AUG 2025

NEUROSCIENCE
NEWSLETTER

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

The Neuroscience Program...

... looking forward to the next 25 years!

Dear Students, Faculty, Friends, and Supporters,
this year, our MSc/PhD/MD-PhD Program and our International Max Planck Research School for Neurosciences are celebrating their 25th Anniversary! The celebrations will take place in Göttingen on September 12-14, with a more formal ceremony on September 12th. Together with our partners from the Molecular Biology program, we look forward to welcoming current and former members of our programs and share memories and success-stories of the past 25 years.
The anniversary week will open with the annual Horizons conference of the Molecular Biology program, featuring many alumni of both IMPRSs and Nobel Laureate Thomas Südhof as a keynote speaker. The celebrations on the subsequent weekend will take off with a scientific keynote by Nobel Laureate Randy Schekman, followed by the anniversary ceremony at the University Aula and the Alte Mensa. The recently reopened Stadthalle Göttingen will be our venue on Saturday for the Alumni Career Forum, Vision Talks including panel discussion, and an evening full of memories and personal interactions.
The anniversary celebrations will also mark an important step in the further development of our program: While the curriculum of our MSc program will remain unchanged, preserving its intensive and research-driven structure, we are going to welcome the last cohort of MSc students receiving excellence stipends from the Max Planck Society. We are confident that, as in previous years, our program will continue to attract highly talented and motivated students from around the globe and maintain its vibrant, interdisciplinary and international spirit!

A major development, triggered by recommendations of the Scientific Advisory Board at the GGNB Science Day in 2024, is the consolidation of the neurosciences programs within the Göttingen Graduate Center of Neurosciences, Biophysics, and Molecular Biosciences (GGNB). The two PhD programs Neurosciences and Cellular and Molecular Physiology of the Brain (CMPB) will be merged into a single, streamlined PhD program. This combined PhD program can be entered directly by students holding an MSc degree – the former mandatory intensive MSc year is no longer a prerequisite, allowing qualified students to start their doctoral research immediately. As part of GGNB, all the hallmarks of our program will be retained beyond 2030, when the funding expires for our IMPRS, including the professional skills courses and the thematic retreats, as well as dedicated Career Service, and the active Alumni Mentoring Program, which will continue to enrich the doctoral experience of our PhD candidates and foster their careers.
These strategic steps reinforce our commitment to providing world-class training while adapting to the evolving needs of early-career scientists. We look forward to welcoming the next generation of neuroscientists – whether they join us as MSc scholars in September or step straight into the newly unified PhD program. Together, we will keep pushing the frontiers of neuroscience research.

Nils Brose, Martin Göpfert & Jonas Barth

CONTENT

IMPRINT

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Layout: Dr. Stefanie Klug

Updating the Lines of Communication

Direct Hippocampal Feedback Modulates Cortical Output *by Tanvi Butola*

We experience the world around us – through sight, sound, smell, touch, and taste – and make memories as we go. These memories of our experiences – good or bad – tell us what we like or dislike, what to avoid or embrace. We never experience our world in isolation but in the context of the past experiences stored as memories. This interplay between our sensory environment and memory helps us learn from our experience. For the past two years, we studied two brain regions – entorhinal cortex (EC) and hippocampus. EC processes sensory information from the environment and routes it to the hippocampus, which converts this information into memories. The forward interaction from the EC to the hippocampus has been widely studied[1] but how the hippocampal feedback influences cortical processing and hence our perception of the sensory environment is still underexplored. In our study[2], we identified a direct feedback from the hippocampus to the EC that iteratively shapes the cortical information it receives and hence cortical output. Imagine a direct line for your memory to guide and influence how the cortex processes the information it receives from the surrounding environment. Such a circuit can have implications in PTSD, Schizophrenia or Alzheimer's disease where there is disconnect between our perception of the sensory environment and what our memory tells us.

Traditionally, hippocampal feedback to the EC was thought to occur indirectly: EC superficial layers send input to the hippocampus, which in turn relays feedback through EC deep layers before reaching superficial layers. Our study[2] reveals an additional, direct hippocampal feedback loop to EC superficial layers (Figure 1), enabling iterative modulation of cortical input. Using anterograde and retrograde tracing in genetically defined mouse lines, we confirmed the existence of this direct

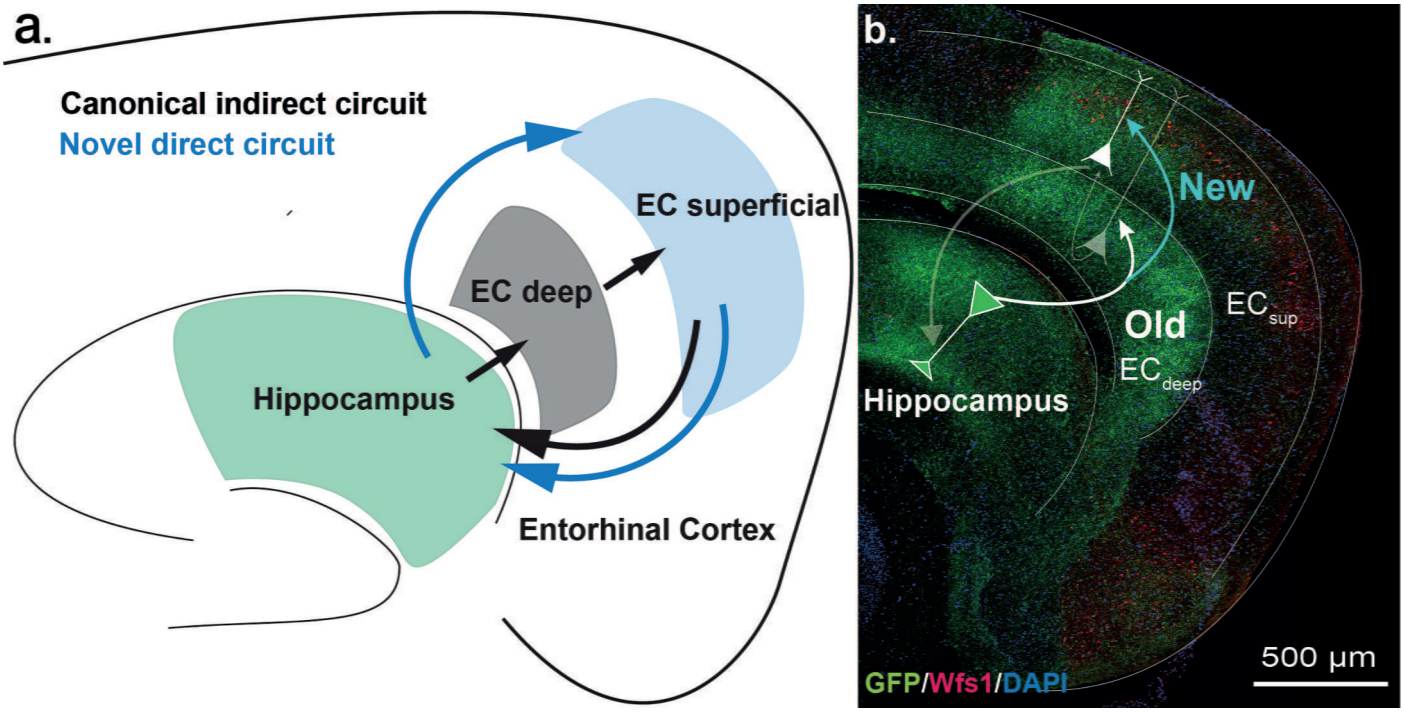

Figure 1. Updating the hippocampus – entorhinal cortex circuit. a, Cartoon showing a horizontal mouse brain slice with the canonical EC superficial – Hippocampus – EC deep – EC superficial indirect feedback loop shown in black arrows, and the novel direct EC superficial – Hippocampus – EC superficial loop shown in blue arrows. **b**, Confocal image of a horizontal slice of a mouse brain expressing eYFP in hippocampal neurons. Green hippocampal axons project to not only the EC deep layers but also the EC superficial layers which send multisensory information to the hippocampus for memory processing thus forming a direct cortico-hippocampal feedback circuit.

Updating the Lines of Communication (continued)

feedback, showing it is sparser than the canonical deep-layer feedback. Optogenetics and electrophysiology further revealed functional distinctions: deep-layer feedback is primarily excitatory, driving action potential firing in EC deep layer neurons, while superficial-layer feedback is inhibitory, eliciting only subthreshold responses. However, when paired with EC layer 1 inputs, the weaker superficial-layer feedback induces heterosynaptic plasticity, modulating cortical output. In contrast, deep-layer feedback strengthens its own synaptic connections through homosynaptic potentiation. Computational modeling indicated that iterative reinforcement of hippocampal feedback to EC superficial layers dynamically refines cortical output, enhancing learning potential. *In vivo* calcium imaging confirmed that hippocampal feedback modulates cortical activity in real-time during goal-oriented learning[3]. Furthermore, freely moving behavioral experiments revealed distinct roles for these feedback pathways: superficial-layer feedback is necessary for recall in novelty recognition, while deep-layer feedback supports object memory encoding. Using circuit-tracing, electrophysiology, optogenetics, computational modeling, freely moving behavior and *in vivo* imaging, we demonstrate that hippocampal feedback differentially modulates EC deep and superficial layers, impacting learning and memory.

