CNS Back to Life: The Relaunch of the Charité NeuroScience Newsletter

Welcome to the revived Charité Neuroscience Newsletter — the CNS. We would firstly want to take this opportunity to introduce the new editorial team consisting of Gina Eom (PhD student), Julia Rummel (MSc student), Katyayni Vinnakota (PhD student), Marietta Zille (MSc student), Nicole Hentschel (PhD student), and Ryan Cordell (PhD student). Many thanks to Ralf Ansorg for designing the layout of the newsletter and Lutz Steiner for his constant support during the inception of the newsletter.

COVER STORY
How Do Brain Tumors Expand?

Markovic and Colleagues Investigate

MMP14, better known as membrane type 1 matrix metalloprotease (MT1-MMP), is a transmembrane spanning protease thought to be involved in promoting tumor invasion (Sato et al, 1994) and other cellular processes such as inflammation.

In their recent research study, Markovic et al. confirm that MT1-MMP plays a role in tumor growth in the brain. Based on studies from both patient samples and mouse brain tissue samples, Markovic showed that MT1-MMP is highly expressed in the microglia (the immunocompetent cells of the CNS) found in close contact with the invasive edge of a glioma.

RESEARCH ON RESEARCHERS
Prof. Dr. Geiger, Institute of Neurophysiology

A New PI of the Cluster of Excellence NeuroCure

In this issue we are introducing Prof. Dr. Geiger to you — a new principle investigator of the Cluster of Excellence NeuroCure. He is following Prof. Heinemann as the Head of the Institute of Neurophysiology. In this article you will learn more about his background, his main topics of interest and what he does in his freetime. Some interesting advice, opinions on the future of neuroscience and experiences make it even more worth reading this interview.
Editorial

NICOLE HENTSCHEL

This newsletter brings you the latest events and hot topics in the field very familiar to you: Neuroscience. In this year’s first issue we aim to sum up the events of the quarter, celebrate the achievements and success of the students, professors and alumni of Medical Neurosciences and present information on interesting elective courses, posters and the neuroscientific news of the past few months. All that we present in a mixture of science and fun, of people and places, of news and events. We are targeting current and former students as well as faculty, prospective students and the wider public. The idea is to be informative as well as entertaining and to create a forum for the Medical Neurosciences community. To get you involved, we include a contest for reader’s contributions (Contest, → p. 10).

In any case, we always love to hear back from you — so, send us your feedback, comments or any suggestions to improve this newsletter and make it more close to you. How do you reach us? Simple: Just contact us by email at cns-newsletter@charite.de, and we promise to get back to you at the earliest. Last but not the least, grab your copy of the CNS today and enjoy reading it!

COVER STORY

How Do Brain Tumors Expand?
Markovic and Colleagues Investigate

(ge) (continued from p. 7) They also demonstrated that MT1-MMP may be involved in tumor growth and invasion. Immunofluorescent staining revealed that microglia, which make up to 30% of the glioma tissue, selectively over-express MT1-MMP at the invasive edge of the tumor (some endothelial cells also express the enzyme). In a brain slice culture model, exposing the slices to mouse glioma cells resulted in the upregulation of MT1-MMP in glioma-associated microglia as early as 3 hours post-exposure.

In order to show that the MT1-MMP expression of microglia was induced by soluble factors released by the glioma cells, supernatant from glioma cell cultures was collected and exposed to naïve microglia. This treatment resulted in the upregulation of MT1-MMP in the microglia cells and subsequently led to the activation of MyD88 and p38 MAPK molecules. This suggests that a Toll-Like Receptor(s) is/are engaged in the pathway in order to upregulate MT1-MMP expression in microglia. Furthermore, gelatine zymography studies revealed that this upregulation of MT1-MMP lead to to the activation of the pro-MMP2 released by the tumor cells, which is yet another protease known to be a key factor in promoting tumor growth and invasion. Silencing MT1-MMP expression resulted in a reduced tumor volume, and in-vivo depletion of glioma-associated microglia, via transgenic mouse models, resulted in a severe (up to 80%) reduction in tumor size.

Taken together, this data from Markovic et al. suggests that microglial MT1-MMP, expressed specifically at the tumor border, plays a key role in the invasion and expansion of glioma tumors. Further studies on the role of microglia-assisted glioma pathology are warranted in the area of drug development and immunotherapies as alternative treatment modalities for gliomas.

Citation: Markovic et al. Proc Natl Acad Sci U S A. 2009 July 28.

