MOLECULAR BIOLOGY
NEWSLETTER
Georg-August-Universität Göttingen · International Max Planck Research School
JAN 2011

Welcome message

The joint celebration of the 10th anniversary of our international Molecular Biology and Neuroscience programs, the alumni reunion on this occasion, and the student-hosted 7th Horizons in Molecular Biology meeting in combination with the 4th Career Fair for scientists were certainly the highlights of the year 2010.

We felt particularly proud and honored by the visits of Venkatraman Ramakrishnan (Nobel Prize in Chemistry 2009 together with Thomas A. Steitz and Ada E. Yonath) and Carol W. Greider (Nobel Prize in Physiology or Medicine 2009 together with Elizabeth H. Blackburn and Jack W. Szostak), both joining us for the anniversary and Horizons week.

This annual newsletter reviews these and other events of the year 2010. It also offers science spotlights on recent publications related to doctoral research in our program, introduces new and leaving students and faculty members, and reports about the personal experience by our alumni after they graduated, inside or outside academia.

The regional focus of this newsletter includes several articles by alumni, who continued their academic career in California. Other contributions include, for example, the cooperation with our colleagues at the Weizmann Institute of Science, Rehovot, Israel, or reports from travels by our alumni to remote and most beautiful places in this world.

After the scientific keynote lecture by Carol Greider on the occasion of 10th anniversary of the Molecular Biology and Neuroscience programs. Ulrich Grossbach, Kurt von Figura, Carol Greider, Ivo Feußner, Reinhard Jahn (from left to right)

CONTENT

We hope that our students, alumni, faculty members, friends and colleagues will enjoy reading this newsletter, which is not only intended to inform everyone about recent events and activities, but also to support the interaction between members of the Göttingen Molecular Biology community within and beyond our program.

Ivo Feußner, Reinhard Jahn, Steffen Burkhardt

How cells move about in the embryo

Rac, RhoA and E-cadherins in migrating germ cells

What could rowing a boat have in common with the process of cell migration? Let me explain. After my thesis defence my puzzled family wanted to finally know what exactly kept me so busy for the past few years? But how do you explain in a few minutes the complexity of cell migration, intracellular signalling, actin dynamics regulation by Rho GTPases, when you are "not allowed" to use any terminology.

I tried a simple analogy: imagine you are in a boat and you want to navigate the river, how would you do it? Easy: you need to generate forces inside the boat and transmit them to the outside environment – a water in this case, like this you pull yourself forward. This is exactly what a cell would do, when it wants to crawl in a body: it will generate forces, and then transmit them to the outside environment. We use our skeleton and muscles to generate forces and movements; the cells, in a similar manner will produce forces but of course, on much smaller scales. To do that, cells will utilize molecular machinery. How exactly? This was the question that we asked.

To study the molecular basis underlying cell migration in a living embryo, we used primordial germ cell migration in zebrafish as a model system. Primordial germ cells (PGCs) are specialized cells and will give rise to gametes - cells that are responsible for

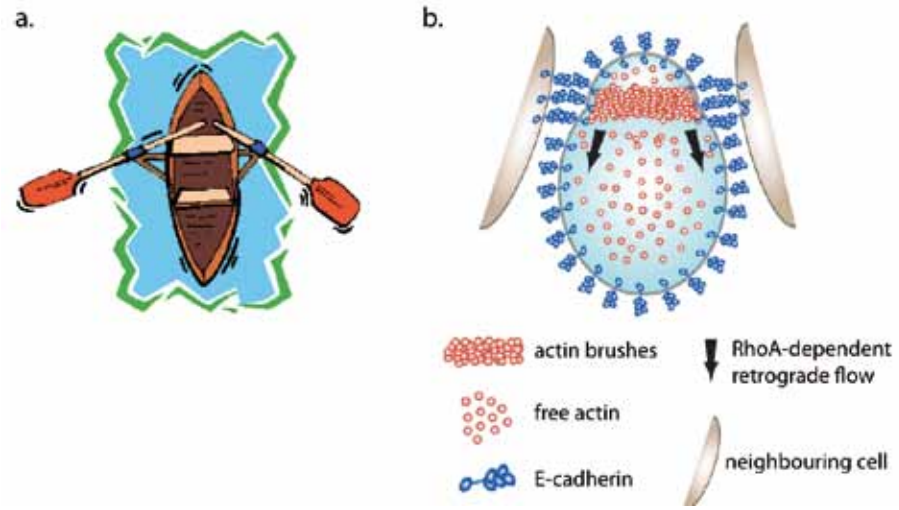


Fig. 1: The analogy between a rowing boat and the migrating cell. a. A scheme of a boat. The paddles are used to transmit the force from inside the boat to the outside environment. **b.** A model for cooperation between blebbing, actin retrograde flow and the E-cadherin-mediated traction force in PGC motility. E-cadherin molecules (blue) provides anchoring points to neighbouring cells. E-cadherin molecules are linked to actin brushes (red) that are enriched at the cell front. RhoA-induced retrograde flow (black arrows) leads to generation of traction forces, that are transmitted via E-cadherin to the environment.

PhD-related Publications 2010 (PhD students of the Molecular Biology program in bold type)

Ader C, Frey S, Maas W, **Schmidt HB**, Görlich D, Baldus M (2010) Amyloid-like interactions within nucleoporin FG hydrogels. Proc Natl Acad Sci USA 107(14):6281-5

Andreou A, Göbel C, Hamberg M, Feussner I (2010) A bisallylic mini-lipoxygenase from cyanobacterium *Cyanothece* sp. that has an iron as cofactor. J Biol Chem 285(19):14178-86

Asli NS, Kessel M (2010) Spatiotemporally restricted regulation of generic motor neuron programs by miR-196-mediated repression of Hoxb8. Dev Biol 344(2):857-68

Barysch SV, Jahn R, Rizzoli SO (2010) A fluorescence-based in vitro assay for investigating early endosome dynamics. Nat Protoc 5(6):1127-37

Bina S, Wright VM, Fisher KH, Milo M, Zeidler MP (2010) Transcriptional targets of *Drosophila* JAK/STAT pathway signalling as effectors of haematopoietic tumour formation. EMBO Rep 11(3):201-7

Burgalossi A, Jung S, Meyer G, Jockusch WJ, Jahn O, Taschenberger H, O'Connor VM, Nishiki T, Takahashi M, Brose N, Rhee JS (2010) SNARE protein recycling by αSNAP and βSNAP supports synaptic vesicle priming. Neuron 68(3):473-87

the reproduction in the adult. PGCs in zebrafish are specified early in development in multiple locations and are guided towards their target by a chemokine SDF-1a, which activates its receptor CXCR4b that is expressed in germ cells. The actual motility of germ cells and the associated cell shape changes are characterized by the formation of blebs – spherical protrusions, which are generated preferentially at the leading edge of the cell in response to local rise in calcium levels. A position, where calcium level is elevated can be controlled by CXCR4b, thereby allowing SDF-1a to bias the direction of a migration.

Our aim was to understand the mechanics of blebs-assisted cell migration. Actin cytoskeleton remodelling is known to play a role in force generation required to change shapes in migrating cells. We first studied the role of Rac and RhoA small Rho GTPases in controlling actin dynamics in migrating PGCs. Using mutants for Rac1 and RhoA we found that the function of these proteins is critical for controlling proper germ cell shape and migration. Using FRET biosensors we determined the site within the cell, where these Rho GTPases become activated.

We could demonstrate that Rac activity at the front of the cell induces the formation of actin-rich structures, which we termed "brushes"; while RhoA action promotes actin retrograde flow at the cell front. To understand, how the intracellular forces translate into cellular movement, we explored the role of cell-cell adhesion by interfering with the function of E-cadherin in PGCs and could show that this molecule is essential for germ cell migration *in vivo*.

Together, our findings suggest that actin retrograde flow at the front of germ cells is essential for generation of E-cadherin-mediated traction forces that are crucial for cell motility *in vivo*.

Elena Kardash worked on her doctoral thesis in the research group „Germ Cell Development and Migration" of Erez Raz, who moved from the Max Planck Institute for Biophysical Chemistry to the University of Münster, Institute of Cell Biology.

These results were published in Nature Cell Biology 12(1): 47-53; sup pp 1-11; 2010.

Denker A, Rizzoli SO (2010) Synaptic vesicle pools: an update. Front Syn Neurosci 2:135

Dressel R, Elsner L, Novota P, **Kanwar N**, Fischer von Mollard G (2010) The exocytosis of lytic granules is impaired in Vti1b- or Vamp8-deficient CTL leading to a reduced cytotoxic activity following antigen-specific activation. J Immunol 185(2):1005-14

Flórez LA, Lammers CR, Michna R, Stülke J (2010) CellPublisher: a web platform for the intuitive visualization and sharing of metabolic, signalling and regulatory pathways. Bioinformatics 26(23):2997-9

Ghalei H, Hsiao HH, Urlaub H, Wahl MC, Watkins NJ (2010) A novel Nop5-sRNA interaction that is required for efficient archaeal box C/D sRNP formation. RNA 16(12):2341-8

Grote M, Wolf E, Will CL, Lemm I, Agafonov DE, **Schomburg A**, Fischle W, Urlaub H, Lührmann R (2010) Molecular architecture of the human Prp19/CDC5L complex. Mol Cell Biol 30(9):2105-19

Helmstaedt K, Schwier EU, Christmann M, **Nahlik K**, Westermann M, Harting R, Grond S, Busch S, Braus GH (2010) Recruitment of the inhibitor Cand1 to the cullin substrate adaptor site mediates interaction to the neddylation site. Mol Biol Cell [Epub ahead of print]

Hoopmann P, Punge A, **Barysch SV**, Westphal V, Bückers J, Opazo F, Bethani I, Lauterbach MA, Hell SW, Rizzoli SO (2010) Endosomal sorting of readily releasable synaptic vesicles. Proc Natl Acad Sci USA 107(44):19055-60

Lightening up hippocampal synapses

Using UV-light to study neurotransmitter release at small glutamatergic synapses

The speed of synaptic transmission is one of the most fascinating features of the nervous system. Upon action potential arrival to the presynaptic terminal, synaptic vesicles can fuse and release neurotransmitter in less than 1 ms. Speed is indeed a crucial parameter in many aspects of nervous system physiology and many vital processes rely on such rapid transmission of information.

But how is this remarkable speed of synaptic vesicle exocytosis achieved? In other words, how can synapses release vesicles so fast upon stimulation, considering that many - if not all - of the maturation steps that make a synaptic vesicle available for fusion (e.g. vesicle biogenesis, translocation, and physical attachment to the release site) are intrinsically much slower?

The secret for speed lies in a biochemical modification known as "priming". Neurons are in fact able to generate and maintain a subset of vesicles (the so-called "primed" vesicles) in a fully-matured and fusion-competent state. Upon stimulus, these ready-to-go vesicles are the ones which fuse with a sub-millisecond time delay.

Thus, it goes without saying that priming is the major determinant for the

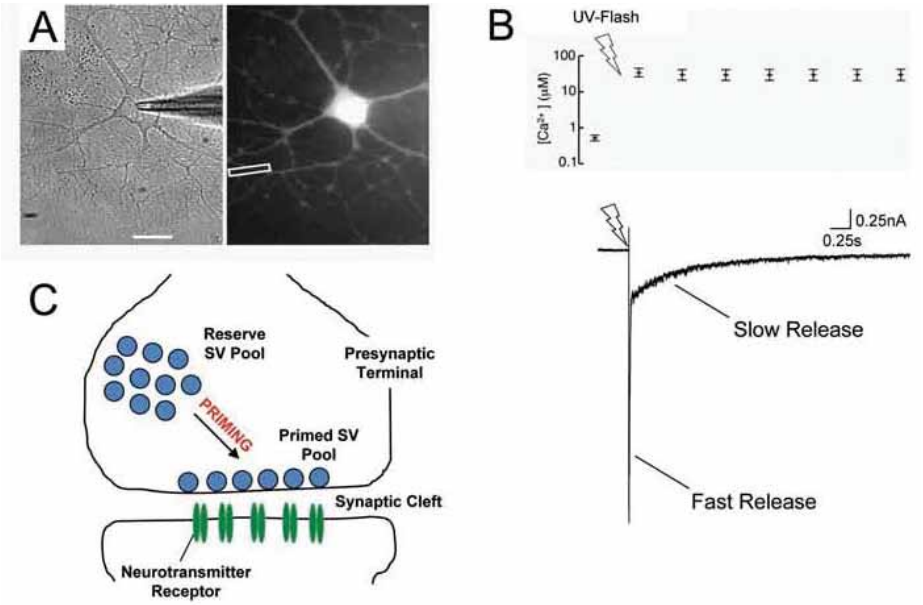


Fig. 1: (A) Transmission and fluorescence images of a single neuron, loaded with caged-Ca^{2+} and fluorescence Ca^{2+} indicators. (B) Ca^{2+} uncaging is used to produce a step-like, prolonged increase in intracellular Ca^{2+} concentration (top), which evokes release with a "fast" and a "slow" release component (bottom). (C) Upon a Ca^{2+} signal, primed synaptic vesicles undergo exocytosis and release neurotransmitter into the synaptic cleft. Primed synaptic vesicles are replenished from an unprimed reserve pool of synaptic vesicles. Modified from Burgalossi et al., Neuron 2010.