Our study challenges and updates the classical model of hippocampal-entorhinal cortex circuit by identifying a direct hippocampal feedback pathway to EC superficial layers, and provides a mechanistic basis for how memory dynamically modulates cortical processing, shaping how experience guides behavior. These findings redefine our understanding of hippocampal-cortical interactions and their role in real-time cognitive processing. By identifying a direct feedback loop for iterative memory integration, our findings highlight a crucial substrate for experience-dependent learning and adaptive behavior.

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Tanvi BUTOLA did her PhD in the lab of Tobias Moser at the Max Planck Institute for Multidisciplinary Sciences. She is currently wrapping up her postdoc at the NYU School of Medicine in New York, USA, and looking for faculty positions in the USA.

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Sharpening the Tools to Illuminate the Blue Spot

by Alexander Dieter

After my graduation in the end of 2019, highly motivated to broaden my scientific horizon and switch the focus of my research, I decided to join the lab of Simon Wiegert in Hamburg, with the goal to investigate the contributions of the locus coeruleus (LC) to learning and memory formation. A few years and one lab move later, the story is a little different.

The LC, due to its high content of neuromelanin also termed the blue spot, is the brain's main source of noradrenaline (NA). After coming to fame as the brain's arousal system, the LC has also been shown to contribute to more refined brain functions such as sensory perception, attention, learning, and memory consolidation. To decipher how the blue spot, which only consists of around 1500 neurons in mice, mediates these manifold task, precise molecular targeting of LC-NA neurons, enabling monitoring and control of their activity, as well as specific, real-time monitoring of NA release can be of great help. Motivated to apply these techniques to learn more about LC function, I realized the hard way that not all that glitters is gold: Upon viral injections of various molecular tools in mice expressing cre recombinase under control of the tyrosine hydroxylase promoter (*Th*^{cre}), the most commonly used model system to access the LC, I realized that my transgene robustly expressed in many cells surrounding the LC – but only at disappointingly low levels within LC-NA neurons themselves. On the search to optimize my strategy I experimented with two more cre driver lines (*Dbh*^{cre}, *Net*^{cre}; where cre expression is mediated by dopamine-β-hydroxylase and the norepinephrine transporter, respectively), as well as a synthetic, NA-specific promoter (PRS×8). Despite these model systems

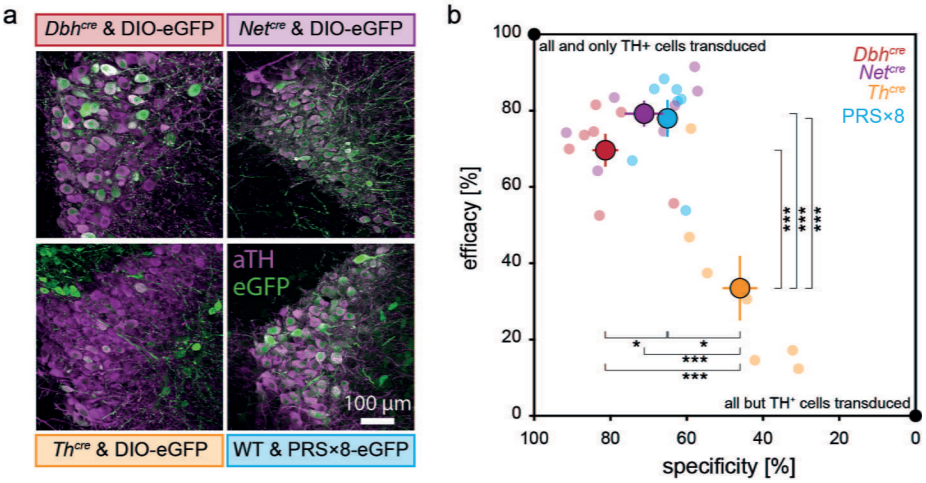

Figure 1. Heterogeneous expression patterns upon LC transduction in different model systems. **a**, Exemplary confocal images of *Dbh*^{cre}, *Net*^{cre}, and *Th*^{cre} mice injected with rAAV2/9-CAG-DIO-eGFP and wild-type mice injected with rAAV2/9-PRS×8-eGFP. Antibody staining against tyrosine hydroxylase (magenta) reveals the LC, while eGFP fluorescence was amplified with a GFP staining (green). **b**, Quantified efficacy (i.e., true positive neurons) and specificity (i.e., the inverse of false positive neurons) reveals highly heterogeneous expression patterns across the model systems shown in a. Error bars denote the standard error of the mean (with $n = 7$), while statistical significance is denoted by */**/*** for $p < 0.05/0.01/0.001$, respectively. Only significant differences are indicated.

should theoretically enable access to the same target neurons, transgene expression across model systems resulted in highly heterogeneous expression patterns (Fig. 1)[1]. During these experiments I finally identified the model system ideally suited to target LC-NE neurons, the *Dbh*^{cre} mouse, and besides documenting the diversity of expression patterns across model systems, which is crucial for the interpretation of previous and the design of future studies, I generated tools based on the PRS×8 promoter allowing monitoring (GCaMP8m) and manipulation (ChrimsonR) of LC-NA activity, irrespective of the genetic background of mice, which now allows for precise targeting of two different neuronal populations in the same mouse, when combined with any cre driver line of interest.

Having finally established the precise control of LC-NA itself, I was then looking for tools to monitor NA release in various target regions receiving LC innervation. Luckily, I came across Tommaso Patriarchi (Zürich University), who just developed a genetically encoded, green fluorescent noradrenaline sensor termed nLightG[2]. Similarly to the widely used GCaMP, nLightG consists of a ligand binding domain, in this case an α_1-adrenoreceptor, which changes conformation upon noradrenaline binding, and a fluorophore (cpGFP), the intensity of which is modulated by the aforementioned conformational change. Hence, by monitoring the intensity of nLightG-fluorescence, one can infer noradrenaline release in real time. Applying nLightG to different regions of the mouse brain, I managed to establish bilateral real-time monitoring of NA release in the LC as well as the hippocampus (HC) using fiber photometry, combined with optogenetic control of

Sharpening the Tools to Illuminate the Blue Spot (continued)

the LC itself (Fig. 2a-d). I then performed some initial experiments on the physiology of norepinephrine release: First, I looked into reuptake kinetics of NA, which were much faster in the LC as compared to the HC (Fig. 2e). Second, I could show that NA release by the LC is much more pronounced in the ipsilateral hemisphere of the brain as compared to the contralateral side upon unilateral LC stimulation (Fig. 1f). While both of these findings can be explained by anatomical data of norepinephrine transporter density (which is higher in the LC as compared to the HC and hence explains the faster reuptake kinetics) as well as the projections of LC axons (which mainly project in the ipsilateral hemisphere), this is the first time that these processes were demonstrated on the physiological level. Besides backing up anatomical data, these exemplary experiments demonstrate the usefulness of genetically encoded biosensors, which offer the possibility to investigate neuromodulation with unprecedented spatial, temporal and molecular precision.

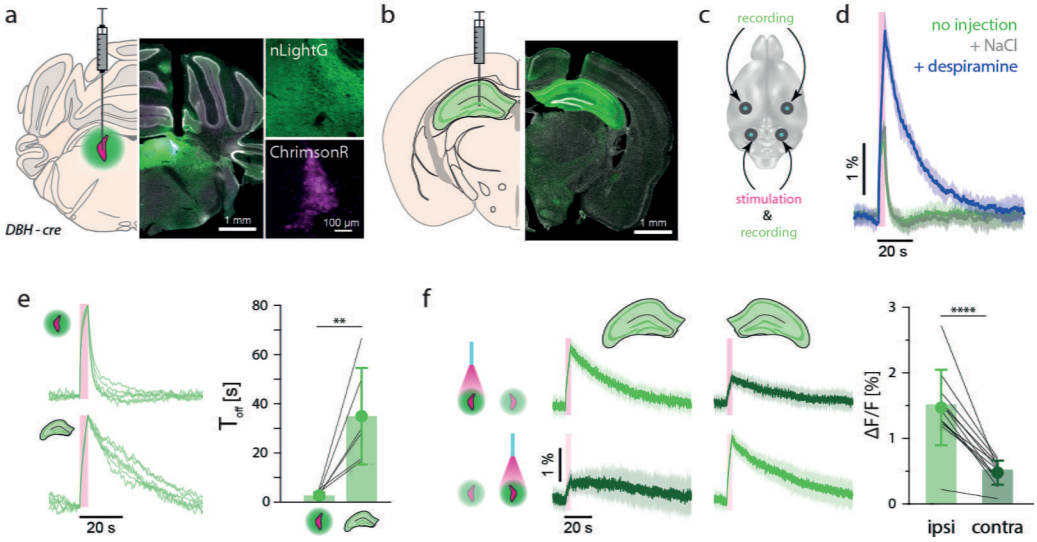

Figure 2. Monitoring noradrenaline release using the genetically encoded biosensor nLightG. a-c, Experimental schematics and histological verification for targeting LC with nLightG and ChrimsonR and the dorsal hippocampus with nLightG. **c**, Optical fibers were bilaterally implanted in the LC to allow for manipulation and monitoring of noradrenergic activity and in the HC to allow for monitoring adrenaline release in a distant brain region. **d**, nLightG fluorescence from LC in response to optogenetic stimulation performed after desipramine injection, which inhibits the re-uptake of NA and saline (control) confirms the responsiveness of nLightG to NA. **e**, Re-uptake kinetics of NA were much faster in LC as compared to HC. **f**, Noradrenaline release was more prominent in the ipsilateral as compared to the contralateral hemisphere of the brain upon unilateral LC stimulation.

