison, only the dose permits something to not be a poison" – Paracelsus.

In a nutshell, all medicine is poison. Although medicine has led major improvements in the treatment and control of diseases, we know they cause

patients, e.g. the WHO International Drug Monitoring Program. Consumers are also encouraged to report any adverse reactions to the authorities or to the companies that sold them the drug or medical device.

As public concern over drug safety grows, pharmaceutical companies are under pressure to intensify their pharmacovigilance efforts. Although data

scientific background and my understanding of clinical trials to good use. There are many ways to track cases of drug reaction. Apart from direct consumer or physician reporting, trawling through published literature is another recognized method. As soon as we can validate a case of drug adverse reaction, we are mandated to report to the relevant health authorities immediately. Such information is then pooled in databanks for assessment, and if there are enough evidence then the health professionals and the general public are informed. In the worse case scenario, a drug will then be withdrawn from the market. The famous cholesterol drug, Baycol, was pulled off the market after it was linked to as many as 40 deaths globally. Reductil, an appetite-suppressor supplement, is withdrawn over fears that it causes heart attacks or strokes. Without the pharmacovigilance measures in place, the risks that outweigh the benefits of these drugs would not have been elucidated; and these drugs would have remained in the market. A scary thought indeed.



Yu Shan Chia

adverse reactions. As soon as we intrude upon our human body, we incur risks whose effects are not predictable. Drugs were meant to cure, and their benefits must outweigh the risks they pose. The increasing number of drug recalls today highlights the urgency of rectifying this trend. The field devoted to detecting, assessing, understanding and preventing drug-induced reactions is called pharmacovigilance, and is the field I am happy to be involved in. Pharmacovigilance is gaining importance and recognition within the medical, scientific and regulatory communities, with international efforts underway to streamline reports submitted by healthcare professionals pertaining to adverse drug reactions in their

on drug safety is collected at every time point during the drug development process, the sterile and controlled environment of clinical trials does not elucidate drug behavior in real-life situation. Patient behaviors outside a trial are uncontrollable and unpredictable, hence, unexpected drug reactions can happen, and in some cases they can be fatal.

As the name suggests, in order to keep vigil on pharmaco-related issues, a multi-disciplinary team is needed. Before I joined this field, I made a stop-over in clinical operations and then business process and administration after graduate school. The challenges within pharmacovigilance put my

Yu Shan Chia concluded her Master's thesis with Thomas Jovin in 2002. After her PhD at the Bernhard Nocht Institute for Tropical Medicine in Hamburg she joined Lilly Pharma Holding GmbH as Clinical Development Technical Assistant in the European regional Oncology Clinical Operations, and later as Medical Clinical Operations Assistant in their Medical Business Office. As of Dec 2009, she joined ICON Clinical Research as a Drug Safety Associate.

Open access

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Bettina Goerner

Now, how does it work? Open access is a big change in the way scientific publishing works. So far, the costs and profits of publishing scientific articles are paid by the reader. Articles in journals which are not subscribed by your institution greet you with „Access denied.“ For open access articles, the payment comes from somewhere else. Some open access journals charge article processing fees to the author side, others are sponsored by societies or in-

stitutions. In any case, scientists don't need to dig into their own pockets, but can increasingly rely on their funding bodies to pay the open access fee.

Science funders (such as the Max Planck Society) and universities (Göttingen, ETH) believe that publicly funded research should be freely available to everyone and thus pay the fees. Other organizations have even made open access mandatory (NIH, Har-

vard). Today, the number of open access articles is growing every day, and more and more traditional publishers are waking up to a quickly changing world.

I make sure that the publishing house Springer (the second largest after Elsevier) stays tuned in this new world. Having arrived there after skipping the PhD (“Bettina, you're wasting your talent. There is nothing out there.”) and

sniffing into McKinsey and INSEAD Business School I started at Springer as a management trainee. Working in different units such as editorial, marketing and e-product development and meeting the people that matter helped me to move on to my current position as Manager Open Access. The job involves plenty of strategic thinking about the changing business landscape as well as many operational responsibilities.

Doing something well has predictable and satisfying results, without the randomness of success we all know from the bench. I am pretty far away from doing science and actually reading papers, but at the same time, by moving Springer in a growing open access world, I make sure that you can read all the articles you need.