Kardash E, Reichman-Fried M, Maître JL, **Boldajipour B**, Papusheva 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

Kawabe H, Neeb A, **Dimova K**, Young SM Jr, Takeda M, Katsurabayashi S, Mitkovski M, Malakhova OA, Zhang DE, Umikawa M, Kariya K, Goebbels S, Nave KA, Rosenmund C, Jahn O, Rhee J, Brose N (2010) Regulation of Rap2A by the ubiquitin ligase Nedd4-1 controls neurite development. Neuron 65(3):358-72

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 11(3):214-9

Khoshnevis S, Neumann P, Ficner R (2010) Crystal structure of the RNA recognition motif of yeast translation initiation factor eIF3b reveals differences to human eIF3b. PLoS One 5(9) pii: e12784

Koebernick K, Loeber J, **Arthur PK**, **Tarbashevich K**, Pieler T (2010) Elr-type proteins protect *Xenopus* Dead end mRNA from miR-18-mediated clearance in the soma. Proc Natl Acad Sci USA 107(37):16148-53

Lammers CR, **Flórez LA**, Schmeisky AG, Roppel SF, Mäder U, Hamoen L, Stülke J (2010) Connecting parts with processes: SubtiWiki and SubtiPathways integrate gene and pathway annotation for *Bacillus subtilis*. Microbiology 156(Pt3):849-59

speed and efficacy of synaptic transmission. Despite its importance, due to technical limitations, it has been very difficult so far to study synaptic vesicle priming at small CNS synaptic terminals, which are the most abundant in the mammalian brain.

To overcome these limitations, we developed a new "Ca^{2+} uncaging" protocol and used brief UV-light pulses (instead of more conventional electrical stimulations) to induce synaptic vesicle exocytosis. By applying this technique to single hippocampal neurons grown in isolation on astrocyte feeder islands (Fig.1A), we were able to generate a step-like, prolonged increase in presynaptic Ca^{2+} concentration (Fig.1B) and to induce the release of the entire pool of primed vesicles from all synapses of a given neuron. Interestingly this technique enabled us not only to estimate the size and release kinetics of the fusion–competent primed vesicle pool (see "fast" release component, Fig.1B), but also to monitor the time-course of synaptic vesicle priming from a reserve pool (see "slow" component, Fig.1B; Fig.1C).

With this new method, in combination with genetic manipulations of protein expression, we were able to make a number of key discoveries regarding the molecular determinants of synaptic vesicle priming and release. First, we extended the initial observations on CAPS protein function in priming, and showed that synapses which lack CAPS proteins are devoid of primed synaptic vesicles under resting conditions. Second, we provided direct evidence for Synaptotagmin-1 to act as the Ca^{2+} sensor for fusion at small CNS synapses. Third, we showed that SNARE complex disassembly is required to maintain a stable pool of primed synaptic vesicles, particularly during phases of persistent neural activity.

In conclusion, our new biophysical method allowed us to study individual steps of the synaptic vesicle cycle in hippocampal synapses at an unprecedented level of detail, and the combination "Ca^{2+} uncaging" with genetic manipulations will definitely continue to be a powerful approach to gain new insights into the molecular mechanisms underlying synaptic vesicle priming and release.

Andrea Burgalossi worked on his doctoral thesis in the group of Jeong-Seop Rhee at the MPI for Experimental Medicine, Dept. of Molecular Neurobiology before he moved to the Bernstein Center for Computational Neuroscience Berlin for his postdoc.

These results were published in Neuron 68(3): 473-487; 2010.

Lizé M, **Pilarski S**, Dobbelstein M (2010) E2F1-inducible microRNA 449a/b suppresses cell proliferation and promotes apoptosis. Cell Death Differ 17(3):452-8

Maritzen T, **Schmidt MR**, Kukhtina V, Higman VA, Strauss H, Volkmer R, Oschkinat H, Dotti CG, Haucke V (2010) A novel subtype of AP-1 binding motif within the palmitoylated trans-Golgi network/endosomal accessory protein Gadkin/gamma-BAR. J Biol Chem 285(6): 4074-86

Morawska-Onyszczuk M, Bienkowska-Szewczyk K, Dobbelstein M (2010) Self-association of adenovirus type 5 E1B-55 kDa as well as p53 is essential for their mutual interaction. Oncogene 29(12):1773-86

Nahlik K, Dumkow M, Bayram O, Helmstaedt K, Busch S, Valerius O, Gerke J, Hoppert M, Schwier E, Opitz L, Westermann M, Grond S, Feussner K, Goebel C, Kaever A, Meinicke P, Feussner I, Braus GH (2010) The COP9 signalosome mediates transcriptional and metabolic response to hormones, oxidative stress protection and cell wall rearrangement during fungal development. Mol Microbiol 78(4):964-79

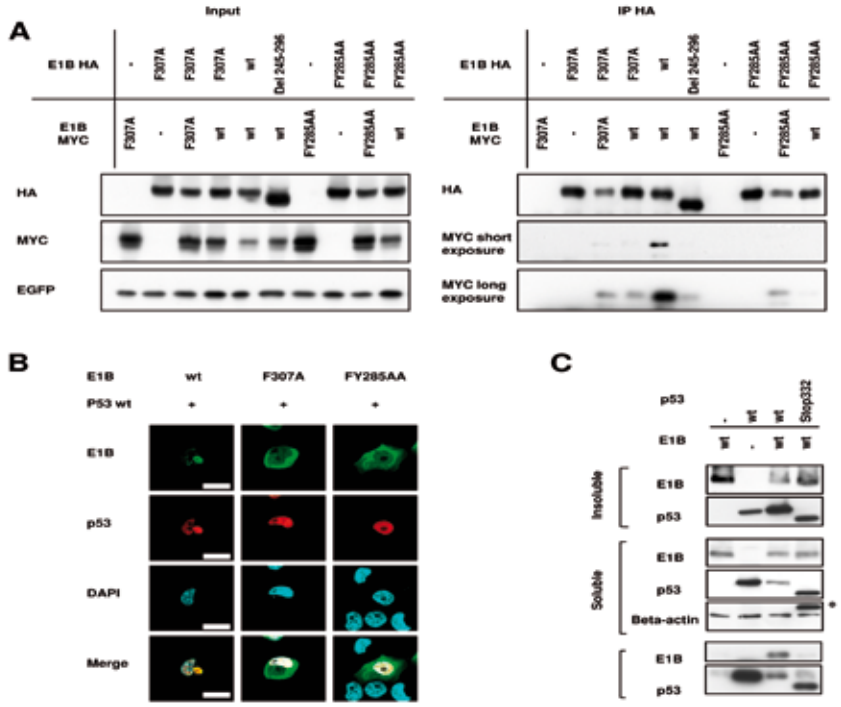
Opazo F, Punge A, Bückers J, **Hoopmann P**, Kastrup L, Hell SW, Rizzoli SO (2010) Limited intermixing of synaptic vesicle components upon vesicle recycling. Traffic 11(6):800-12

Ribic A, Zhang M, Schlumbohm C, Mätz-Rensing K, Uchanska-Ziegler B, Flügge G, Zhang W, Walter L, Fuchs E (2010) Neuronal MHC

What can we learn from a viral oncoprotein?

Stabilization of the p53-E1B 55 interaction through avidity effects

p53 is at the center of the sensory system for DNA damage and is the product of the most frequently mutated gene in human cancer. It can cause cell cycle arrest or lead to apoptosis. Interestingly, it is only active in a tetrameric state, with regard to transcriptional activity and also tumor suppression. Although p53 monomers can bind to DNA and stimulate transcription under specific circumstances, the stability of this interaction is much weaker.



Adenoviral E1B-55 was one of the first DNA tumor virus proteins to be characterized, and the discovery of its interaction with p53 initiated our current understanding of tumor suppressor functions. Although purified E1B-55 has been shown to form dimers, the functional consequences of this interaction have been poorly understood.

In our study, we obtained evidence that E1B-55 oligomerization occurs *in*

Fig. 1: A) Direct interaction of E1B F307A and E1B FY285AA with wild type E1B-55 or with itself assessed by immunoprecipitation. B) The impact of oligomerization mutants of E1B-55 on p53 localization. C) Detection of p53/E1B-55 kDa interaction by co-immunoprecipitation. P53 Stop332 - monomeric p53 mutant. P53 and b-actin staining were performed consecutively on the same blot. Therefore p53 Stop332 can be observed in the b-actin panel indicated by an asterisk. Note the different solubility of wild type E1B-55 kDa and wild type p53 when they were coexpressed.

Class I molecules are involved in excitatory synaptic transmission at the hippocampal mossy fiber synapses of marmoset monkeys. Cell Mol Neurobiol 30(6):827-39

Rodríguez-Castañeda F, Coudevylle N, Becker S, Brose N, Carlomagno T, Griesinger C (2010) 1H, 13C and 15N resonance assignments of the Calmodulin-Munc13-1 peptide complex. Biomol NMR Assign 4(1):45-8

Rodríguez-Castañeda F, Maestre-Martínez M, Coudevylle N, Dimova K, Junge H, Lipstein N, Lee D, Becker S, Brose N, Jahn O, Carlomagno T, Griesinger C (2010) Modular architecture of Munc13/calmodulin complexes: dual regulation by Ca^{2+} and possible function in short-term synaptic plasticity. EMBO J 29(3): 680-91

Schneider M, Hsiao HH, Will CL, Giet R, Urlaub H, Lührmann R (2010) Human PRP4 kinase is required for stable tri-snRNP association during spliceosomal B complex formation. Nat Struct Mol Biol 17(2):216-21

Schneider M, Will CL, Anokhina M, Tazi J, Urlaub H, Lührmann R (2010) Exon definition complexes contain the tri-snRNP and can be directly converted into B-like precatalytic splicing complexes. Mol Cell 38(2):223-35

Stegmann CM, Lührmann R, Wahl MC (2010) The crystal structure of PPIL1 bound to cyclosporine A suggests a binding mode for a linear epitope of the SKIP protein. PLoS One 5(4):e10013

vivo. We also mapped a domain essential for oligomerization to the central region of the protein. In an attempt to identify specific amino acid residues responsible for E1B-55 oligomerization, we created a series of single substitution mutants. The E1B-55 mutants F307A and FY285AA largely fail to self-associate (Fig. 1A). We also determined the ability of E1B-55 substitution mutants to associate with and inhibit p53 (Fig. 1B). The mutants did not detectably relocalize p53 nor inhibit its transcriptional activity in reporter assays. These results were compatible with the assumption that the self-association of E1B-55 might represent a prerequisite for p53 binding. p53 forms a tetramer which raised the question whether the oligomerization of p53 also contributes to its interaction with E1B-55. P53/E1B immunprecipitation demonstrated that monomeric p53 retained only a weak ability to associate with E1B-55 (Fig. 1C).