Now that my initial hurdles have been overcome, I am looking forward to apply the tools we developed to finally learn more about the contributions of noradrenaline (and dopamine) to learning and memory formation. Here, I will now focus on fear learning, mediated by the basolateral amygdala, and extinction learning, mediated by the nucleus accumbens. If these are topics that also interest you, feel free to reach out at any time – may it be due to interest in the tools we pioneered, in the context of scientific collaboration, or to help me fill a fully-funded PhD position working on this topic by the end of 2025.

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Alexander DIETER completed his PhD in the lab of Tobias Moser at the Institute for Auditory Neuroscience in 2019, before starting his postdoctoral research in the lab of Simon Wiegert at the Center for Molecular Neurobiology in Hamburg. Currently, he works as a senior postdoc and deputy director of the Department of Neurophysiology of the Medical Faculty Mannheim of Heidelberg University, led by Simon Wiegert.

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Oligodendrocytes

An Overlooked Producer of Amyloid-β in Alzheimer's disease *by Andrew Sasmita*

Alzheimer's disease (AD), the most prevalent cause of dementia, impacts approximately 35 million individuals globally and this number is expected to rise. A central feature of the disease is the accumulation of amyloid-β (Aβ), a protein naturally present in the brain, which aggregates into insoluble plaques in a cascade that leads to neuronal damage. While neurons have been recognized as primary contributors to Aβ production[1,2], recent findings published in Nature Neuroscience highlight that oligodendrocytes, a specialized type of glial cell, also produce Aβ[3], suggesting a broader cellular involvement in the disease pathology.

Oligodendrocytes are primarily responsible for producing myelin, an insulating layer that enhances the speed of neuronal signal transmission, and for providing local metabolic support to axons. Although neurons remain the dominant source of Aβ, oligodendrocytes significantly contribute to its production, with this Aβ becoming incorporated into plaques. Previous studies using cell culture experiments hinted at this capability[4,5], yet the high expression of Aβ-processing components in neurons and other glial cells[3,6] left questions about whether non-neuronal cells, including oligodendrocytes, contribute to Aβ production in AD models and human patients.

Using a genetic knockout approach to eliminate β-secretase 1 (BACE1) – the rate-limiting enzyme in Aβ production – in oligodendrocytes, a reduction of approximately 30% in plaque load in AD mouse models was observed via quantitative light-sheet microscopy. Importantly, this oligodendroglial contribution to Aβ burden was corroborated by additional studies[7,8]. However, analogous experiments targeting excitatory neurons reduced plaque formation by about 95%, emphasizing that neurons are the primary drivers of rapid plaque seeding. This further highlights that a threshold concentration of Aβ is required prior to plaque deposition as the kinetic relationship between Aβ production and plaque deposition is sigmoidal[9]. Notably, mice lacking neuronal BACE1 still exhibited significant plaque deposition over time, highlighting a slower but consistent contribution from non-neuronal sources such as oligodendrocytes.

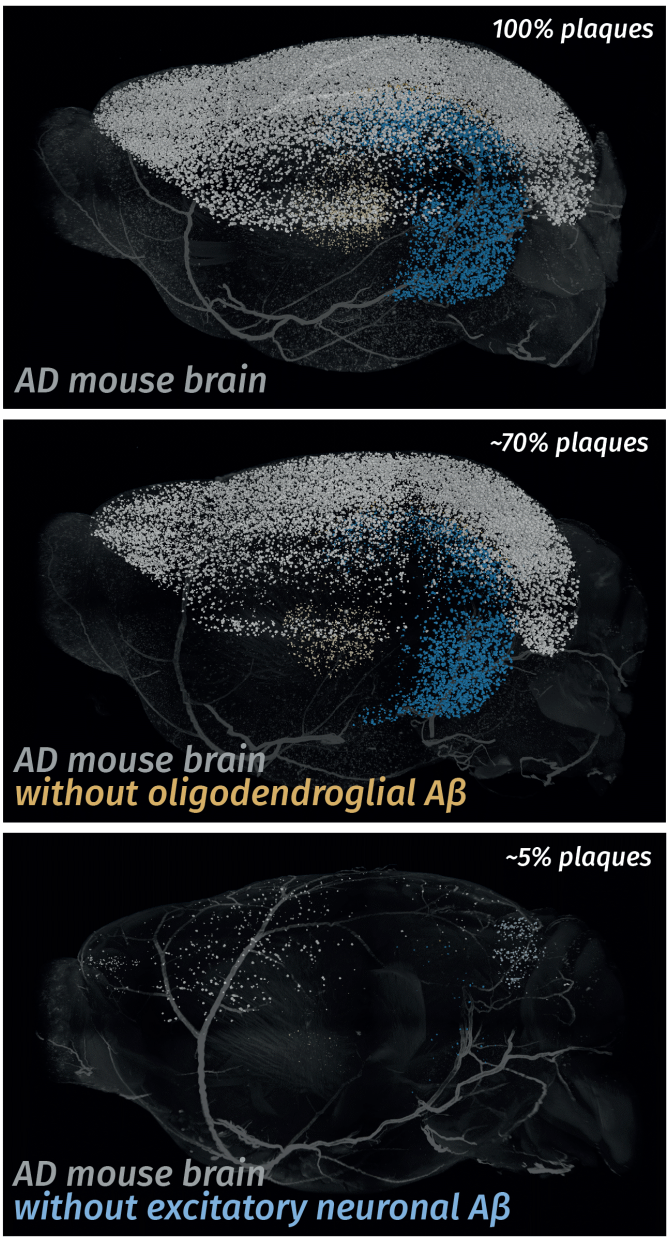

Figure. D renders of AD mouse brains without oligodendroglial (middle) or excitatory neuronal (bottom) Aβ. Plaques are depicted in different colors to denote various brain regions.

Interestingly, BACE1 knockout in oligodendrocytes also led to a substantial reduction in soluble Aβ levels[3,7]. This raises the question of why a seemingly minor contribution from oligodendrocytes has such a pronounced impact. One explanation may lie in the preferential production of Aβ42 over Aβ40 by oligodendrocytes, as cultured human-derived oligodendrocytes exhibit a one-third higher Aβ42/Aβ40 ratio compared to neurons, alongside

Oligodendrocytes (continued)

a threefold increase in oligomer and protofibril formation[7]. Furthermore, size differences between neurons and oligodendrocytes as well as regional distinctions in oligodendrocyte abundance, such as between white and gray matter, may influence local Aβ production. For instance, in the human brain, oligodendrocytes are more abundant relative to neurons[10], even in the gray matter, compared to the mouse brain.

Targeting oligodendroglial Aβ production has been shown to mitigate neuronal hyperactivity and promote non-amyloidogenic processing of the amyloid precursor protein (APP). Such approaches could avoid the adverse effects associated with global BACE1 inhibition, which has been linked to cognitive decline and reversible brain shrinkage[11]. Nevertheless, further research is required to delineate the specific roles of Aβ-processing components in oligodendrocytes to minimize potential off-target effects that could impair neural function.

Lastly, the observed threshold concentration of soluble Aβ necessary for plaque formation underscores the importance of early therapeutic interventions during prodromal AD stages. Developing sensitive biomarkers for early detection and incorporating oligodendrocytes into AD research, including large-scale data initiatives, will be crucial for achieving a comprehensive understanding of the disease and advancing therapies.

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Andrew Octavian SASMITA did his Master's and PhD theses under the supervision of Prof. Klaus-Armin Nave in the Department of Neurogenetics, Max Planck Institute for Multidisciplinary Sciences. He is currently a postdoctoral researcher in the labs of Prof. Yvonne Nolan and Prof. John Cryan at University College Cork, Ireland.

