MOLECULAR BIOLOGY
NEWSLETTER
Georg-August-Universität Göttingen · International Max Planck Research School
JAN 2020

Welcome message

Dear alumni, students, friends and colleagues,

This edition of our annual Molbio newsletter reviews the initial phase of our new IMPRS funding period since 2019. One of the key measures outlined in our "18-plus" proposal was successfully launched last fall: the Alumni Mentoring Program, organized jointly with our sister program in the Neurosciences (see also back cover of this newsletter). Our growing network of alumni proves to be an invaluable asset guiding our current students in their career planning. This is supported not only by individual counseling at the GAUSS Career Service, but also by numerous career-related measures such as our annual PhD retreat in combination with an Alumni Career Day, the Horizons career fairs, monthly Career Impulse Sessions, industry excursions, workshops, our online alumni database, and LinkedIn groups. A great example of how the value of our Molbio network is appreciated by our students in their search for the next career step is described on pp. 24-25 of this newsletter.

Lively scientific exchange and networking has always been the driving force for our annual, student-organized Horizons meeting (pp. 36-37) and, newly launched, last year's LMB-GGNB Symposium in Life Sciences, held in July 2019 in Cambridge (p. 28). Beyond such events, we are happy to report the successful nomination of several of our PhD students for the annual Lindau Nobel Laureate Meetings (pp. 34-35) and achievements in international contests such as the Three-Minute Thesis competition of the Coimbra Group (p. 31).

A big THANK YOU goes to our current and former PhD representatives who over the past 1½ years invigorated the local networks of our Molecular Biology and Neuroscience programs. With great enthusiasm they organized a variety of social events such as barbecues, visits of the Christmas market or hiking tours (pp. 32-33). The large number of participants reflects the appreciation by all classes of MSc and PhD students.

Molbio students meet alumni at the annual retreat

At our Molbio PhD retreat in Leipzig in June 2019 the idea was born to organize a joint retreat in summer 2020 with our Neuroscience colleagues on the occasion of the 20th Anniversary of both programs (see also back cover of this newsletter). The Molbio/Neuro PhD retreat will be held at the Harnack Haus, a conference venue of the Max Planck Society in Berlin, on June 11-13, 2020. We will use this opportunity not only for lively scientific discussions but also for the fine-tuning of our plans to celebrate our 20th Anniversary together in Göttingen on September 18-20, 2020. Everyone please make sure to save this date and not to miss our 20th Anniversary celebrations.

This welcome message would be incomplete without congratulating Reinhard Jahn, one of the co-founders and former IMPRS speaker of our Molecular Biology Program, on his election as President of the University of Göttingen. Only a few months earlier, Reinhard had been awarded the „Aureus Gottingensis" medal of the University for his outstanding contributions to the University and Campus and for his support for early career researchers in particular. We look forward to continuous and committed support of our graduate students and other early career researchers on the Göttingen Campus under his presidency.

P. Rehling, M. Rodnina, S. Burkhardt

CONTENT

Nucleotide excision DNA repair – a sneak peek

DNA frequently suffers unwanted physical and chemical changes, suggesting that DNA is not stable enough to preserve the genetic information through generations. However, several surveillance systems evolved to quickly locate, identify and repair all types of DNA damage. The nucleotide excision DNA repair or NER is one of the main repair systems which surpasses all others in a variety of DNA lesions it can fix. It acts as a "cut and paste" function of our genetic text by excising the damage - containing oligonucleotide and replacing it with an undamaged one. NER factors were discovered genetically because lack of their function causes a disease Xeroderma pigmentosum (XP), mostly characterized by extreme sun sensitivity. We currently understand the main events governing NER, but the exact molecular mechanism of repair is unknown, mostly due to the lack of structural knowledge on DNA repair intermediates. This is where we stepped in (emoji with sunglasses).

We purified all seven NER factors present in humans (XPA - XPG), mostly as part of multiprotein complexes. The

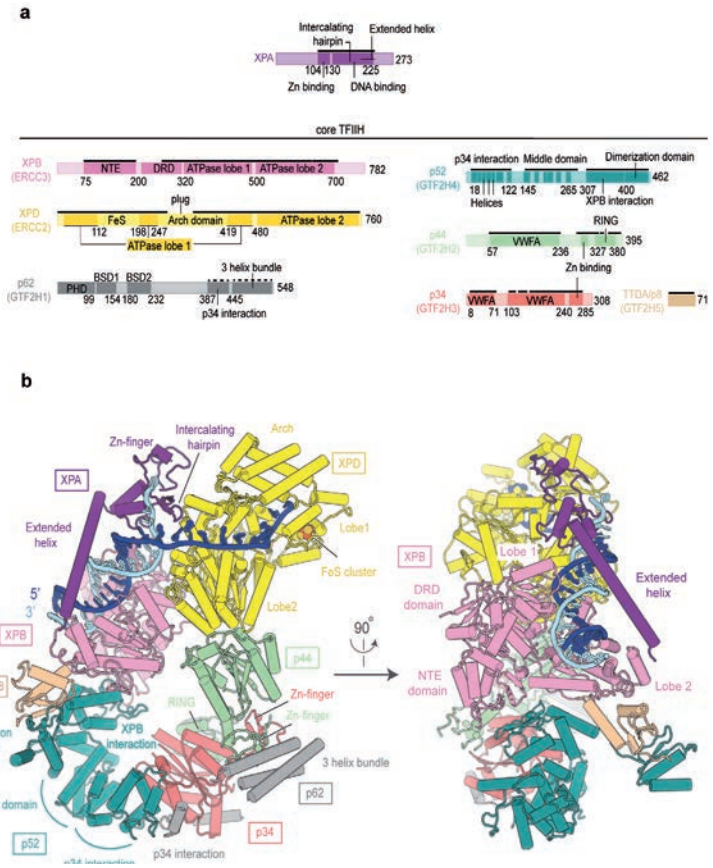


Fig. 1: Structure of human core transcription factor IIH (TFIIH)-XPA-DNA complex. (a) Domain organization of XPA and human TFIIH subunits. Residues at domain borders are indicated. Solid and dashed black lines mark residues modeled as atomic and backbone structures, respectively. DRD damage recognition domain, NTE N-terminal extension, VWFA von Willebrand factor type A domain. **(b)** Cylindrical representation of the structure. Proteins colored as in A.

PhD-(and MSc-) related publications 2019 (PhD students of the Molecular Biology program in bold type)

Aksu M, Trakhanov S, **Rodriguez AV**, Görlich D (2019) Structural basis for the nuclear import and export functions of the biportin Pdr6/Kap122. J Cell Biol 218(6), 1839-1852

Beissel C, Neumann B, Uhse S, Hampe I, **Karki P**, Krebber H (2019) Translation termination depends on the sequential ribosomal entry of eRF1 and eRF3. Nucleic Acids Res 47(9), 4798-4813

Bock LV, **Caliskan N**, **Korniy N**, Peske F, Rodnina MV, Grubmüller H (2019) Thermodynamic control of-1 programmed ribosomal frameshifting. Nat Commun 10, 4598

Callegari S, Muller T, **Schulz C**, Lenz C, Jans DC, Wissel M, Opazo F, Rizzoli SO, Jakobs S, Urlaub H, Rehling P, Deckers M (2019) A MICOS-TIM22 Association Promotes Carrier Import into Human Mitochondria. J Mol Biol 431(15), 2835-2851

Choudhury P, Hackert P, **Memet I**, Sloan KE, Bohnsack MT (2019) The human RNA helicase DHX37 is required for release of the U3 snoRNP from pre-ribosomal particles. RNA Biol 16(1), 54-68

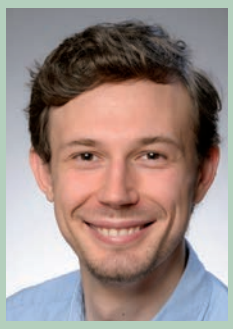
superhero amongst these complexes is the transcription factor IIH (TFIIH), which opens the DNA around the lesion site, verifies the presence of the lesion and coordinates DNA excision. TFIIH can be divided into the kinase module and the core module that contains two ATPases, XPB and XPD. We used the reconstituted NER system to show that XPB double-strand DNA translocase and XPD helicase activities are strongly stimulated by additional NER factors XPA and XPG, respectively. To understand the mechanism of this stimulation, we assembled the core-TFIIH-XPA-XPG complex on a bifurcated DNA that mimics the edge of a repair bubble and analysed it by single particle electron cryomicroscopy and crosslinking mass-spectrometry (a shout-out to my fellow MolBio and the mass-spec guru Aleksandar Chernev ;)).

The structure reveals all but one subunit of the TFIIH core at the overall resolution of 3.5 Å (Fig. 1). The two core ATPases are trapped in a DNA bound state: XPB binds the DNA duplex and XPD binds the 5′ single - stranded DNA extension, as predicted by our enzymatic assays. XPA wraps around the duplex - single strand DNA junction and bridges XPB and XPD.

The structure nicely explains how XPA stimulates XPB translocase activity. The long helix in XPA encloses DNA duplex within the XPB active site (Fig. 1), thereby preventing the DNA to dissociate between the rounds of ATP hydrolysis, which increases XPB processivity. This XPA function could also be employed to anchor the NER machinery to DNA while the lesion is being processed. Interestingly, for DNA repair to proceed, the TFIIH kinase module has to be removed from the TFIIH core. Comparison between our structure and the recently reported structure of the kinase bound TFIIH shows that XPA dramatically alters the TFIIH structure, thereby releasing the kinase module. Moreover, XPA-mediated TFIIH rearrangements remove the plug element from the DNA binding pore in XPD which allows XPD to move by 80 Å and start scanning DNA for a lesion.

Overall, the first structure of an NER intermediate provides the basis for understanding NER on a molecular level and opens the door to a structure-based design of novel anti-cancer drugs.

Goran Kokic completed his doctoral thesis in spring 2019 in the lab of Patrick Cramer at the MPI for Biophysical Chemistry, where he is currently continuing his research as a postdoctoral researcher.



These results were published in Kokic G, Chernev A, Tegunov D, Dienemann C, Urlaub H, Cramer P (2019) Structural basis of TFIIH activation for nucleotide excision repair. Nat Commun 10, 2885

Chukhno E, Gärtner S, Rahman Siregar A, Mehr A, Wende M, Petkov S, Götting J, Dhingra A, Schulz T, Pöhlmann S, Winkler M (2019) A Fosmid-Based System for the Generation of Recombinant Cercopithecine Alphaherpesvirus 2 Encoding Reporter Genes. Viruses 11(11), pii: E1026

El Ayoubi L, Dumay-Odelot H, **Chernev A**, Boissier F, Minvielle-Sebastia L, Urlaub H, Fribourg S, Teichmann M (2019) The hRPC62 subunit of human RNA polymerase III displays helicase activity. Nucleic Acids Res 47(19), 10313-10326

Frumkin I, Yofe I, Bar-Ziv R, Gurvich Y, **Lu YY**, Voichek Y, Towers R, Schirman D, Krebber H, Pilpel Y (2019) Evolution of intron splicing towards optimized gene expression is based on various Cis- and Trans-molecular mechanisms. PLoS Biol 17(8), e3000423

Ghaem Maghami M, Scheitl CPM, Höbartner C (2019) Direct *in vitro* selection of trans-acting ribozymes for posttranscriptional, site-specific, and covalent fluorescent labeling of RNA. J American Chem Soc 141(50): 19546-19549

Gomes de Castro MA, Wildhagen H, **Sograte-Idrissi S**, **Hitzing C**, Binder M, Trepel M, Engels N, Opazo F (2019) Differential organization of tonic and chronic B cell antigen receptors in the plasma membrane. Nat Commun 10, 820

Programmed ribosome frameshifting in HIV-1

–1 programmed ribosome frameshifting (–1PRF) is a ubiquitous translation phenomenon, which allows the ribosome to produce multiple proteins from the same mRNA by shifting an open reading frame backwards by one nucleotide. The functions of –1PRF are to increase the genome coding capacity and to regulate gene expression. The key mRNA element necessary for –1PRF is a so-called "slippery site" (SS), which is a repetitive heptanucleotide sequence where the ribosome slippage takes place. One of the prominent examples of viral frameshifting is a *gag-pol* mRNA of human immunodeficiency virus type 1 (HIV-1). Here –1-frameshifting is necessary to maintain a constant ratio between viral structural proteins (Gag, 0-frame) and enzymes (Gag-Pol, –1-frame), and dysregulation of frameshifting efficiency is detrimental for the infectivity and viability of HIV-1.

Despite extensive research, the mechanism and modulation of –1PRF on the *gag-pol* mRNA remained unknown, which prompted us to study this phenomenon. Unlike in other viruses, –1PRF in HIV-1 results in

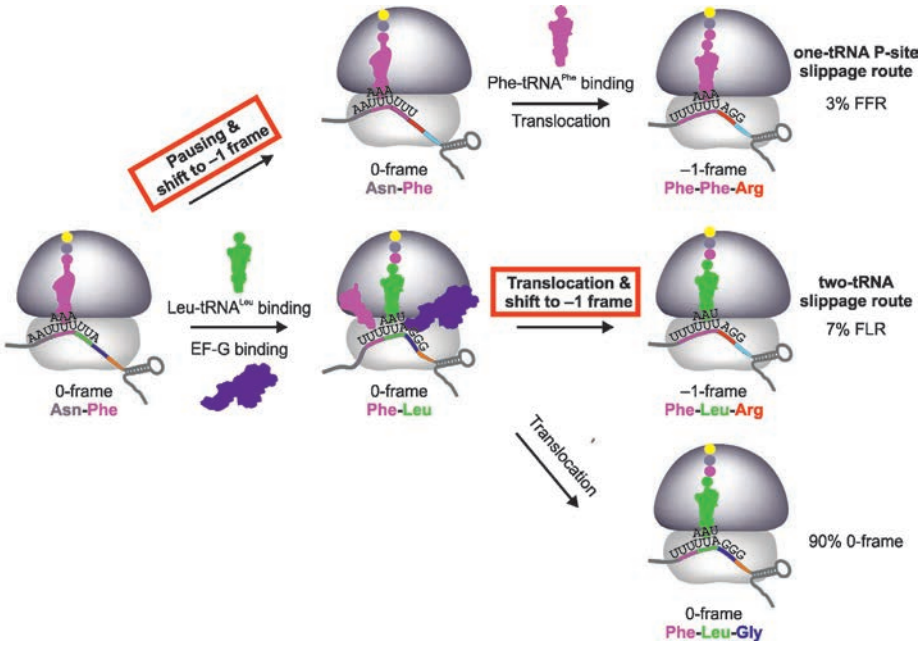


Fig. 1: Kinetic mechanisms of FFR (upper) and FLR (lower) –1PRF pathways on the *gag-pol* mRNA of HIV-1 with given frameshifting efficiencies. Phe-tRNA^{Phe} and Leu-tRNA$^{Leu(UAA)}$ reading UUU and UUA codons of the SS are in magenta and green, respectively. After reading the SS, translation can continue in the –1-frame by incorporating Arg at the AGG codon (red) or in 0-frame by decoding Gly at GGG codon (blue). The –1-frame commitment steps on the FFR and FLR routes are marked in red. Figure and legend are modified from Korniy N, Samatova E, Anokhina MM, Peske F, Rodnina MV (2019). Mechanisms and biomedical implications of –1 programmed ribosome frameshifting on viral and bacterial mRNAs. FEBS letters, 593(13), 1468-1482.