Our results indicate that the interference of E1B-55 with p53 function is not merely determined by a simple bimolecular interaction. Instead, both partners need to self-associate in order to interact efficiently with each other. Multiple interactions within a higher-order complex of molecules can strongly enhance the stability of the complex as a whole in a synergistic fashion, as seen for immunoglobulin M antibodies. They contain ten undistinguishable antigen binding sites (paratopes), and the interaction with their antigens is far stronger than the interaction observed between single Fab fragments and antigens, as long as the antigen is presented in aggregates with multiple epitopes of the same kind. This phenomenon described as "avidity", is different from the affinity of a single bond. Our results strongly suggest that the interaction between E1B-55 and p53 requires a similar avidity effect; the self association of both partners is required for efficient interaction with each other.

The capability of many additional p53 interaction partners to self-associate has not been assessed yet. This includes histone acetyltransferases (HATs), kinases, and numerous other direct or indirect modifiers of its activity. A majority of these modifiers are found in large protein complexes. This raises the intriguing possibility that the stabilization of associations between p53 and its partners through avidity effects is a general phenomenon that reaches far beyond the interaction with adenovirus E1B-55.

Magdalena Morawska-Onyszczuk
worked on her doctoral thesis under the supervision of Matthias Dobbelstein, Dept. of Molecular Oncology, University of Göttingen in collaboration with Krystyna Bienowska-Szewczyk, University of Gdansk.

These results were published in Oncogene 29(12): 1773-86; 2010.

Tarbashevich K, **Dzementsei A**, Pieler T (2010) A novel function for KIF13B in germ cell migration. Dev Biol [Epub ahead of print]

Tarbashevich K, Raz E (2010) The nuts and bolts of germ-cell migration. Curr Opin Cell Biol 22(6):715-21

Volkov A, **Liavonchanka A**, Kamneva O, Fiedler T, Goebel C, Kreikemeyer B, Feussner I (2010) Myosin cross-reactive antigen of *Streptococcus pyogenes* M49 encodes a fatty acid double bond hydratase that plays a role in oleic acid detoxification and bacterial virulence. J Biol Chem 285(14):10353-61

Wachowius F, **Javadi-Zarnaghi F**, Höbartner C (2010) Combinatorial mutation interference analysis reveals functional nucleotides required for DNA catalysis. Angew Chem Int Ed Engl 49(45):8504-8

Wagner G*, Peradziryi H*, Wehner P, Borchers A (2010) PlexinA1 interacts with PTK7 and is required for neural crest migration. Biochem Biophys Res Commun 402(2):402-7. * These authors contributed equally

Wagner M, **Hoppe K**, Czabany T, Heilmann M, Daum G, Feussner I, Fulda M (2010) Identification and characterization of an acyl-CoA:diacylglycerol acyltransferase 2 (DGAT2) gene from the microalga *O. tauri*. Plant Physiol Biochem. 48(6):407-16

Master's class 2010/11

Metin Aksu, Turkey
BSc from Middle East Technical University, Ankara

Irena Andreeva, Bulgaria
BSc from University of Sofia "St. Kliment Ohridski", Sofia

Victor M. Bustos Parra, Colombia
BSc from Universidad Nacional de Colombia, Bogotá

Marta Gião Carneiro, Portugal
MSc from Universidade Nova de Lisboa, Lisbon

Ibrahim Ömer Çiçek, Turkey
BSc from Bogaziçi University, Istanbul

Bernard Freytag, Germany
BSc from Georg-August-Universität Göttingen

Christoffer Hitzing, Germany
BSc from Georg-August-Universität Göttingen

Paola Kuri, Mexico
MSc from Universidad Nacional Autónoma de México, Mexico City

Maria Levchenko, Ukraine
BSc from Taras Shevchenko National University of Kyiv

Maj Ewa, Poland
MSc from University of Gdanks and Medical University of Gdansk

Sona Pirkuliyeva, Turkmenistan
BSc from Middle East Technical University of Ankara, Turkey

Tino Pleiner, Germany
BSc from University of Leipzig

Michael Ratz, Germany
BSc from University of Leipzig

Ines Rudolf, Germany
BSc from Heinrich-Heine-Universität Düsseldorf

Kundan Sharma, India
MSc from University of Delhi

Avani Shukla, India
BSc from Sri Venkateswara College, University of Delhi

Ingrid-Cristiana Vreja, Romania
BSc from University of Bucharest

Applications 2010

In the year 2010, the Molecular Biology program received 472 applications from 58 countries.

Germany 32
other Western Europe 25
Eastern Europe 56
North America 12
Central/South America 27
North Africa 21
Central/South Africa 27
Asia / Near East 38
Central Asia / Far East 234

PhD projects started in 2010

Ahmed AbdelSamad
Molecular mechanisms controlling regeneration in the adult pancreas.
Ahmed Mansouri, Silvio Rizzoli, Reinhard Schuh

Kevser Gencalp
Biochemical and structural analysis of actin nuclear transport complexes.
Dirk Görlich, Jörg Großhans, Reinhard Jahn

David Haselbach
Conformational dynamics of large protein complexes.
Holger Stark, Kai Tittmann, Jörg Enderlein

Christian Hoffmann
Using genetic code expression to investigate the role of histone core modifications in chromatin assembly and remodelling.
Heinz Neumann, Wolfgang Fischle, Steven Johnsen

Samir Karaca
Investigation of the role of Nup protein in nucleocytoplasmic trafficking.
Henning Urlaub, Dirk Görlich, Ralph Kehlenbach

Sinem Saka
The logistics of membrane trafficking in the secretory pathway.
Silvio Rizzoli, Michael Kessel, Mikael Simons

Jennifer Seefeldt
Structural and functional analysis of eIF3 (*Triticum aestivum*) and its regulatory role in eukaryotic translation initiation.
Dirk Görlich, Marina Rodnina, Volker Lipka

Olena Steshenko
Dynamics of proteins and lipids in myelin membrane sheet growth.
Mikael Simons, Silvio Rizzoli, Jörg Enderlein

Halenur Yavuz
Mechanisms of SNARE-mediated membrane fusion using artificial membranes.
Reinhard Jahn, Dirk Görlich, Silvio Rizzoli

External MSc projects

Seol-hee Joo,
supervised by Prof. Dr. Martin Göpfert, Dept. of Cellular Neurobiology, University of Göttingen

Simone Mayer,
supervised by Nenad Sestan, MD, PhD, Dept. of Neurobiology, Yale University, New Haven, CT, USA

Rafik Tarek Neme Garrido,
supervised by Prof. Dr. Diethard Tautz, Dept. of Evolutionaty Genetics, Max Planck Institute for Evolutionary Biology, Plön, Germany

Momchil Ninov,
supervised by Prof. Yosef Yarden, Department of Biological Regulation, Weizmann Institute of Science, Rehovot, Israel

Paula Perin,
supervised by Prof. Dr. rer. nat. Stefan Pöhlmann, Institute for Virology, Hannover Medical School, Hannover, Germany

The Masters of 2010

Ilian Atanassov (H. Urlaub)
SDS PAGE combined with pIEF for in depth mass spectrometry analysis of complex mixtures

Julia Cajan (G.-P. Dotto, University of Lausanne, Switzerland)
Oscillatory activity of Notch1 signaling in epithelial growth and differentiation control

Iris Finci (I. Feußner)
Biochemistry of the fatty acyl-CoA reductase family of *Arabidopsis thaliana*

David Haselbach (M. Rief, Technische Universität München)
Unfolding mechanics of the knotted proteins HCAIII and UCH-L3

Fatemeh JavadiZarnaghi (C. Höbartner)
Functional characterization of a lariat- and branch- forming deoxyribozyme

Elisabeth Koers (K. Tittmann)
Determination of carbanion intermediates in ThDP-dependent enzymes

Nadja Kondratiuk (A. Mansouri)
Role of epithelial cell adhesion molecule, EpCAM, in the development of mouse pancreas

Wen-ti Liu (H. Stark)
Structural analysis of IGHMBP2 bound human 80S ribosome by single-particle 3D cryo-electron microscopy

Helena Magliarelli (H. Shcherbata)
The role and regulation of Dystrophin glycoprotein complex in muscular dystrophy development in *Drosophila*

Sinem Saka (V. Lipka)
Functional characterization of the *Arabidopsis* LysM-RLK CERK1 and its interactors

Hanno Sjuts (G. Schreiber, WIS)
Re-design of the barnase barstar interface for the creation of cellulose degrading designer cellulosomes

Christopher Spencer (P.A. Cohen, Mayo Clinic, Arizona, USA)
Overcoming tumor-induced immunosuppressive countermeasures by TLR agonist immunopotentiation and chemotherapy-mediated immunomodulation

Olena Steshenko (C. O'Kane, University of Cambridge, UK)
Generation and characterization of mutations in the *Drosophila* ortholog of the human neurodegenerative disease gene spatacsin/SPG11

Caroline Gräfin von Spee (J. Wienands)
Subcellular targeting of adaptor molecules involved in B cell signaling

Barbara Waldmann (J. Stülke)
Signal perception and transduction by the small regulatory RNAs GlmY and GlmZ in *Escherichia coli*

The Doctors of 2010

Alexandra Andreou
New non-heme iron mini lipoxygenases from prokaryotes. *I. Feußner, G. Sheldrick, C. Griesinger*

Christoph Biesemann
Development of fluorescence activated aynaptosome sorting (FASS) and analysis of VGLUT1 synapses from mouse brain. *N. Brose, D. Klopfenstein, R. Jahn*

Monika Bug
The accumulation of mutant p53 in human cancer cells. *M. Dobbelstein, F. Melchior, S. Rizzoli*

Lope A. Flórez Weidinger
Systems biology in *Bacillus subtilis*: databases for gene function and software tools for pathway discovery. *J. Stülke, B. Morgenstern, C. Griesinger*

Ieva Gailite
The role of the novel endosomal protein Rush hour (CG14782) in endosomal trafficking in *Drosophila melanogaster*. *A. Wodarz, R. Schuh, I. Feußner*

Homa Ghalei
Investigation of the structurally related U4 snRNP, U4atac snRNP and Box C/D s(no)RNPs. *M. Wahl, R. Ficner, W. Kramer*

Peer Hoopmann
Investigation of endosomal recycling of synaptic vesicles. *S. Rizzoli, R. Jahn, N. Brose*

Sohail Khoshnevis
Structural and functional investigations of the protein synthesis in *Saccharomyces cerevisiae*. *R. Ficner, H. Stark, M. Rodnina*

G. B. Madhu Babu
Towards uncovering the role of pre-fibrillar oligomers of α-synuclein in the pathogenesis of Parkinson's disease. *H. Jäckle, C. Griesinger, S. Eimer*

Konstantina Marinoglou
A novel phosphatase modulating the DNA damage response and the tumor suppressor p53. *M. Dobbelstein, A. Wodarz, H. Jäckle*

Gabriel Mora
Pathways for phospholipid deacylation in *Saccharomyces cerevisiae* and their impact on fatty acid trafficking and equilibrium. *I. Feußner, M. Thumm, K.-A. Nave*

Adrian Schomburg
Effects of Heterochromatin Protein 1 on chromatin transcription and architecture. *W. Fischle, M. Wahl. F. Melchior*

Christian Stegmann
Investigations of the structure and function of spliceosomal enzymes. *M. Wahl, G. Sheldrick, R. Jahn*

Anton Volkov
Analysis of prokaryotic fatty acid double bond hydratases, members of myosin cross-reactive antigen family. *I. Feußner, D. Fasshauer, C. Griesinger*

Achim Werner
Functional and mechanistic characterization of the F-box protein Fbxw5. *F. Melchior, G. Braus, R. Lührmann*

Martina Wirth
Functional analysis of mitochondrial sirtuins in *C. elegans* and mammalian cells. *W. Fischle, H. Jäckle, F. Melchior*

Larisa Yurlova
Myelin membrane growth and organization in a cellular model system. *M. Simons, R. Jahn, D. Doenecke*

San Francisco

Or how to find your way in the city of the smart and crazy

"When you are going to San Francisco, Be sure you're wearing some flowers in your hair." Although written by The Mamas & The Papas during the time of the late 60s the song's praise of "gentle people" and a "whole generation with a new explanation" is still valid. In February 2010 I moved to San Francisco to study anti-tumor immune responses at the University of California, and found an environment where curiosity, tolerance, and a positive attitude towards almost anything (except Sarah Palin) dominate your everyday life.