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Master‘s class of 2024/25

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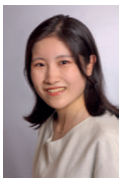

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Yerin Kim
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Ewha Womans University, South Korea
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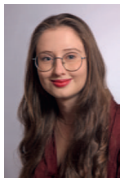

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* **Neurasmus Students**
Neurasmus is an Erasmus Mundus Joint Master Degree program (EMJMD), which is based on the cooperation of 6 partner universities, comprising Université de Bordeaux/France, Vrije Universiteit Amsterdam/Netherlands, Charité – Universitätsmedizin Berlin/Germany, Université Laval/Canada, University of Göttingen/Germany, Universidad de Coimbra/Portugal. For details please refer to the Neurasmus website https://www.neurasmus.u-bordeaux.fr/

Master's class of 2024/25 (continued)

Stergios Eleftherios Kolovos
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Application Statistics 2024

In the year 2024, the Neuroscience program received 619 applications from 70 countries.

Germany	37	North Africa	17
other Western Europe	27	Central/South Africa	51
Eastern Europe	25	Asia / Near East	140
North America	13	Central Asia / Far East	287
Central/South America	22	Australia	0

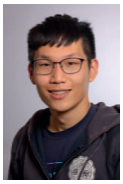
New Students

PhD projects started in 2024/2025

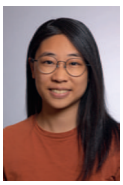
Laura Alacán Ricardo
Multimodal Neuroimaging of Brain Mechanisms Linking Anesthesia and Cardiovascular Risk Factors to Cognitive Dysfunction
Susann Boretius
Emilie Macé
Christine von Arnim

Andrea Alcaraz Ramírez
Molecular basis of pathogenic KCNH mutations
Luis Pardo
Martin Göpfert
Andreas Neef

Andrea Campos Perez
Neural and network mechanisms underlying statistical learning, predictive coding, and adaptive flexibility during visual cognitive tasks across different species
Caspar Schwiedrzik
Emilie Macé
Alexander Gail



Tsun-Kai Chang
Investigating neuromodulatory pathways in behaving mice using functional ultrasound
Emilie Macé
Caspar Schwiedrzik
Simon Wiegert (external)



Wing Sum Cheung
Optimizing Optogenetic Stimulation of Bipolar Cells in the Retina
Tim Gollisch
Emilie Macé
Marcus Jeschke

Maren Cremer
Neural systems underlying curiosity-driven sampling of perceptual information
Caspar Schwiedrzik
Fabian Sinz
Annekathrin Schacht

Anushka Deb
Influence of Extracellular Matrix Protein Trafficking on Brain Activity
Silvio Rizzoli
Nils Brose
Oliver Schlüter

Klara Esch
Synaptic underpinnings of sound intensity encoding
Tobias Moser
Silvio Rizzoli
Wiebke Möbius

Esther Grewe
Engineering of Optimized Red-Shifted Channelrhodopsins for Future Optogenetic Therapies
Tobias Moser
Emilie Macé
Tobias Brügmann

Ece Idil
Multisensory Feedback for Learning to Control Brain-Computer Interfaces
Alexander Gail
Hansjörg Scherberger
Fabian Sinz

Efsun Kavaklioğlu
Visual information processing in humans and in cortical neuronal networks of rhesus macaques
Stefan Treue
Hansjörg Scherberger
Annekathrin Schacht

Ahsen Konaç-Sayıcı
Characterizing optogenetically evoked RGC activity in mice with vision loss
Tim Gollisch
Emilie Macé
Alexander Gail

PhD projects started in 2024/25 (continued)

Hannah Luksch
Kalium channelrhodopsin based constructs for advanced neuronal activation by dual color optogenetics
Tobias Moser
Emilie Macé
Tobias Brügmann

André Mendes Costa
Non-invasive analysis of the heart-brain axis using zebrafish larvae
Thomas Frank
Tobias Brügmann
Jan Huisken

Ruchi Modgekar
Age-associated changes in the vestibular hair cells (VHCs)
Carolin Wichmann
Wiebke Möbius
Thomas Frank

Antonios Ntolkeras
Brain pathophysiology at the atomic level through Ex-SIMS
Silvio Rizzoli
Tobias Moser
Stefan Hell

Shreshth Shekhar
Brain wide correlates of Optogenetic Vision Restoration in blind mice
Emilie Macé
Tim Gollisch
Marcus Jeschke

Lejla Šoše
Deciphering mechanisms of sound intensity encoding
Tobias Moser
Thomas Frank
Susann Boretius

Abilgail Trebilcock
Enhancing the dynamic range and temporal precision of optogenetic stimulation of the auditory nerve
Tobias Moser
Emilie Macé
Martin Göpfert

Ana Trpchevska
Studying the role of Noonan-syndrome associated gene LZTR1 in neurological disorders using iPSC-derived models
Lukas Cyganek
André Fischer
Michael Heide

Students
Graduated

The Masters of 2024

Mels Akhmetali
Generalizing deep neural network model captures the functional organization of feature selective Retinal Ganglion Cell axonal boutons in the Superior Colliculus
F. Sinz / T. Gollisch

Klara Esch
The presynaptic active zones of Inner Hair Cells – Heterogeneity and CaV1.3 Channel Dynamics
T. Moser / S. Rizzoli

Erinne Ong
Investigating the contribution of dysfunctional myelin to tau pathology *in vivo*
K.-A. Nave / T. Outeiro

Dyutika Banerjee
Neurophysiological correlates of social decision making in a dyadic interactive game
A. Schacht / A. Gail

Natalia Evdokimova
Role of Ca^{2+} binding to the otoferlin C2D-domain in the exocytosis of inner hair cells
T. Moser / E. Neher

Liisi Promet
Brain Age Disparities in Psychosis across DSM Diagnoses and B-SNIP Biotypes
G. Pearlson (extern) / A. Fischer

Evgeniia Bukina
Encoding of social signals in the CA1 region of the ventral hippocampus
L. Roux (extern) / J. Clemens

Yasmin Fiedler
Unraveling the Epileptogenic Zone: Comparisons of Spike Related High Gamma Power in Focal Epilepsy
N. Focke / I. Kagan

Micah Provost
Validation of Stardist deep learning algorithms for the classification and quantification of oligodendrocyte lineage cells in neuroinflammatory research
H. Ehrenreich / S. Rizzoli

Sukanya Chakraborty
Contributions of heart rate, breathing and arousal on threshold visual detection
M. Wilke / C. Schwiedrzik

Efsun Kavaklioğlu
Investigating the Rhythmicity of Attention Using Continuous Psychophysics
S. Treue / A. Schacht

Yashas Ramakrishna
Eye Tracking in Unrestrained Non-human Primates
S. *Treue / S. Boretius*

Yixuan Chen
The role of novelty-induced dopamine signalling in silent synapses generation
O. Schlüter / A. Fischer

Ahsen Konaç-Sayıcı
Attention is not Required for Prediction Error Processing: Evidence from Pupil Responses
C. *Schwiedrzik / M. Wilke*

Lejla Šoše
Deciphering mechanisms of sound intensity encoding
T. Moser / A. Gail

Maren Cremer
Regional Interactions in Abstract Predictions in the Human Brain
C. Schwiedrzik / N. Focke

Vismitha Nadig
Effect of sleep-related changes on EEG-based functional connectivity in patients with focal epilepsy
N. Focke / C. Schwiedrzik

Tarannomsadat Taghavi
The Role of Long Non-Coding RNAs in an *in vitro* Model of Early Life Stress
A. *Fischer / T. Outeiro*

The Masters of 2024 (continued)

Abigail Trebilcock
Targeting Cochlear Sound Encoding: from studying the Ca^{2+} dependence of neurotransmitter release to optogenetic stimulation of spiral ganglion neurons
T. Moser / T. Gollisch

Ana Trpchevska
Development and Characterization of Rhesus Macaque Cerebral Organoids Containing Endothelial Cells
M. Heide / M.P. Zafeiriou

The Doctors of 2024/25

Lukas Amann
Multisensory integration under visual target uncertainty during planning of reaching movements
Alexander Gail, Hansjörg Scherberger, Christian Tetzlaff

Paloma Huguet Rodríguez
Molecular mechanisms underlying silent synapse generation and their role in drug-associated behaviors
Oliver Schlüter, Nils Brose, Silvio Rizzoli

Ranjit Pradhan
Cell-type specific roles of long non-coding RNAs in Neurodegenerative diseases
André Fischer, Tiago Outeiro, Alexander Flügel

Avika Chopra
The role of RNA in synapse physiology and neurodegeneration in synucleinopathies
Tiaog Outeiro, André Fischer, Silvio Rizzoli

Nare Karagulyan
Synaptic mechanisms of sound intensity coding in the cochlea
Tobias Moser, Erwin Neher, Oliver Schlüter

Perianen Ramasawmy
Pairing transcranial direct current stimulation and mindfulness meditation in the treatment of fibromyalgia
Andrea Antal, Melanie Wilke, Frank Petzke

Max Crayen
Perceptual Misbinding of Color and Motion – Visual Feature Integration in Humans and Macaques
Stefan Treue, Hansjörg Scherberger, Michael Wibral

Tarana Nigam
Flexibility and optimization of neural codes in primate sensory cortex
Caspar Schwiedrzik, Alexander Gail, Siegrid Löwel

Lucía Rojas Meza
Molecular mechanisms of neurotransmitter release at dorsal root ganglion neurons
Jeong Seop Rhee, Swen Hülsmann, Thomas Dresbach

Delane Espinueva
SNARE Cis-Reassembly: Investigating SNARE Interactions Post-Disassembly
Reinhard Jahn, Silvio Rizzoli, Claudia Steinem

Adrián Palacios Muñoz
Multisensory integration of courtship song and taste in male *Drosophila melanogaster* social behavior
Jan Clemens, Tim Gollisch, Viola Priesemann

New Faculty

Joining the program in 2024

Oliver Barnstedt joined the MBExC (Multiscale Bioimaging – Cluster of Excellence) and the ENI in Göttingen in 2024. Having completed his Master's and doctoral degree from the University of Oxford, UK, Dr. Barnstedt returned to Germany to complete two postdocs and become (junior research) group leader. His 'Multiscale Circuit Analysis' group seeks to understand how the hippocampal memory system integrates sensory and motor information to form long-lasting memories and how precisely these memories are influencing behavioural action. Dr. Barnstedt started supporting our program by hosting this year's lab rotation seminars. We look forward to further involving him in our progam in the future.