Götzke H, Kilisch M, Martínez-Carranza M, **Sograte-Idrissi S**, Rajavel A, Schlichthaerle T, Engels N, Jungmann R, Stenmark P, Opazo F, Frey S (2019) The ALFA-tag is a highly versatile tool fornanobody-based bioscience applications. Nat Commun 10, 4403

Jevtic Z, Stoll B, Pfeiffer F, **Sharma K**, Urlaub H, Marchfelder A, Lenz C (2019) The Response of *Haloferax volcanii* to Salt and Temperature Stress: A Proteome Study by Label-Free Mass Spectrometry. Proteomics 19(20), 1800491

Kokic G, **Chernev A**, Tegunov D, Dienemann C, Urlaub H, Cramer P (2019) Structural basis of TFIIH activation for nucleotide excision repair. Nat Commun 10, 2885

Koopmans F, van Nierop P, Andres-Alonso M, Byrnes A, Cijsouw T, Coba MP, Cornelisse LN, Farrell RJ, Goldschmidt HL, Howrigan DP, Hussain NK, Imig C, de Jong APH, Jung H, **Kohansalnodehi M**, Kramarz B, Lipstein N, Lovering RC, MacGillavry H, Mariano V, Mi H, **Ninov M**, Osumi-Sutherland D, Pielot R, Smalla KH, Tang H, Tashman K, Toonen RFG, Verpelli C, Reig-Viader R, Watanabe K, van Weering J, Achsel T, Ashrafi G, Asi N, Brown TC, De Camilli P, Feuermann M, Foulger RE, Gaudet P, Joglekar A, Kanellopoulos A, Malenka R, Nicoll RA, Pulido C, de Juan-Sanz J, Sheng M, Südhof TC, Tilgner HU, Bagni C, Bayés À, Biederer T, Brose N, Chua JJ, Dieterich DC,

two frameshifting products, FFR and FLR (letters refer to amino acids (aa) incorporated on and following the SS U_1 UUU_4 UUA_7), which differ by only one aa. To understand their origin and function, we translated the *gag-pol* mRNA in a fully reconstituted *in vitro* translation system. Synthesized peptides were characterized and quantified by reversed-phase high performance liquid chromatography followed by scintillation counting of radioactive labels on aa. The mechanisms of –1PRF were deciphered by a codon-walk approach, which allows to calculate the rates of incorporation of individual aa into a peptide and based on rate changes upon PRF determine the exact timing of the slippage.

We find that FFR and FLR peptides result from two distinct kinetic routes. The switch between two routes is modulated by the availability of a specific Leu-tRNA$^{Leu(UAA)}$ isoacceptor reading the UUA codon of the SS. Under Leu-tRNA$^{Leu(UAA)}$ limitation, the FFR product is dominant. FFR results from one-tRNA slippage of the P-site Phe-tRNA^{Phe} while the A site with presented UUA codon is empty due to the lack of the corresponding tRNA. This route takes place during the accommodation step of translation elongation and is often referred to as "hungry" PRF. If Leu-tRNA$^{Leu(UAA)}$ is present at the saturating concentrations, the FLR pathway takes over, which results from the two-tRNA (Phe and Leu) slippage over the SS during translocation and does not depend on the tRNA availability.

We also show that Leu-tRNA$^{Leu(UAA)}$ is rare in CD4$^+$ T-lymphocytes, the natural reservoir of HIV-1 infection in human host. Thus, the two routes of –1PRF in HIV-1 might represent an adaptation mechanism to maintain the constant frameshifting efficiency regardless of the fluctuations in the tRNA levels. Out data deepens the understanding of –1PRF in pathogenic viruses and sheds light onto the virus-host interactions at the level of tRNA profiles and protein synthesis. Frameshifting modulation by specific tRNAs might also lay a foundation for the novel virus-specific antiviral therapy minimizing side effects for the patients.

Natalia Korniy completed her doctoral thesis in the group of Marina Rodnina at the MPI for Biophysical Chemistry in spring 2019. Currently she works as a Management Trainee Biopharma at Boehringer Ingelheim.

These results were published in Korniy N, Goyal A, Hoffmann M, Samatova E, Peske F, Pöhlmann S, Rodnina MV (2019) Nucleic Acids Res 47(10), 5210-5222

Gundelfinger ED, Hoogenraad C, Huganir RL, Jahn R, Kaeser PS, Kim E, Kreutz MR, McPherson PS, Neale BM, O'Connor V, Posthuma D, Ryan TA, Sala C, Feng G, Hyman SE, Thomas PD, Smit AB, Verhage M (2019) SynGO: An Evidence-Based, Expert-Curated Knowledge Base for the Synapse. Neuron 103(29), 217-234.e4

Korniy N, **Goyal A**, Hoffmann M, Samatova E, Peske F, Pöhlmann S, Rodnina MV (2019) Modulation of HIV-1 Gag/Gag-Pol frameshifting by tRNA abundance. Nucleic Acids Res 47(10), 5210-5222

Korniy N, Samatova E, Anokhina MM, Peske F, Rodnina MV (2019) Mechanisms and biomedical implications of-1 programmed ribosome frameshifting on viral and bacterial mRNAs. FEBS Lett 593(13), 1468-1482

Kosinsky RL, Helms M, Zerche M, Wohn L, **Dyas A**, Prokakis E, Kazerouni ZB, Bedi U, Wegwitz F, Johnsen SA (2019) USP22-dependent HSP90AB1 expression promotes resistance to HSP90 inhibition in mammary and colorectal cancer. Cell Death Dis 10(12), 911

Labeling RNA with RNA

RNA labeling is an essential prerequisite to study RNA localization and structural dynamics. Site-specific labeling of naturally produced RNA at internal positions is a particularly challenging task. Despite the significance of such labeling methods, versatile, efficient tools for this purpose are largely lacking. Chemo-enzymatic RNA-labeling methods have shown varying levels of success. However, most of these techniques are either too specific or too general.

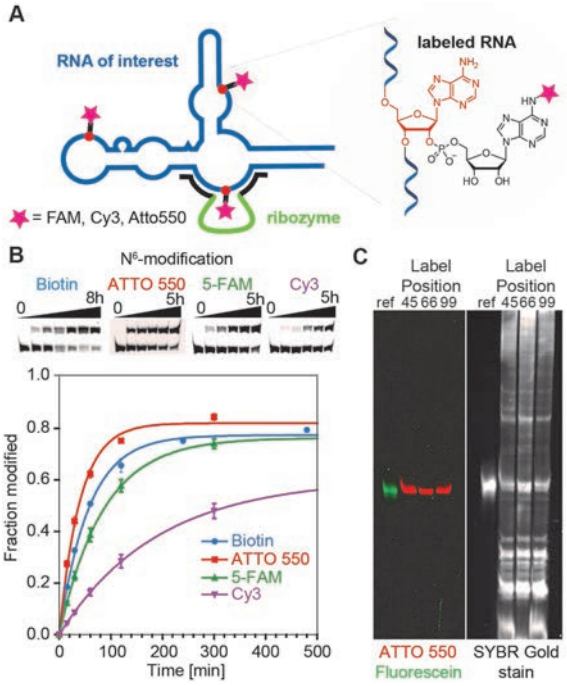


Fig. 1: (A) Schematic representation of FH14 mediated RNA labeling strategy. **(B)** Single turnover kinetics of FH14 mediated labeling of a short synthetic substrate sequence. Biotin can be replaced with a variety of labels with similar efficiency. **(C)** FH14 mediated ATTO 550 labeling of *E. coli* 5S rRNA in total cellular RNA context. FH14 can successfully label its target positions in *E. coli* 5S rRNA with high efficiency and specificity. *In vitro* transcribed fluorescein labeled 5S rRNA was used as reference (ref).

Deoxyribozyme based tools had previously been developed and optimized for site-specific RNA labeling in vitro. These DNA catalysts recognize their target sequence via canonical Watson-crick base-pairing and add a single nucleotide branch to the 2′-OH of a bulged adenine nucleotide. The ribose-modified nucleotide substrate for this labeling reaction can carry a biophysical probe or a bio-orthogonal functional group that is in turn attached to the target RNA. These tools demonstrate great specificity and efficiency *in vitro*. However, there are many challenges to overcome for applying them in live cells. RNA analogues of such deoxyribozymes can prove invaluable as they have greater potential for *in vivo* application due to vector encodability of RNA.

Since such RNA catalysts were unkown, the goal of our research was to develop ribozymes, that function under relatively mild conditions and are easier to target towards different RNA substrates. A partially structured random RNA pool was designed to direct the labeling reaction to a bulged adenine nucleotide in a hypothetical substrate sequence. N^6-biotinylated ATP was used as selection substrate to allow streptavidin/neutravidin based

Lakomek NA, **Yavuz H**, Jahn R, Perez-Lara A (2019) Structural dynamics and transient lipid binding of synaptobrevin-2 tune SNARE assembly and membrane fusion. Proc Natl Acad Sci USA 116(18), 8699-8708

Maidorn M, Olichon A, Rizzoli SO, Opazo F (2019) Nanobodies reveal an extra-synaptic population of SNAP-25 and Syntaxin 1A in hippocampal neurons. MABS 11(2), 305-321

Maier LK, Stachler AE, Brendel J, Stoll B, Fischer S, Haas KA, Schwarz TS, Alkhnbashi OS, **Sharma K**, Urlaub H, Backofen R, Gophna U, Marchfelder A (2019) The nuts and bolts of the *Haloferax* CRISPR-Cas system I-B. RNA Biol 16(4), 469-480

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Parra RG, Papadopoulos N, **Ahumada-Arranz L**, **Kholtei JE**, **Mottelson N**, **Horokhovsky Y**, Treutlein B, Soeding J (2019) Reconstructing complex lineage trees from scRNA-seq data using MERLoT. Nucleic Acids Res, 47(17), 8961–8974

retention of "self-biotinylating" RNA. Within 13 selection rounds, a number of active sequences capable of modifying the hypothetical substrate sequence were enriched in the library. Gratifyingly, several examples were able to catalyze the labeling reaction in trans. The most efficient variant was named FH14.

Probing data confirmed that the labeling occurred exactly at the 2′-OH of the unpaired A-nucleotide as planned. Co-varying the binding arms and the positions in hypothetical substrate sequence outside the modification-site confirmed the flexibility of these ribozymes (especially FH14) regarding their substrate sequence specificity. The ribozyme FH14 also readily accepts various N^6-modified ATP analogues as labeling substrates, including various dye-conjugated analogues.

The FH14 ribozyme was then challenged for labeling of cellular RNA targets, significantly larger than the synthetic variants utilized in initial characterizations. Three FH14 variants were designed to address three adenosines in different structural and sequence contexts within the *E. coli* 5S rRNA. The great performance of these ribozymes to specifically and efficiently label 5S rRNA at all three positions with fluorescent ATTO550-ATP, and in the context of total cellular RNA is demonstrated in Figure 1.

In summary, we have developed a method for the in vitro selection of RNA labeling ribozymes, which can readily be engineered for labeling various RNAs of interest, exemplarily shown for 5S rRNA. Similar ribozymes were then evolved using different biotinylated substrates and selection conditions. These new tools utilize bio-orthogonal labeling substrate and enable simultaneous multicolor labeling of target RNAs in different positions. These ribozymes will be reported in due course, and in near future will be optimized for live cell applications.

Mohammad (Farbod) Ghaem Maghami
is a PhD student in the group of Claudia Höbartner who joined the University of Würzburg recently.

These results were published in Ghaem Maghami M, Scheitl CPM, Höbartner C (2019) Direct *in vitro* selection of trans-acting ribozymes for posttranscriptional, site-specific, and covalent fluorescent labeling of RNA. J American Chem Soc 141(50): 19546-19549

Prajapati S, **Haselbach D**, Wittig S, Patel MS, Chari A, Schmidt C, Stark H, Tittmann K (2019) Structural and Functional Analyses of the Human PDH Complex Suggest a „Division-of-Labor" Mechanism by Local E1 and E3 Clusters. Structure 27(7), 1124-1136

Richter F, Dennerlein S, **Nikolov M**, Jans DC, **Naumenko N**, Aich A, MacVicar T, Linden A, Jakobs S, Urlaub H, Langer T, Rehling P (2019) ROMO1 is a constituent of the human presequence translocase required for YME1L protease import. J Cell Biol 218(2), 598-614

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Schneider D, **Chua RL**, Molitor N, Hamdan FH, Rettenmeier EM, Prokakis E, Mishra VK, Kari V, Wegwitz F, Johnsen SA, Kosinsky RL (2019) The E3 ubiquitin ligase RNF40 suppresses apoptosis in colorectal cancer cells. Clin Epigenet 11, 98

What is the trigger?

Identifying early markers of Alzheimer's disease

Alzheimer's disease (AD) is a progressive neurodegenerative disorder estimated to affect more than 40 million people worldwide. At the molecular level, deposit of amyloid beta (Aβ) and phospho-tau fibrils are main molecular hallmarks of AD that are commonly used for histopathological diagnosis. However, these molecular species cannot fully explain the cognitive decline observed in AD patients. The available knowledge on biological processes affected in the early stages of AD are particularly scarce. Therefore, in this study, we aimed to investigate the early stage differences in protein expression in AD brain. For this purpose, we used the triple-transgenic mouse model of AD (3×Tg-AD) that develops the AD-related phenotypes in a progressive pattern similar to humans.

We have used quantitative tandem mass spectrometry to profile the brain proteome of the 3×Tg-AD transgenic mice and their age-matched controls at four time points (2, 6, 12, 18 months) that correspond to the various stages of the disorder. Our analysis revealed several functional groups of proteins that were expressed differently between the 3×Tg-AD mice and the controls (see Fig. 1).