Feel free to email me with comments, thoughts or questions at be.goerner@gmail.com or connect at <http://de.linkedin.com/in/goerner>

Bettina Goerner concluded her Master's thesis with Jürgen Klingauf in the Department of Membrane Biophysics at the Max Planck Institute for Biophysical Chemistry in 2007. She continued with internships at McKinsey and the INSEAD Business School. In fall 2008, she joined a management trainee program at the publishing house of Springer, where she currently holds the position of Manager Open Access.

Welcome Abhiram

On 4th of April 2009, we were blessed with a baby boy and we named him Abhiram. In fact during my „Mutterschutz Urlaub“, it was on the 3rd of April when I completed editing a manuscript, I thought „Great now I finished all my work“, when I had to go to the hospital. And then all of a sudden everything changed, since my son had the „Jet lag“ from womb to the outside world, we spent many sleepless nights (like everyone else I guess) and I had my second thoughts of either continuing or quitting my work as it was very chaotic managing things at home with a newborn baby and keeping up with research in the lab.

I was then wondering how other women I knew managed to accommodate both family and work. I also had the bad conscience that I was not a good mother. On the other hand as far as my research is concerned, I have just seen the tip of the iceberg and I had the urge not to stop working at this point of time. As I could not afford a break in my career I decided to start working from the 1st of June again. Our (my husband who works as a key account manager and travels almost every month to India) biggest problem was „Time management“. I just thought it would be great if „one day“ had at least 48 hours. It was a quite stressful situation how myself and my husband managed everything at home and at our work places. Slowly I realized that I am not an exception. My greatest teacher is my mother, who never took a holiday, started working the second day after she delivered me and was working as a medical doctor for almost thirty five years now with three kids.

I started working as a postdoc in the group of Prof. Yves Muller from December 2006 and had difficulties getting some results. Then suddenly I started getting great results as soon as I knew that I was pregnant!!! I could



Madhumati Sevvana and Abhiram

publish one paper and also got results for three more manuscripts by the end of 2009. It's a great encouragement for me ... I thought. Suddenly I realized that we are able to manage time better than before, plan our work much better than before and now when my son does not wake up in the nights, we have a lot of time left for everything.

The greatest support and help we got from our parents, especially my mother (who stayed for 6 months, leaving my father who managed their hospital all alone) who flew from India to help us with taking care of the baby while we were working. My current boss was very understanding and supportive and gave me several concessions that sometimes I could work from home, could go twice from work in between to feed the baby and also gave me a

student when I was pregnant, who worked for me in the lab for 6 months while I was planning experiments and working on the computer. In a country like Germany, where it is very difficult to find a baby sitter before our son was 6 months old, it might have been certainly impossible to continue working without the support from family and the boss and I was lucky to have both. In essence, I guess family is the greatest thing in one's life, which should not be ignored just because one has to make great careers.

It is difficult, being a woman, to do justice to both family and work but it's not impossible. Me and my siblings are all doing well in their careers, although my mother never stopped working and I am sure and hope that I will manage being a good mother as well as do my job. What I learnt so far is that with more responsibilities one is able to plan „work“ better. My son now goes to a „Kinderkrippe“ organized by the university and has a nanny at home who takes care of him while I am working. Finally I would like to quote something from an anonymous author for all the mothers in this world „No painter's brush, nor poet's pen, in justice to her fame, has ever reached half high enough, to write a mother's name“.

Madhumati Sevvana did her PhD studies with George Sheldrick at the Department of Structural Chemistry. Currently, she holds a post-doctoral research position in the protein structure and design group of Yves Muller at the University of Erlangen-Nürnberg.

Family management in Berlin

When I finished high school my dream was to develop innovative medications that will help people suffering from different diseases. Thus I decided to study Biochemistry/Molecular Biology with a future career to become group leader and eventually professor in my mind.

clinical trials for the pharmaceutical industry. Therefore, though not directly conducting research at the bench, I am still part of the development process a new drug must pass until it eventually reaches the market. My job is to organize the study medication supply for

Although I sometimes miss the actual “hands-on” practical work, I think it had been the right decision for me and my family. As we don’t have any grandparents, aunts or other relatives nearby, the organization of our daily family life depends on outer settings like the availability of day care, flexible working times in the job and a working position for both of us in the same area. Luckily, all of this has worked out just fine up to now. The day care offers opening hours from 6 am to 6 pm, which gives us great flexibility on when to bring and pick-up Lisa. My core working hours are from 9 am to 3 pm and my contract allows me to work 30 hrs a week in the office and 10 hrs from home. In addition, Micha found fantastic post-doc positions - first at the Max Delbrück Center in Berlin Buch, now at Merz Pharmaceuticals GmbH in Potsdam.