The city's world-wide fame for being built on a major earth quake fault on a small peninsula, with ridiculously steep hills that offer stunning views of the San Francisco icons Golden Gate Bridge, the prison island Alcatraz, and the downtown skyline, hides the fact that this relatively small metropolis only houses 800,000 people within its city limit. However, the city and surrounding communities of the Bay Area harbor some of the world's leading universities and technology companies. The world-famous private university Stanford and the three public University of California institutions in Berkeley, Davis, and San Francisco score top in international university rankings. 4,000 biotech companies (including Affymetrix, Applied Biosystems, and Genentech) with 130000 employees, the IT giants of Silicon Valley (Microsoft, Intel, Apple) and the West Coast's banking industry and fashion brands (Levi's, GAP) draw numerous international talents. Being a newcomer to the field of immunology and cancer research I am stunned and intimidated every Monday morning, when the leaders of the field come to meet their friends at UCSF and present their latest work in the departmental lecture series. And because some of these leaders actually work at UCSF itself I sometimes forget how unusual such a concentration of great researchers is.

But the San Francisco Bay Area is much more than just a great workplace. San Francisco is a melting pot of cultures: Victorian homes of European immigrants shape the city at large, however just one step into the worldwide oldest and largest Chinatown, or the Latin American Mission District, and you need a dictionary in order to find your way. It is probably for this reason that you can find almost any type of food in this city, which praises itself for having the highest number high quality restaurants in the country. And so far, I can

Mission Dolores Park between San Francisco's Mission and Castro Districts is a popular hangout on a sunny afternoon

Panorama of Downtown San Francisco embedded by the San Francisco Bay Bridge (left) and the Golden Gate Bridge (right)

only agree. Chefs that cherish diversity and creativity dominate in town, offering classic French gourmet cuisine with Asian ingredients; whereas the Korean barbeque and next-doors Burmese restaurants send your pallot on a very interesting journey. The excellent German restaurants in town are useful when you need to satisfy your stomach with an astonishingly well-made Sauerbraten and an extensive list of German beers.

The city has always been home to people that advocate an alternative way of life. The 60s flower power movement and the anti-Vietnam war movement of the 70s all have begun in the San Francisco Bay Area. Today, San Francisco is a major force in liberal US politics, currently heavily involved in fighting for the establishment of gay marriage laws. Self-expression is a mandate in this city, everything is done with that special San Francisco sparkle. Irrespective of how common and normal something may appear, you will always find someone in this city that will make something impressive and special out of it. Workshops teach you to create your own art from recycled trash, the alternative hipster crowd of the Mission District sports its very own fashion trends with lots of unkempt facial hair, while the famous Naked Guys prefer to not to wear anything but socks and a hat – all year long! Bored of having a normal pet? How about instead of having a dog you walk a cat or chicken in one of the city parks or carry a parrot on your shoulder? If that is what makes you happy, go for it! The large gay population of the Castro district hosts a popular nightlife hot spot in the city that on any night delivers wild and eccentric parties for anyone that is not afraid of the next morning's hangover.

Since San Franciscans enjoy their private life, Bars are never empty, restaurants always busy. Relationships are friendly and dynamic; invites to private dinner parties are as spontaneous as their last-minute cancellations. Because of its liberalism San Francisco is considered the most European city in the US, however the often flighty way of living typical to the States and especially prominent in California can be a challenge to a German mindset that expects reliability and consistency. However, there is a niche for everyone in this city, and when I move away from here I hope to carry along its unique ability to give you a different view of things in life.

Bijan Boldajiour

Bijan somewhere in San Francisco

Bijan Boldajipour did his PhD with Erez Raz. He graduated from the Molecular Biology program in August 2009. In summer 2010 he joined the University of California San Francisco, Department of Pathology, Krummel Lab in San Francisco, California, USA.
http://pathology.ucsf.edu/krummel/

An American City with a European Flair

Postdoctoral training in an international hot spot for basic and translational science

I live in San Francisco with my wife Yaisa and our son Gabriel. The San Francisco Bay Area has beautiful forests, lakes and mountains. The Bay itself with its breathtaking views. Life in San Francisco combines American, European and Asian cultures. The city was greatly influenced by the Gold Rush, the Hippie culture and the '.com' boom, and its many unique neighborhoods give it a nice European flair. San Franciscans tend to be laid back but are, at the same time, very liberal and aware of environmental and social issues. San Francisco is also extremely expensive. An average small 1-bedroom apartment rents for at least $1500. Daycare for toddlers is $1000 and up (per month!). Despite the high prices, I highly recommend the city for its liberal politics, rich cultural diversity, high quality of life and beautiful architecture.

Daniel, Gabriel and Yaisa

Currently, I am working as a postdoctoral fellow at the Gladstone Institutes, a dynamic, private research institution located at the Mission Bay campus of the University of California, San Francisco (which will develop into a $10 billion campus over the next decade). Gladstone is an excellent environment for 'cutting edge' basic and translational life sciences. Postdocs enjoy rigorous scientific training, excellent funding and access to core laboratories for stem cells, histology, bioinformatics, genomics, animal behavior, flow cytometry and transgenics. The hierarchy within labs is relatively flat. The laboratories in each department work together in one big open space, and the lack of physical barriers facilitates interaction and collaboration. Postdocs receive 'better than usual' benefits, such as above average salary, childcare support, and even a retirement plan.

For my postdoctoral project, I completely switched fields. During my PhD studies, I worked on SNARE-mediated membrane fusion, and now I am investigating the role of the kynurenine pathway in microglia in Alzheimer's disease. I look at the influence of neuroactive metabolites of this pathway on behavior and neurodegeneration. The main finding of my work is that blocking the kynurenine pathway in peripheral immune cells (not in the brain), alters behavior and ameliorates neurodegeneration.

At first, my transition to Gladstone was challenging. It was hard to learn different terminology and to explore new scientific territory while adjusting to American culture and a new environment. At the same time, it was refreshing to step away from biophysical methodology and to work on neuroinflammation and animal behavior. Looking back, the training I received at the IMPRS was immensely helpful for my success, and I can say confidently that switching fields was a very good move.

I have a healthy work/life balance. I chair the Gladstone Postdoctoral Advisory Committee. I am an active member of the National Postdoctoral Association, participate in Gladstone's outreach programs to the local schools, and teach Wing Tsun Kung Fu. Most importantly, I can share these experiences with Yaisa and Gabriel. I am happy here, and I recommend postdoctoral training in San Francisco.

Daniel Zwilling did his PhD with Reinhard Jahn. Daniel graduated from the Molecular Biology program, his wife Yaisa Andrews-Zwilling from the Neuroscience program; both in fall 2005, only two months before Gabriel was born. Daniel and Yaisa are now postdoctoral research fellows at the Gladstone Institute of Neurological Disease in San Francisco.

California Dreaming

There is a famous song by The Mamas and The Papas called "California dreaming". The song is about a cold winter day someplace else, because it is always warm and sunny in California… and this is particularly true for Los Angeles. After spending 7 years living in this amazing city, we realized that so many people come here for jobs or schooling, or perhaps to start their own engineering or biotech business, or even just to try their luck in Hollywood or at the music scene, but they find it difficult to leave, attracted by the sun rays of the endless Californian summer. Of course, warm winters and summers at the beach, and the best places in the world for outdoor recreation are not the only attractions California has to offer. Many come looking for an opportunity for better life and professional success.

Our Californian dream started more than seven years ago. We arrived to Los Angeles to continue graduate school, after finishing Master thesis projects in the Molecular Biology Program in Göttingen. Actually, both of us founded ourselves starting graduate school all over again. It was really tough to start again with the feeling as though we halfway completed our graduate training. After a very organized and structured curriculum in Germany witch provided students with clear and predicable timeline to getting doctoral degree, we faced a bit more open-ended, far less structured, and more self-guided approach to scientific training, which on average lasts about a year and a half longer compared to similar programs in Europe. And, unfortunately, like the rest of the people in the scientific community here, we were facing a severe cut in federal funding for scientific research, on which vast majority of laboratories at universities across United States rely upon. Like most of other Ph.D. students at U.S. universities, to help ease the financial burden on our labs, we were involved in teaching of undergraduates and securing our own funding in form of fellowships. This was a great

Marta, baby Olivia and Sean

but very demanding experience, and it made us appreciate the good old days at the Max Planck Institute in Göhttingen where the money for reagents, equipment and latest technologies was never short, and we were not even expected to think or worry about it. On the other hand, "federal funding crisis" in U.S. gave us an opportunity to learn a great deal about writing and revision process of research grant applications, and how to be more efficient in spending limited amount of money on a scientific project and experiments. These are essential skills for survival in professional world for any young scientist planning a career in research.

Despite the cuts in federal funding, California still offers some of the best places in the world for scientific research and post-doctoral training in biological sciences, medicine and engineering. Universities and institutes in San Diego, Los Angeles and San Francisco areas are some of the best and well known in the world, and attract very talented and dedicated scientists from all over the globe. Being in an excellent research institution such as Caltech in Pasadena, one has access to excellent facilities similar to those in Max Planck Institutes in Germany. Also, California has an enormous economy with many opportunities for bioscience related professionals. There are numerous opportunities for cutting-edge research and career development outside of academic path in biotech companies. San Diego and San Francisco metropolitan areas have the highest density of private scientific and bio-medical companies in the world.

Outside of the lab, we spend time surfing and boogie boarding at the beach, mountain biking and hiking in summer and cross-country and downhill skiing in winter. While living in Los Angeles we got involved in soccer and basketball leagues, rock climbing, running

Sean Gordon concluded his Master's thesis with Petra Schwille in 2003. After obtaining Ph.D. at the California Institute of Technology in Pasadena, California with Elliot Meyerowitz, he joined U.S. Department of Agriculture as a Research Molecular Biologist in November 2010.

Marta Vuckovic concluded her Master's thesis with Thomas Jovin in 2004. She finished her doctoral studies in the Neuroscience Graduate Program at the University of Southern California in Los Angeles in December 2010 and she is starting a post-doctoral position in early spring 2011 at the University of California San Francisco.

California Dreaming (contd.)

and biking Los Angeles and Pasadena marathons and martial arts. Sports in California are exceptional, and people make the time to enjoy outdoor activities and meet new friends. This is an important part of the culture here. Also, camping trips to local mountains, desserts, forests and beaches are very popular among Californians, and so are trips to local wineries for wine tasting.

We met so many people from all over Europe and Asia (some with mutual friends in Göttingen) that came to graduate school or post-doctoral training in California, partly to take advantage of the endless summer and relaxed culture. We also had access to a great array of professional and recreational clubs at Caltech and the University of Southern California. We are forever thankful for the exceptional group of

Sean surfing the waves on Santa Monica beach

friends from around the world that we have come to know while living in Los Angeles and in San Francisco.

And finally, we have come to realize that everybody here has her/his own unique Californian dream. All you have to do is to come to California and live it.

Scientific Life Back in Ghana

Operating Far Behind the Frontiers of Science

My next move after completing my PhD in Göttingen was certainly to be

a Post-doc in a great lab. While I tried very hard, there were considerably difficulties in landing the dream position.

One of the least likely places to settle was a university back home in Ghana and the main reason for this low rating is the lack of progression in science. The situation is far dire that I thought, I had hopes of a fairly good chance of getting some project work done as a way of applying the excellent training I had received. But the harder I have tried the lower my chances.

The most obvious of the problems of a scientist in Ghana is funding for equipment and reagents, but that does not inhibit my enthusiasm as much as the attitude of people towards science and research. People who were trained in Europe, America and Japan, after relocating to Ghana, seem to think that science is not supposed to be done here as though it's a "foreign culture", one that will be frowned upon by the gods of the land. Now, I appreciate the reason why fewer students are successful in the most competitive graduate programs world-wide, teaching in the sciences is done with orientation towards examinations.

In the absence of strong and credible research activities, most students turn out disillusioned about science and therefore move away after graduation. Those who go on to pursue science at the graduate level are the few very determined ones. This situation, however, cannot allow the benefits of science to impact the development of Ghana. I have tasked myself to identity and encourage a lot more determined students mostly in Chemistry and Biochemistry, to understand the current trends in science to make them competitive in a graduate school.

As I work to develop research projects that will allow me to continue to make meaningful contributions to science and society, I appreciate occasional invitations to workshops in Germany.