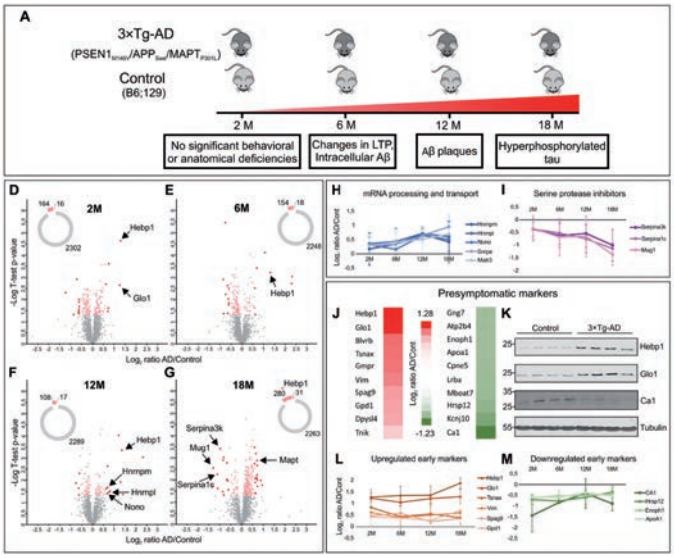

Fig. 1: Study design and comparative proteome analysis of 3×Tg-AD and control brain samples.

In the next step, we focused on the proteins that were affected most at the presymptomatic stage (2 months). Among this group of proteins, heme-binding protein 1 (Hebp1) demonstrated the highest degree of expression change and was upregulated in 3×Tg-AD mice at all the analyzed time points. To make sure that this result was not just a model organism artifact, we verified the levels of Hebp1 in postmortem human brain samples. The expression of Hebp1 was indeed elevated in AD patients.

Hebp1 belongs to the SOUL protein family and was originally identified as a tetrapyrol-binding protein capable of binding protoporphyrin IX and heme. However, no prior knowledge on its role in neurodegeneration or normal brain function were available.

So C, Seres KB, Steyer AM, Mönnich E, Clift D, **Pejkovska A**, Möbius W, Schuh M (2019) A liquid-like spindle domain promotes acentrosomal spindle assembly in mammalian oocytes. Science 364, eaat9557

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Truckenbrodt S, Sommer C, Rizzoli SO, Danzl JG (2019) A practical guide to optimization in X10 expansion microscopy. Nat Protoc 14(3), 832-863

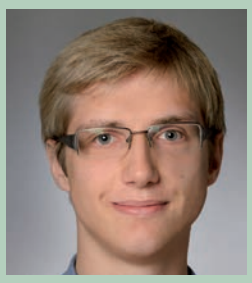
Vera Rodriguez A, Frey S, Görlich D (2019) Engineered SUMO/protease system identifies Pdr6 as a bidirectional nuclear transport receptor. J Cell Biol 218(6), 2006-2020

We thus further investigated the function of this protein in the brain. Immunohistochemical analysis revealed that Hebp1 is abundant in neurons. We aimed to decipher Hebp1 role by identifying its subcellular localization and binding partners in neurons. The data indicated that Hebp1 locates in a close proximity to mitochondrial outer membrane and interacts with MICOS complex, potentially via association with outer mitochondria membrane proteins such as SAMM50 and Mtx2.

The homologue of Hebp1, a protein called SOUL, is known to relocate to mitochondria upon cellular stress and was previously shown to be involved in cell death. We therefore were curious whether Hebp1 can also be involved in cell death of neurons, a pivotal process in AD progression. We knocked out Hebp1 by means of CRISPR/Cas9 in primary hippocampal neurons and then exposed both control and the Hebp1-depleted cells to different cytotoxic agents. Remarkably, depletion of Hebp1 protected cells from the excessive concentration of heme but not from other common cytotoxic compounds. The heme-mediated cell death in this scenario followed apoptotic pathway. Furthermore, we have determined that the treatment of neurons with exogenous Aβ also affected Hebp1-depleted neurons to lesser extend in comparison to the control cells. This may additionally suggest that Hebp1 promotes neuronal apoptosis specifically in the environment of AD brain.

Overall, our study provided a dynamic map of brain proteome in the progression of AD. We have identified Hebp1 as a novel protein involved in the early stage of the disease that is linked to neurotoxicity. What are the exact mechanisms and is Hebp1 an initiator or mediator of neuronal loss? We still do not have all the answers to those questions. However, we hope that this study will be a meaningful piece in the complex puzzle of Alzheimer's disease origin.

Oleksandr Yagensky completed his doctoral research in summer 2018 in the group of John Chua at the MPI for Biophysical Chemistry. Currently he works as a consultant at Bain & Company in Munich.



Mahdokht Kohansal Nodehi completed her doctoral research in November 2016 under the supervision of Reinhard Jahn at the MPI for Biophysical Chemistry. Currently she works as a postdoctoral researcher at Roche Diagnostics in Penzberg/Munich.

These results were published in Yagensky O, Kohansal-Nodehi M, Gunaseelan S, Rabe T, Zafar S, Zerr I, Hartig W, Urlaub H, Chua JJE (2019) Increased expression of heme-binding protein 1 early in Alzheimer's disease is linked to neurotoxicity. eLife 8, e47498

Watson ER, Grace CRR, Zhang W, Miller DJ, Davidson IF, Prabu JR, Yu SS, Bolhuis DL, Kulko ET, Vollrath R, **Haselbach D**, Stark H, Peters JM, Brown NG, Sidhu SS, Schulman BA (2019) Protein engineering of a ubiquitin-variant inhibitor of APC/C identifies a cryptic K48 ubiquitin chain binding site. Proc Natl Acad Sci USA 116(35), 17280-17289

Yagensky O, **Kohansal-Nodehi M**, Gunaseelan S, Rabe T, Zafar S, Zerr I, Hartig W, Urlaub H, Chua JJE (2019) Increased expression of heme-binding protein 1 early in Alzheimer's disease is linked to neurotoxicity. eLife 8, e47498

Zielinska AP, Bellou E, **Sharma N**, **Frombach AS**, Seres KB, Gruhn JR, Blayney M, Eckel H, Moltrecht R, Elder K, Hoffmann ER, Schuh M (2019) Meiotic Kinetochores Fragment into Multiple Lobes upon Cohesin Loss in Aging Eggs. Curr Biol 29(22), 3749-3765.e7

New Students

Master‘s class 2019/20

Rodrigo Alarcón, Peru
BSc, Cayetano Heredia University

Jannis Anstatt, Germany
BSc, Ruhr-Universität Bochum,
University College London

Artem Babych, Ukraine
MSc, Taras Shevchenko National
University of Kyiv

Daniel Blösel, Germany
BSc, University of Applied Sciences
Fresenius

Carmela Rieline Cruz, Philippines
BSc, University of the Philippines Diliman

Nesil Esiyok, Turkey
BSc, Istanbul Technical University

Tayfun Hazar Eyyuboglu, Turkey
BSc, Bogaziçi University, Istanbul

Vaishali Goyal, India
BSc, Sri Venkateswara College,
University of Delhi

Viktoriia Huryn, Ukraine
BSc, Taras Shevchenko National
University of Kyiv

Naintara Jain, India
BSc, Sri Venkateswara College,
University of Delhi

Sara Jamous, Romania
BSc, University of Bucharest

Mareike Lohse, Germany
BSc, Utrecht University

Frederike Maaß, Germany
BSc, University of Göttingen

Annabel Maisl, Germany
BSc, Julius-Maximilians-University of
Würzburg

Carolina Monteiro, Portugal
BSc, University of Aberdeen, Scotland

Denis Oliinyk, Ukraine
BSc, Taras Shevchenko National
University of Kyiv

Nadia Paglilla, Argentina
BSc, University of Buenos Aires

Atmika Paul, India
MSc, Indian Institute of Technology, Madras

Ana Carolina Schwarzer, Brazil/Germany
BSc, Federal University of Paraná

Applications 2019

In 2019, 712 students from 67 countries applied.

Germany 26 / West Europe 24
East Europe 77
North America 12
Central/South America 24
North Africa 55
Central/South Africa 104
Asia, Near East 46 / Far East 344

Damla Temel, Turkey
BSc, Middle East Technical University,
Ankara

Chairini Cássia Thomé, Brazil
MSc, Federal University of Rio Grande
do Sul, Eberhard Karls University
Tübingen

Marcel Stefan Waclawczyk, Germany
BSc, Heinrich-Heine-University
Düsseldorf

Akanksha Yadav, India
BSc, Indian Institute of Technology,
Bombay

Ryan Timothy Yu, Philippines
BSc, University of the Philippines
Diliman

PhD projects started in 2019

Julio Abril Garrido
Structural and biochemical studies of nucleosome-protein complexes in transcription.
Patrick Cramer,
Kai Tittmann,
Argyris Papantonis

Julia Kurlovich
Characterization and regulation of primordial germ cell development in common marmoset.
Ufuk Günesdogan,
Rüdiger Behr,
Melina Schuh

Sofia Ainatzi
Quantitative analysis of protein ubiquitylation in isolated nerve terminals.
Henning Urlaub,
Alexander Stein,
Reinhard Jahn

Valentyn Petrychenko
Macromolecules in motion by high-resolution Cryo-EM.
Holger Stark,
Marina Rodnina,
Helmut Grubmüller

Ivan Avilov
Coordination of the cytoskeleton in oocyte and in embryo.
Péter Lénárt,
Melina Schuh,
Roland Dosch

Debojit Saha
Mechanisms of chromosome architecture and aging in mammalian meiosis.
Melina Schuh,
Ufuk Günesdogan,
Markus Bohnsack

Sakshi Jain
Messenger RNA modifications in translation regulation.
Namit Ranjan,
Kai Tittmann,
Alex Faesen

Aikaterini Vrentzou
Investigation of regulated ER-associated protein degradation in *Schizosaccharomyces pombe*.
Alexander Stein,
Blanche Schwappach,
Ivo Feußner

Students
Graduated

The Masters of 2019

Julio Abril Garrido (*Patrick Cramer*)
Structural analysis of yeast transcription factor IID – nucleosome interactions.

Sofia Ainatzi (*Henning Urlaub*)
Quantitative analysis of protein ubiquitylation in isolated nerve terminals.

Ivan Avilov (*Dirk Görlich*)
Optimized immunostaining and STED imaging of starfish oocytes reveals clustering of nuclear pore complexes on the lamina during nuclear envelope breakdown.

Tiana Sophia Behr (*Stefan Jakobs*)
Comparison of mitochondrial architecture upon different apoptotic stimuli.

Ekaterina Chukhno (*Stefan Pöhlmann*)
Development and application of recombinant system and reporter virus models for herpesvirus SA8.

Polina Derevianko (*M. Dobbelstein*)
MDM4 supporting DNA replication in pancreatic cancer cells.

Anna Dyas (*Florian Wegwitz*)
Investigating the role of ROBO3 in triple negative breast cancer.

Mariana Eggert Martinez (*A. Fischer*)
Modeling the mouse hippocampal transcriptome in health and disease.

Nils Eickhoff (*Markus Bohnsack*)
Regulating the dynamics of RNA modifications: Characterization of ALKBH dioxygenases.

Matthew Grieshop (*Johannes Söding*)
An investigation of the sequence features specifying protein inclusion into biomolecular condensates.

Antony Grüness (*Till Ischebeck*)
Analysis of the pollen metabolome during rehydration and viability experiments.

Yehor Horokhovskyi (*Juliane Liepe*)
Characterization of immunopeptidome to eradicate senescent lymphoma cells after chemotherapy.

Mila Ilic (*Ufuk Günesdogan*)
Developmental competence for primordial germ cell fate.

Sakshi Jain (*Namit Ranjan*)
Role of Internal m6A mRNA modification in translation.

Julia Kurlovich (*Ufuk Günesdogan*)
Characterization of primordial germ cell differentiation in common marmoset.

Meline Macher (*Marina Rodnina*)
Co-translational folding of the beta-structured Cold shock protein A.

Wiebke Maurer (*Lutz Walter*)
Identification of signaling adaptor proteins of activating killer cell immunoglobulin-like receptors of the rhesus macaque (*Macaca mulatta*).

Noah Mottelson (*Patrick Cramer*)
Bioinformatic analysis of single cell-derived, newly synthesized RNA sequencing data.

Anastasija Pejkovska (*J. Wienands*)
Adaptation of protein depletion methods for the degradation of B cell antigen receptor signalling effectors.

Valentyn Petrychenko (*Holger Stark*)
Investigation of structure of ribosomal complexes using single particle Cryo-EM.

Elsa Rodrigues (*Ufuk Günesdogan*)
A CRISPR/Cas9-based method to analyse single transcription factor binding sites.

Debojit Saha (*Melina Schuh*)
Understanding the role of transcription in mammalian oogenesis.

Aikaterini Vrentzou (*Alexander Stein*)
Characterization of Plh1 as a Hrd1 substrate in ER-associated degradation in *Schizosaccharomyces pombe*.

Ka Man Yip (*Holger Stark*)
Optimization of 3D map quality in high resolution cryo-EM.