Of course we still meet challenges when we both have appointments or business trips we cannot move, but it is at least the exception, not the rule.

Pia Schmidt (former Kaplanek)

did her PhD with Michael Weig and Uwe Groß in the Department of Medical Microbiology, University of Göttingen, Faculty of Medicine.

Michael Schmidt did his PhD with Volker Haucke (form University of Göttingen, now FU Berlin).

Both graduated from the Molecular Biology program in November 2007.



Pia, Michael and Lisa Schmidt

However, when defending my PhD thesis nine years later, the intention of developing medications to help people was still in me, but a few settings in my personal life had changed. Being married and having an eight months old baby, I chose a different way to go for my goals than originally intended.

Currently I work in Berlin for PAREXEL International GmbH, a Contract Research Organization (CRO) conducting

the investigational sites participating in a clinical trial - a rather straight forward task but the devil is in the details. Coming to work in the morning I never know which accident or disaster I have to solve this time (customs strike, changing customs regulations, unhandiness of investigators, courier or depot staff, errors of airlines, sponsors changing their mind or simply mother nature playing with the elements). It never gets boring ...

MotoEurasia - On the road to Nepal

Tales from the saddle - A solo motorcycle expedition to the Himalayas

25.000 km, 18 countries, 4.5 months, 1 motorcycle – where should I start? I have always wanted to do this journey, and with the Gänseliesl kissed and a new career step ahead, this seemed to be the perfect time to do it.

From Germany to Nepal, by motorcycle, experiencing new cultures, religions and landscapes through what I now know to be my ultimate form of



Getting close to Kathmandu, Nepal

travelling. Independent of public transport, neither bound by time nor by roads (or the absence thereof), with the freedom to explore the world from Europe to Asia, travelling the ancient silk route and the legendary Karakorum Highway.

After more than a year of planning, visa and other paperwork, and wrenching away on a motorcycle engine for the first time in my life, I could hardly believe that it was now happening for real when I left Göttingen in August 2009 to merge southbound onto the A7. Having assembled and packed my

Beached ship on the shore of the Aral Sea, Uzbekistan



Sunday market, Kashgar, China

(untested) equipment for the first time at about 2 a.m. the night before departure, the feeling of adventure was certainly imminent. In retrospect it seems like a bit of a miracle that it all worked out without some kind of epic failure.

Two months on, the scenic beauty of the Balkan, the comforts of Europe and the beaches of Turkey behind me, I had settled into the routine of life on the road. Yet routine seems a very inappropriate word, with new landscapes, historic sites and amazing people to discover every day. Meeting, interacting and taking part in the lives of people

I met on the way has been one of the most fascinating experiences. Once you get used to the idea that everyone seems to deem their neighbors mischievous crooks, it is a pleasant surprise over and over again to discover that the further you go, the friendliness, hospitality, and generosity of people appears to be ever increasing. This was an especially pleasant surprise in Iran



Friendly hosts, Uzbekistan

and Pakistan, which normally do not come across too well on the news.





Sikh warrior at Golden Temple, Amritsar, India

Of course it is not all fun and games day in, day out. Long days in the saddle on some of the worst roads on this planet, corrupt officials after your backup dollars, insane traffic and the need to find the motivation to do the necessary maintenance after a tiring day all take their toll. Navigation, dealing with the unexpected and doing the maintenance on gear and machine needed to



High above the Indus river, Pakistan

prevent it all from falling apart around you certainly make it feel more like a full-time job than a holiday most of the time.

Finding the simplest of common household items you need for a repair can sometimes turn into an impossible nightmare, but if you keep your eyes and mind open, you will probably end up finding a lot more, such as fantastic



Yurts on the Ala-Bel pass, Kyrgyzstan

new friends, a place to stay and becoming the guest of honor at a local wedding.