Patrick Kobina Arthur
graduated from the Molecular Biology Master's program in March 2003. He continued with a doctoral thesis under the supervision of Tomas Pieler in the Dept. of Developmental Biochemistry and reveived his doctoral degree from the University of Göttingen in 2008. He returned to his home University of Ghana in Leggon-Accra.

Next-Generation Sequencing Technologies

The myriad of genomic data before us and its implications on public health

Many common diseases like cardiovascular disease, type I diabetes and cancer present familial clustering. Although a genetic component has been demonstrated, the exact gene-gene and gene-environment interactions are not fully understood. This is both due to complexity (30,000 genes in the human genome) and the underpowered nature of traditional single candidate gene linkage studies. In contrast, genome-wide research evaluates genetic markers across the genome to discover new loci associated with disease. Genome-Wide Association Studies (GWAS) rely both on the complete nucleotide sequence of the human genome (3 billion base pairs) and on a map of common genetic variants (Single Nucleotide Polymorphisms SNPs) the HapMap, which consists of a collection of alleles arranged linearly along the DNA molecule. SNPs are the most common type of human sequence variation, occurring about every 500-1000 base pairs. Future research should be extended to as many diverse populations as possible, since, to date, most of the genomic data collection has focused on individuals of European ancestry. However, to achieve this goal, innovative funding mechanisms and additional commitments from genome scientists will be required.

Even the most powerful GWAS can only explain a small percentage of the genetic traits involved in complex diseases. These studies detect variation of alleles with a frequency of at least 5% in the population. Less common types of variation including single nucleotide insertions and deletions or duplications of longer tracts of DNA (Copy Number Variation CNV) remain undetected. It is envisaged, that upon completion of the 1,000 Genomes Project, many rare variants (with a minor allele frequency of 1% or higher) will be identified and thus improve our ability to identify loci contributing to variation in the susceptibility of complex diseases. Nonetheless, the primary value of genetic mapping is not

Fernando at the Royal Botanical Gardens, Madrid

risk prediction but to provide novel insights about mechanisms of disease. In addition, genetic association alone does not indicate biological causation. Only through protein and animal model work (e.g. gene knockout) can the role of a gene or DNA region identified by GWAS be explored.

In technologies like next-generation sequencing it is customary to oversample the genomic data. This provides highly accurate sequence information due to its high signal-to-noise ratio. Thus, it allows the detection of mutations and other genome alterations in heterogeneous samples. A major challenge in genomic research will be to make biological sense of the myriad of data being generated. This will require computational analyses that assess reproducibility and statistical significance; biological analyses to study links to pathways and the functional relevance of the mutated genes; and clinical analyses that determine the relationships of genome alterations with epidemiology, histology, prognosis and response to therapy.

These technologies are already a reality for diagnosis in oncology and cardiovascular disease. For example, CardioChip, a microarray developed at Harvard with 10,848 heart-specific complementary DNAs, interrogates multiple genes simultaneously for mutations, providing a single diagnostic assay to rule out multiple inherited cardiomyopathies.

Fernando Rodriguez-Castaneda read for his PhD with Christian Griesinger in the Department of NMR-based Structural Biology at the Max Planck Institute for Biophysical Chemistry, Göttingen, Germany. He graduated from the Molecular Biology program in 2007. He is currently a Postdoctoral Research Fellow in the Department of Biology at the University of York, United Kingdom.

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Intellectual Property

When my love for science had started to fade somewhere in the course of my PhD studies, I started to think about an alternative to a career in basic research without wasting the last 10 years of my life. I have found this "nearly perfect" alternative in the intellectual property business.

Nadja Jung

To start with, I had no idea what to expect of my new "intellectual property life", and reflecting the situation from my current point of view, for a lab person it is actually impossible to imagine.

While in the lab it is crowded, at least five people too many rushing from one beeping timer to the other, running three experiments in parallel, the radio babbling, everybody chatting, hurrying to the next talk or lecture, having students jumping around crashing the Eppendorf pipettes, there is life, action and, above all, interaction, my life had changed drastically when I had entered into intellectual property business. Mainly, there was SILENCE. They gave me my own office, which I call "box", a pile of files, a smile and a big pat on the back. "Good morning", "Good night" ... that was it, for the next month or so and I was left with my very urgent need for social interaction. This also caused to change my night life from my beloved quiet evenings with a good book to chatting and dancing on after work parties, meeting people, dining out and the like.

But anyway, what I know now is that the sizzling life in the lab is only hiding the fact that you are a hamster in a wheel, tilting against windmills, taking one step forward and three back, having a rough idea of the interaction of two tiny proteins after more than three years of day and night work! Okay, "day-and-night-work" is more or less still the same, but everything else changed.

I am now working on a million of different exciting topics from vaccines against Influenza or HIV, gene therapy, cosmetics against orange peel effect, fat burner, or simply bed bug protection devices, just to name a few. Admittedly, not all inventions I am handling are worth a Nobel prize, but then you still have the legal aspects to the work, and if you really don't like a case, you can be sure, it will be off your desk in no later than two days.

The downside, the reason why this alternative to research is only "nearly perfect", is the fairly tough an extremely long education, which takes at least 34 months on top of a scientific or technical study, advantageously with a PhD graduation, requires to study law for patent attorneys and to spend a period of eight months without payment at the German Patent and Trademark Office and the Federal Patent Court which ends with the final exams and a considerable amount of grey hair.

Nonetheless, I have not regretted my choice for a single second, since the work as a patent attorney offers a sense of achievement and satisfaction that I had never experienced in science.

Nadja Jung did her PhD in the lab of Prof. Dr. Volker Haucke (University of Göttingen and Freie Universität Berlin) in clathrin-mediated endocytosis at the synapse. She graduated from the Molecular Biology Program in November 2006 and started her education for becoming a German Patent Attorney in the patent law firm Dr. Volker Vossius (Munich) in June 2007.

She graduated as a German Patent Attorney in November 2010 and currently she is working as a German Patent Attorney in the patent law firm Graf von Stosch (Munich).

She will take the European Qualifying Examination for becoming a European Patent Attorney in March 2011

Chances in the Life Sciences Sector

Expanding availability of information, rising capital investment for research, and increasing flexibility to form ventures through new business models were good news for the life science industry during the past two decades. The critical parameters, however, are

Jürg Stebler

productivity and economic feasibility. The enormous increase in both venture capital and private sector investment was not reflected in the number of new medical therapy approvals, which was actually decreasing. In spite of the continuous rise of cumulative revenues of all biotech companies over the past 20 years, cumulative net income of all publically traded companies was zero or even negative. Possible explanations include the increased complexity to identify new specific drug targets, evaporation of resources in opportunistic rather than strategic research programs, a substantial increase of regulatory barriers, and a growing pressure on therapy pricing Furthermore, the ability to bring an idea to a product requires expertise that cannot be provided by single persons but only by teams. Ventures often fail because of lacking competent teams, therefore missing information when decisions are taken.

The main pillars of expertise that a biotechnology company requires include non-clinical research, regulatory affairs, quality assurance, clinical research, human resources, as well as legal, intellectual property, finance, and general management skills. Private and public life science organizations seek human resources who are experts in one of the above-mentioned pillars and understand the principles of the other pillars. This is essential for effective communication between experts and enables each individual to integrate the different mosaic pieces correctly into the complete picture of a strategy and a developmental plan.

While I had not yet expertise in any of the required pillars when finishing my PhD, the education that I enjoyed at the International Max Planck Research School was an excellent basis to extend my background to additional fields. In my first function in a young biotechnology company, I was responsible to expand the product portfolio by applying the company's proprietary technology to unmet medical needs of cancer patients. Such tasks start with market analysis, patent landscape assessment, financial valuation, project management and budgeting. In my case, this was accompanied by close cooperation with several mentors. Later on, my responsibility also involved clinical research, leadership and strategic planning. Retrospectively, I believe that not the field of entry is critical but rather that oneself develops continuously and strives for highest possible quality in education and own work. To further extend my qualifications, I was given the opportunity to pursue MBA studies at the IE Business School, Madrid and graduated with an MBA degree. Looking back, the time was mind opening, educational and one of the best decisions I made.

Now, I am in a management function at a young biotech venture. While I am reading more research articles than during my PhD, a fundamental difference in my current work is that I need to integrate information from all the different pillars when I develop thoughts and decisions. Rumors about the "industry" such as that "freedom to assess fields of interest are not possible" or that "the focus is very narrow or even repetitive" cannot be confirmed from my side. I rather see a very similar situation like at academic institutions where freedom and scope of work is solely dependent on the position and the qualification of the leader in human resource management & organizational behavior.

In the past years I took several small steps that built on and were supported by the scientific education of the International Max Planck Research School. For any graduate who has an interest to understand other disciplines than research but are directly interlinked with it, I see the private life science sector as a valid and talent hungry option for future scientific development

Jürg Stebler concluded his doctoral thesis in the group of Erez Raz at the MPI-bpc in 2005. He continued as research scientist and as clinical trial manager in the biotech company Kuros AG in Zurich, Switzerland. He received an MBA from IE Business School, Madrid in 2009, is now heading the operations at Xeltis AG, a young biotech venture in Zurich, Switzerland, and is advisor for scientific entrepreneurs who start-up a venture.

New Zealand – A lifetime experience

You don't get the chance to see such a sky very often. It was a clear, dark night and the black ceiling was covered with bright little dots. In such moments I can understand why people in former times would stay up all night making up stories about the beginning of the world. To get a glimpse on such a scenery today, you have to go to the desert, to be lost somewhere in the ocean, or go to the other end of the world – to New Zealand.

Marc Schneider on the top of Mt. Tongariro with Mt. Ngauruhoe in the back

It was the mid of January, when I first had the opportunity to get such a clear view on the stars of the southern hemisphere. I was about to sleep in a hut in the Tongariro National park. I was tramping – or hiking – through a volcanic area in the center of the northern island of New Zealand. I was here for hardly a week, when I experienced this first great highlight of my trip. It's not only the night skies that are magnificent, but nature on it's on is just breathtaking in this country. When I approached the volcanic area, I first saw Mount Ngauruhoe. It just looks like a stereotypical volcano with the missing tip at the top where the crater is and a deep black, steep slope. It looks so impressive that Peter Jackson decided to use it as Mt. Doom for the Lord of the Rings trilogy. When I got closer, more and more details became apparent. Mt Ngauruhoe is surrounded by other volcanoes and is connected to Mt. Tongariro by a kind of plateau. Once up there I hardly found a plant growing. But I did not really realize it until I was back. There were too many impressions attracting my attention. There are craters in deep red, the soil changes from black (lava) to yellowish (sulfur) and in the middle of all this you find three small clear, bright blue lakes. When I passed them my nose caught a familiar smell; rotten eggs reminded me of my early chemistry classes. I therefore headed on to my first nights hut to rest after a long, exhausting day. I must have fallen asleep with a big grin on my face.

10 days later I'm still in New Zealand, but the scenery changed completely. I'm now on the southern of the two main islands of New Zealand. I just plunged into the Tasmanian sea. The beach is endless and the sand golden, fine and warm. The beach is so flat in this bay that I can walk for 5 min in the water and it just reaches my waist. Today, I walked through an amazingly green forest. You see ferns everywhere. And not just the small ones like in Europe, here they grow into entire trees. After a day of walking you can even recognize what seems to be different species. Some of them have a rather smooth bark, whereas others are more hairy. You can see that some fern leaves are green on both sides of the leaf, whereas others are colored in a dark brown on the bottom side. My way lead me almost all the time along the coast line with an astonishing view on

A fern leaf - a symbol for New Zealand

The Emerald lakes near Mt. Ngauruhoe

Lake MacKienzie in the Southern Fjordlands

the golden beaches of the Abel Tasman national park, with sometimes nobody else but me on them. I could stay here forever, if there wouldn't be so many more interesting things to see. I feel like I would stand on the shoulder of a giant. The view into the valley is incredible. It reminds me of the European Alps, but there are some important differences. I can't see a single house, or even a street somewhere near by. There is only a small creek running through the valley. Next to it I can see meadows shining in a light green. The slopes of the mountains are covered in dark green trees. As the mountains grow into the sky less and less trees can be found and the clear grey rock becomes visible. Some of the highest mountains are still covered with a small snow tip. All this is governed by a clear blue sky.