The Doctors of 2019

Arshiya Bhatt
Unraveling details of CIN85/CD2AP assistance to SLP65-mediated B cell activation.
(Wienands, Schwappach, Johnsen)

Marc Böhning
Investigating phase separation mechanisms for transcriptional control.
(Cramer, Urlaub, Zweckstetter)

Priyanka Choudhury
Functional analyses of RNA helicases in human ribosome biogenesis.
(Bohnsack, Rodnina, Stülke)

Ákos Farkas
The client spectrum of Get3, an evolutionarily conserved chaperone of membrane proteins.
(Schwappach, Stein, Rehling)

Sebastian Grosse
Gbp2 and Hrb1 continue their mRNA quality control in the cytoplasm and take part in nonsense mediated decay.
(Krebber, Lührmann, Großhans)

Martin Helm
A quantitative analysis of the molecular organization of dendritic spines from hippocampal neurons.
(Rizzoli, Brose, de Groot)

Prajwal Karki
Programmed translational readthrough in *Drosophila melanogaster*.
(Rodnina, Shcherbata, Krebber)

Goran Kokic
Structure-function analysis of human nucleotide excision DNA repair.
(Cramer, Stark, Höbartner)

Natalia Korniy
Recoding of viral mRNAs by –1 programmed ribosome frameshifting.
(Rodnina, Stark, Pöhlmann)

Franziska Kretzschmar
Protein turnover on plant lipid droplets.
(Ischebeck, Stein, Gatz)

Sebastian Ludwig
Investigation of the effects of the splicing inhibitor Pladienolide B and cancer related mutations in the SF3b1 protein on pre-mRNA splicing *in vitro*.
(Lührmann, Cramer, Ficner)

Indira Memet
Insights into the regulation of RNA helicases by protein cofactors.
(Bohnsack, Rodnina, Rehling)

Sara Osman
The Mediator kinase module: structural and functional studies in transcription regulation.
(Cramer, Stark, Schwappach)

Claudia Schmidt
Reconstitution of Doa10p-mediated ER-associated protein degradation with purified components.
(Stein, Schwappach, Stark)

Madhobi Sen
The role of ARID1A in oncogenic transcriptional (de)Regulation in colorectal cancer.
(Johnsen, Dobbelstein, Schuh)

Kashish Singh
New sample preparation techniques of macromolecular complexes for high resolution structure determination using cryo-EM.
(Stark, Tittmann, Ficner)

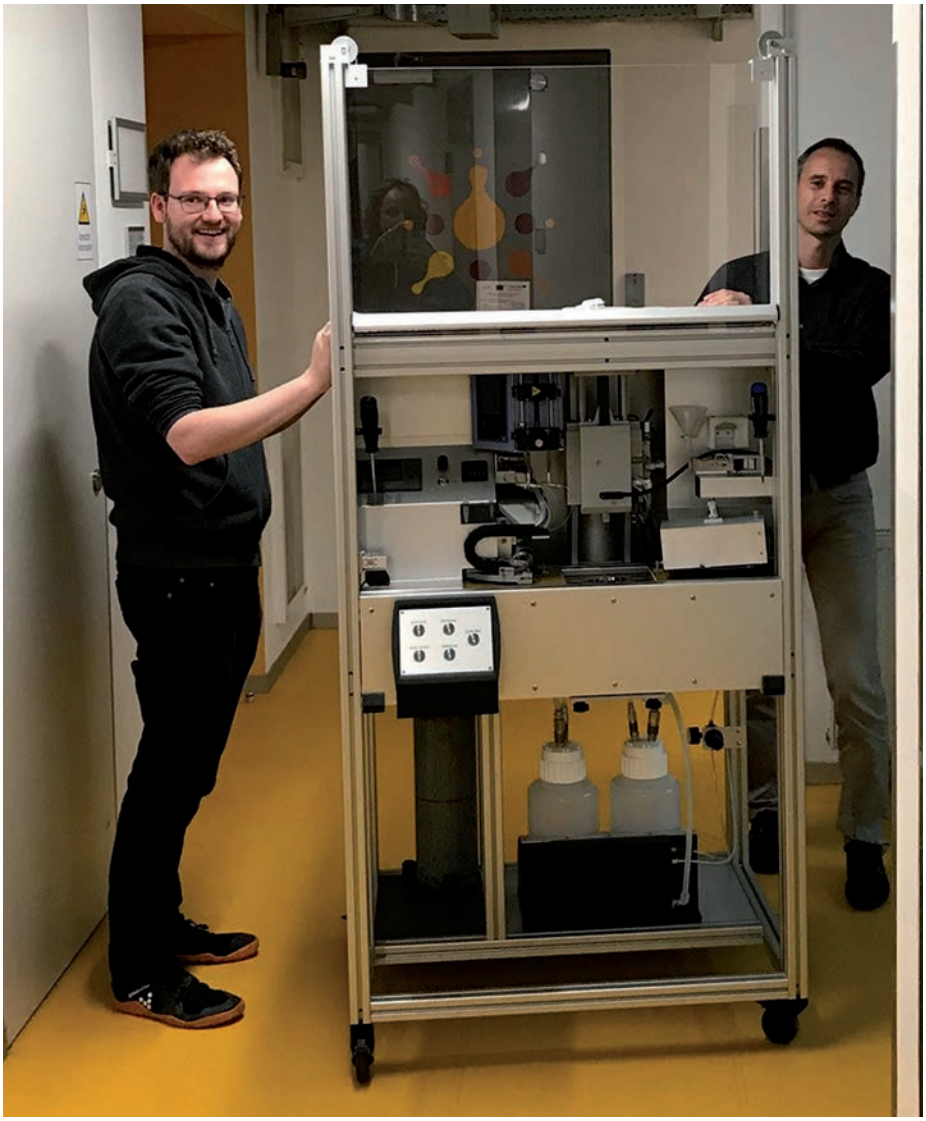
Shama Sograte Idrissi
Optimization of tools for multiplexed super resolution imaging of the synapse.
(Rizzoli, Rehling, Schwappach)

Daryna Tarasenko
Molecular investigation of mitochondrial inner membrane morphology.
(Meinecke, Schwappach, Dosch)

Vedran Vasic
Reconstitution of retrotranslocation by the Hrd1 ubiquitin ligase with purified components.
(Stein, Rehling, Steinem)

Group leader against all odds

After four years of PhD research and two years as a postdoc in the Stark lab I was encouraged that I could try to directly look for PI positions as my expertise in cryo electron microscopy was rare and wanted. Within a year I was invited to several interviews and indeed got in the end three offers. One tenure track professor in the UK, one in east Germany and a Fellow position in the IMP in Vienna. The latter one was, compared to the other two, very limited in time (3+3 years), in personnel (two positions) and resources, however was in a nice and friendly institute with very enthusiastic and helpful colleagues and, most importantly, easy access to any thinkable technique. And against all odds, I decided to take this offer for exactly these reasons. This gave me the possibility to start my independent scientific life with minimal pressure and was giving me the time to develop my own research program.



Newly built time resolved cryo EM apparatus

Thus, I moved to Vienna in August 2017 together with my wife Lisa. I got my own bench and office and could start right away with my own research, or so I thought. After all I have spent only little time in the lab to do experiments but rather have been in meetings to get to know all people, which proved to be very helpful indeed. I was brought in close contact with many different areas of biology that are very fashionable in Vienna such as chromosome organization, phase separation, transcription regulation or organoids. By having expertise in cryo EM I easily discovered many interested collaborative projects within these areas and could start to work on them right away. This made my research productive very early on and also helped to get workflows established for my lab.

While my workload increased, I started looking for personnel. I quickly found a technician who has been working in crystallography for many years, which was ideal for a start. And then I went looking for my very first PhD student. To do so I joined the Vienna Biocenter PhD selection. This challenged me rapidly with questions I have never given much thought before such as: How do I judge an application? After a lot of advice from my colleagues I defined a few ground skills that I think a good student would require and I tried quantifying them for the applications or interviews. And this seemed to work. While I thought I found a good way of judging candidates, almost all my colleagues told me “Don’t hire if you have the slightest doubt!” and “You yourself are your best employee” And indeed within the last two years I learned that these two were the best pieces of advice I have ever gotten in my career. I followed them

Group leader against all odds (continued)

and didn't employ anyone for several PhD selections as I always had doubts. With this misfortune I started looking for other kinds of personnel and found an amazing Bachelor's student and an outstanding Master's student so that I quickly had a small team together and could start to explore new areas for my lab in an efficient way.

While the students and my technician worked on our acquired collaborations and in the ubiquitin proteasome field, I started to build an apparatus for sample preparation for

Lisa, David and Matilda-Luise Haselbach

time resolved cryo EM. Indeed I had the opportunity and time to do a little engineering and build - with the help of the IMP's great workshop - a new device, which I proposed to be central to my future research which is focused on the biophysical chemistry of macromolecular machines. At the moment we are running the first assays on the device and gain new insights in the fast kinetic steps of ubiquitination and protein degradation in full structural detail.

Another important aspect in my life as early PI has been being part of the scientific community in Vienna and in the world. Local and international collaborators improved our work and brought us up to full speed quickly. While I am still collaborating with people that I knew from my previous scientific life I am in the great position of meeting big shots in science almost every week as they come as invited speakers to various seminars. Discussing with them has let already to a few breakthroughs in our work.

But not only scientific life was wonderful, as my wife and I got a little daughter in my first year as a PI. Here I was fully supported from the institute but also all of my colleagues and most importantly my small lab. Thus, while I took some time off, my lab was running still at full speed and we managed to produce the first structures within only a few months.

In summary the first two years in my position as a fellow at the IMP have been the most turbulent but also the most exciting two years of my scientific life and of my life in general. Within these years I finished building our new device, got several papers in revision and even received a major grant. And thus, so much for a happy ending, I was promoted early to become a real group leader by the beginning of 2020.

Haselbach lab Christmas dinner with members and collaborators

David Haselbach completed his doctoral thesis in the group of Holger Stark. He graduated from the Molecular Biology Program in October 2014 and continued his research in the Department of Structural Dynamics at the MPI for Biophysical Chemistry as a postdoctoral fellow. In 2017, David joined the Research Institute of Molecular Pathology (IMP) in Vienna as a Research Fellow. In 2020, he became a Group Leader at the IMP focussing on „Molecular Machines in Action".

My take on being a group leader - keep juggling

ICE 577 somewhere between Mannheim and Stuttgart, 17.01.2020
I am very late to write this article – in fact I have luckily already been granted an extension from Steffen. Now it is Friday afternoon and finally all the urgent to-dos of the week are completed and I can focus on some more creative work, like writing this article. I've gotten up early this morning to go from Tübingen to Heidelberg for an interdisciplinary event at the academy of sciences of the state. The goal of the event was to pitch the previously submitted research pre-proposals to an interdisciplinary audience with the aim to find collaboration partners in as far away fields as philosophy or economics. Still thinking about how to combine different research fields to answer an overarching research question, I'm happy the event finished early, as this has allowed me to catch an earlier ICE than expected. This means my dad will also get a free evening, as he is currently looking after our 1-year old daughter, while my husband, Carlos Eduardo Lima da Cunha (also know as Cadu), another Molbio alumnus, is on a business trip in Norway.

This brief insight into my day today gives a good flavor of what my life as a group leader at the Hertie Institute for Clinical Brain Research is like. There are many different demands and diverse tasks, I like them all, but somehow there is never enough time to do anything in as much detail as I wish (or sometimes on time). But somehow everything always gets done. Importantly, I'm very happy to have both a very active professional life but also an enriching and refreshing family life. In fact, I feel that the question of work-life balance hasn't arisen since my daughter was born - life always takes priority now.

Simone, Amalia and Cadu on a recent weekend trip to the black forest

Following my research interest in neurodevelopment
But how did I get here? I graduated from the Molbio program in 2014, having done my PhD on inhibitory synaptogenesis in the department of Nils Brose at the Max Planck Institute for Experimental Medicine and my Master thesis on human brain development and evolution externally at Yale University, USA. After an excursion to science policy at the European Commission, I followed my research interest in neurodevelopment as a postdoc at the University of California, San Francisco in the lab of Arnold Kriegstein. Here I had the chance to be at the forefront of research on single-cell biology and contributed to the field by developing a method that allows calcium imaging and transcriptome analysis of the same single cell (Mayer et al., Neuron, 2019). Using this approach, we revealed that neurotransmitter-based signaling has an exquisite cell type-specificity already at earliest stages of human brain development. In 2018, I moved back to Germany as an independent group leader at the Hertie Institute for Clinical Brain Research where I aim to combine my basic neuroscience research interests with clinical applications through collaborations with neurologists, pediatricians, and neurosurgeons.

In the last year, a main focus of my work was to set up my research team and establish a functional lab. My team now consists of a postdoc, a PhD student, a technician, and an internship student. Soon the first master thesis student will join the team. I find the management of a small highly international team (I'm currently the only team member that only has a German passport…) an exciting challenge. I'm trying to use different leadership strategies, which I got to know in diverse courses over the years in the different cultural backgrounds I have worked in, to set up a good team spirit and work culture. Setting up the lab has been a culture shock – coming from California, where most orders were delivered within days and new experimental ideas could be im-

My take on being a group leader (continued)

plemented within the same week, the complicated bureaucracy of a German university was unexpected.

This semester I am teaching for the first time an entire course, Developmental Neurobiology, to the MSc students. This has been very demanding on my time, but also very enjoyable and enriching as I had the opportunity to completely redefine and reformat the course. Being able to give a very broad overview of my research field while adding newest data and controversies that I have experienced myself in the last years at conferences has been very exciting and has surely also helped to broaden my perspective on my own research. It has been intriguing to see how critical the students are about research papers in our field currently published in top journals that employ systems biology approaches where concretely gained new mechanistic insights are sometimes hard to grasp.

Molecular Brain Development logo, design by Wendy Liu

The Mayer lab at the first summer party in July 2019

https://www.hih-tuebingen.de/en/forschung/independent-research-groups/molecular-brain-development/

"Horizons in Molecular Biology" lessons and contacts reloaded

So how does my current work link back to the times of being part of "the program" in Göttingen? In 2019, I was very happy to re-connect with the current Molbio students after the years abroad at two meetings, one at the retreat in Leipzig, one at the "Horizons in Molecular Biology" conference in Göttingen. Also, I can currently apply the lessons learned from being a Horizons organizer during my PhD times, while establishing a summer school program entitled "How life history affects ageing" that crosses disciplines at the Tübingen Neuro Campus (https://tuebingenresearchcampus.com/research-in-tuebingen-de-de/tnc-de-de/tnc-summer-school-2020/).

I would like to end with a huge "Thank you" to my Horizons co-organizer Wendy Liu. Knowing her graphics design skills from Horizons logo and poster design, I contacted her about the creation of a logo for my lab a few months ago, and she did a great job displaying how I'm aiming to combine molecular biology with human brain development in a simple logo. Thank you so much, Wendy!

Simone Mayer completed her doctoral thesis in the Department of Molecular Neurobiology (Nils Brose) under the supervision of Theofilos Papadopoulos. She graduated from the Molecular Biology Program in June 2014. After a 5-month traineeship at the European Research Council in Brussels, Simone continued her research at the University of California San Francisco in Arnold Kriegstein's lab as a postdoctoral research fellow. In September 2018 she joined the Hertie Institute for Clinical Brain Research in Tübingen as an Independent Research Group Leader.

From Labfolder to Labforward

2019 was a special year for labfolder, the company I had founded together with Simon Bungers, whom I met during my PhD in Göttingen. 2019 was the year Labforward GmbH was founded, by uniting labfolder and cubuslab, marrying two companies into one with one mission: to connect the laboratory environment.

With the Labfolder ELN, we can see how more and more research organizations are embracing the digital approach to research data management. More importantly, they are sticking with it and never looking back. There is something about finding your research data in seconds that is just magical, especially when compared to the experience of retrieving information from paper notebooks.

Labforward's unique approach to laboratory data management has enabled our software solutions to compete globally, attracting researchers in industry and academia. The merger has allowed us to grow from a small start-up into an innovation leader that convinced some of the biggest research organizations in the world to buy into nation- or worldwide roll-outs. It's just so simple: Manage your data, connect your devices, build your workflows on the go, and press play. Let's just say that lab automation is about to go mainstream!

Our company consists of many talented individuals driven to ensure that our customers receive the best possible experience. This year's merger has led our team to grow, resulting in us having plenty of new faces in the main offices in Berlin and Karlsruhe, and some members who work remotely.