It is difficult for me to pick a defining moment to pack these months into such few words, but highlights have included crossing the Himalayas by motorbike via the world's highest border crossing at 4800 m above sea le-

vel from China to Pakistan, only to fall into a frozen river crossing minutes la-



Taj Mahal, India

ter; riding the spectacular Karakorum highway through Pakistani valleys in autumn blossoms, surrounded by dozens of peaks near 8000 m tall; finding beached ships in the desert in Uzbekistan; giving a wedding speech to about 140 Kyrgyz people none of whom understood a word of what I was saying; and most notable of all, the incredible hospitality of people all around the world.

I will certainly remember many of these moments for the rest of my life. If you also have a dream, an idea, or a journey in mind, be it small, but special or epic and crazy, I can only give you one piece of advice: do it!



Benedikt Frank did his PhD with Christian Griesinger in the Department of NMR-based Structural Biology at the Max Planck Institute for Biophysical Chemistry. He graduated from the Molecular Biology program in July 2009.

Joining the program in 2009

Jörg Großhans moved with his research group to Göttingen to take up a professorship at the Faculty of Medicine. The group is located in the Department of Developmental Biochemistry (T. Pieler) in the Ernst-Caspari-Haus (GZMB building). Jörg Großhans did his doctoral research with Christine Nüsslein-Volhard at the Max Planck Institute for Developmental Biology in Tübingen, spent five years at Princeton University as a postdoctoral research fellow with Eric Wieschaus, before he headed an independent research group at the Center for Molecular Biology Heidelberg (ZMBH). His current research focuses on the molecular mechanisms how biological structures are formed in the *Drosophila* embryo employing genetical, biochemical and embryological experiments as well as live-imaging.



Further information:
www.uni-goettingen.de/en/105241.html

Claudia Höbartner joined the Max Planck Institute for Biophysical Chemistry as an independent research group leader of the Nucleic Acid Chemistry group. She received her doctoral degree from the University of Innsbruck, Austria and continued



her scientific career with postdoctoral fellowships at the University of Illinois at Urbana-Champaign, USA and the University of Innsbruck. Her new research group in Göttingen, founded in 2008, focuses on the chemistry and biochemistry of natural and artificial nucleic acids, with special emphasis on functional and structural properties of catalytic DNA and modified RNA.

Further information:
www.uni-goettingen.de/en/101286.html

Steven Johnsen is assistant professor of Molecular Oncology in the Faculty of Medicine at the University of Göttingen. The group is located in the Department of Molecular Oncology (headed by M. Dobbstein) in the Ernst-Caspari-Haus (GZMB building). After completing his Ph.D. at the Mayo Clinic College of Medicine in Rochester, Minnesota (USA) and a post-doctoral fellowship at the Center of Molecular Neurobiology (ZMNH) in Hamburg, Germany, Steven Johnsen worked as a post-doctoral fellow at the European Molecular Biology Laboratory (EMBL), Heidelberg, Germany before moving to Göttingen in 2007. His group focuses on the role and regulation of chromatin modifications in controlling transcription and transcription-coupled nuclear processes during tumorigenesis. The primary interest of their work is currently on the monoubiquitination of histone H2B (H2Bub1) which appears to serve a tumor suppressor role in bre-



ast cancer and is associated with active gene transcription.

Further information:
www.uni-goettingen.de/en/57988.html

Volker Lipka is head of the Department of Plant Cell Biology at the University of Göttingen. He received his doctoral degree from the Technical University Aachen, followed by post-doctoral fellowships at the Sainsbury Laboratory, John Innes Centre in Norwich, UK and at the Max-Planck Institute for Plant Breeding Research in Cologne, Germany. As a leader of independent research groups he spent several years at the Department for Plant Biochemistry, Centre for Plant Molecular Biology at the University of Tübingen and at the Sainsbury Laboratory, John Innes Centre, Norwich, UK, before he joined the University of Göttingen in 2009. His laboratory is interested in the molecular analysis of plant innate immunity, focusing on 1) the molecular dissection of mechanisms that control activation of basal defence in *Arabidopsis thaliana*, 2) the analysis of defence mechanisms that contribute to resistance against fungal pathogens, and 3) the identification of fungal effector molecules that interfere with the plant defence machinery and allow host plant colonization.