Further information:
https://www.uni-goettingen.de/en/695381.html

Lukas Cyganek studied Chemistry and Biology at the University of Göttingen before he joined the GGNB program "Molecular Physiology of the Brain" in 2009. After his doctorate, he worked as a postdoctoral researcher in the Stem Cell Laboratory of the Cardiology and Pneumology at the University Medical Center Göttingen – the lab he later became head of. The group focuses on the generation of patient-specific induced pluripotent stem cells (iPSCs) and their applications in genome editing, cardiac differentiation, tissue engineering and disease modelling.

Further information:
https://www.uni-goettingen.de/en/609928.html

Marcus Jeschke became a junior group leader in Göttingen in 2018 at the German Primate Center and Professor of Auditory Neuroscience in Primates in 2024. Prof. Jeschke's group investigates the neurobiological foundations of cognitive processes involved in hearing with the goal to understand how hearing and cognition interact, driving the development of more effective rehabilitation strategies.

Further information:
https://www.uni-goettingen.de/en/695318.html

Carolin Wichmann has been affiliated with the Göttingen Neurosciences Program for a long time already. She regularly gave introductory lectures on Electron Microscopy and Tomography and courses on sample preparation and Electron Microscopy. After 'detours' to Würzburg and Berlin, Prof. Wichmann returned to Göttingen in 2011 and became a group leader at the InnerEarLab at the University Medical Center and a W2 professor for "Molecular Ultrastructure of Synapses". Using a combination of immunohistochemistry, high resolution light microscopy and electron microscopy, the group studies morphological aspects of wild-type and mutant synapses of the early auditory pathway. We look forward to Prof. Wichmann's continued commitment to our study program.

Further information:
https://www.uni-goettingen.de/en/424152.html

Current Faculty Members

Georg August University

Biology & Psychology
Prof. Gregor Bucher, Developmental Biology
Prof. Hannelore Ehrenreich, Clinical Neuroscience
Dr. Thomas Frank, Olfactory Memory & Behavior
Prof. Martin Göpfert, Cellular Neurobiology
Prof. Ralf Heinrich, Cellular Neurobiology
Prof. Siegrid Löwel, Systems Neuroscience
Prof. Annekathrin Schacht, Cognition, Emotion & Behavior

University Medical Center

Prof. Andrea Antal, Non-Invasive Brain Stimulation Lab
Prof. Mathias Bähr, Neurology
Prof. Thomas Bayer, Molecular Psychiatry
Prof. Wolfgang Brück, Neuropathology
Dr. Lukas Cyganek, Stem Cell Unit
PD Dr. Peter Dechent, Cognitive Neurology
Prof. Thomas Dresbach, Anatomy & Cell Biology
Prof. Rubén Fernández-Busnadiego, Structural Cell Biology
Prof. Alexander Flügel, Neuroimmunology & Multiple Sclerosis
Prof. Niels Focke, Clinical Neurophysiology
Prof. Tim Friede, Medical Statistics
Prof. Tim Gollisch, Sensory Processing in the Retina
Prof. Emilie Macé, Brain-wide Networks
Prof. Tobias Moser, Auditory Neuroscience & InnerEarLab
Prof. Tiago Outeiro, Experimental Neurodegeneration
Prof. Silvio Rizzoli, Neuro- & Sensory Physiology
Prof. Oliver Schlüter, Psychiatry & Psychotherapy
Prof. Jochen Staiger, Neuroanatomy
Prof. Christian Tetzlaff, Computational Synaptic Physiology
Prof. Carolin Wichmann, Molecular Ultrastructure of Synapses
Prof. Melanie Wilke, Cognitive Neurology
Prof. Fred S. Wouters, Molecular & Cellular Systems
Dr. Maria Patapia Zafeiriou, Pharmacology & Toxicology *

German Center for Neurodegenerative Diseases

Prof. André Fischer, Epigenetics in Neurodegenerative Diseases

** Associated Lecturer*

MPI for Multidisciplinary Sciences

Prof. Nils Brose, Molecular Neurobiology
Prof. Gregor Eichele, Genes & Behaviour
Prof. Stefan Hell, NanoBiophotonics
Prof. Olaf Jahn, Neuroproteomics *
Dr. Oleksiy Kovtun, Molecular Mechanisms of Membrane Trafficking
Dr. Wiebke Möbius, Electron Microscopy Core Unit *
Prof. Klaus-Armin Nave, Neurogenetics
Prof. Luis Pardo, Oncophysiology
Prof. Jeong Seop Rhee, Neurophysiology
Prof. Michael Sereda, Translational Neurogenetics
Prof. Hauke Werner, Neurochemistry Group
PD Dr. Sonja Wojcik, Neurotransmitter Systems

MPI for Dynamics & Self-Organiszation

Prof. Viola Priesemann, Neural Systems Theory
Prof. Fred Wolf, Theoretical Neurophysics

German Primate Center

Raymundo Báez-Mendoza, PhD, Social Neurobiology
Prof. Susann Boretius, Functional Imaging Laboratory
Prof. Alexander Gail, Sensorimotor Neuroscience & Neuroprosthetics
Dr. Michael Heide, Degenerative Diseases
Prof. Marcus Jeschke, Cognitive Hearing in Primates
Dr. Igor Kagan, Decision & Awareness Group
Prof. Hansjörg Scherberger, Neurobiology
Prof. Stefan Treue, Cognitive Neurosciences

European Neuroscience Institute

Dr. Oliver Barnstedt, Multiscale Circuit Analysis
Brett Carter, Ph.D., Synaptic Physiology & Plasticity
Prof. Jan Clemens, Neural Computation & Behavior
Dr. Anne Petzold, Neural Circuits for Behavioural Adaptation
Prof. Caspar Schwiedrzik, Neural Circuits & Cognition

Honors and Awards

In April 2025, **Burak Gür** has been awarded a Long-Term Postdoc Fellowship from the Human Frontiers Science Program.

Madhura Ketkar received a postdoc grant from the DFG (Walter Benjamin Programme) in 2024.

Summa cum laude distinctions for their doctoral theses have been awarded to **Max A. Crayen**, **Paloma Huguet Rodríguez**, **Nare Karagulyan** and **Perianen (Krishna) Ramasawmy**.

Congratulations!

Mateusz Ambrozkiewicz: "100 Köpfe der Hauptstadt – Wissenschaft 2024"

The 'Tagesspiegel' honoured **Mateusz C. Ambrozkiewicz** as one of the "100 Köpfe der Hauptstadt – Wissenschaft 2024" ("100 heads of the capital – Science 2024") chosen each year. He combines two things that at first glance seem to have nothing in common: The cellular protein homeostasis and how our thinking organ, particularly the cerebral cortex, develops.

Mateusz is considered a promising researcher: After completion of his fast-track doctorate in the Göttingen Neurosciences Program, he built up his team in Berlin and has been selected to join the prestigious FENS-Kavli Network of Excellence (see also p. 11 of NeuroNewsletter 2024).

mateusz.cyryl@gmail.com

Varsha Ramakrishna: Third Prize in the Three Minute Thesis Competition

Varsha Ramakrishna (Gollisch Lab) won the third prize in the Three-Minute Thesis competition 2024 organised jointly by the University of Göttingen and Alumni Göttingen e.V. She received a certificate, a goodie bag and a cash prize of 100 Euros.
Congratulations!