I sit down and take a break with this impressive scenery around me. I moved southwards. I'm now in the Fjordlands at the southwest coast of New Zealand. It is clearly colder than in the northern parts, which is of course reflected in the landscape. I move on. There is more to experience in this country.

I will jump 134 m deep into a valley with only my feet attached to a thin rope. I will see the impressive cliffs of the milford sound. I will learn the differences between seals and sea lions. I will try out kite surfing. I will eat one of the best burgers in the world (Queenstown, Fergburger). But I won't have time to do so many other things. I might have to come back again…

One of the many endless beaches in the Abel Tasman National Park

A map of New Zealand: 1) Tongariro National Park 2) Abel Tasma National Park 3) Fordlands

Marc Schneider did his PhD with Reinhard Lührmann in the Department of Cellular Biochemistry at the Max Planck Institute for Biophysical Chemistry. He graduated from the Molecular Biology program in July 2009.

Climbing around the world

It all started with a German climbing magazine having a lead article about a climbing trip around the world. Referring to Jules Verne's "Around the World in Eighty Days" its header read "Around the World in Eighty Moves". The idea of doing such a trip was born but being busy with the PhD-thesis this idea had taken a back seat.

Years later, there was an edition of the same magazine reporting on the most fascinating climbing spots worldwide. Fortunately, it just took a train ride and a copy of this article to convince a friend and long lasting climbing partner of mine to do such a climbing trip around the world.

The first challenge was to find a date where both of us would have finished our theses. Then we studied climate tables of all the potential stops. The conditions needed for each climbing spot should be neither too hot nor too cold and with a very low probability of rain, otherwise climbing would be impossible.

After a while we decided to do a four-month trip leading us around the world including stops in South Africa, Tanzania (even though climbing Mount Kilimanjaro is not really rock climbing), Madagascar, Australia, USA, Spain and Morocco.

Table Mountain and youth hostel in Cape Town, South Africa

Having successfully applied for all necessary visas, gotten all requried vaccinations and having booked all the flights, we finally headed for our first stop - South Africa. Wherever possible we used public transport and stayed at youth hostels or small private lodgings to get to know the country and its people as good as possible.

Bus station in Madagascar

Public transportation in South Africa, Tanzania, Madagascar and Morocco was surprisingly unproblematic. Sometimes it took quite a while to find the right bus company and to reach our destination but as compensation we often had a nice chat with other passengers and thereby learned a lot about the country. Even though we experienced that the bus or minibus was not the means of transportation generally used by many tourists we can only recommend it. Once we ended up driving about half an hour through slums and townships of Cape Town, which was really interesting and thought-provoking. Unexpected things might happen but you also will see things and places you might not see otherwise!

Climbing in those different countries was fantastic! Even though we had been climbing for quite a while, we learned a lot during our trip (sometimes the hard way), including climbing long multi-pitch routes, crack climbing and securing completely clean routes. Moreover we had to experience that being quite fit is not always an advantage. According to the national park rules we had to climb the Kilimanjaro with a group of guides, porters and a cook

Climbing at the Blue Mountains, Australia

Climbing at Montagu, South Africa

Uhuru Peak Mount Kilimanjaro, Tanzania

(a weird situation for us) and even though we stayed several days above 3000-4000 meters we suffered from mountain sickness the night we were heading for the Uhuru peak (5895 meters) just because we went too fast … Besides the amazing landscapes and flora we got to see, we also faced

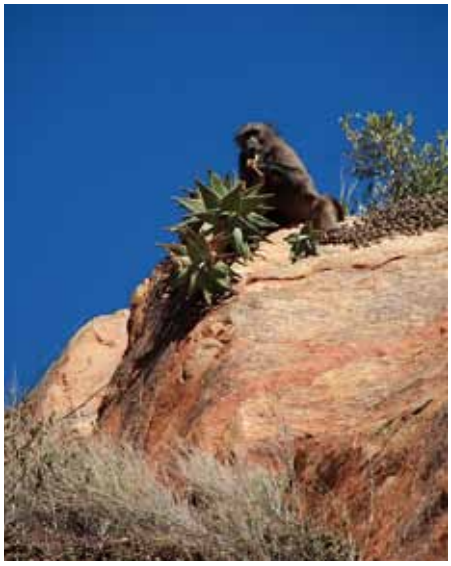
Rainforest in the Usambara Moutains, Tanzania

the fauna of the different countries – sometimes closer as one would call enjoyable. Twice we were followed by a "gang" of baboons but in the end it seemed they only made fun of our "rope-climbing" style. And once in the

Half Dome at Yosemite National Park, USA

Yosemite National Park we had to put a black bear to flight by shouting at him. Fortunately, the bear seemed to be even more scared than us! As always during our whole trip, things sorted out in the end.

Finally this journey is something we will never forget and if you have something in mind you always wanted to do but never found the time, we truly can recommend to take some time off and just do it!



Baboon at Montagu, South Africa

Lemur at Camp Catta, Madagascar

If you are curious about some more information and pictures, visit us at: www.climb-around.com

Sven Pilarski did his PhD with Michael Kessel in the Developmental Biology Group at the Max Planck Institute for Biophysical Chemistry. He graduated from the Molecular Biology program in April 2008.

Science & Family: Vlad and Kerstin‘s story

“Ich mach das!“ (“I’ll do it alone!“) and “Gleich” (“Wait”) are Nadia’s favourite words when it is time to go to work. Nadia likes to join her friends at the MPI kindergarten - but in her pace. That is why Kerstin and Vlad arrive at their desks usually later than they have planned. Both work at the MPI for Molecular Biomedicine in Münster, a beautiful, middle-sized city in the Northwest of Germany; Kerstin as a group-leader, Vlad as a scientist. Their family history began in Göttingen where both graduated from the Molecular Biology Program.

Vlad, Nadia and Kerstin

Kerstin: “The decision for a child was made at the end of my PhD. We thought there was probably never a good time for getting children and interrupting our career, so we could get them anytime or never. When I applied for a group leader position with a small child and only a short postdoc behind, I considered my chances almost zero for several reasons. In particular, I had never been away for more than a year and I believed experience abroad would be crucial. When I got pregnant, I abandoned the idea of moving to the US. Also, I thought people would consider me not experienced enough with 7 months maternity leave and 5 months half-time work in my CV. It was my former M.Sc. supervisor Prof. Mary Osborn who told me that “woman apply to the same position when they meet 7 or 8 out of 10 selection criteria, men apply when they meet 2 or 3”. Her words encouraged me and in the end my application was successful.”

Vlad: “I wanted Kerstin to try, although it seemed unlikely to find a suitable position for myself in Münster. After Kerstin got the job and we found out that Hans Schöler, director at the MPI in Münster, was interested in a computational structural biologist with my profile, moving to Münster became a real alternative. Besides, the Max Planck Society is very engaged in supporting the arrangement of family for career. Nadia got a place in the MPI KiTa right away. Managing a successful career and a happy family is still a real challenge. However, things appear to be improving in Germany. The real challenges may come when Nadia is older. Already now, searching for a full-day kindergarden gives us headaches. And school will be even more difficult…

Kerstin: “So far, we have been lucky and everything has worked out, not least because people around us have been so supportive. It might not go that smooth in the future. But I feel confident and in the end it is mainly up to us to make the best out of everything. What is my biggest goal? I hope that my students are successful and that my lab is their stepstone into a great scientific career. At the same time I want to be a good mother and give my family all the love and attention they need. With a child, the times spending all night and all weekend in the lab are over. But this can be compensated by organizing yourself better and getting out of bed earlier.”

Vlad: “Yes, and if both parents share the responsibility…. For our second child I will take a few months off as paternity leave. Professionally, my goal is a successful career that will give me good chances for a permanent position in an academic institution.“

Kerstin Bartscherer completed her Master‘s thesis under the supervision of Mary Osborn at the MPI for Biophysical Chemistry in 2004. She continued with her PhD and early postdoc with Michael Boutros at the German Cancer Research Center in Heidelberg, before she became project leader at the Medical Faculty Mannheim/University of Heidelberg. Since May 2010 she is an independent Max Planck Group Leader at the MPI for Molecular Biomedicine in Münster.

Vlad Cojocaru did his PhD with Thomas Jovin at the MPI for Biophysical Chemistry and graduated in 2005. He continued in the group of Rebecca Wade at EML Research Heidelberg, before he took up a research staff position in the Department of Cellular and Developmental Biology at the MPI for Molecular Biomedicine in Münster in 2010.

Motivated for Science?

A personal retrospect on the 60th Meeting of Nobel Laureates in Lindau

Have you ever hated science? You should have if you ever happened to be a last year PhD student. You probably know what I'm talking about. Constant disappointment by nature that things don't behave they should according to the design of your experiments. Quite dim career perspectives. Crisis of motivation. Everything just doesn't look the way you expected three (four, five?) years ago. The idea to change the career path and forget all this as a nightmare occupies more and more students' minds. "It's good that at least some of us don't completely exclude a possibility to do a postdoc", one of my friends said during a seminar recently.

Can anything change this situation? Well, probably. Think of a happy 85 year old scientist. What makes him happy? Own huge department with an unlimited budget? Oliver Smithies had it. Before. Today he has not a single student working in his lab. "They are afraid that I'm too old", he smiles. Nevertheless he is working alone seven days per week. Still happy. The secret is, as he says, that he is not working but playing with nature. One doesn't get disappointed by results if the process of research is rewarding itself.

Oliver Smithies at the 60th Lindau Nobel Laureate Meeting in summer 2010

If you have doubts whether science is your thing, try going somewhere like Lindau Nobel Laureate Meeting. Look at those living legends. Talk to them. Try to feel the way they do.

If I stay scientist for all my life I guess I know what I want to be in my 80's. Curious, always busy and still happy to go to the lab on Sunday morning.

Andrei Shchebet is a PhD student in the group of Steven Johnsen at the Department of Molecular Oncology of the University of Göttingen Medical School.

Honors and Awards

Kevser Gencalp, PhD student with Dirk Görlich at the MPI for Biophysical Chemistry was awarded a GGNB Excellence Stipend.

David Haselbach, PhD student with Holger Stark at the MPI for Biophysical Chemistry and the Faculty of Biology of the University of Göttingen was awarded a GGNB Excellence Stipend.

Elena Kardash, alumna of the Molecular Biology program and postdoc with Erez Raz at the University of Münster, was awarded the first poster prize at the international meeting "Morphogenesis in living systems" on May 27-29, 2010, in Paris, France.

Simone Mayer, MSc student of the Molecular Biology program received a stipend by the DAAD for conducting her external Master's thesis at Yale University.

Patrick Müller, alumnus of the Molecular Biology program and postdoc at Harvard University was awarded a prize for the best talk at the EMBO Conference on "Systems Biology of Development" on August 16-20, 2010 in Ascona, Switzerland.

Sinem Saka, PhD student with Silvio Rizzoli in the ENI group "STED Microscopy of Synaptic Function" was awarded a Dorothea-Schlözer Stipend by the University of Göttingen.

Christian Schulz, PhD student with Peter Rehling in the Department of Biochemistry II at the University of Göttingen Medical School was awarded both a GGNB Excellence Stipend and a Boehringer Ingelheim PhD stipend.

Welcome to the Weizmann Institute

Visits of the Life Sciences Open Day and Intracellular Trafficking Meeting 2010

Every other year, the Weizmann Institute of Science invites for its Life Sciences Open Day. Prominent scientists, such as the Nobel Prize Laureates Tim Hunt or Ada Yonath give plenary lectures. All life science departments present their current research as posters. An exciting opportunity to learn about the research on the Weizmann campus! Every Life Sciences Day also includes additional events, such as visits to the new animal house and other research facilities, or a "Jazz at the Pond" get-together in the evening of the 2010 Life Sciences Day with wine, beer and live music.