Labforward founder and MolBio Alumnus Florian looking into the future of laboratories

Labforward´s solutions powering the lab of the future

Our company´s vision has united individuals who not only contribute their skills but also work hard to achieve the company's overall mission. Our aims are to create an inclusive and diverse team where everyone feels welcome, respected and appreciated.

We showcased our vision for the "Lab of the Future" at 2 trade fairs: Labvolution in Hannover along with BCEIA in Beijing. These exhibitions highlighted our newest product offering: Laboperator, the lab execution

Florian Hauer completed his doctoral research in the group of Holger Stark at the MPI for Biophysical Chemistry. He graduated from the Molecular Biology Program in August 2009. In 2012 he co-founded labfolder (www.labfolder.com), a free electronic lab notebook service for laboratory research, where he joined as COO. In 2019 labfolder was merged into Labforward (www.labforward.io) which he now supports as CPO.

From Labfolder to Labforward (continued)

Lab training for the Labforward software engineers

Thanksgiving at the Labforward headquarters

system for device management, lab IoT and smart workflows.

In addition to pushing forward our vision of smart and connected laboratory, we focused on improving some of the core features of Laboperator: jobs, measurements, and customizable user views.

For our Labfolder electronic lab notebook, we not only improved several existing features but also introduced Signature Workflows, an app which streamlines the data validation process.

The Labforward team in Summer 2019

Without giving away too many spoilers, here are a few things to look forward to in the coming year: In 2020 we will be launching a number of new features in our products, along with updating existing features to ensure that we're meeting the specific requirements of researchers whether they work in neuroscience, agriculture or chemistry.

Over the next year, we will continue to generate relevant content to strengthen our customer's knowledge about the benefits and opportunities of a fully functioning smart lab. We are always striving to improve our customer support system better, to ensure that our customers always receive the best possible service.

Our vision is to create an entirely unified, flexible, innovative environment where scientists can safely store their research data. Digital technologies and software are at the forefront of laboratory evolution, they alter the way experiments are executed and how findings are recorded and analysed. This new layer of connectivity allows for more expedited, efficient research to be conducted. Labforward is a company which excels in creating software for the laboratory, in the next year we hope to continue our mission to strive towards a more connected laboratory.

Adventures in Children‘s Publishing

How I published my first picture book and united my passions for science and art

Far from being a professional writer, in 2019, I unexpectedly became a best-selling author and illustrator of a picture book. This is the unusual story of how it all that transpired.

Awarded picture book on Charles Darwin‘s “On the Origin of Species“

I grew up in Bulgaria, in a small city situated in the Rhodope mountains, Southeastern Europe. The region features breathtakingly beautiful nature with lakes and vast woods. As a child, I used to take long walks in the forest and collected plants and other treasures which I examined under my toy microscope. I was also always drawing, as far as I remember.

At school, I excelled in Biology, and my parents encouraged me to choose science as a career pathway. I moved to Germany after high school and eventually made my way to the Molbio Program and International Max Planck Research School at the University of Göttingen. In the program, I found like-minded people, an exceptional learning environment and a genuine feeling of belonging. At the time, I was laser-focused on the path to becoming a molecular biologist. It was during the second year of my PhD at KIT when I decided to switch to a creative career.

Fast forward to 2017: I was living in England with my family, working as a graphic designer and studying MA in Illustration. My main focus became projects that combine science with art. For one academic assignment, I chose to make a picture book adaptation of Darwin‘s On The Origin of Species.

What fascinated me with Darwin‘s seminal work is the method by which, in the absence of modern technology, he arrived at his groundbreaking theory of evolution by natural selection. In his book, Darwin makes connections between diverse fields of science. He draws on examples from botany, zoology, anatomy, embryology and geology to support his ideas. We can infer from his success that breath and range can be a powerful way of making scientific discoveries. Maybe it is a trend nowadays for scientists to become specialized early in their career, which narrows their focus significantly. Staying intellectually curious and looking beyond one‘s field of expertise could lead to revolutionary findings.

During my research, I noticed many widespread misconceptions about evolution and became aware of ferocious opposition and controversies. I think the complexity of the subject and the archaic language of Darwin‘s book are a drawback to many who want to learn about his theory. This inspired me to make a picture book that is artistic, beautiful, inviting and at the same time, offer accurate scientific information. Both children and grownups can benefit from a more approachable and visually stimulating adaptation. I was able to distil a 500-page book into a short picture book by using diagrams, symbols, visual storytelling and even humor.

My vision throughout the process was a picture book I would have loved to read as a child and that I would still treasure today. We didn‘t have beautiful nonfiction when I was growing up, and it seems nowadays many adult readers are catching up and awakening the child within by reading science picture books.

Sabina Radeva completed her MSc thesis in the Molecular Biology Program in 2008 and started a PhD project at the Karlsruhe Institute of Technology. In 2009 she founded Design Garden Ltd, a graphic design and illustration studio (www.designgarden.co). In 2019 she graduated from the University of Hertfordshire with an MA Illustration with disctintion.

Adventures in Children's Publishing (continued)

One of the main challenges was creating the text. Some people jokingly say that, after all, what I did is simply retell an existing text. Yet, the writing process was not a walk in the park. I had to consult educators and scientists, who cautioned me the book is not suitable for young children. I won them over with my prototype pages of simplified text and colorful illustrations.

Another big obstacle was how to finance and self-publish the book. I turned to the crowdfunding platform Kickstarter with low expectations. Instead, the campaign amassed close to £50k, exceeding multiple times my funding goal and caught the attention of several publishers. The book was finally published in February 2019 by Penguin Random House. It became an instant bestseller on Amazon and sold out a month later in the UK. By early 2020, we are now on a third reprint and 31 translations. The book was nominated for several awards, with the most prestigious among them - Waterstone's „Book of The Year Award". It is an indescribable feeling finding my book in the company of Nobel Prize in Literature nominee Margaret Atwood and Greta Thunberg's volume of published speeches.

The whole experience revealed to me that my purpose and fulfilment stem from using all my skills and knowledge - at the intersection of art and science. And with a single twist of fortune, despite all plans and intentions, I became a children's book writer and illustrator. Meanwhile, I am doing editorial illustration for a children's science magazine and working on three new books.

If you would like to connect or reconnect, my LinkedIn profile is linkedin.com/in/sabinaradeva.

The author Sabina Radeva at work

View inside the picture book

Baby in a scientific family

Five lessons of parenting I learned so far

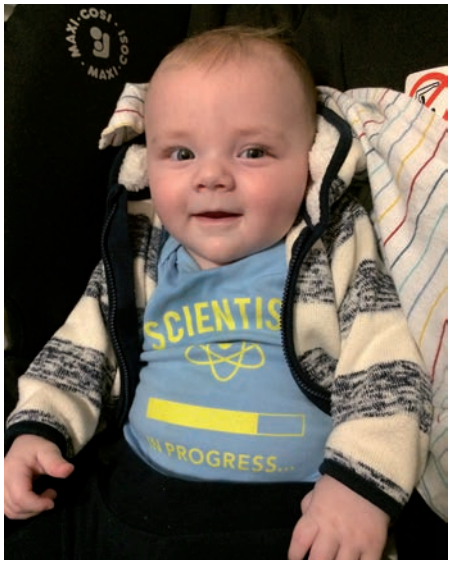
Our beautiful parenting experience started last July when our son Stephan was born. He arrived in a scientific family - I am a postdoc at the Technical University of Munich and my husband is a research associate in the Institute of Neuronal Cell Biology - however, we are still "beginners" in combining family and science. I am currently in maternal leave, so the experience of advancing my career while taking care of Stephan is still to come. But when I got the offer to write for the Newsletter, I thought I could share the main challenges I faced as a person who used to invest a lot of time in my work and had to sharply stop and change to an activity I had no experience in, even though I thoroughly prepared for it. And, following a trend of catchy titles like "10 reasons why wine and chocolate are good for you", here are the 5 main facts I learned during my still rather short parenting time:

(1) You become very socially isolated. For me that was one of the hardest things to face. I was ready for sleepless nights, for feed-burp-change-repeat and for crying without a reason. What I was not ready for – that all the things you like and you are used to do are gone in one day. There is only a wonderful tiny soul that needs you and the world ends there. For me the best way to fight it was to make arrangements I could not skip and forcefully go out – although it never seemed to be a right time to do so, afterwards I was always happy I did that.

(2) You receive a lot of advices. A LOT. From virtually everybody. Even from a random person in a supermarket suddenly approaching you and telling that she would not buy the baby food I chose. It does get you irritated at first, but a posteriori that was a good training for keeping calm and training my inner peace.

Nicolas, Oleksandra and their son Stephan

(3) You miss your work. I think this feeling is even more acute for scientists, since our work is a huge part of our social life and even leisure (what else would you do on Sunday, right?). I am very lucky that Nicolas, my husband, is also a scientist, so talking to him about his or my work was always very encouraging and helped me to feel less isolated from the life out there.



(4) Your baby has his own opinion. For example, among the hips of toys of all shapes and colors, Stephan's most favorite amusement is a zip-bag with diapers. I once gave it to him because of desperation during a car ride and he spent 40 (!) minutes quietly playing with it. I should patent that thing, really. Of course, sometimes this almost turns into stubbornness, but I learned to respect it and even take a little pride in my baby with "character".

(5) And the most important lesson comes last - you will never be prepared for everything. This is very difficult to embrace for a scientist – we are tuned to plan our experiments, projects, papers to minimize the unknown, to include dozens of controls and to have a back-up plan for everything. But now every day is a bit of a Russian roulette - will we have a lovely evening full of laughter and games or will we end up going to the hospital at 2 am because Stephan

Oleksandra Karpiuk was a PhD student in the group of Steven Johnsen at the University Medical Center Göttingen. After her graduation in November 2012 she continued her postdocal research at the Max Planck Institute for Immunology and Epigenetics in Freiburg (2013-2014) and at the German Cancer Research Center (DKFZ) in Heidelberg (2015-2018). Currently, she works as a postdoctoral research fellow at the Technical University Munich (TUM).

Baby in a scientific family (continued)

has fever? Only now, after months of protesting against the unknown, I finally start to find this uncertainty useful and even somehow pleasant. It reminds me how fragile and fleeting the most valuable things are and I enjoy the happy moments while they last.

Of course this list is by far not complete and there will be many more lessons with the years to come. Stephan will start going to the nursery in February and I dread the day when I will leave him with somebody else for whole 8 hours. And coming back to work and being a productive scientist while trying to be a good mother will be a whole new challenge. But it is a leap of faith – one just has to try. So I go on and hope that the lessons I learnt so far will be useful for some of the Molbio folks out there. One last thing - parenting is the most wonderful experience, enjoy the ride!

Honors and Awards

Faculty Members
(current and former)

Patrick Cramer has received the Ernst Schering Prize.

Dirk Görlich has been awarded an ERC Synergy Grant as member of a European research consortium.

Christian Griesinger has been awarded the Günther Laukien Prize 2019.

Herbert Jäckle received the Klaus Sander Award by the Society for Developmental Biology (Gesellschaft für Entwicklungsbiologie).

Reinhard Jahn received the "Aureus Gottingensis" medal by the University of Göttingen. Furthermore, he was awarded the Rolf-Sammet Guest Professorship by the University of Frankfurt.

Stefan Jakobs has been awarded an ERC Advanced Grant.

Tobias Moser has been awarded the Guyot Prize by the University of Groningen.

Marina Rodnina was awarded the Otto Warburg Medal by the German Society for Biochemistry and Molecular Biology (GBM) in cooperation with Elsevier.

Melina Schuh received the Gottfried Wilhelm Leibniz Award 2019 of the German Research Foundation (DFG).

Students
(current and former)

Mohamed El-Brolosy has been awarded the International Birnstiel Award for Doctoral Studies in the Molecular Life Sciences.

Mohammad (Farbod) Ghaem Maghami received a Poster Prize at the RNA Meeting in Krakow, Poland.

Patrick Müller has been awarded an ERC Consolidator Grant.

Amanda Schalk has received a 40 Under 40 in Translational Science Halo Award for scientists who are changing the world through innovative technologies.

Claudia Schmidt won the international Three-Minute-Thesis Competition presentation contest of the Combra group (see also p. 31 of this newsletter).

Ninadini Sharma has been awarded a PhD fellowship by the Boehringer Ingelheim Fonds.

Sumana Sharma has been awarded a Sir Henry Wellcome Postdoctoral Fellowship to continue her research in Oxford.

Summa cum laude distinctions for outstanding PhD theses and their defense in 2019 have been awarded to **Marc Böhning**, **Ákos Farkas**, **Martin Helm**, **Goran Kokic**, **Natalia Korniy**, **Franziska Kretzschmar** and **Claudia Schmidt**.
Congratulations!

Conversations with friendly strangers

How the Molbio/Neuro Alumni network helped me get the first job after my PhD

I finished my PhD last year and unsurprisingly, I was quite confused about what I wanted to do. It took some months of thinking guided by conversations with IMPRS Molbio/Neuro alumni to come to a conclusion. It was an unexpected but very rewarding experience that I describe below.

I grew up in a family of academics. I liked finding out more about things that interested me and so, having seen the people around me, my future seemed very clear to me. I had to decide what it was I wanted to find out more about and become a researcher in that field. And that's exactly what I did.

Speed-dating with alumni at a Molbio PhD Retreat. Left to right: Natalia Manrique (Springer Nature), Anita Smarandache, Madhobi Sen

Before I got into the Molbio Master's I already knew what kind of research I wanted to do. I was fascinated by how small perturbations in cells could wreak havoc and cause cancer. I wanted to know more and (as us all) contribute meaningfully to Science.

When I started my PhD, I loved it but as time passed and I was exposed to more people I realized I had never really thought about anything but the ultimate academic goal. I had viewed career fairs with skepticism, because I thought I knew what I wanted to do. Naive, I know. This changed when I started attending more career fairs where I realized that there was a whole network of alumni doing some very interesting things. Talking to an alumna working at Springer, I was intrigued. I had enjoyed writing, presenting and editing theses and manuscripts more than the minute details of lab work.

Later, when I attended the Lindau Nobel Laureate Meeting, the most important takeaway for me was how scientists had used the influence they had gained by winning the Nobel prize to contribute in very positive ways to society. And while they were foremost scientists, their role in society was possible because they were excellent communicators. I was convinced of the importance of the communication of scientific knowledge in a precise, accessible and effective manner to realize its full potential in society. But what did this mean? Should I be applying for scientific editor jobs? I couldn't think of too many other jobs in the field.