The Three Minute Thesis (3MT®) is an academic research communication competition developed by The University of Queensland, Australia.
In 2024, the Graduate Schools and Alumni Göttingen e.V. hosted their own Three-Minute-Thesis format in the course of the university's alumni day on 16 November according to the rules and judging criteria of the University of Queensland.
Göttingen's PhD students already participated four times at the international Coimbra Group 3MT competition and three times they made it to the finals, among them our alumna Tanvi Butola in 2017, and now our PhD student Varsha Ramakrishna. We are also pleased to mention that the Molecular Biology student Monica Gobran won the first prize this year.
A report about the alumni day (in German) is available on https://www.alumni-goettingen.de/news/gat24bilder/

Neuroscience PhD Retreat 2024

by Tarannom Taghavi

From July 3rd to 4th, the PhD Retreat 2024 brought together PhD students, alumni, faculty members, and program staff in the vibrant city of Leipzig, Germany. Hosted at the Hotel Michaelis and Alte Essig Manufactur, the retreat offered three days filled with engaging scientific discussions, networking opportunities, and cultural exploration.

The scientific program was a key focus of the retreat, offering a platform for sharing and discussing research in depth. Over the course of three oral presentation sessions, students had the opportunity to present their work, with each session moderated by MSc/PhD student representatives. These sessions encouraged valuable feedback and meaningful dialogue. Complementing the oral presentations was a poster session, which began with short research pitches by each student, followed by individual discussions at the posters. This setup allowed for in-depth exchanges and fostered potential collaborations between participants.

The retreat also provided valuable insights into life beyond the PhD through alumni engagement activities. Alumni shared their career journeys during a series of talks, showcasing diverse paths ranging from academia to industry and publishing. In addition, the speed dating sessions allowed us to interact with alumni in smaller groups, giving us the chance to ask questions and gain practical advice about navigating post-PhD opportunities.

Beyond the scientific and career-focused aspects, the retreat celebrated the cultural richness of Leipzig. Participants could choose from activities such as a guided city tour, museum visits, or a boat tour. These experiences not only deepened our appreciation of the city's history and culture but also offered a relaxed and friendly environment to strengthen social connections within the group.

The retreat brought together PhD students at various stages of their journey, from newcomers to those preparing for their defenses. This mix offered a unique perspective on the PhD process and provided a clearer view of the challenges and opportunities that lie ahead. Additionally, interacting with faculty members and principal investigators in an informal setting gave us valuable insights into academic life and career pathways, fostering a sense of approachability and support.

One of the important moments of the retreat was the election of new PhD representatives. I am delighted to share that Marina Saade and I, Tarannom Taghavi, were elected for this role. We look forward to supporting our peers, fostering collaboration, and ensuring that the voices of PhD students are well-represented within the program.

Looking back on the retreat, it was an incredibly enriching experience that combined science, culture, and personal growth. It allowed us to broaden our scientific horizons, explore potential collaborations, and connect with peers and mentors in meaningful ways. I am excited about the opportunities and inspirations gained during these few days and the positive impact they will have on our journeys ahead.

Expanding horizons at Neurizons 2024

by Marina Saade

Neurizons is a biennial multidisciplinary neuroscience conference organized by the students of the International Max Planck Research School (IMPRS) for Neurosciences in Göttingen, hosting renowned researchers from diverse fields in neuroscience, from academics to industry and business experts. The 11th edition of Neurizons happened from 21st to 24th of May 2024 at the Max Planck Institute for Multidisciplinary Sciences, campus Fassberg. On the first day of Neurizons, the career fair event inspired young scientists who want to pursue a job outside academia. We gathered professionals who pursued their PhD in biology – including former students of the program – to talk about their trajectories and the opportunities beyond academia. On the same day, we hosted two different workshops "*What to do with a Ph.D.?*" and "*Communicating Animal Research for the Public*", which were very interactive and allowed our participants to further discuss their personal objectives and how to achieve them.

The second day of Neurizons started with the opening ceremony followed by a great talk by our first keynote speaker, Dr. Li-Huei Tsai, who pioneered the work in Alzheimer's disease and epigenetics. Then, the day continued with talks from brilliant scientists in the fields of Computational and Cognitive Neuroscience that were very interactive and dynamic to our participants. At the end of the day, participants and speakers had the chance to explore Göttingen in one of our city tours. Gladly, the weather allowed the visitors to have a glimpse of our city of science.

Expanding horizons at Neurizons 2024 (continued)

Our third day started with three exciting talks about Molecular Neuroscience, followed by a lively Panel Discussion on "*The Integration of Neuroprosthetics into our Daily Lives*" that reunited specialists of different aspects of research and implementation of neural prosthesis in an engaging discussion that provided invaluable insights to all of those present. In the afternoon, we had presentations from exceptional students who were chosen to present in our Young Investigator Contest. During this session, the students had 30 min to showcase their research to our audience and receive valuable feedback. We also hosted Power Pitch talks on Wednesday and Thursday before our Poster Session to allow other students to introduce their projects in short 5 min presentations and promote their posters. Finally, our poster session happened at the end of the third day of the conference, allowing many young scientists to present and discuss their research with their peers and speakers who attended the session with some wine and cheese. The final event of the third day of Neurizons was a delicious barbecue and party at the institute, allowing the attendees to relax or network – or both!

On the last day, thrilling talks on the field of Clinical Neuroscience and Emerging Techniques inspired and encouraged our participants to be innovative. Our last talk before the closing session was a much-awaited talk by Dr. Peter Dayan, our second keynote speaker, that filled the auditorium and led to a great discussion in the end. To finalize the conference, the winners of the Best Poster Award, Young Investigator Award, and the Creutzfeld PhD thesis award were announced. The Creutzfeld PhD is an award given by the IMPRS program to the best Ph.D. theses of the year endowed with 2,000 Euros and is donated by Sartorius Stedim Biotech GmbH. The winners of the Creutzfeld PhD thesis award were Elsa Steinfath and Burak Gür, the winner of the Young Investigator Award was Paulina Wanken and the three best poster winners were Anna Marie Müllen, Luca Büschgens, and Merle Frick. Congratulations to all of you and thanks to the participants!

The whole conference was a great opportunity to get to know areas of Neuroscience that are not our primary focus, expanding the view of what could be done to advance the field. But Neurizons was more than 4 days of scientific knowledge exchange, especially for the ones that were behind the scenes organizing the event. Organizing a 4-day conference with fellow students who also have their master's or Ph.D. projects running requires a lot of time and teamwork. The preparations for Neurizons started over a year before the conference started. We had to develop and work on skills that are not in your usual laboratory daily basis, such as reaching out to speakers, organizing the venue, and creating a schedule, but also had to think about the small details of a big event such as "where can we get wine glasses?" and quickly deal with unexpected situations. From the outside, it seemed as if everything was running smoothly, but it was due to a few students dressed up in blue t-shirts addressing problems and emergencies as they came up. In the end, what remains is another successful Neurizons edition, the great memories and soft skills that we got on the way. A big thank you to the Neurizons 2024 organizers, speakers, and participants – together we made a great event! Hope to see you again in 2026!

Bridging Fields: The First Joint IMPRS PhD Retreat

by Andrea F. Campos-Pérez, Marina Saade & Tarannom Taghavi

The PhD Retreat 2025 was the first ever joint retreat between the Molecular Biology and Neurosciences International Max-Planck Research School's (IMPRS) Programs, hosted in the Harnack-Haus in Berlin-Dahlem over the first weekend in July 2025. Over a hundred people gathered for this retreat, including doctoral students, faculty, and staff, to enjoy three full days of interdisciplinary scientific discussions, networking, cultural engagement, and career guidance. The retreat was a great opportunity to learn about the research done by fellow students in both programs and expand the scientific horizon of the attendees through multidisciplinary exchange.

The program began with doctoral students presenting their research projects at various stages of their PhD paths, from early conceptual work to final results, engaging in lively discussions with the audience. This was followed by a well-received poster session, where students from both programs participated in constructive scientific conversations and exchanged feedback in a more informal setting. To end on a high note, on the final day, five alumni from the IMPRS programs joined the retreat to share insights from their career paths in a speed-dating format. Sessions featured alumni now leading their own research group, as well as those working in strategy consulting, scientific publishing, and industry R&D, offering a broad spectrum of career perspectives for current students, both inside and outside academia.

Beyond the academic program, the students had the opportunity to explore Berlin-Dahlem through cultural excursions, including visits to the Freie Universität Museum, the Botanical Garden, and a tour of the historic district often referred to as the "German Oxford."