RESEARCH ON RESEARCHERS

Prof. Dr. Geiger, Institute of Neurophysiology

A New PI of the Cluster of Excellence NeuroCure

(nh) NH: What is your academic background? How did you come across neuroscience?

JG: I studied Biology at the Freie University (FU) here in Berlin and also delved into physics, especially biophysics. My first exposure to neurobiology was during my studies of Biology. There, I met Prof. Randal Menzel, the head of the Neurobiology department of the FU. As my main interest back then was biophysics, he arranged a diploma thesis in the lab of Prof. P. Fromherz, a biophysicist working on neuroelectronic systems combining neurons with field-effect transistors (FETs). I was able to work on an application-oriented topic in the field of neurophysiology and to combine biophysics with neurobiology on a technical background. In order to pursue the path of neurophysiology, I started my doctoral thesis at the Department of Cellular Physiology at the Max Planck Institute (MPI) for Medical Research headed by Prof. B. Sakmann under the supervision of Peter Jonas.

What is your motivation to do neuroscience research?

After my undergraduate studies, I was not really committed to neuroscience.
My favourite subjects were systems and theoretical biology. So I searched for an experimental field in which you can design research projects that also contain a theoretic dimension. Neurobiology is a good field in which you can find both elements.

What are your main topics of interest in neuroscience?
Currently, I am focusing on two main topics of interest: The first one is the investigation of the analogue-digital hybrid code of axonal signal transmission, which I am working on with Dr. H. Alle. This code emphasizes the role of the propagation of subthreshold neuronal signals in terms of modulation of action-potential-dependent transmitter release. We also intend to examine an assumed pro-epileptic role of the analogue signal and reveal how to pharmacologically influence this signal. Secondly, I am interested in interneurons and their connection to diseases — especially the role of different types of interneurons in schizophrenia. I want to ask questions such as which symptoms arise from interneuron dysfunctions. This will in the end help us to learn more about interneurons and their function and may help to develop new therapeutics in the future.

What impressed or astonished you the most during your career?
I had a really instructive doctoral time in which I learned from high-ranking post docs. That is why I obtained really great training. Nearly every challenging project I started ended up yielding interesting results, in spite of several people before me having attempted to solve the problem, but giving up.

What do you think will be the major milestones in neuroscience research in the future?
This clearly depends on the perspective from which you look. Nevertheless, I think that the progress we make in unravelling the underlying pathomechanisms of neurodegenerative diseases will be one important milestone. This is not only important for developing more effective therapeutics but also to ensure the social recognition of the neurosciences.

What other passions do you follow besides neuroscience?
I try to spend all my free time with my daughter. Moreover, I enjoy reading books, watching TV on Saturdays, and having a Martini with friends.

What would your message be to aspiring neuroscience students today?
The most important thing is that you follow a topic you are passionate about so that you can find satisfaction in your work and gain gratification.

What do you consider as your greatest achievements so far?
Methodically, I would say the optimisation of the quality of acute brain slices, being among the first who studied interneuron synapse physiology in paired recordings of pre- and postsynaptic neurons using the patch-clamp technique and especially the direct presynaptic recordings on mossy fiber boutons of the hippocampus. In the latter, I guess, we have the highest standard worldwide. Content-wise, my greatest achievement is the discovery of the analogue-digital hybrid code of axonal signal transmission.

Who are the researchers (dead or alive) whom you look up to as role models?
In my opinion, you should never adore the heroes of the past, something my former boss Prof. Sakmann would also argue for. My role model is the structure of working groups which existed in the middle of the 20th century. Back then, it was usual to have small groups with lots of discussions and intensive team work/co-operation.

A TASTE OF HOME
Sasaya – Best Japanese in Town

Sasaya is the go-to place for sushi connoisseurs, and one of the best places for the pricepoint in Berlin. Having grown up along the Pacific Ocean, my standards are extremely high when it comes to fresh seafood. I can say that this is the only place in Berlin where I will eat sashimi. The service is quick and friendly, run by Japanese staff, and the menu is traditional. They only have the best sakes on their beverage section, so you cannot go wrong here. But don’t think about going without reserving ahead of time, unless you want to eat at the crowded bar!

Price: 10-20 Euros per person.