Further information:
www.uni-goettingen.de/en/105875.html



Left Göttingen in 2009

Joining in 2009 (continued from previous page)

Halyna Shcherbata joined the Max Planck Institute for Biophysical Chemistry as Max Planck Research Group Leader of the Gene Expression and Signaling group. She received her doctoral degree from the Kyiv Institute for Plant Physiology and Genetics, Ukraine and continued as scientific researcher and assistant professor at the Genetics and Biotechnology department at the National University in Lviv, Ukraine. After four years of research as post-doctoral fellow at the University of Washington, Seattle, USA in the Biochemistry Department, Institute for Stem Cell and Regenerative Medicine, Halyna Scherbata founded her research group in Göttingen. Using *Drosophila melanogaster* as a model system, her group is currently working on studying the role of the miRNA pathway in stem cells. By performing genetic screens, they are trying to find different components and pathways, which are required for stem cell division and maintenance. In addition, another project focuses on understanding the origin of muscular dystrophy.

Further information:
www.uni-goettingen.de/en/105883.html



Frauke Melchior, former head of the Biochemistry I department at the University of Göttingen, Faculty of Medicine, took up a W3 professorship at the Center for Molecular Biology of the University of Heidelberg (ZMBH), where she is also a member of the DKFZ-ZMBH alliance. In her new lab she continues her research on posttranslational modification with Ubiquitin related modifiers of the SUMO family. She is still active in five thesis committees of the Molecular Biology program. Two of the Molbio students, Achim Werner and Volkan Sakin, moved with her to Heidelberg to conclude their PhD thesis there.

Further Information: www.zmbh.uni-heidelberg.de/melchior/default.shtml



Markus Wahl, former leader of the X-Ray Crystallography group at the Max Planck Institute for Biophysical Chemistry, took up a W3 professorship at the Institute of Chemistry and Biochemistry, Freie Universität Berlin. His Structural Biochemistry group investigates the molecular mechanisms, by which RNAs and proteins cooperate to bring about the biological functions of ribonucleoprotein complexes (RNPs). He is still active in 13 thesis commit-



tees of the Göttingen Graduate School for Neurosciences and Molecular Biosciences (GGNB), including five PhD students of the Molecular Biology program.

Further information: www.chemie.fu-berlin.de/cgi-bin/personen_en?Markus+Wahl

Current Faculty Members

Mathias Bähr, Botho Bowien, Gerhard H. Braus, Bertram Brenig, Nils Brose, Matthias Döbelstein, Detlef Doenecke, Stefan Eimer, Wolfgang Engel, Dirk Fasshauer, Ivo Feußner, Ralf Ficner, Wolfgang Fischle, Christiane Gatz, Dirk Görlich, Christian Griesinger, Uwe Groß, Jörg Großhans, Heidi Hahn, Claudia Höbartner, Herbert Jäckle, Reinhard Jahn, Steven Johnsen, Michael Kessel, Dieter Klopfenstein, Wilfried Kramer, Volker Lipka, Reinhard Lührmann, Ahmed Mansouri, Burkhard Morgenstern, Klaus-Armin Nave, Erwin Neher, Tomas Pieler, Stefanie Pöggeler, Peter Rehling, Silvio Rizzoli, Marina Rodnina, Reinhard Schuh, Halyna Shcherbata, George Michael Sheldrick, Mikael Simons, Holger Stark, Jörg Stülke, Michael Thumm, Kai Tittmann, Henning Urlaub, Lutz Walter, Jürgen Wienands, Ernst Wimmer, Andreas Wodarz.

For details regarding the research of all faculty members, see www.gpmolbio.uni-goettingen.de/content/c_faculty.php

Horizons 2009

Another year passed - another Horizons meeting took place and showed once again that a symposium organized by PhD students for PhD students is a convincing concept.

In 2009, "Horizons in Molecular Biology" which is organized by PhD students of the International Max Planck Research School for Molecular Biolo-

gy, Ben-Ari, Sandra Schmid and Elspeth Garman.