This experience was greatly enjoyed by the students from both programs, as it offered an opportunity to socialize and network, in a welcoming and intellectually stimulating environment, where science can be discussed and exchanged without judgment, and knowledge is built through collaboration. The value of the experience is best expressed through the words of the participants:

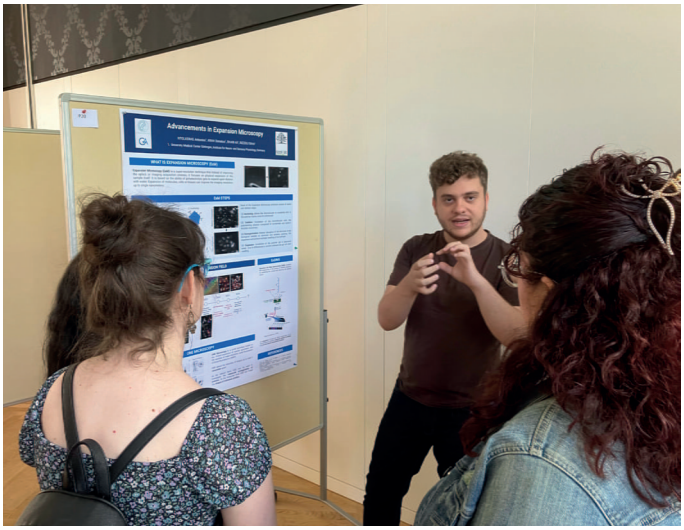
"What I took from the 2025 joint retreat was the chance to connect with people from completely different fields. For example, monkey research

Bridging Fields: The First Joint IMPRS PhD Retreat (continued)

at the DPZ or non-linear modeling, which really inspired me and opened up new ways for me to think about my own PhD project. I also got to meet other patch-clamp researchers that I hadn't been able to reach before. Overall, it was a very unique and fun opportunity to exchange ideas across disciplines, and I actually found inspiration."

"I really enjoyed having a joint retreat with not only my colleagues from the Neuroscience program, but also from the Molecular Biology program, as I believe that multidisciplinarity makes us think outside of our box. I received feedback and suggestions for my work that were truly valuable. Another highlight for me was the career fair, which helped me to have a better projection of the job market I'll soon get into, and how I can start preparing now for my future."

"I really enjoyed the joint MolBio–Neuro retreat because I feel it gave us an opportunity to see what work has been happening not only in the Neuroscience but also in the MolBio program. There was not too much of MolBio or too much of Neuro – I think the balance was really good. And lastly, I feel the joint retreat had one very positive thing, which was that we also got to speak with alumni from the MolBio program. I feel the overall idea of their occupations was something we could also benefit from, so definitely a plus from my side."



From Patch Clamp to Pitch Decks

A Scientist's Guide to Consulting by Jenifer Rachel

Life sciences consulting can sound like an abstract career path, especially to fellow scientists. The question I get asked most often is: "*What does a typical day look like for you?*"

In many ways, a typical day as a consultant mirrors academic life: I read lots of articles (scientific reports, competitive intelligence, market reports etc.), I make a *lot* of PowerPoint slides, and yes, I drink an alarming amount of coffee. Sounds familiar?

The biggest difference, however, lies in the pace. Unlike the long timelines of academic research, traditional consulting projects move quite fast, usually wrapping up within 2 to 4 months. Clients, typically major pharmaceutical companies, expect weekly progress updates. One of the biggest challenges I faced in consulting was learning how to adapt my communication style for client conversations. Clients aren't interested in every detail of the work you've done, they want to know what it means for them. You're expected to distill complex research into clear, targeted insights, and deliver them, week after week.

Jenifer RACHEL did her PhD thesis and postdoctoral work at the Institute for Neuroanatomy, University Medical Center, in the lab of Prof. Dr. Jochen Staiger. She currently works as a consultant at stradoo GmbH, a boutique life sciences consulting company headquartered in Munich, Germany.

What Do Life Sciences Consultants Actually Do?

Consulting firms come in all shapes and sizes, each with their own focus within the drug development pipeline. Some specialize in the early stages of drug development: evaluating promising compounds, conducting landscape assessments, or helping clients evaluate both scientific viability and commercial potential. Others focus on later stages: guiding clinical trial strategy, shaping go-to-market plans, or supporting successful product launches.

I currently work at stradoo, a boutique life sciences consulting firm headquartered in Munich. Our projects span the entire drug development pipeline, and every few months I get to dive into a new topic: a new disease area, a new drug, or a new set of commercial challenges and the corresponding customized project methodologies. This variety is what keeps me engaged and energized. No two days are the same, and no two teams are either. The role demands flexibility, curiosity, and the willingness to be challenged.

It also requires resilience. Consulting hours can be long: during busy periods, 10- to 12-hour days are not uncommon. However, the intensity is accompanied by rewards. There's real excitement in solving a tough problem, closing a difficult project or receiving positive feedback from a client. The icing on the cake is that we get to help bring innovative medications to patients who are desperately waiting for such therapeutics.

At stradoo, we also make space for professional development and connection: every year we come together as a team for two business retreats. End of last year, we spent a few unforgettable days in Kitzbühel, a ski town nestled in the Alps. We worked on various aspects of business development, explored the mountains, and I even learned the quintessential German winter sport of Eisstockschießen.

The Leap from Academia to Consulting

Breaking into consulting from an academic background isn't easy. I had my share of ups and downs (an experience worthy of its own article). It takes patience, perseverance, and the willingness to stretch beyond the familiar. Here's what I would tell someone who's trying to break into life sciences consulting:

1. Identify if consulting is a good fit for you:
If you're unsure whether consulting is for you, consider doing an internship first to test the waters. Many of the skills that we learn in scientific training like problem solving, resilience and curiosity translate extremely well into consulting. However, consulting interviews that test such skills are quite different from academic interviews. In a consulting interview, you're often expected to work through business problems by means of a case study and explain your thinking clearly. It's very helpful therefore, to take some time to

From Patch Clamp to Pitch Decks (continued)

learn key business concepts, practice case interviews, read up on the latest developments in the pharmaceutical world and more than anything else; learning to trust your instincts and common sense. The preparation can be challenging, but it's also a chance to discover what truly excites you.

2. Start the job search early, even during your PhD or postdoc:
The job market is competitive, and relying on a short-term job-seeker visa to secure my residency in Germany made the process even more intense. I went through a challenging nine-month stretch filled with uncertainty and self-doubt. In hindsight, I would have started exploring opportunities earlier – ideally during my time in academia, and I would have even extended my postdoc to create a stronger safety net. It wasn't easy, but I learned a lot about perseverance and resourcefulness in the process. While I wouldn't want to relive that pressure, I now know that the transition can be navigated, and it's absolutely worth it.

3. Adopt sustainable practices:
Searching for a job in a new country (often in a language you're still learning) can be an incredibly isolating and overwhelming experience. It's essential to build a strong support system of people who understand your experience: fellow job-seekers, empathetic friends, and encouraging family. At the same time, set boundaries around your time and energy. One of my biggest regrets was letting the job search take over my life. I neglected my health, hobbies, and well-being. If I could go back, I would set fixed hours for applications and interviews, and then step away from the noise. I came to learn that movement, rest, self-reflection are not luxuries; they are necessities, especially during stressful times.

Life sciences consulting is a demanding yet deeply rewarding career path. For those of us with scientific training, it offers a rare balance: a space where you can lean on the comfort of your academic background while continuously learning about the commercial dynamics of the pharmaceutical space. I'm grateful that I can still dive deep into complex science, but now I'm applying that knowledge to help companies make strategic decisions on drug development and market access. If you're curious, resilient, and ready to stretch beyond the lab bench, consulting might be exactly the right next step.

Christmas tree and the mountains: A snowy escape in Kitzbühel: reconnecting with colleagues and celebrating the year's wins, big and small

Bringing science into EU policy making

by Leonard Engels

What do I do?

How can we make it easier for Europeans to eat healthy and sustainable food? How can the EU better prepare for crises, such as pandemics, floods, and wildfires? What are the benefits of a holistic approach to human, animal and plant health? EU policy makers work with such questions every day. To do that, they need an understanding of what the evidence on any of these questions is. This is where the Scientific Advice Mechanism of the European Commission comes in.

We provide advice on any subject where insights from research are important. For that, we work with ad hoc expert groups of independent scientists. These scientists review all the latest relevant evidence and summarise it in an Evidence Review Report. The Commission's Group of Chief Scientific Advisors, a standing group of seven independent scientists from various fields, then issues a Scientific Opinion based on the Evidence Review Report and further considerations. It is crucial that this Opinion is written succinctly and in a style that is understandable for non-scientists. After all, we want policy makers from any background to be able to understand the evidence and incorporate it into their deliberations.

I work in a secretariat within the European Commission that coordinates the work of these scientists and their exchanges with policy makers from the EU. We support their work with additional evidence-gathering, organise meetings with experts and stakeholders, and work to spread information about the scientific advice within the EU institutions.

How did I get here?

During the IMPRS Neuroscience Master's programme, I became more and more interested in hand prostheses and how prosthesis users could be made to feel what their robotic hands were doing. The IMPRS secretariat allowed me to do my thesis in Prof. Dario Farina's lab (now at Imperial College London) on just this topic.

I continued working on hand prostheses at the Scuola Superiore Sant'Anna in Pisa. But even before finishing my PhD I understood that I wasn't that interested in pursuing excellence in a single, narrow field of science and an academic career.

Then I found the job at the European Commission where I now work to enable EU policy makers to consider scientific evidence when drafting new legislation.

Would this be something for you?

My day-to-day work is constantly changing. Developing sound scientific advice takes us about one-and-a-half years, everything considered.