Sasaya
Lychener Straße 50, 10437 Berlin (Prenzlauer Berg, Helmholtzkiez), phone 030 44 71 77 21.
Thu–Tue, 12:00–15:00, 18:00–22:00; Wed, closed. Reservation strongly encouraged!
**BRAIN REELS**

**Lars and the Real Girl**

(ts) Lars is a 27-year-old guy. He’s never had a girlfriend. He lives in the garage of his brother and tries to avoid contact with other people. Who wants to live like that? Is that normal? “No, that’s not how people are!” — What is going to happen next in a movie which starts like this? Is there going to be a girl named Bianca appearing from nowhere and completely changing Lars’ life like it happens in every love-movie?? Yes, this is exactly what happens in the 2007 production ‘Lars and the Real Girl’ by Craig Gillespie. There is only one little thing which makes this movie different and greatly brilliant: Bianca, Lars’ new girlfriend, is a life-size half-brazilian plastic doll. Somebody has stolen her luggage and wheelchair and because of her deficits in the English language Lars is going to take care of her.

“What the hell is he doing with a delusion?” Lars’ brother asks the doctor. “This is what we have to find out…” replies the doctor and suggests behaving like Bianca is a perfectly ordinary addition to Lars’ life. Following this advice the doll becomes more and more part of the small town’s community where everybody tries to support Lars. It seems that Lars has some serious issues, but at the same time the movie identifies numerous types of behavior we might intuitively regard as normal but which might be as artificial and absurd as being in love with a half-brazilian plastic doll. After lots of laughing the movie leaves you with the idea that sometimes it might be a good idea to just play the game of life and accept some of its aberrations and confusions — watch it and judge yourself.

**SCIENCE MEETS ARTS**

**Enception**

The Inner World of Neuroscience

Dorsal Root Ganglion Neurons, created by Heiti Paves, Institution: Tallinn University of Technology, Department of Gene Technology

(rc) Enception: The Beautiful Mind reveals the inner world of neuroscience through the microscope lens. As a photo exhibition, Enception uses vivid imagery collected from laboratories around the world to visually transport complex scientific matter to a broad audience.

The aim of Enception is to raise public awareness of the biological sciences, especially the neurosciences, by showing them the beauty that lies within. We hope to inspire people’s curiosity and create a desire in them to learn more about a field that may be considered too complex or sophisticated to appreciate.

The exhibition is composed of donated images by scientists and students from around Europe. The pictures themselves come from laboratory experiments and represent various brain cells and tissues derived from cutting-edge research. They demonstrate the beauty of neuroscience and reflect the myriad ways it can engage our curiosity and sense of wonder. The exhibit was first shown in November 2009 at the Charité’s Museum of Medical History and will next be on display at the FENS Forum in Amsterdam, 3 to 7 July 2010. If you will not be able to see these wunderful images life, you can admire them online at [www.enception.org](http://www.enception.org).

**COURSE DESCRIPTOR**

**Experimental Design and Conceptualization**

A Closer Look to an Elective Course

(mz) During academic studies, we accumulate knowledge about a specific field of science and about techniques and methods which can be used in daily research. However, when it comes to developing a concept about which experiments may help to answer a scientific question appropriately and as fast and good as possible, we depend on our supervisor. To overcome this problem, the Experimental Design and Conceptualization Course was initiated.

**About**

The Experimental Design and Conceptualization Course offers students the possibility to learn about the current state of high-impact research from experienced scientists. They then consider appropriate experiments based on the papers presented or questions suggested by the lecturer. The lecturer gives feedback as to whether the project de-
signs (i.e. chronology and suitability of suggested experiments to address the scientific question) are reasonable.

The idea behind this course was born in 2008 as a students’ initiative driven by Ha Thi Hoang with the support from his fellows Anand Sivasubramaniam and Ivana Galinovic. Since then I have continued organizing the course with the help of my fellow students and six sessions featuring diverse research areas of neuroscience ranging from molecular to computational to clinical neuroscience and neurophilosophy have taken place.

By establishing such a course, our goal is to contribute to the students’ understanding of how to conceptualize and design experiments logically, apart from the mere knowledge of how techniques work. Recommendations for new topics and lecturers come from students interested in a certain lecturer’s research. Thanks to the support of the program office it is also possible to invite researchers from outside of Berlin, and you are warmly encouraged to submit suggestions that may be of interest.