The symposium was interdisciplinary due to the different sessions Horizons traditionally features. They covered the latest research in the fields of cell biology, developmental biology, structural biology, neuroscience and, as a special session, biomedicine. This multidisci-

plinary nature of the event provided professional contacts and gain first-hand career information and advice.

Preparations for this year's Horizons are underway. If you don't want to miss the chance to learn about latest research in molecular biology directly from renowned researchers and if you want to avail yourself of the unique opportunity to present your own research, remember that Horizons 2010 will be held on 27-30 September 2010.

Birgit Manno

Further information:

www.horizons.uni-goettingen.de



The organizers of the Horizons 2009 meeting

gy took place for the sixth time. This means six years of growing experience when it comes to organizing such a meeting and also six years of increasing reputation and significance.

"International, interdisciplinary, and intensive" - Prof. Dr. Annette Schavan, Federal Minister of Education and Research, ascribed the motto of the study program also to the symposium and honored the event by accepting the patronage. And indeed, it was international with speakers coming from all over Europe, from Canada and the United States. We were honored to welcome for instance Matthias Mann, Yehezkel

plarity as well as the lively interaction of young scientists discussing their research and forming networks are the strengths of Horizons.

For the third time Horizons was preceded by a Career Fair which also became very popular among students. It featured workshops, company presentations, a podium discussion, CV checks and a live interview with Roche Diagnostics. A special guest was Prof. Klaus Landfried, one of the founding fathers of the Bologna process, who commented on education-related issues. The Career Fair offered an excellent forum for students to make pro-

Invited Speakers

Cell Biology

Jean Gruenberg, Ramanujan Hegde, Matthias Mann, Sandra Schmid, Suzanne Pfeffer

Neuroscience

Yehezkel Ben-Ari, Pietro De Camilli, Ana Maria Cuervo, Britta Qualmann

Structural Biology

Elspeth Garman, Luis Serrano, Irmgard Sinning, Alfred Wittinghofer

Developmental Biology

Denis Duboule, Oliver Hobert, Janet Rossant

Biomedicine

Christian Buchholz, Brian Coombes, Marc Mareel, Tobias Spielmann

Student-hosted meeting at WIS

Students of the Life Science faculties at the Weizmann Institute of Science (WIS) in Rehovot, Israel invited for a new, student-hosted scientific meeting. The „Development Now!“ meeting took place on 17-19 March 2009 on the campus of the Weizmann Institute. Invited speakers included Sarah Bray, James Briscoe, Rene Ketting, Juergen Knoblich, Ben Scheres, and Shahragim Tajbakhsh.

Following a several-year old tradition of mutual visits, five students of the Göttingen Molecular Biology and Neuroscience programs – International Max Planck Research Schools were invited for the meeting. They enjoyed not only the presentations by renowned scientists and the opportunity to talk with the professors in informal discussion rounds, but also the great hospitality,



Ieva Gailite, Bijan Boldajipour, Martina Wirth and Hanna Peradziriyi at WIS

and the unofficial part of the meeting, including a pub crawl and an excursion to Jerusalem. Ieva Gailite, one of the students of the Göttingen Molecular Biology program remembers: “I was very impressed by the great care the organizers took to ensure we are comfortable during the meeting, starting from booking the hotel rooms for us, helping us with transport to the airport, and helping us to organize our after-conference stay in Tel-Aviv.”

Bijan Boldajipour, another Molecular Biology member of the group, was invited for a student-talk on the control of chemokine-guided cell migration



Göttingen students and their hosts in Jerusalem

in zebrafish. The next “Prof. Alvin M. Kaye Student-Hosted Meeting”, as these events are officially called, is planned for 3-5 May 2010 and will focus on intracellular trafficking processes.

StB

Further information:

www.weizmann.ac.il/conferences/student09/

www.weizmann.ac.il/conferences/Trafficking/

GGNB Science Day 2009

More than 200 PhD students of the Göttingen Graduate School for Neurosciences and Molecular Biosciences, including 32 Molecular Biology students, presented posters about their research at the first GGNB Science Day on 23 November 2009. The recently renovated, spacious new lecture halls at the MPI for Biophysical Chemistry were urgently needed to host all members of the graduate school. The Scientific Advisory Board of GGNB visited Göttingen on the occasion of the Science Day and the first evaluation of the graduate school. The SAB members who were able to attend the Science Day, included Bart de Strooper, Regine Kahmann, Joshua Kaplan, Ruth Lehmann, Teresa Nicolson, Tom A. Rapoport, Sara A. Solla, Hermann Wagner, and Elmer Wahle. After the meeting, the SAB members stated that they were “impressed with both faculty and students” and recognized that “much has been achieved (...) in a short span of time”.