When the cooperation between the Feinberg Graduate School at the Weizmann Institute and the international Molecular Biology and Neuroscience programs was initiated five years ago, both partners agreed that a lively cooperation can only develop along a lively interaction between people. That's why MSc students, PhD students and faculty members from Göttingen regularly visit the Weizmann Institute on the occasion of the biennial Life Sciences Day, and PhD students of the Feinberg Graduate School join the Horizons and Neurizons meetings in Göttingen. An exchange of students for methods courses has also become a tradition by now. Another element of the cooperation is the opportunity for external Master's projects or short PhD research projects. Every year so far, one Molbio student went from Göttingen to the Weizmann Institute (labs of Gideon Schreiber, Dan Tawfik, and Yossi Yarden) for an external Master's thesis project. All of them were excited about both the high level of research and the supervision and hospitality.

Poster session during the Life Sciences Open Dy 2010 on the WIS campus

Guided trough through the historic parts of Jerusalem

In April 2010, a group of 20 students and faculty members from Göttingen visited the Life Sciences Open Day. Some of the PhD students presented their own posters there. Upon arrival on campus, the Göttingen students were taken by the Weizmann students to their labs, while the senior scientist from Göttingen met with colleagues from the Weizmann Institute for one-on-one meetings. The visit also included activities such as a guided tour across the Weizmann campus and a one-day trip to Jerusalem.

The Göttingen students were excited about the visit of the Weizmann

The Göttingen delegation and members of the Feinberg Graduate School on the occasion of the Life Sciences Open Day 2010

Institute as becomes evident by quotes from a letter they sent after the trip: "From a scientific and professional point of view it was very enriching to visit an institute where world class research is being conducted. This gives us a broader view of the scientific situation worldwide and some ideas about future career opportunities. For some of us this visit also gave more direct results, since we met people working in our own fields of interest and had important input about our work, this we think will open the door for more direct cooperation. (…) Besides the scientific exchange, we had an excellent impression of the people at Weizmann. For all of us, the one-on-one meetings were very successful since our Israeli partners were very friendly and eager to show us around the laboratories, the institute, but also their country and their culture. It was a fantastic idea to visit the city of Jerusalem with them. We sincerely want to thank them for their time and their friendly attitude."

As an immediate result of the (still young) cooperation, the Göttingen Graduate School of Neurosciences and Molecular Biosciences (GGNB) "stole" the idea of the biennial science day, while the Weizmann people implemented student-hosted scientific meetings similar to the Göttingen Horizons and Neurizons events. On May 3-5, 2010, five Göttingen students attended the student-hosted "Intracellular Trafficking Processes" meeting and reported with great enthusiasm afterwards.

StB

Student organizers of the Intracellular Trafficking Meeting taking Göttingen students for a one-day trip to the Dead Sea

Cooperation with the Feinberg Graduate School at WIS

The cooperation of the Feinberg Graduate School at the Weizmann Instiute of Science with the Göttingen Graduate School for NNeurosciences and Molecular Biosciences (GGNB), in particular the MSc/PhD programs and IMPRS for Molecuar Biology and Neurosciences, mainly includes the following elements:

- Short-term exchange of PhD students (specific research projects)

- Mutual invitations for methods courses

- Long-term exchange of MSc students ("external" thesis projects)

- Shared website: student fora, information on collaborative projects, courses, etc. (planned)

- Mutual invitations to scientific events (e.g. Life Sciences Open Day, Horizons & Neurizons Symposia)

- Other activities

Horizons and Career Fair 2010

Much has been written about the "Horizons in Molecular Biology" PhD student symposia in previous years, always being a great success owing to the enthusiastic and professional organization by the Molecular Biology students, distinguished speakers enjoying a young and interactive audience and exciting student presentations. All of this was true, again, for the Horizons meeting and Career Fair on 27-30 September 2010 under the auspices of the Federal Minister of Education and Research Annette Schavan.

The organizers of the Horizons 2010 meeting

Several features, however, made the Horizons 2010 meeting a truly memorable one: As it took place in the same week as the 10th anniversary celebrations of the Molecular Biology and Neuroscience programs, many alumni attended the meeting this year. Some of them presented their current research in specially featured alumni sessions, others contributed to the program of the Career Fair for Scientists, sharing their experience with their juniors.

In addition to Carol Greider, who gave the scientific keynote lecture for the 10th anniversary a few days later, Venkatraman Ramakrishnan followed the invitation of the students and presented "Structural insights into decoding of the genetic message by the ribosome". Meeting laureates of both the Nobel Prize in Physiology or Medicine 2009 and the Nobel Prize in Chemistry 2009 during the same week was not only exciting for the organizing PhD students and participants of the Horizons meetings, but also for the new Master's students who had just arrived a few days earlier. When Carol Greider discussed her travel plans with her neighbor Rachel Green before she left Baltimore, they found out that both had bought tickets for Göttingen – small world.

Peter Walter, best known not only for his research on organelle biosynthesis, membrane dynamics, and protein sorting, but also for the famous textbook "Molecular Biology of the Cell", gave an exciting opening lecture on "How to succeed in science" at the Career Fair, as well as the scientific keynote for the Horizons meetings on "The unfolded protein response in health and disease". He allowed us to print the e-mail, which he sent to the Horizons organizers after the meeting, in this newsletter (see next page). This leaves us with the concluding remarks that we fully agree with his appreciation of a wonderful meeting. Once again a big "thank you" to the organizers!

StB

see www.horizons.uni-goettingen.de for list of speakers and further details

Letter by Peter Walter





From top to bottom: Horizons reception desk/ Peter Walter at the Career Fair/ Plenary session in the lecture hall/ Venki Ramakrishnan during his lecture/ Poster session.

From: Peter Walter
To: Horizons Organizers
Subject: 7th Horizons in Molecular Biology Symposium

Dear Horizons Organizers,

Sorry for the delay in getting back to you with a few words of thanks and appreciation. Foremost, I must congratulate you to having put together such an exquisite Symposium and thank you on behalf of all the invited speakers for the warm reception we received from you in Göttingen.

The scientific content of the Horizons in Molecular Biology Symposium was broad and cutting-edge, easily at par with the very best meeting that I have attended in the recent past. Without exception the talks were outstanding and each speaker made a superb effort to introduce his or her topic to a broad audience - putting the results into a broader context and delivering inspiring talks. The program committee could not have done better in identifying such a fantastic cast of speakers. As such, it was easy to follow talks in more distant fields with ease, which was evident by the strong attendance throughout the sessions and by the lively discussions that followed each talk. I also enjoyed the talks by Alumni, presenting fresh science and ideas. Despite the forbiddingly large auditorium, the atmosphere was engaging and interactive. Questions and discussion were actively encouraged and included a vast number of the PhD students. This fact alone speaks for the tremendous value of having a program that covers a large scope of topics where not only experts debate the details of their latest experiments, as it only too often happens at other meetings.

And then there was the incredible hospitality and smooth organization with attention to every detail, including the little boxes of chocolates and ‚welcome cards' signed by all of you that greeted us in our hotel rooms. As speakers we felt as honored guests, and very conceivable need was attended to. There were numerous opportunities build into the schedule for informal interaction and breaking down barriers, and I fondly recall many late night discussions with the students covering every conceivable aspect of research philosophy and career development. The student attendance of all of these events was truly international, with no single group dominating the discussions or activities, speaking volumes about the inclusive and interactive atmosphere of your program.

My list of things to improve is short: First for the Career Fair that preceded the meeting, I would suggest to build a less formal structure in which the dialog of speaker and audience is more proactively encouraged. Perhaps it was simply the Monday morning time slot or the tight schedule, but there was hardly any discussion after my talk (although many topic resurfaced in one-on-one informal discussions later in the week). Second, I felt sorry for those of you who had to sit at the organizers' desk while so many excellent lectures were presented. I would suggest to only occupy the desk during the breaks, so that the organizers also can fully enjoy the presentations.

But these are very minor issues at best. You have done a fantastic job and made it a memorable symposium for all. Thank you from all of us!

With warm wishes from sunny San Francisco, Peter

10th Anniversary

Ten years ago, the first students joined the international Molecular Biology and Neuroscience programs in Göttingen. A moment to look back, remember the first courses and culture nights, evaluation and excursions, welcome parties and graduations.

10th anniversary celebration in the University Aula, Wilhelmsplatz

What could be a better start into the 10th anniversary celebrations than a scientific keynote lecture by a former student of the University of Göttingen and Nobel Prize Laureate, Carol Greider. No free seat was left in the University Aula when she presented a beautiful review of telomerase and the consequences of telomerase dysfunction.

The following ceremony was opened by President Kurt von Figura, being one of the founder members of the Molecular Biology program himself. Before the Dean or Speaker of the international programs gave brief personal reviews of the history of the programs, the former Education Minister of the State of Lower Saxony and current member of the German Parliament, Thomas Oppermann, the Vice Secretary General of the German Academic Exchange Service, Ulrich Grothus, the State Secretary of the Lower Saxony Ministry for Science and Culture, Josef Lange, and the Vice President of the Max Planck Society, Herbert Jäckle were full of praise regarding the success of the two international graduate programs in the past ten years.

Among the invited speakers: Josef Lange, Ulrich Grossbach, Ivo Feußner, Ulrich Grothus, Thomas Oppermann, Carol Greider, Kurt von Figura (from left to right)

Yaisa Andrews-Zwilling, alumna of the first Neuroscience class and married to Daniel Zwilling, alumnus of the first Molbio class, remembered how she climbed and kissed the Gänseliesel on the predicted due date of giving birth to her son Gabriel. Fortunately, everything went well as can also be viewed on page 14 of this newsletter.

More than 300 guests joined the reception and dinner after the anniversary ceremony in the adjacent conference center, discovered former colleagues on the alumni world maps, were reminded of past events by watching the slide show of activities during the last years, and enjoyed live music by the Göttingen *A Capella* Group "Seven Up".

Speech by Yaisa Andrews-Zwilling, PhD graduate of the Neuroscience program

Altogether, it was a wonderful day, full of memories, emotions, and time to meet old friends and colleagues.

StB

Carol for a Coffee

From top to bottom: Students meeting Carol Greider at the GZMB/ Anniversary reception/ String quartet at Aula/ A capella life music/ Alumni world map.

When Carol Greider first came to Göttingen as an undergraduate exchange student some twenty years ago, she saw her first telomeres during a project with Professor Grossbach at the Institute of Zoology next to the train station. At the train station she was welcomed, once again, by Ulrich Grossbach, together with Akanksha Goyal, a Molecular Biology student. Akanksha now lives in the dormitory room at which Carol Greider resided while she was studying here. Reason enough for having a cup of coffee at her former home. Akanksha remembers:

The day began unusually early for me. I groggily looked around my room laden with books and clothes and wondered where to start. You see, I was required to tidy up. Not something I usually reserve my Saturday mornings for, but this Saturday was special. I was expecting a visit from a Nobel Laureate, namely Professor Carol Greider.

Welcoming Carol Greider at Göttingen train station. C. Greider, U. Grossbach, A. Goyal.

Remember the old times - still delicious food in the Mensa.

It took me an hour to clear up the clutter by which it was time to get ready. Countless thoughts whirled through my mind. What should I wear? Something formal perhaps; I didn't want to appear like I was trying too hard. Something casual; then it would look like I didn't bother. What would I say when I meet her? Should I bow? That's ridiculous! So she's a Nobel Laureate; she's also a normal person. It's no big deal; but it is a big deal!

After a lot of deliberation, I set out in a semiformal pullover and jeans to meet her at the University's Alumni meet. Following her lecture I escorted her to the Central Mensa where we small talked over lunch. Afterwards I was required to bring her to my room. <Flashback> In 1982 a 21 year old Carol Greider studied Molecular Biology at Goettingen university and coincidently resided in the same room as me in Rosenbachweg dormitories <End of flashback> It was the University Alumni Head's suggestion that she may enjoy a visit to her old room during her stay in Goettingen.

While we contemplated calling a cab I asked if she might like to travel by bus instead. She sportily agreed and we were soon standing in my ground floor room, where she reminisced how her friends would tap on her window in the evenings and jump in to be greeted by a hot cup of tea prepared by her. She spoke fondly of her children and kittens and before I knew it, it was time to leave for the city center, where she was to meet the rest of the molbio class. We went to Mr. Jones for coffee, during which she enjoyed their company as they did hers. At last, it was time for her to leave and so ended a delightful rendezvous with Professor Carol Greider.

Alumni Reunion 2010

Many current and former students were surprised when they realized that the international Molecular Biology and Neuroscience programs already count more than 230 graduates since they were established ten years ago. And more than half of our alumni came to join the 10th anniversary celebrations and the alumni reunion on the 1st and 2nd of October 2010.