Experimental Design and Conceptualization during summer term 2010

Wed, May 12, 3 p.m. to 6 p.m.
Speaker: Dr. Isabel Dziobek
Research Area: Structural and functional MRI of social cognitive functioning in autism

Tue, May 18, 3 p.m. to 6 p.m.
Speaker: Prof. Dr. Mary Harrington
Research Area: Book “The Design of Experiments in Neuroscience”

Wed, June 16, 3 p.m. to 6 p.m.
Speaker: Prof. Dr. Peter Hegemann
Research Area: Optogenetics

Students’ opinions

Léon: “The Experimental Design course is something special because it is based on a students’ initiative. Participants have the possibility to suggest speakers not giving lectures in the Medical Neurosciences program. Thus, the themes addressed in this course run from ‘decoding the brain’ to neurophilosophy and broaden our scientific horizon.”

Timo: “Looking for a neuroscientific subfield which is fascinating enough to spend some of your intellectual abilities and lifetime on, everybody automatically meets a multitude of people. Some people devote years of their lifetime to a special protein and try to nail down its properties using all of the massive armamentarium molecular biologists developed. Listening to others rouses the feeling that mathematical tricks will soon make our dream of being able to read others’ minds true. Some people seem to lose the ‘big picture’, others seem to explain the whole universe. How to judge what type of researcher you want to be? (1) Listen for at least 3 h to people talking about their obsession with neuroscience (2) Do some introspection (3) See if you detect some correlation of time and arousal.”

Dan: “It was a privilege to spend a few informal hours with the Professors Rosenmund and Haynes, learning about the questions they do research on and the strategies they use to get at them. In order to be prepared, we read a few of their recent papers, and heard the interesting story of the decisions, problems, and unexpected findings they encountered along the way to publication. The course helps to understand how scientific progress is currently being made in individual labs with available tools and clever experiments.”

Anonymous: “I appreciate lectures that highlight the focus of the lecturer’s research since they provide priceless insights into the field as well as into current developments. To even benefit more from the professor’s knowledge and experience, it might be helpful to complete the lecture with a discussion lasting an hour at most where questions of students associated to their own research will be discussed in the group. The attendance at this discussion should of course be voluntary. It is really worthwhile to have the opportunity to present ideas and subsequently gain input from the professor as well as from other brains.”

NEUROSCIENCE IN THE PRESS

Depression: Therapy with Deep Brain Stimulation

Patients suffering from therapy-resistant depression can be treated with the electroconvulsive therapy. At the Clinic for Psychiatry (Charité, Campus Benjamin Franklin) patients receive cramp-inducing electric shocks for one minute, three times a week. A newer, still more experimental method is the deep brain stimulation (DBS), used for severe cases of depression. Here, electrodes are implanted to stimulate the reward system and the frontal lobe. The documentary “Schattenzeit” deals with patients that have severe depression and was filmed at the Charité. It will be broadcasted on TV on September 10 (rbb). (DIE ZEIT. Online Edition. Published Feb 04, 2010).
**NEUROSCIENCE IN THE PRESS**

**Development: Skin Cells Become Neurons**

(jr) Marius Wernig’s research group from Stanford was able to program skin cells from mice to develop into nerve cells without taking the step back to the state of stem cells. This might lead to the possibility to bread neurons that die in neurodegenerative diseases. These could be injected into the patients brain, e.g. dopamine-producing neurons into Parkinson patients. In Germany, research on embryonic stem cells is forbidden; however, in the US research on embryos that remain from artificial fertilization is allowed. (DIE ZEIT. Online Edition. Published Feb 02, 2010.)

**NEUROSCIENCE IN THE PRESS**

**Disease: Amyloid Beta Belongs to the Innate Immune System**

(jr) The protein amyloid beta (Aβ) is known as a waste product that causes the Alzheimer disease, without any real function. Now, a function has been suggested: it might help the brain to defend against bacteria and microbes. The genes coding for Aβ are very similar to those of LL-37, a well-known protein of the innate immune system. Like Aβ, LL-37 also clumps into plaques. And like LL-37, Aβ can kill microbes that are known to be killed by LL-37. However, it remains unclear whether Aβ is cause or consequence of the inflamed brain in patients with Alzheimer’s disease. (New York Times. Online Edition. Published Mar 8, 2010.)

**WHATEVER HAPPENED TO...?**

Jan Klohs, PhD

(ge) Jan Klohs graduated *summa cum laude* with a PhD as a student of the Medical Neuroscience PhD program in the Department of Experimental Neurology under the supervision of Prof. Dr. Ulrich Dirnagl and PD Dr. Andreas Wunder. His PhD was concerned with the development of a new optical imaging technique which allows the non-invasive monitoring of pathophysiological processes in the brain. He successfully demonstrated that the technique can be used to visualize inflammatory processes in a mouse model of stroke. He published 9 research and review articles during that time.