In a state of confusion, I took up Steffen's offer of discussing this with him. I inarticulately explained to him that I was broadly interested in scientific communication. Having had many such conversations with students, Steffen was able to gauge my interests. Sure enough, the next day I received from him the contact details of several alumni working in the field from editors to science managers to medical writers.

The next few months were an exercise in coming out of my reserved comfort zone and making the effort to contact people I had never met before. This was the only way I could find out what people were actually doing. I sent long emails to 4-5 alumni working broadly in communication and I was, to say the least, overwhelmed with the response. I had extensive resources sent to me, phone calls on weekends, cover letters corrected an hour before a midnight deadline and just some very interesting conversations. Each of them told me in detail what exactly they do (the day-to-day and the bigger picture), the rewards and the challenges, their career trajectories, the mobility in their job and across jobs among other things.

Such personal experiences from people at various stages in their career made me much more informed. I decided I

Conversations with friendly strangers (continued) & Review of Launch of Alumni Mentoring?

Round-table discussion of PhD students with Christian Stegmann (Bayer) at a Molbio PhD Retreat

wanted to apply for medical writer positions. A medical writer works with the large amount of documentation in the approval of medical products, dealing with clinical data and communicating it to regulatory authorities. I started applying and at this stage a very helpful resource was Stefanie Klug, the coordinator of the GAUSS career service and alumni network. She not only gave me some very useful feedback on my CVs and cover letters but also made me aware of many important aspects of the application processes for different jobs. However, as expected it was still difficult. I either got no responses or rejections for a while.

It was then that I contacted Ioanna Bethani again, the medical writer among the alumni that had got me very interested in the job that she was doing. The company that she had started her career in had no open positions, but when I asked, she encouraged me to send them an initiative application. I mentioned that I had been in touch with her and I got an immediate response.
In the next weeks of interviews, she gave me some very helpful advice, answering all my emails and was willing to talk on the phone whenever I had questions. I cannot emphasize how important her advice of 'being yourself' at interviews was. It worked and I got the job. Subsequently, she also talked to me about what to expect from the job and from Frankfurt where I would be moving. In all senses, she played the role of a mentor when she didn't really have to and for that I'm very grateful. And so, Steffen not only put me in contact with someone who helped me identify and get my first job outside of academics but has given me a connection in a new city where I don't really know anyone.

When the Alumni Mentorship Program was announced (if you are at the end of your PhD, please look this up) I decided to apply for it. I was matched with Bettina Görner, who works at a senior management position at Springer. I had got the job as a medical writer at this point, but I decided to continue in the program to keep interacting with someone with a broad and experienced perspective in the Science communication field. In my conversations with her, importantly, I have learnt things that I should keep in mind as I start my first job in industry from the point of view of someone who actively hires people. She has made me aware of keeping my skills diverse and updated in things that are emerging as potentially cutting-edge. I am looking forward to our conversations in the next few months and to being more informed.

I wanted to write about this in the newsletter because not everyone is aware of how willing the vast network of alumni are to help and advice you in many ways. And this includes Steffen and Stefanie. People like sharing their experiences. Write to them even if you don't know exactly what to ask. You will be pleasantly surprised. Long days in the lab at the end of your PhD can get frustrating. Such a conversation at the least might turn your day around or confirm something you already knew but at the most it can give you a job that you have been well informed about and more importantly a mentor.

Madhobi Sen completed her doctoral thesis with Steven Johnsen at the University Medical Center Göttingen (UMG). She graduated from the Molecular Biology Program in January 2019 and continued her research as a postdoc at the UMG for several months. In January 2020, Madhobi started as a Junior Medical Writer at Trilogy Writing & Consulting in Frankfurt.

YES, AND... Where science meets improv

How improv may help you to stop worrying and embrace the unknown

When I moved to Geneva for my postdoc, I wanted to add something new to my weekly routine of experiments in the lab. I had always loved theater and was once in a drama group. Geneva is a small but vibrant international place with lots to do and sure enough there was a theater group. A theatrical improvisation group to be more precise. The description read: We welcome everyone who is interested in practising theater improvisation and comfortable performing in English. I found that a little intimidating. I have never been good at speaking spontaneously in front of strangers even in my own language, let alone foreign one. But curiosity overcame my fears.

Elena (5th from the left, holding Z) with her Improv Group on stage

Elena (holding the guitar) with her Improv Group after the rehearsal

Improv, or impro is short for improvisation. There are as many ways to perform improvisation at theater as there are coaches. What unites them all is that during improvisation, actors create a scene on the spot without using a script. This makes it more spontaneous, more real, more exciting and of course, very scary for someone who has never done that before. There is no safety belt of a rehearsed script to hold onto! As if it wasn't scary enough to perform a rehearsed text in front of an audience, here we create something new from scratch. You might well ask, how is it done? Is it even possible to learn spontaneity? As it turns out, we all have a natural ability to improvise even if we are not fully aware of this fact. One way to develop this skill is by playing improv games.

A fundamental principle of improv that is at the basis of nearly every scene can be expressed in two words: "Yes, and…". What does this mean? For the scene to roll, two or more actors on stage must agree with one another and accept each others' ideas. The first to start a scene makes an offer by suggesting a particular reality that could either be weather, a character, a type of relationship between the characters, a location, or anything else. The other actor must accept this reality and add something to it for the scene to progress.

Why is the "Yes, and…" principle so important? What happens if you say "no"? Let's see. If one actor starts a scene by saying to his partner "It is cold today, isn't it?" and the partner responds "Not at all, the sun is shining", the scene won't go anywhere because it becomes a conflict of ideas. On the other hand, if the partner accepts the reality of the cold weather and adds "Yes, it is cold and windy", the scene can move forward. Actors then take turns to add something new each time.

In life, we often tend to say "no" to offers, or in other words, to reject ideas. Rejecting an idea on stage means killing the scene. Why do we say "no" to ideas? One reason could be a fear of the

Elena Kardash did her PhD research with Erez Raz, a former group leader at the MPI for Biophysical Chemistry, now at the University of Münster. She graduated from the Molecular Biology Program in November 2008. After several transitional steps and four years as a postdoc at the University of Geneva, Elena currently works as a researcher at the French National Center for Scientific Research (CNRS) in Gif-sur-Yvette near Paris.

YES, AND... (continued)

unknown. But on stage, we are only playing, nobody is going to get hurt while sailing rough seas on an imaginary boat with pirates or fighting a fictional dragon.

To my surprise, I found that practising improv was not only a fun activity filled with laughter, it also changed the way I approached life in general. After doing improv for some time, I noticed that I started saying "yes" to situations in life more often than before. I was calmer in stressful situations and felt more connected with people in general. Improv taught me how to listen and be more comfortable with making mistakes. In life, we are often scared of making a mistake. On stage, a mistake is great because it may lead to a funny situation. It also shows the vulnerability that makes us all human and people respond positively to that.

This is probably why there has been an increased interest in improvisational theater training in other professions far removed from performing arts. Improv helps people to form connections, be more spontaneous, take risks, and accept differences between one another. It also boosts creativity. I thoroughly recommend it!

Current profession and location of our PhD alumni

Profession

Academia / Research (57%)
Professor, PI,
academic staff 11%
Group leader,
senior scientist 5%
Postdoc 36%
Science management 4%
Other 1%

Private Sector (36%)
Scientist, team leader,
manager R&D 20%
Staff, team leader,
manager non-R&D 11%
Consulting 6%

Other Profession (5%)
Media, publishing 2%
Patent attorney 2%
Scientific software development 1%

Other (2%)
Other professions, internships,
job applications, family
management etc. 2%

Country Distribution

Europe (77%)
Austria 1%
Belgium 1%
France 1%
Germany 55%
Luxembourg 1%
Malta 1%
Netherlands 2%
Norway 1%
Poland 1%
Spain 1%
Sweden 1%
Switzerland 4%
Turkey 1%
United Kingdom 7%

North America (17%)
Canada 3%
United States 14%

Asia / Australia (6%)
Australia 1%
China 1%
India 1%
Iran 1%
Qatar 1%
Saudi Arabia 1%
Singapore 1%

How one opportunity leads to another...!

It all happened in September 2018, when Prof. Patrick Cramer reached out to the main organizers of Horizons 2018. 15th Horizons in Molecular Biology had just finished and while we were rejoicing over the success of Horizons symposium, an email from Prof. Cramer indeed felt like something we can now handle. He had been invited by PhD students of LMB, Cambridge to talk about his work in an annual symposium in Life Sciences.

The Göttingen team of organizers. From left to right: Eric Bucholz (Molecular Medicine), Ninadini Sharma (Molecular Biology), Sofiia Reshetniak (Molecular Biology), Rashi Goel (Molecular Biology), Cera McDonald (Genes and Development), Marco Dombrowski (Biomolecules).

Every year, a team of seven organizers from Cambridge teams up with equivalent number of organizers from a partner institute, that year IGBMC, France. The students in Cambridge approached Prof. Cramer and expressed their interest in having Max Planck Institute for Biophysical Chemistry as their partner institute for the symposium in 2019. This was the genesis of LMB-GGNB jointly organized Symposium in Life Sciences, 2019.

This opportunity was quite new to our program as it involved forming a team of enthusiastic students and organizing a symposium over Skype. After several discussions amongst each other and with Steffen, we decided to extend the opportunity to entire GGNB, from where we could meet students from all different programs and form a team of 7 graduate students. The concept of the symposium was very similar to Horizons but over a period of 2.5 days. One could call it a 'Mini-Horizons'. In the end, we managed to find an exciting team, organized the event through Skype calls and few meetings internally in Göttingen. Organizing Horizons in the past proved to be very helpful as we knew how to divide the tasks and what challenges to expect. After the virtual organizing part came the actual conference. The Göttingen team, received a warm welcome from the Cambridge team and within some time we started organizing the final pieces of the symposium. It was amazing that the faces that were usually seen on screens were finally seen in person.

The event begun with a keynote talk by Sir Gregory Winter, Nobel Laureate 2018. The scientific program included diverse topics and speakers including Magdelena Zernicka-Goetz, Hendrik Dietz, Tom Ellis, Wei Yang and others. We also had a wine and cheese poster session, a three-minute thesis competition, and punting. It was a wonderful opportunity to not only help organize the symposium while gaining insights from tons of exciting talks.

This experience made us realize the importance of networking and to absorb the fact that one opportunity simply leads to another, and one should be open to all kinds of ideas brewing up in the minds of young researchers. Prof. Cramer's initiative and Horizon's success led us initiating a new collaborative chapter with Steffen's help. We are very happy that the event succeeded to establish a new collaborative event in the catalogue of our program manoeuvers. We would also like to encourage others to take up such collaborative projects.

Please lookout for our GGNB newsletter, which will have more information about the event itself.

Rashi Goel and Ninadini Sharma

Rashi Goel and **Ninadini Sharma** are both PhD students of the Molecular Biology Program at the Max Planck Institute for Biophysical Chemistry. Rashi in the Department of Neurobiology (Reinhard Jahn), Ninadini in the Department of Meiosis (Melina Schuh).

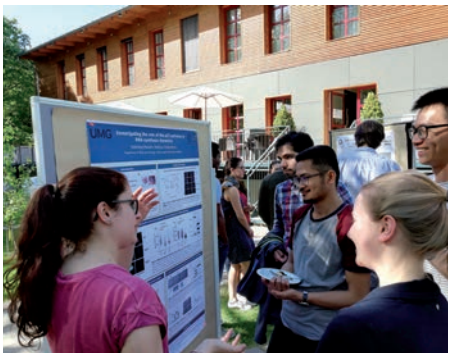
Our MolBio PhD retreat in Leipzig

Towards the end of each year I impatiently wait for the one email about the next PhD retreat and I ask myself: where is it going to be this year? In a castle like our 2018 retreat in Bremen? A cool city I haven't explored before? How is the breakfast (my favorite meal) going to be like? Well, 2019 did not disappoint me; our 30th MolBio PhD retreat took place last April, in the wonderful city of Leipzig! It was a great success, and all of us enjoyed our time together sharing our science, catching up and walking around the city center.

We left Göttingen quite early on a Thursday morning to arrive at the Michaelis Hotel by 10am sharp and, after a coffee and a few snacks, we immediately kicked in with the first sessions of oral presentations from the current PhD students. We were quite lucky with the weather, so in the afternoon we were able to host the poster session outside in the sun. The session was a success, we were all very excited (maybe too much, by my side) to hear about everybody´s science and to share information. In my excitement, I did not realize I was way over time and late for dinner: apologies to the poor souls who listened to me for 2h non-stop!

Finally, Friday morning arrived, which meant one thing: breakfast time. My personal review on the breakfast was 10/10, I was extremely satisfied with the amount of food, choice and coffee quality. Anyway… let´s get back to the science. After breakfast, we had the last session of oral and poster presentations, followed by an afternoon of cultural excursions and guided tours in Leipzig. The majority of us decided to visit the Panometer, a visual panorama displayed inside a former gasometer. I was personally very curious about it, because I have never heard of an exposition where the pictures are 30 metres high, and where digital technology is used to combine photos and paintings. This year's thematic exhibition was "Carolas Garten", where the viewer is the size of an ant, looking up at all the things of a former employee of the Panometer. The scientist in me was particularly interested in the electron microscopy involved in making the close-up bee!

Group photo at the PhD retreat in Leipzig



Valentina at her poster

Speed-dating with alumni after the career talks

On Saturday, the last day of the retreat, we had our annual Alumni career talks. We were joined by our fellow ex-molbios Carlos Eduardo Lima da Cunha, Annette Denker, Caghan Kizil, Simone Mayer and Lope Andres Florez Weidinger. We had the chance to talk about various career paths, including policy officer, consulting, industry and academia. The alumni speed dating was a great hit, and all of us students could talk to each alumni individually and ask questions about their career path, their struggles and their successes. The honesty and authenticity of the alumni made this session particularly insightful and enjoyable; I felt absolutely comfortable rising any doubt that came to my mind, and I had a much clearer idea about my future after all the discussions.

Something else exceptional happened during this retreat: the idea of a joint Neuro/Molbio retreat came up. To celebrate the 20th Anniversary of the two IMPRS programs, a combined PhD retreat will take place on 11-13 June 2020, so make sure to save the date! More information regarding the retreat will be sent soon, so keep an eye on your emails. We are very excited to take part in it, and we look forward to seeing as many of you as possible.

Valentina Manzini is a PhD student under the supervision of Matthias Dobbelstein in the Department of Molecular Oncology at the University Medical Center Göttingen.

The iBiology Young Scientist Seminar

On-camera training and recording of your first research talk

When we first stepped in front of the green screen, my fellow winners of the iBiology Young Scientist Seminar and me immediately started goofing around. We flailed our arms practicing the weird sideways gestures we would need to perform to point at our presentations during the recording, wrapped ourselves in backup sheets of green screen to make our heads float before the test image and just generally dissolved into giggles. This was also the moment when it really hit me for the first time – this is happening, we are doing this.