StB

10th anniversary, alumni reunion and Caspari lecture

Ten years ago, in October 2000, the first class of 20 students accomplished the pioneering task of joining the Molecular Biology program. The first alumni reunion will be held on the occasion of the 10th anniversary celebration on 1-2 October 2010, together with the “twin program” in the Neurosciences. More than 200 current and former members of the two international programs will celebrate together. Alumni have the opportunity to present their current research at the Horizons meeting preceding the anniversary celebration on 27-30 September. A particular scientific highlight: Nobel prize laureates of both the 2009 prize for Chemistry (Venkatraman Ramakrishnan), and the 2009 prize for Physiology or Medicine (Carol Greider) will come to Göttingen that week. V. Ramakrishnan accepted the invitation for an invited talk at the Horizons 2010 meeting. Carol Greider, who spent part of her early studies in Göttingen, will give the Ernst-Caspari Lecture of the GZMB on the day of the 10th anniversary celebrations.

StB

Lindau Nobel Laureate Meetings

A personal retrospect on the 59th Meeting of Nobel Laureates

Last spring, I was selected to participate in the 59th Meeting of Nobel Laureates at Lake Constance that took place from June 28th to July 3rd 2009. Thus, I set out for the nice island of Lindau which constitutes the venue for an extraordinary meeting taking place annually. Each year, Nobel Prize winners are invited there to meet and discuss with young scientists from all over the world about current topics of medicine and physiology, physics, economics or chemistry. In 2009, the latter was the topic of choice and 23 Nobel Prize winners, among them Roger Tsien, Martin Chalfie and Osamu Shimomura who received the Nobel Prize in Chemistry 2008



Sir Harold Kroto

For their discovery of green fluorescent protein, were attendant to give lectures and discuss questions with nearly 600 students and young researchers. For

me, this meeting was a remarkable experience because I got the chance to listen to many famous researchers and their stories of success. But not all lec-



Martin Chalfie

tures were about science: Sir Harold Kroto, who got the Nobel Prize in Chemistry 1996 for his work on fullerene carbon compounds, for example gave a really impressive talk about what his ideas and visions for our future would be. Furthermore, several panel discussions about current urgent topics like global warming and renewable energy completed the program. One very important point about the meeting was of course also the possibility to interact with other students and young researchers and get to know them during the well-organized get-togethers. In summary, the meeting was a great experience for me and I would recommend

it to everyone who should get the opportunity to be part of it in the future. If you are interested in further information, please check this website: www.lindau-nobel.de/WebHome.AxCMS.

Katharina Hoppe

Honors and Awards

Annette Denker, PhD student with Silvio Rizzoli in the ENI group „STED Microscopy of Synaptic Function“ was awarded a Boehringer Ingelheim PhD stipend.

Lope A. Floréz Weidinger, PhD student with Jörg Stülke in the Dept. of General Microbiology was awarded a PhD stipend by Stiftung der Deutschen Wirtschaft. In addition, he won the poster prize at the International Conference on Gram-positive organisms in San Diego, California, USA.

Oleksandra Karpiuk, PhD student with Steven Johnsen in the Dept. of Molecular Oncology, was awarded a Dorothea-Schlözer Stipend by the University of Göttingen.

Frederik Köpper, PhD student with Matthias Dobbstein in the Dept. of Molecular Oncology, was awarded a PhD stipend by Studienstiftung des Deutschen Volkes.

Madhumati Sevana, alumna of the Molecular Biology program and post-doc in the protein structure and design group of Yves Muller at the University of Erlangen-Nürnberg was awarded the Fakultätsfrauenpreis 2009 in natural sciences from the University.

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Publisher: Molecular Biology Coordination Office, Georg-August-Universität Göttingen

General Design: LifeTechMedia (Eva-Maria Twehues, www.lifetechmedia.de)

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