After completion of his PhD in November 2009, he moved to Zurich where he is currently pursuing a post-doctoral fellowship in the Department of Biomedical Engineering at the ETH Zurich. His work is now concerned with the application of high-field magnetic resonance imaging in neuroscience. He recently became a project leader for the structural and functional imaging of mouse models of Alzheimer’s disease using MRI and optical imaging. Congratulations and good luck in all your future endeavours, Dr. Klohs!

GE: Jan, thanks for taking the time to speak with us. Tell me a little bit about what made you go into the field of neuroscience and how you stumbled upon the MedNeuro MSc program (which led to staying for the PhD program).

JK: Yes, I actually did my undergraduate majors in Chemistry and Business Management at the University of Wales, where I had the chance to spend a year in Montpellier, France. There, I was given the option to choose a project in mass spectrometry or going into a more biological direction. I ended up working in the lab of Alain Privat, where I worked on neuroprotection and NMDA receptor antagonists. So it was by chance that I got introduced into the neuroscience field. I was actually offered a PhD position there, but I decided to get a more thorough background in neuroscience with medical relevance, so the options for me were Göttingen, Tübingen, and Berlin.

And how do you think the MedNeuro program benefited you the most?

Well, the real advantage of this program is that you get to know the entire neuroscience community in Berlin from the beginning on. Since the community cooperates with one another closely, you get to know the field quickly. You also get a very thorough background in neuroscience from the beginning - and I am still benefiting now from the training of the Masters program. You are also getting connected with other students. Besides building friendships, this becomes incredibly useful as your classmates specialize into their different fields and...
you can "exchange notes" and expertise.

What exactly is your current position at the ETH in Zurich and what are you hoping to accomplish during your stay there?

Well, I am currently occupying a research position unique to Switzerland, called "Oberassistent", which is like an extended senior postdoctoral fellowship. We get to lead our own projects, have time to supervise PhD students, teach, and collaborate with industry. It's quite a bit of work but in turn we get more independence. My goals for this stay are several folds. For one, this is one of the few labs in the world that image with this unique technology, and I want to benefit from the expertise here. Secondly, since it is a position with a longer duration than the classic 2 year contracts in the US, I can take time to really develop long-term projects.

Ok, and where do you see yourself in 10 years? (laughs) Not sure. Just like I stumbled onto neuroscience by chance, I don’t have a concrete idea of where I have to be in 10 years. I guess the most important thing right now is to fulfill each requirement at each step of my career. I would like to stay in science, I am attempting an academic career, but it’s hard to say where I will be. It’s also dependent on a bit of luck. So it’s hard to answer this question.

And do you see yourself in a certain country?
I am not restricting myself to a certain country, if that’s what you mean. I liked my stay in Berlin, but I am not restricting myself to Germany or any other country.

Ok, now for a lighter question, have you acquired your favourite Swiss chocolate?
Yes, there is a family owned company called Sprüngli, they make excellent chocolate.

Any other comments, on anything we talked about in particular?
You realize that the neuroscience community is super small. Currently there are lots of people originally from Berlin, who have ended up in Switzerland, via the US or otherwise. Once you’re in this community, it’s nice to speak to someone you already know or have a connection with. It’s a small world.

DIGGING DEEPER

Cutting Edge

Francesco Boato: Institute of Anatomy, PhD under the supervision of Prof. Dr. Sven Hendrix

Quantification of BDA-labeled nerve fibers between the tract end and the lesion site and that cross the lesion: promoting effects of C3bot154-182. For detailed explanations see publication.

(fb) My doctoral work focuses on the study of central nervous system (CNS) regeneration in vitro and in vivo in models of traumatic brain and spinal cord injury.