What was I doing here and how did I get there? The motto of iBiology is: "Bringing the World's Best Biology to You!" The platform hosts introductory video courses side-by-side with cutting-edge research talks, all presented by the world's foremost experts in their field. To give early-career scientists the opportunity to take part in this great sharing of knowledge and passion for research, iBiology instituted the Young Scientist Seminars.

And now here I was, after months of a competitive multi-stage application process including written proposals and online interviews, in front of a green screen in the iBiology recording studio in San Francisco. I'm not gonna lie: the cameras, the screens, getting mic'd up – it was intimidating! Luckily, the iBiology Young Scientist Seminar is more than a recording session. We weren't just thrown in front of the camera and told "GO!" No, we arrived here after extensive and professional preparation – months of online coaching, crowned by an intense three-day training program on site at the iBiology headquarters in San Francisco.

All four of us winners had honed our presentations for months before arriving, but I can honestly say that these three days did more for my presentation skills than all other courses I had ever taken, preparation at home, and presentation practice over the years, combined. The training itself was led by Carol Schindler, an acting professional and amazing coach who has worked in improvisational theater and acting training for decades. Her passion to help us improve combined with a keen eye for what was holding us back positively catapulted our performances forward.

The workshop participants playing with the green screen for the first time.

The winners of 2019, left to right: Sven Truckenbrodt, Karina Mondragon-Shem, Maite Ghazaleh Bucher and Katie Murphy.

On the first day, we hardly even touched our presentations – it was all acting training, figuring out how to perform in front of an audience and a camera. Carol started us off with some impro exercises to loosen us up and get to know each other. If you think that sort of thing is not helpful for you – wait until Carol puts you through your paces! I never got to know new people faster and learned more about my own strengths and what to work on than in these first few minutes. On the second day, we applied what we had learned to our presentations – and threw over almost everything we had brought here! Knowing what we had to do to get the response we desired from your audience meant radical changes, but I never felt insecure or rushed – we knew what we were doing now. On the third day, we perfected our presentations in one-on-one sessions with the iBiology team and checked out the studio for the first time. And finally, on the morning of the fourth day, it was time to record. One last, deep breath – and "GO!" You can watch the results for all of us online over at iBiology or YouTube.

It was a wonderful experience, but intense as well. I don't know if I had made it through it if it hadn't been for the amazing support of the iBiology team and among our little group of winners, constantly lifting each other up at every opportunity during our shared exercises, practice sessions and meal breaks. If you are on the fence of applying or not sure if you are "good enough" – just go for it! It's not about being perfect, it's about learning and growing – and you'll find the perfect environment for that at iBiology!

Sven Truckenbrodt did his PhD with Silvio Rizzoli at the University Medical Center Göttingen. He graduated from the Molecular Biology Program in October 2016. Currently, Sven is a postdoctoral research fellow at the IST Austria in Klosterneuburg.

Zooming out

… to present my PhD at the Three-Minute-Thesis Competition in Krakow

As scientists, we regularly discuss our experiments with our colleagues and present our results at seminars and conferences. We are (more or less) familiar with the background of our audience and know how to introduce our specific topic. But when our relatives ask us at the big family dinner, what we work on, we often struggle to find the right words to explain our research.

I realized that I needed to work on my communication skills so that I can finally talk about my work in an understandable way to people outside the "biology bubble". When a friend showed me the call for a three-minute thesis (3MT) competition, I got excited.

Why three minutes? The competition is structured as follows. Presenters have a time frame of three minutes to explain their research to a non-specialist audience. Originally introduced by the University of Queensland, such a competition is carried out each year by the Coimbra Group, an association of European universities. After initial competitions at each member university (including the University of Göttingen), a video of each winner's talk enters a Coimbra Group-wide competition from which three contestants are selected for the final.

Last year in January, I sat down to prepare my talk. How should I break down my PhD project on "Reconstitution of Doa10-mediated ER-associated protein degradation with purified components"? I soon came to realize that a lot of fancy terms such as "proteins" are not necessary to understand the essence of my project. Luckily, I prepared the talk together with a friend. This helped a lot to find and eliminate these complicated words and phrases. Moreover, I used metaphors to convey concepts. And by this method, I replaced my favorite protein Doa10, the proteasome and ER-associated protein degradation with the trash collector, the trash can and recycling in the cell. To keep the audience interested, I tried to narrate a story of my discoveries. When I finally had a story written down, I had to prepare my talk. The good thing about a three-minute talk is that you can practice wherever and whenever - so I got creative and my toothbrush as well as probably a lot of random people on the bus now know what I am working on.

The three finalists: Claudia Schmidt in the center

Source: Coimbra Group

The competition in Göttingen was a very interdisciplinary event. PhD students from disciplines such as biology, mathematics, agriculture, and history came together. Luckily, as the talks were prepared for a non-specialist audience, I was able to follow the presentations. I managed to win the competition in Göttingen and was super excited when I got the email that I was selected to travel to the final in Krakow where the annual meeting of the Coimbra Group took place last year. Owen James (University of Edinburgh), Femke Cnossen (University of Groningen) and I presented our PhD projects with topics ranging from Neurobiology to Economics. I was very surprised and happy to win the first prize! Afterwards, Femke, Owen and I enjoyed our stay in the beautiful city of Krakow where we ended the day with dinner in a traditional polish restaurant. And so, I not only received a prize but also met two amazing PhD students from such different fields that sharing our experiences was refreshing and fun. This made the trip absolutely memorable.

Despite having to deal with quite some nervosity, I really enjoyed presenting my PhD in three minutes. A scientific presentation usually contains a lot of detail. This talk was totally different. I tried to zoom out as much as possible to be able to deliver a bigger picture - being used to the opposite, this was quite a difficult but extremely fun task. Moreover, only one slide was allowed. I noticed that this has a big advantage on stage. I was able to give my full attention to the audience without any distractions. I had time to look at people, look at their expressions and how they react to my story. All in all, this 3MT competition taught me a lot. Especially, that talking about your research to people outside your bubble, zooming out of the details and getting connected with scientists from all disciplines can really motivate you to pursue your research.

Claudia Schmidt was a PhD student in the group of Alexander Stein at the Max Planck Institute for Biophysical Chemistry, where she currently works as a postdoc. She graduated from the Molecular Biology Program in November 2019.

A report from your fellow PhD representatives

Our goals, activities, and excitements

We, Salma, Valentina and Rashi, started our term as PhD representatives in May. Following our previous representatives Claudia and Franzi, we were excited to continue their established tradition of organizing social events tailored for PhD students who have lost part of their liver in culture nights. Other than the culture nights where we can dance and party, this seemed like a great opportunity to network in a quieter setting and connect with our fellow students.

We were also interested to understand the way the program works and see from the other side how the administration manages to put out the fully functional MolBio program. In the last months, we have had the fantastic opportunity to attend the program committee meetings, discuss the curriculum and, based on the previous feedback, suggest possible changes. This way the MolBio program itself keeps improving over time, we are very happy we got the chance to become a part of this by representing the interests of our students.

Being a representative at our program has other advantages too. Even though there is a long-established tradition (almost 20 years now) of doing things in certain ways, Steffen is always seeking feedback from students to change things for the better and was open to us whenever we wanted to discuss our ideas with him. We took advantage of this to push for one of the issues that felt close to our heart. Having experienced PhD for two years, we knew that it is a rocky road for everyone. But we also realized there were ways to minimize the bumps on the road. We therefore sought for ways to transfer this knowledge to younger MolBio generations.

Being your representatives has been very rewarding. We took advantage of being close friends already and had many organizing and brainstorming sessions over dinners at each other's places. As a result, we have organized several events by our mid-term which we would like to report on:

A summer BBQ

Who doesn't like barbequed piece of meat or veggies when the weather is bright and sunny with a pint of cold beer! Well, the event organized at Kiessee brought around 40 people together where we started with food and ended the afternoon with games.

The event took place at the end of August last year, and it was particularly nice since the participants were all from different batches and from both the Neuroscience and Molecular Biology programs. The number of people was also perfect for having one-to-one conversations with everybody. Thanks to the suggestion of some students, we made sure to keep the event as eco-friendly as possible, avoiding plastic plates or cutlery. Instead, we all brought our own plates and forks from home. We really appreciated the suggestion, so please feel free to contact us with ways to improve our social events!

Since it was a great success, we hope that the summer BBQ will continue to happen in the future and hopefully become a yearly tradition.

Seminar on 'A guide for a happier PhD experience'

PhD is difficult at times — for everyone. The amount of academic pressure has been increasing over time with increasing competition among academics and the prevalence of mental health problems among PhD candidates is at an alarming rate. We have realized through our own PhD experiences and sharing thoughts with others that choosing a fitting research group and a supporting network can minimize many of such problems. On the other hand, our program has a perfect structure for raising awareness on such issues. We have the unique opportunity to try many labs before committing to master and PhD projects. This also encouraged us to hold a seminar for first-year Master students, sharing some thoughts and experiences to encourage more reflection on their future steps.

On the course of this seminar, we discussed important criteria to choose a fitting lab, ways to evaluate a lab culture before spending a considerable amount of time working there, how to

A report from your fellow PhD representatives (continued)

choose TAC members, how PhD funding works, and where to seek mental and personal support when encountering problems during studies.

We believe that this has been a small step to enhance the quality of scientific life on our campus. Encouraged with a lot of positive feedback afterwards, we feel motivated to continue the seminar in the following years.

News for our new MolBio students: Our next seminar will take place on **April 1st, 2020**. Keep an eye!

Hiking in the Harz mountains

To celebrate the arrival of our new master class and with the aim of connecting different generations of MoBio and Neuro Master and PhD students, we organized a hiking event that took place on October 13th. We co-organized this event with the help of Master students Alex and Marcel and were delighted to have more than 70 participants ranging from newcomers to last year PhD students.

We started the trip by a regional train ride from Göttingen to Goslar and then headed for our round route of 14 km through the Harz mountains from the Goslar train station. We shaped a very long queue strolling the streets which was indeed an interesting sight for the locals. By the mid-point, we had gained quite some elevation along the way and could enjoy a beautiful view over Goslar and its surroundings.

After five hours of successful hiking, talking, resting and absorbing the beauty around us, we rewarded ourselves by a break at a local cafe which was arranged to exclusively serve our weary hikers. All-in-all we enjoyed getting to know the new faces and catching up with the old ones while doing some exercise on a lovely sunny autumn day.

We are grateful that you trusted us for this position and are happy to have spent many good moments with you. If you have suggestions for improvements, have feedback for us, or ideas you want to implement, don't hesitate to contact us. Being a PhD student representative has been a rewarding and educating experience for us. We will have the next call for volunteers in April. If you are interested in continuing this role, don't miss out on this opportunity!

Salma Sohrabi, Rashi Goel, Valentina Manzini

Salma Sohrabi, **Rashi Goel** and **Valentina Manzini** have been elected as PhD student representatives of the Molecular Biology Program for the current 2019/2020 term.

Three take-aways from Lindau

A report on the 69th Lindau Nobel Laureate Meeting

The 69th Lindau Nobel Laureate Meeting dedicated to physics took place from 30 June to 5 July 2019. This year 39 Nobel laureates and 580 young scientists from 89 countries gathered to discuss topics like laser physics, gravitational waves, dark matter and cosmology. I was honored to attend the meeting – together with the neuroscience students Dimokratis Karamanlis and Sinem Sertel – engulfing myself in areas I had only read about in Steffen Hawking's popular science books or in the news. But the meeting was not limited to that. While such Lindau gatherings are dedicated to outstanding scientific discoveries, they are also a platform to communicate science to the public and to encourage discussions on the future of science by connecting the most distinguished scientists with an enthusiastic younger generation of researchers.

I would therefore like to elaborate on three aspects I particularly enjoyed about this year's Lindau meeting:

1. Lindau: A platform for change

The moment I entered the conference venue for registration, I was astonished by how organized everything was. But also, by how many photographers and journalists were around. This feeling of being observed continued to be a recurrent theme throughout the meeting and even though it felt weird and overwhelming, it distinguished this meeting from other scientific gatherings. The media attention gave us, young scientists, a unique opportunity to discuss our favorite scientific topics. More importantly, the media also allowed us to openly voice our concerns on pressing issues in the scientific world. I took advantage of this opportunity in the following days, when I chatted with several journalists – both informally and as official interviews – about such issues. I discussed the threat of nationalism on international collaborations and the future of science, as well as my concerns on cases of power abuse in academia resulting from the ever-increasing stress scientists face.

Salma Sohrabi, Dimokratis Karamanlis and Sinem Sertel (from left to right) at the conference venue and on the Mainau island

The meeting program also included a panel discussion titled "Student, PostDoc, and then?", focusing on the career development for younger researchers and addressing our challenges in gaining visibility and getting the most out of a non-deterministic system. This fostered a lively discussion between students and Nobel laureates. One of the insights I kept from Nobel laureate Wolfgang Ketterle was related to defining interesting projects in science and boils down to this: if you can get your peers or students excited about a project, you're already on the right path.

2. Big scientific collaborations in physics

During the conference week in Lindau, mornings were filled with talks of Nobel laureates, usually explaining the history of their discovery and its implications. Among others, I learned about the 2013 Nobel prize on characterization of the Higgs mechanism (how elementary particles get their mass) which was experimentally measured in CERN, the 2015 Nobel prize for the discovery of neutrino oscillations *via* giant neutrino detectors, and the 2017 Nobel prize for the detection of gravitational waves by the LIGO consortium. What all these discoveries have in common is the un-

Lindau 2019 (continued)

derlying multi-national collaborations that brought hundreds of researchers together and enabled a revolutionary breakthrough.

Such large-scale collaborations are very common in physics. The considerable expense of many instruments and their complexity encourages physicists to work closely together more often than in other fields. Does biology have anything to learn from such gigantic projects? While we have had bigger consortia like sequencing the human genome, Encode, and some Flagship Projects, their success was not always so far as planned. Moreover, these projects were still made up of rather independent efforts from participating labs. I therefore wonder if we could foster similar large-scale collaborations and shared techniques, instruments, protocols, and preliminary results more widely. Maybe this would foster an acceleration of advancements in biology.

Lindau island's lighthouse and lion statue

The view from Lindau's lighthouse

3. Networking: Meeting many enthusiastic young researchers

The Lindau meeting was enriched by discussions of young scientists from diverse scientific backgrounds coming from various corners of the world. We had many opportunities to talk with fellow participants in small groups, during events organized for breakfast, lunch and dinner. Moreover, every dinner had an open-end and often resulted in late night discussions at the venue or at a local bar.