What a commitment to travel around the globe from places such as Sydney, Beijing, Singapore, Accra, San Francisco, Boston, or New York to join the alumni reunion! Together with almost all current students, many faculty members, the coordination teams, parents and friends, the alumni met in the Mensa am Turm to celebrate and remember the old times. And we counted quite a few children …

Following a cherished tradition, the event started with the graduation ceremony for the Master's graduates, followed by a reception, the welcome of the newcomers, and a buffet. Three alumni presentations by Alex Poulopoulos (Harvard Medical School, Boston, USA), Gabriella Ficz (The Babraham Institute, Cambridge, UK), and Paola Valbuena & Markus Strasser (Sanofi Aventis, Switzerland) provided an entertaining insight into the "life after the program". The program was concluded by a review of the past ten years from a coordinator's perspective (Steffen Burkhardt, Michael Hörner), combined with a who-is-who faculty quiz. It was amazing how the students and alumni identified faculty members based on more or less embarrassing photos from their early childhood - and a lot of fun too.

The who-is-who faculty quiz

While the almost complete class of the year 2000 was sharing their memories well beyond midnight, the class of 2001 pointed out that *their* 10th anniversary is coming up in only twelve months. Another reason to come together and celebrate.

StB

Just arrived: Welcome of the newcomers

Memories of the alumni reunion

From top to bottom: Alumni reunion at Mensa am Turm/ MSc graduation / Dinner buffet/ Gabriella Ficz before her alumni talk/ Alumni talk by Paola Valbuena and Markus Strasser.

Naisana Seyed Asli

"It was definitely worth the 23 hours of flight! Going back to the good old Göttingen, flashbacks from the very first days of sliding into the arms of the "PROGRAM" ... To the very last days of a whole new life in front of you ... The whole experience was amazing and so was going back."

Naisana is a postdoc at the Victor Chang Cardiac Research Institute in Sydney, Australia. She concluded her doctoral studies in the group of Michael Kessel at the MPI-bpc in 2008.

Gabriella Ficz

"I consider the Göttingen years important in my life because they offered the best environment to fulfill my dreams: to do science at the highest standards with great colleagues and friends. That's why it was so good to go back, remember those times and was glad to see that many made the effort to travel long distances for similar reasons."

Gabriella Ficz is a postdoc at the Babraham Institute in Cambdrige, UK. She concluded her doctoral studies in the group of Donna Arndt-Jovin at the MPI-bpc in 2005.

Sina Victoria Barysch

"After leaving Göttingen in August, the 10th anniversary celebration in September was just the right event at the right time: For two relaxed days with a lot of very good food and drinks I was back in Göttingen, saw all the old friends again (even those that I hadn't seen for many years) and could finally say bye to everyone …"

Sina is a postdoc at the Center for Molecular Bioogy of the University of Heidelberg (ZMBH). She concluded her doctoral studies in the department of Reinhard Jahn at the MPI-bpc in 2009.

Foteini Orfaniotou

"The two-day celebration resulted in connecting people, refreshing great memories that were shared all these years and, of course, a lot of fun. The objective of the event was more than met. Nostalgic and emotional moments characterized the atmosphere. It was great to share the career and personal developments of old classmates and promises to keep in contact were made. The 10th anniversary and alumni celebration was proof of the excellent organization of the program and the continuous effort it puts into "connecting" and "educating" its students. Thank you all for your enormous efforts all these years, and the excellent idea and organization of the 10th anniversary and alumni celebration."

Foteini works for Novartis (Hellas) S.A. in Athens, Greece. She concluded her doctoral studies in the department of Klaus-Armin Nave at the MPI-em in 2009.

New Faculty

Joining the program in 2010

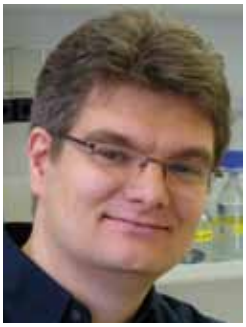
Roland Dosch is group leader at the Department of Developmental Biochemistry (T. Pieler). The group is located in the Ernst-Caspari-Haus (GZMB building). Roland Dosch did his doctoral research with Christof Niehrs at the German Cancer Research Center (DKFZ) in Heidelberg and spent four year at the University of Pennsylvania, Department of Cell and Developmental Biology with Mary C. Mullins as a postdoctoral research fellow. From 2004 to 2010 he was a junior group leader at the University of Geneva, Department of Zoology and Animal Biology. His current research focuses on the genetics of zebrafish oogenesis, applying cell biological and biochemical approaches in combination with embryological methods to molecularly characterize novel control genes.

www.uni-goettingen.de/en/192192.html

Heike Krebber was appointed as Professor for Molecular Genetics at the University of Göttingen, Institute of Microbiology and Genetics in 2010. She did her doctoral thesis project at the German Cancer Research Center (DKFZ) in Heidelberg. During that time she went to the Weizmann Institute of Science as visiting scientist. After three years on a scientific position at the Dana-Farber Cancer Institute at Harvard Medical School, she took up the position of a Junior Group Leader at the University of Marburg, Institute for Molecular Biology and Tumor Research (habilitation in Molecular Biology in 2005, Heisenberg Fellow in 2006) and was honored with the Heinz-Maier Leibnitz price of the DFG in 2009. Her current research focuses on the identification and characterization of export-competent mRNPs that are transported into the cytoplasm, using *Saccharomyces cerevisiae* as a model organism. Her lab uses a combination of genetics, biochemistry and cell biology to gain insight into mRNA export out of the nucleus.

www.uni-goettingen.de/en/192168.html

Heinz Neumann leads the Applied Synthetic Biology Group in the Department of Molecular Structural Biology (R. Ficner). The group is located in the Ernst-Caspari-Haus (GZMB building). He did his doctoral research with Andreas Mayer at the Universities of Tübingen, Germany and Lausanne, Switzerland, before he assumed the position of a postdoctoral fellow with Jason Chin at the Medical Research Council, Laboratory of Molecular Biology(MRC-LMB) Cambridge, UK. His junior research group makes use of "unnatural" amino acids to develop new strategies for introducing spectroscopic probes into proteins to study the dynamic properties of chromatin. The group is also interested in the effect of the post-translational acetylation of lysine residues on protein structure and function.



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Blanche Schwappach is Professor of Biochemistry and Head of the Biochemistry I Department of the University of Göttingen Medical School. Her group is also associated with the MPI for Biophysical Chemistry. After her doctoral research with Thomas Jentsch at the Center for Molecular Neurobiology at the University of Hamburg, she worked as a postdoctoral research fellow in the laboratory of Lily Jan, University of California, San Francisco, USA. She continued as a research group leader at the Center for Molecular Biology (ZMBH) at the University of Heidelberg, where she completed her habilitation in molecular biology and cell biology. Before she came to Göttingen, she held the position of a Wellcome Trust Senior Research Fellow at the Faculty of Life Sciences at the University of Manchester, UK. Her laboratory is interested in different aspects of membrane protein biogenesis and its integration into the physiology of organs such as the brain or the heart. The research focuses on the early life of tail-anchored proteins that are post-translationally targeted to the endoplasmic reticulum for membrane integration. Other projects address the role of sorting motifs during the passage of ion channels and neurotransmitter receptors through the secretory pathway.

www.uni-goettingen.de/en/192164.html

Left the program in 2010

Botho Bowien, Professor of Microbiology and former head of the Department of Molecular Physiology at the Institute of Microbiology and Genetics of the University of Göttingen, retired in fall 2010. He spent most of his scientific life at the Institute of Microbiology and Genetics. His recent research focused on the transcriptional control of the cbb operons encoding most of the enzymes of the Calvin carbon dioxide reduction cycle in the aerobic, facultatively chemoautotrophic bacterium Ralstonia eutropha.

The regulatory components of the cbb system, their response to metabolic signals and the interlocking of the cbb control with larger regulatory networks were his prime research subjects. He joined the Molecular Biology program as a faculty member from the very beginning and was member of the admission board of the program for many years. The program thanks him for his contributions both to teaching and admission of students in the Molecular Biology program.

www.uni-goettingen.de/en/57918.html

Detlef Doenecke, Professor of Biochemistry and former Head of the Department of Molecular Biology at the Institute of Biochemistry and Molecular Cell Biology of the University of Göttingen Medical School, retired from this position in fall 2010, where he continued as provisional head of the Department of Biochemistry II. His main research interest was in the structure, function and regulation of synthesis of nuclear proteins including chromosomal proteins and other protein factors involved in the control of transcription. Other major projects dealt with the factors mediating the transport of histone-related transcriptional regulators from the cytoplasm to the cell nucleus, and with the structural transitions of chromatin during programmed cell death and with the regulation of factors involved in apoptotic chromatin cleavage and histone modification. He joined the Molecular Biology program as a faculty member from the very beginning. The program benefitted to a great extent from his experience as the speaker of the DFG research training group GRK 521 in structured doctoral education. He is still actively involved in the selection of students applying for the Molecular Biology program from all over the world. The program thanks him for his committed help and continuous support.

www.uni-goettingen.de/en/57932.html

Dirk Fasshauer, moved from the position of an Independent Research Group Leader of the Structural Biochemistry Group at the Max Planck Institute for Biophysical Chemistry, Göttingen to the University of Lausanne, Switzerland, where he is now Associate Professor in the Department of Cellular Biology and Morphology. He is still active in several thesis committees of GGNB and the primary supervisor of the Molbio PhD student Esra Demircioglu, who will graduate this year.

www.uni-goettingen.de/en/57940.html

Current Faculty Members

Mathias Bähr, Gerhard H. Braus, Bertram Brenig, Nils Brose, Matthias Dobbelstein,Roland Dosch, Stefan Eimer, Wolfgang Engel, 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, Heike Krebber, Volker Lipka, Reinhard Lührmann, Ahmed Mansouri,Burkhard Morgenstern, Klaus-Armin Nave, Erwin Neher, Heinz Neumann, Tomas Pieler, Stefanie Pöggeler, Peter Rehling, Silvio Rizzoli,Marina Rodnina, Reinhard Schuh, Halyna Shcherbata,Blanche Schwappach, 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

Alumni in Boston

Luncheon with Thomas Oppermann, MdB, kicks off regular alumni meetings in Boston

Bernd Hackstette, Head of the Göttingen Alumni Office, invited alumni from Göttingen for a luncheon at the MIT Faculty Club on October 18th, 2010. Five Göttingen alumni currently working in the Boston area at the MIT, Harvard and in the private sector attended the luncheon.

Thomas Oppermann, MdB and Consul General Friedrich Löhr with Göttingen alumni

The luncheon at the MIT Faculty Club overlooking the Charles River and the Boston skyline featured two important guests: Thomas Oppermann, MdB, and Friedrich Löhr, German Consul General for New England. Thomas Oppermann himself is also a Göttingen alumnus, still lives in Göttingen, and is currently member of the Bundestag. As Minister for Science and Culture in Lower Saxony from 1998-2003, he was instrumental for the conceptual design and implementation of our graduate programs "Molecular Biology" and "Neurosciences" in Göttingen.

After a couple of years away from Göttingen, it was therefore a great pleasure for me to meet one of the important initiators of our graduate programs. During lunch, we discussed our experience with the academic system in the U.S. and Germany. Thomas Oppermann told us about his time as Minister for Science and Culture, and how he was inspired by the U.S. academic system to initiate new organizational structures for the University of Göttingen with more autonomy and private sponsoring.

I personally also enjoyed reconnecting with people from Göttingen and refreshing my memories of studying and living there. After this networking event, we therefore decided to have regular alumni meetings in Boston to continue the interesting discussions. In the long run, it could be interesting to establish a regional Göttingen alumni association similar to "Heidelberg Alumni U.S. (HAUS)" to reconnect with old friends, meet new alumni and to stay informed about research and life in Göttingen.

Patrick Müller did his PhD with Martin Zeidler. He graduated from the Molecular Biology program in 2007. He is currently a postdoctoral research fellow at Harvard University, Department of Molecular and Cellular Biology.

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Please contact me if you are in the Boston area and interested in meeting alumni from Göttingen.

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