Our work starts with talking to the policy makers who would like to request advice and help them formulate questions that are unbiased and that can be answered by scientific evidence. We then work with a consortium of European academies (SAPEA) to review the evidence. In the beginning, my job involves lots of emails and meetings and, of course, becoming familiar with the topic in question. Once the evidence is reviewed, I do a lot of writing and strategizing about translating the scientific review into language that is understandable by, for example, lawyers who do not have much time. As the publication date of an Opinion comes closer, my work also involves setting up meetings, identifying and inviting relevant participants, and working on publicising our work. And then we start again.

This job might be for you if you like to read about science, write well and clearly, have diplomatic sensibilities, are interested in EU politics and don't miss the lab.

If you would like to stay in science and still contribute to policy making, you could of course become one of the experts that work with us!

Leonard ENGELS joined the IMPRS in 2014 evaluating a feedback system for myoelectric hand prostheses in his MSc thesis. Afterwards he completed his PhD in Biorobotics at the Scuola Superiore Sant'Anna in Pisa. He now works as a Policy Officer in the Scientific Advice Mechanism for the European Commission in Brussels.

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Our Alumni Mentoring Experience

by Adrián Palacios Muñoz and Juan (Chepe) Flórez Weidinger

Around the end of my PhD I felt was approaching a turning point in my academic journey, and asked myself over and over: Should I stay (in academia) or should I go (to industry)?

The question was not just about career options; it was about identity. For years, I had been developing skills in a very specific academic context (behavior and neural computations in fruit flies' social behavior), and I found it challenging to understand how these skills might translate to other sectors. Can I communicate the value of my research training outside a university setting? What roles were available for someone like me? Could I compete against younger people with straight careers?

Simultaneously, I was not ready to completely let go of academia. I wanted to understand what staying in academia would realistically involve – what kind of postdoc might open new doors, both professionally and personally? Would the satisfaction of finishing current projects and starting new ones outweigh the uncertainty and stress? What would a sustainable and fulfilling academic path look like for me, and how does that vision align with my values and long-term goals?

Just in time, an email with information about the mentorship program arrived. The structure of the mentoring program helped maintain consistency and a good rhythm. We started by setting clear goals after meeting for the first time, creating a framework to explore all my questions and interests with a clear, measurable goal in mind. Our meetings occurred once a month, which helped create a consistent space for reflection, feedback, and dialogue. Between sessions, I worked on homework, such as reading recommended materials, doing self-assessment exercises, exploring job listings on LinkedIn, and drafting versions of my CV and motivation letters tailored to different paths. During these assignments, Chepe was very patient and attentive, providing excellent feedback on my written tasks and reflecting on any questions I had. One of my favorite tasks was to simulate applying for a postdoc and a company position, using real examples of my interest, which gave me the experience I was missing in a safe and constructive environment.

This blend of reflection and action was helpful. The exercises guided me to formulate, sometimes for the first time, what I was really looking for – not just in a job, but in a working life. Our conversations were open-ended but purposeful; each added a new layer to my understanding of my priorities and helped me see more clearly how various career paths might align (or not) with them.

The mentoring experience did not provide me with a final answer – and that is okay. It provided me with a clearer framework to think through the decision and a broader set of perspectives to consider. I took home with me:

- A deeper awareness of my skills and how to communicate them.
- A better sense of the realities and challenges in both academia and industry.
- A clearer view of what I look forward to in either option.
- A better toolkit and experience in navigating job searches.
- A richer understanding of myself – my motivations, values, and long-term aspirations.

All of this has helped me feel more grounded and confident in the next steps of my professional journey.

Balancing the mentoring program with the final stretch of my PhD, including writing and defending my thesis, was not easy. It was possible, and I am glad I did it, but I would recommend that future participants consider joining the program either a bit earlier or a bit later in their timeline if they want to get the most out of it. The content and conversations deserve full attention.

For anyone approaching a career transition, whether within academia or beyond, mentorship can be a powerful tool. Not because it provides answers, but because it helps you ask better questions. Sometimes, having a space to think out loud with someone who has walked a similar path is exactly what you need to move forward.

by Adrián Palacios Muñoz (Mentee)

Adrián PALACIOS MUÑOZ did his PhD in the lab of Jan Clemens at the European Neuroscience Institute Göttingen and is finalising his projects as a postdoc. He is currently evaluating possible postdoc positions and considering his next career steps.

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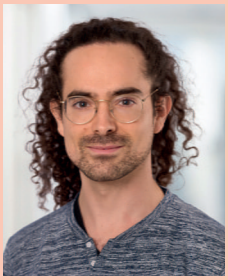

Our Alumni Mentoring Experience (continued)

When I saw the invitation to participate in the alumni mentoring program, I was initially hesitant. Could my limited experience really help someone else decide what career move to make and how? Still, I sensed it would be an enriching experience for both a mentee and me, so I signed up.

My hesitation stemmed from how we often imagine a career as a Snakes and Ladders game: a fixed board, a clear goal, and predefined obstacles and shortcuts. In that model, the mentor's role is to point out where the snakes are and where the ladders lead, offering tactical advice to climb faster and fall less. But to me a career feels more like a game of Go: the board evolves with every move, and each decision reshapes the entire game. If that's true, then as a mentor I might be pointing to ladders that no longer exist, or missing snakes that weren't part of my game.

All I truly have is my own story: the transition I made from academia to industry. But once you're in industry, you encounter many more stories, people who took completely different paths but ended up in similar places. This exposure creates a kind of collective memory of the transition, helping you put your own moves in perspective and broaden your understanding of the possibilities. That's where mentoring becomes valuable; not to predict the mentee's future board, but to help illuminate the rules of the game. Mentoring doesn't give you a map you can follow to draw a route. It's more like a toolkit to keep your car (or bike) running smoothly on the journey, and a glimpse of destinations you didn't know existed but might be exciting to explore.

The organizers of the mentoring program did a fantastic job of finding a good match. I was paired with Adrián, who shared a similar academic background (physics) and cultural roots (Latin America). That common ground helped us start the conversation in the same language, literally and metaphorically. In our sessions, Adrián told his story, and I told mine. I rewound the tape to the moment I decided to leave academia: what motivated me, what other options I considered, and how I made the leap. This helped clarify the state of the board I was playing on at that time, hoping Adrián might find echoes of his own situation. We also included exercises to help him better understand his current position, what motivates him, his values, priorities, and what "success" might mean for him personally. We explored how this applies to a broader scope inside and beyond academia. Just as importantly, we talked about what happened after the move. How the board changed, and how I changed too. Because in the career game, not only does the board evolve; you do as well. At times, I may have talked too much or oversimplified the reality. But I hope the insights helped Adrián navigate his own journey with more clarity and confidence.

After the mentoring sessions, I realized how valuable it is to have someone else's perspective, someone outside your immediate environment who can help you see things differently. That experience made me reflect on my own current position. Was I still seeing the full board? Or had I become too focused on my own corner of the game? To continue broadening my view, I decided to join professional mentoring sessions. This time, I was the one seeking guidance. It helped me reframe my goals, recognize patterns in my decision-making, and explore new directions I hadn't considered. It also uncovered many aspects I could have done better as a mentor; less about sharing stories, more about asking the right questions and challenging assumptions. That's a learning I will definitely apply next time I have the chance to be a mentor.

by Juan (Chepe) Flórez Weidinger (Mentor)

Juan Daniel (Chepe) FLÓREZ WEIDINGER did his PhD and postdoctoral work in the lab of Fred Wolf at the Max Planck Institute for Dynamics and Self-Organization. He is now a Senior R&D Scientist at Genedata in Basel, Switzerland.

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Whereabouts of our Neuro PhD Alumni

Current profession

Academia / Research	**(51%)**
Professor	11%
Group leader, PI	10%
Staff/ senior scientist	3%
Postdoc	20%
Science management	7%
Private & Public Sector	**(34%)**
Scientist, team leader, manager R&D	19%
Staff, team leader, manager non-R&D	10%
Science manager/ coordinator	2%
Consulting	3%
Other Profession	**(10%)**
Media, publishing	2%
IT, software development	2%
Patent Attorney	1%
Resident, Chief resident	3%
Self-employment, founder	2%
Other	**(5%)**
Other professions, internships, job applications, family management etc.	5%

Current location

Europe	**(74.9%)**
Austria	3.1%
Belgium	0.5%
Czech Republic	0.5%
Denmark	2.1%
France	0.5%
Germany	51.3%
Hungary	1.0%
Ireland	1.0%
Liechtenstein	0.5%
Netherlands	2.1%
Norway	0.5%
Spain	1.5%
Switzerland	5.6%
Turkey	1.0%
UK	3.6%
America	**(17.4%)**
Brazil	0.5%
Canada	1.0%
USA	15.9%
Africa	**(1.0%)**
Ghana	0.5%
Lesotho	0.5%
Asia	**(6.7%)**
China	2.6%
India	1.0%
Israel	0.5%
Qatar	0.5%
Taiwan	2.1%

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