Those interactions brought about the formation of a "diversity group" with the aim of promoting discussion on the struggles of the LGBT+ scientists and gender imbalance in academia and suggesting ways to address such problems in the future. I also benefited from discussing my project with physicists who often had a different mindset in approaching the same problem.

Although Lindau was a place to learn and to get inspired, it was more than just talks, lectures, and panel discussions. We had two cultural evenings: one hosted by South Africa and another by the state of Bavaria. In these two evenings, we tried traditional food, watched traditional dance performances, and danced along ourselves. On the last day of our stay, we took a boat trip to the marvelous Mainau island, where we had time to catch up once again with the lovely people we had met during the week. Some of the highlights included walking through the beautiful flower gardens, visiting a butterfly reservoir, and eating local products of the island in a science picnic. On the way back, we enjoyed a beautiful view through lake Constance one last time and celebrated a successful week on the boat.

On the last evening, I was lucky enough to get an exclusive ticket for the Voyager III concert, where Nobel laureate John Mather and German singer and songwriter Gisbert zu Knyphausen joined on stage and took us to a musical journey to interstellar space. The theme of the evening was nominating pieces for Voyager III and answering the big questions musically and intellectually: Who are we? What are we doing? And how do we live?

After Voyager III concert. From left to right: John Mather, Jane Hauser Mather, I, and Sinem Sertel

Salma Sohrabi Jahromi
is a PhD student in the Research Group Quantitative and Computational Biology of Johannes Söding at the Max Planck Institute for Biophysical Chemistry.

Looking out to the Horizons and beyond

As every year, the MolBio September is marked by the Horizons in Molecular Biology symposium, inviting many great scientists of all age groups to come together in Göttingen to have a good time.

For the 16th time, the conference took place with the goal to provide a platform for young scientists to listen and meet established peers in the molecular life sciences. Based on the success of the student-organisers from previous years, the conference offers a variety of lectures, activities and events.

The conference kicked off with the 13th Horizons Career Fair in Life Science, which aims at answering the question of "What is a Career in Life Science?" To do so, scientists working around academia, industry, publishing are invited to join, giving talks about their experience from Bench to the position they currently hold. Highlights this year were people like Andreas Laustsen, who is both a bioentrepreneur and faculty member at the University of Copenhagen, Bernd Reichert from the EU Commision talking about a career in science policy and Beata Mierzwa, who showed the audience how to advertise her science through art. Furthermore, the Mol.Bio alumni Simone Meyer from the Hertie Institute for
Clinical Brain Research gave insights into her path from PhD student to a position as group leader in academia. The career fair also offered a set of workshops, allowing young scientists to expand the skills not taught in the lab. Deb Koen shared her experience as a career developer to teach how to bring science to life with presentations that pop, and Angelika Hofmann revealed the do's and don'ts of successful grant writing.

This years Horizons not only had the honor of hosting Michael Rosbash, Nobel Prize awardee in Physiology and Medicine of 2017, but also scientists who profile themselves through groundbreaking research and great personalities. Michael Levine, co-discoverer of the Homeoboxes, was always available for a fun chat. Needhi Bhalla talked about science, politics, joint by a casual joke and laugh to ease the atmosphere. Jen Heemstra not only came as a scientist but also as a career adviser, having plenty of advice ready for young rising scientists .

The venue was truly in the light of the Mol.Bio spirit, bringing together many scientists from all over the world, and creating a connecting atmosphere for everyone to share their work and passions. This year, we were joined by participants from over 20 different countries, spread over five continents. Next to presenting their work during the poster session, three students had the chance to give a talk during the awarded student talks. Shout out to to Angel

Looking out to the Horizons and beyond (continued)

Santiago-Lopez, Julie Trolle and Triana Amen for their great talks.

The preparations for the 17th Horizons in Molecular Biology are currently underway. In 2020, the Symposium will also be in the light of the 20th anniversary of the IMPRS in Molecular Biology, hosting alumni of the program whose work has been the starting point of the conference, and on which its success is built upon. By December 2019, we already had Pedro Carvalho, Abdou Rachid Thiam, Argyris Politis, Ramanarayanan Krishnamurthy, Jay Mellies, Jane Mellor and Rachel Green as confirmed speakers for our conference, and more are to be announced. For further updates on speakers, career fair and workshops, feel welcome to check our webpage horizons-molbio.de. If you got curious, save the date 14th to 17th of September 2020 in you calendar and join us for another great scientific gathering. See you at the 17th Horizons in Molecular Biology.

The Horizons 2020 Organizing Team

Horizons speakers 2019

Asifa Akhtar, Naama Barkai, Needhi Bhalla, Max Cryle, Miki Ebisuya, Robert Ernst, Randy Hampton, Jen Heemstra, Zoya Ignatova, Leo James, Michael Levine, Tatjana Kleele, Margaret McCarthy, Argyris Papantonis, Gaia Pigino, Leonie Ringrose, Michael Rosbash, Sjors Scheres, Pavel Tomancak, Christopher Vollmers, James Williamson

New Faculty

Joining the program in 2019

Sarah Adio performed her PhD work at the LMU with Prof. Manfred Schliwa and received her degree in 2007. After one year of postdoctoral research at the National Institute for Medical Research in London, she joined the MPI for Biophysical Chemistry as project leader in the department of physical biochemistry headed by Prof. Marina Rodnina. Since 2017, Sarah is a research group leader at the GZMB. As a new Molbio faculty member, she contributes to lectures and methods courses. Sarah's research focuses on single molecule biochemistry of macromolecular machines. In particular, she addresses fundamental questions on translation mechanisms of pro- and eukaryotic ribosomes with the aim to understand how protein synthesis is regulated, and to demonstrate how aberrant translation regulation relates to the development of diseases.

http://www.uni-goettingen.de/en/579309.html

Till Ischebeck did his doctoral research at the University of Göttingen, where he also continued as a postdoc from 2009-2010. After two years of postdoctoral research as an EMBO fellow at the University of Vienna, her returned to University of Göttingen in 2013 first as a postdock and since 2015 as a group leader in the Department of Plant Biochemistry. At that time, he was already involved in teaching and supervision of Molbio MSc and PhD students. As a newly elected Molbio faculty member, Till contributes to the practical training and to the lecture series for MSc students. His major research interests concern lipid droplet synthesis and degradation, pollen biochemistry and metabolism, as well as primary metabolite profiling. In 2019, he completed his habilitation.

http://www.uni-goettingen.de/en/533683.html

Peter Lénárt is an expert on light microscopy, who worked at the European Molecular Biology Laboratory (EMBL) in Heidelberg as a staff scientist (2008-2011) and group leader (2011-2018). After his PhD graduation in Heidelberg in 2005 he worked as a postdoctoral fellow for three years at the Institute of Molecular Pathology in Vienna. Since 2018, Peter is research group leader and head of the live-cell imaging facility of the MPI for Biophysical Chemistry. His research group is mainly interested in understanding how the cell division machinery, the cytoskeleton in particular, adapted to carry out the specialized cell division to produce fertilizable eggs during oocyte meiosis. In the Molbio program, Peter offers methods courses and lectures.

http://www.uni-goettingen.de/en/615167.html

Jochen Rink was appointed as Director at the MPI for Biophysical Chemistry in 2019. After completion of his doctoral research at the MPI for Molecular Cell Biology in Dresden in 2006, Jochen spent five years at the Howard Hughes Institute / University of Utah School of Medicine in Salt Lake City as a postdoctoral researcher. In 2011, he returned to Dresden as an independent Max Planck Research Group Leader. The research of his new department focuses on regeneration, using planarian flatworms as a model system in a highly interdisciplinary and methodologically diverse approach. In addition to the supervision of MSc and PhD students, Jochen contributes to the lecture series of the Molbio program.

http://www.uni-goettingen.de/en/614964.html

Marcel Wiermer completed his doctoral studies at the MPI for Plant Breeding Research in Cologne. From 2006-2009 he was a Feodor-Lynen postdoctoral fellow at the University of British Columbia in Vancouver, Canada. When he returned to Germany, he joined the Department of Plant Cell Biology at the University of Göttingen as a junior group leader. Since 2016 he is heading an independent research group at the Albrecht-von-Haller Institute for Plant Sciences, where he habilitated in 2018. As a new Molbio faculty member he contributes to the lecture series. Marcel's research investigates the molecular mechanisms that regulate spatial communication between the cytoplasm and the nucleus in plant cellular immunity to pathogenic microbes, using *Arabidopsis* as model organism.

http://www.uni-goettingen.de/en/557523.html

Leaving the program in 2019

Fabian Commichau joined the Molecular Biology Program in 2017 after his habilitation in Microbiology at the University of Göttingen. As a group leader in the Department of General Microbiology his research focus was on the control of glutamate metabolism in the Gram-positive model organism *Bacillus subtilis*. In the Master's curriculum he taught a lecture on Molecular Evolution and hosted lab rotations. In 2019 he accepted an offer for a professorship at Brandenburg University of Technology Cottbus-Senftenberg at the Institute for Biotechnology, heading the unit of Synthetic Microbiology. We thank Fabian for his contributions to the Molecular Biology Program and wish him all the best on his new position.

Halyna Shcherbata joined the Molecular Biology Program in 2009 after she had started as an independent group leader of the Research Group Gene Expression and Signaling at the Max Planck Institute for Biophysical Chemistry. In her research at the MPI-bpc, she focused on the role of the miRNA pathway in stem cells using *Drosophila* as a model system. Halyna contributed to the Molbio Master's curriculum with lectures on RNA-based regulation in eukaryotes and on cell adhesion. At the PhD level, her group offered methods courses on basic histology techniques. Halyna also hosted two PhD students in the Molecular Biology Program. Beyond her contributions to teaching, training and supervision, Halyna was a member of the Molbio admissions panel for many years, served as an examiner for the MSc oral examinations and participated in the Molbio MSc mentoring program as a mentor. In 2019, Halyna accepted the offer for a professorship at Medizinische Hochschule Hannover (MHH). The research of her group currently focuses on the control and regulation of germline stem cells" and on a *Drosophila* model of neuromuscular disorders". We cordially thank Halyna for her continuous commitment and invaluable contributions to the success of our program.

Vladimir Pena joined the Molecular Biology Program in 2015. At that time, he took over the lecture on "Protein Structures and Folding" and also taught the MSc methods course on "X-Ray Crystallography", while he had already actively participating in the training of Molbio MSc students even before. In the year 2019, Vlad accepted an offer to join the Institute of Cancer Research (ICR) in London as a full Professor of Structural Biology and Gene Expression, leading a research team investigating the mechanisms and structural basis of splicing regulation under normal, pathological and drug-induced conditions. We thank Vlad for his invaluable contributions to our program.

Current faculty members

University of Göttingen

Biology
S. Adio, G. Braus, R. Daniel, I. Feußner, R. Ficner, C. Gatz, U. Günesdogan, K. Heimel, T. Ischebeck, W. Kramer, H. Krebber, V. Lipka, B. Morgenstern, S. Pöggeler, J. Stülke, K. Tittmann, M. Wiermer, E. Wimmer

Chemistry
A. Janshoff, C. Steinem

Physics
J. Enderlein, D. Klopfenstein

Agricultural Sciences
B. Brenig

Medicine
M. Bähr, H. Bastians, T. Beißbarth, M. Bohnsack, M. Dobbelstein, R. Dosch, A. Fischer, U. Groß, H. Hahn, T. Moser, A. Papantonis, P. Rehling, S. Rizzoli, B. Schwappach, M. Thumm, J. Wienands

Max Planck Institute for Biophysical Chemistry
P. Cramer, A. Faesen, D. Görlich, C. Griesinger, H. Grubmüller, S. Hell, R. Jahn, S. Jakobs, P. Lénárt, R. Lührmann, M. Rodnina, J. Rink, M. Schuh, J. Söding, H. Stark, A. Stein, H. Urlaub

Max Planck Institute for Experimental Medicine
N. Brose, K.-A. Nave

German Primate Center
R. Behr, S. Pöhlmann, L. Walter

Alumni mentoring launched

One of the challenges for our PhD students towards the end of their doctorate is the decision on the next career step. The good news: There is a rich choice of career options as we can see from the colorful mix of professions of our alumni. Consequently, the question is not whether our PhD graduates will find a good job, but whether they have made themselves knowledgeable about professions that fit their talent and interest best and are ready to take well-informed decisions.

With our newly launched Alumni Mentoring Program, a joint initiative of the Molecular Biology and Neuroscience Programs, we intend to add to the already existing portfolio of career services. Its goal is to facilitate connections between experienced alumni and advanced PhD students or early-stage postdocs based in Göttingen across a wide spectrum of academic and non-academic careers and research fields. In the initial phase, 6-10 mentees per biannual call can participate and benefit from the personal and professional experience our alumni are happy to share.

In July 2019, a new online platform opened. Prospective mentees could apply for admission and our alumni could sign up as mentors. Within less than two weeks, 15 students had submitted their applications and a similar number showed intentions to apply later. Likewise, more than 40 alumni completed their applications to become a mentor and a similar number indicated their interest in joining the mentoring program in one of the next rounds.

The selection and matching process was completed by mid-August. Nine mentees qualified for the first cycle of our mentoring program and were matched with experienced alumni working in the field the mentees were most interested in. The mentees found it exciting that the mentors covered a wide range of different professions, including academic careers, scientists and managers in the private sector, consultants, policy advisors or publishing experts. A kick-off workshop in September and additional individual coaching sessions prepared the mentees for their mentoring relationships and supported networking activities in the peer group. Since then, the mentees meet regularly on their own initiative to share their ideas. Regular contact of the mentor-mentee tandems became established between mid-September and early October.

In a mid-program event in December, feedback was provided by both mentors and mentees, which was very positive throughout. In spring 2020, we plan a closing event for the first cohort of our Alumni Mentoring Program. At the same time, this event marks the kickoff of the next mentoring cycle. The final reports by our mentors and mentees will be carefully evaluated. We are grateful for the committed contributions by our alumni who volunteered to serve as mentors and look forward to further improving the program for future participants.

StB

20th Anniversary ahead

Dear current and former members of the Molecular Biology and Neuroscience programs, dear colleagues and friends,

On **September 18-20, 2020** we will celebrate our 20th Anniversary in Göttingen. The celebrations will take place after the Horizons conference and Career Fair (September 14-17). You are cordially invited to combine both occasions to visit Göttingen and stay in touch with your friends and colleagues. Please **save the date** and spread the information on the celebrations.

The format will be similar to our 15th Anniversary, including an official **ceremony** on Friday, an **Alumni Day** on Saturday and a **social closing event** on Sunday morning. Further information and an official invitation will follow soon. We look forward to meeting you there.

StB

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