Small GTPases of the Rho family play versatile roles in the formation, development, and plasticity of axons and dendrites. The effects of the Rho GTPases are often studied by the Rho-inactivating C3 transferase (C3bot) derived from Clostridium botulinum. In this study, we focused on the effect that the application of the enzyme-deficient Clostridium botulinum C3 protein-derived 29-amino acid fragment (C3bot154-182) had on functional recovery and regeneration in corticospinal tract (CST) fibers following spinal cord injury by compression or dorsal hemisection in adult mice. Single application of C3bot154-182 significantly improved locomotor restoration in both injury models as assessed by the open-field Basso Mouse Scale for locomotion and Rotarod treadmill experiments. These data were supported by tracing studies showing enhanced regenerative growth of CST fibers in treated animals as visualized by anterograde tracing using biotinylated dextran amine (see figure). In addition, regenerative growth of raphespinal fibers was stimulated by C3bot154-182. Using α-bungarotoxin staining we demonstrated a reduced loss to motor endplates in tibial muscles of treated animals as well as a reduced proportion of non-innervated endplates. These in vivo data obtained from injured mice are supported by in vitro data showing an enhanced axon outgrowth of both α-motoneurons of the spinal cord and hippocampal neurons cultivated on normal or growth-inhibitory substrate after application of C3bot154-182. The observed effects were probably caused by a non-enzymatic downregulation of active RhoA by the C3 peptide as indicated by pull-down experiments. Surprisingly, C3bot154-182 did not induce neurite outgrowth in primary cultures of dorsal root ganglion cells.
In conclusion, C3bot154-182 represents a novel and promising tool to foster axonal protection and/or repair as well as functional recovery after traumatic CNS injury. Further studies will have to be conducted to better understand the precise mechanism of action and if the Rho-inactivating properties of C3bot154-182 is a direct or an indirect effect.

Citation: Boato et al. J Cell Sci. 2010 Apr 20.

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**MESSAGE IN A BOTTLE**

**Vancouver**

British Columbia, Canada

Ocean and the mountain range, Vancouver is a mid sized city (about 1.3 million inhabitants) and an ideal location for outdoor enthusiasts. From plenty of camping sites along the islands, coasts, and lakes, to skiing in three different resorts within one hour of the city, to whale watching and canoeing, the city will mesmerize any visitor with its wildlife and natural beauty. At first glance, a quiet and clean multi-cultural Vancouver boasts of excellent restaurants from every country of the world, beautiful scenery, great shopping scenes and cafes. If you look beyond the surface, you will see that the city reveals a lot of culture as well — from a blooming fashion scene, to an up and coming independent music and art scene, you will see why Vancouver is frequently voted the number one place in the world to live in. You cannot ignore the film industry either: frequently called “Hollywood North”, it is a favorite location for movie making, where hundreds of movies are shot each and every year.

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**STUDENT PARADE**

**Benjamin Rost**

PhD Student, AG Schmitz

“I actually inherited my PhD project from a former medical neuroscience master student, Patrick Nicholson, who by that time (2005-06) worked with slices of mouse hippocampus to study presynaptic inhibition of neurotransmitter release by GABAb receptors. I guess my boss was interested in putting me on that project because I had some experience with cell cultures, and he wanted to get neuronal cell culture working in our lab. I visited the lab of Nils Brose in Göttingen to learn the so called autaptic culture technique, which afterwards took me and our technician a while to get it working reliably in our lab. The basic principle of these cultures is that one single neuron is sitting on an island of glia cells and by that can only form synapses with itself. Transmitter release of these neurons can be easily investigated with patch clamp methods, and they can be manipulated by viral gene transfer or toxin treatments of the cultures, which is difficult to do in slices. Our aim was to study how GABAb receptors inhibit transmitter release, with the working hypothesis that they act on two different levels of the release process: by shutting down presynaptic calcium influx, and by directly inhibiting fusion of neurotransmitter vesicles. The latter I was only able to demonstrate after a two weeks visit to the lab of Christian Rosenmund, by that time in Houston Texas. He taught me how to apply short hypertonic shocks on autaptic cultures, a technique developed by him in the 1990, which allows to trigger neurotransmitter release without presynaptic calcium influx. With the experiments from his lab I could demonstrate that GABAb receptors can directly lower the release probability of neurotransmitters by making it more difficult for the vesicles to overcome the energy barrier for membrane fusion. How this actually works we still don’t know, as our most likely candidate, SNAP-25, turned out to be a wrong guess. I disabled this protein using Botulinum toxin A (known as Botox), but found that the direct inhibition of the fusion step by GABAb receptors was still working afterwards. The search for the molecular target of this process might require several more years of research, so I might continue with this work after finishing my PhD. This course of action fits well with my plan for a future post-doc position: I would like to join the Rosenmund lab, which recently moved to Berlin, and continue my investigation into presynaptic regulation of neurotransmitter release.”

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JR: Why did you join Medical Neurosciences?

BR: I liked the combination of basic neuroscience and clinical aspects. Plus, it appeared to fit well to my master in biomedical science.

What are your main topics of interest in neuroscience?

The combination of molecular biology with physiology.

What other passions do you follow besides neuroscience?

Freeclimbing, photography, cooking; beach volleyball in summer.

What do you like best about the program?

That it brings together people from all kind of backgrounds and from all over the world.

What is your scientific background before you joined the program?

Humanbiologie (biomedical science) in Marburg, Germany.

ELEVATOR TALK

Mirrors of the Brain

(kv) Have you lately heard about the “mirror effect” that dissolves all barriers between self and others?

“I am a brain, my dear Watson, and the rest of me is a mere appendage.” — Sherlock Holmes

Don’t be surprised, we are indeed talking about “mirror neurons”, those special neurons that fire not only when an animal/person acts but also when the animal/person observes the same action performed by another. In short, they “mirror” or reflect the behavior of the other, as though the observer were the one doing the acting. Mirror neurons, discovered by Giacomo Rizzolati of the University of Parma in 1995, are being claimed to be one of the most promising new discoveries in neuroscience. Some researchers have even said that mirror neurons are for neuroscience what the DNA helix is to molecular biology.

Most primates, including humans and birds are reported to “express” these neurons in the premotor cortex and the inferior parietal cortex. The famous neuroscientist V. S. Ramachandran claims in his essay titled “Mirror Neurons and imitation learning as the driving force behind ‘the great leap forward’ in human evolution” that these neurons might prove to be the key to open several new facets of understanding intentions, empathy, language, autism, theory of mind, gender differences as well as many more functions of the brain. This emerging field is replete with new ideas and theories, albeit with a lot of skepticism and controversies, too. There is still a lot that needs to be unmasked about this “mirror system”, but only time will tell where all this leads to and if mirror neurons have the potential to change the face of neuroscience research. Whattsay, Watson?

CAMPUS BITES

auf die hand

(ge) “auf die hand” (yes, all lower capitals) belongs to the budding trend of artisan “fast” food lunch places in Berlin Mitte. Located right around the corner from the Deutsches Theater, and less than fifty meters away from the Charité Campus Mitte, it offers a beautiful array of healthy, nutritious lunches ready to be taken back to your office, with just that extra little bit of gourmet twist (eg. Club sandwich with grilled beef tenderloin, or the green bean and sugar snap pea salad with orange zest — my personal favourite!). Admittedly, the items are notably pricey even compared to the hip coffee shops in your average yuppy areas, but it’s by far the most outstanding hotspot for a stylish quick bite between a jam-packed agenda of experiments, surgeries, patient appointments, what have you. So if you feel like pampering yourself, or if your boss is treating you to a nice cup of coffee, do not hesitate to steer towards the general direction of Luisenstraße and “stumble upon” this nice little venue!

PS. Their oatmeal cookies with raisins are the most divine creations sent from above and whoever is making them deserves a medal.

auf die hand
Luisenstraße 45
Mon-Fri 8-18 Uhr
Sat 10-16 Uhr
phone 030 - 48 82 37 59.
WHAZZUP?

Calendar of Events in Berlin

(mz) This issue’s recommendation of events.

May 13–15: Symposium New Perspectives in Sleep Medicine
May 21–24: Karneval der Kulturen

Jun 03–05: 3rd Meeting of Western Europe Societies of Biological Psychiatry
Jun 05: Lange Nacht der Wissenschaften
Jun 10: TEAM Staffel - 5x5k relay
Jun 12: BNF Liebenwalde
Jun 17: MedNeuro summer BBQ
Jun 19: Christopher Street Day
Jun 19–23: 20th Meeting of the European Neurological Society
Jun 21: European & Worldwide Music Day
Jun 24–26: 3rd Berlin Summer Meeting

Jul 01–03: 1st International Congress on Borderline Personality Disorder
Jul 15–20: Classic Open Air 2010

Aug 28: Lange Nacht der Museen

Sep 06–12: Berlin Music Week
Sep 26: Berlin Marathon
Sep 24 – Jan 09: Exhibition “Weltwissen. 300 Jahre Wissenschaft in Berlin”

Oct 10–13: World Health Summit 2010
Oct 13–24: Festival of Lights
Oct 14–17: 21st European Student Conference

300 years Charité
from March 26, 2010 to February 27, 2011: Berlin Medical Historical Museum Special Exhibition

Next career days

May 07, 5 p.m. to 6 p.m.
Ms. Ute Heckel, KISSWIN
Introduction to KISSWIN, the platform for researchers of tomorrow and general career development issues presented by Ms. Heckel of the Center for Learning and Knowledge Management and Department of Information Management in Mechanical Engineering (RWTH Aachen)
Lecture hall, Institut für Mikrobiologie und Tierseuchen, Philippstraße 13, House 4

June 04, 5 p.m. to 6 p.m.
Dr. Sebastian Tegethoff
As patent lawyer with a natural science academic background, Dr. Tegethoff will speak on patent law, intellectual property issues and his career switch.

CONTEST

Contest

Images, Pictures, Poems, or Thoughts on Neuroscience

(mz) Starting with the next issue, we would like to also include your contributions. To give you some incentive, we hold a contest calling on you to submit anything you see fit on the topic of neuroscience. Send us your most exciting microscopic pictures, or a creative photo, thoughts on neuroscience or self-written poems — whatever comes to your mind! The best contribution will be published and rewarded with the DVD “Lars and the Real Girl” (Brain Reels, p. [i]). So, what are you waiting for, start the engine of your mind and get going! Trust us, it is worth participating!

Send your contribution to cns-newsletter@charite.de to win this great DVD. Deadline for submission: July 01, 2010.

PUZZLE

Crossword

Find out the correct answers.

(mz) The boxes (p. [ii]) indicated make up the Mystery Word. Send the Mystery Word to cns-newsletter@charite.de to win a Medical Neuroscience cup. Deadline: July 01, 2010. Please note that some answers consist of more than one word. In this case, an empty box should be used as a space.

1. marker for neuronal stem cells
2. consists of nerve fibres crossing over from one half of the spinal cord to the other
3. perceived with visual area V5
4. effect is used to measure neuronal activity with fMRI
5. one of the winners of the Nobel Prize for the discovery of the nerve growth factor
6. technique used to visualize the brain’s spontaneous electrical activity
7. a strategy the Vampire Squid uses to hide from its predators
8. statistical measure of reliability of an estimate
9. constitute 90% of all neurons in the brain
10. bundle of nerve fibers in the central nervous system
11. a hallmark of multiple sclerosis
12. a neurodegenerative genetic disorder named after its affected protein
13. one of the four cardinal symptoms of Parkinson’s Disease
14. ... NS: involuntary sensory and motor neurons control gastro-intestinal tract
15. part of the eye that does not contain any photoreceptors and through which light impulse passes when exiting the eye

Find the Mystery Word

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**Late Submission of Master Thesis**

(ls) A number of students have left the program - and often Berlin - without having submitted their Master thesis by the due date. Some of them contact the program years later, wanting to finally submit their thesis. As understandable as their reasons may be, the Zulassungs- und Prüfungsausschuss decided at its meeting on March 29 not to grant exceptions in those cases. Only those students who can prove that they were unable to work on and complete their thesis for health reasons may get the deadline extended. A respective doctor’s notice must be provided the student.

According to the program regulations published on Sep 18 2007, the thesis must be registered by April 01 and it must be submitted by September 30. There is no option for extension!

**Lars Niehaus is Leaving the Program**

(ls) After two years as program officer, Lars has decided to pursue alternative career opportunities. Thank you, Lars, for your dedication and hard work. And all the best for the future!

**Our New Campus Ambassadors**

(ls) Four of our alumni have agreed to help us further promote the program across the globe by serving as Campus Ambassadors: Xiaolu He in Beijing, China; Guido Günther in Mexico City, Mexico; Astghik Markosyan in Yerevan, Armenia; Martin Munz in Montreal, Canada.

The idea is that they serve as regional points of contact for students interested in MedNeuro. They will share their experiences in the program and help applicants to evaluate if the program is right for them. To find out more about what these four currently do, see our website.

And if you would like to become a Campus Ambassador as well, send an email to lutz.steiner@charite.de.

**Sing dich glücklich!**

(ls) Experimental data suggests that regular singing significantly increases a sense of happiness. If you would like to reproduce this data by singing yourself, the following methodology is suggested: Join the Singing Shrieks, a choir of neurologists, neuroscientists, psychiatrists and psychologists. Contact Dr. Mazda Adli for more details: mazda.adli@charite.de.

**Admission Interviews 2010**

(ls) What a difference! This year’s admission interviews did not just include a 20 min conversation with the members of the admission’s commission. Rather, the program office organized a number of additional features that allowed applicants to get a much better idea of what to expect from the program, Charité, and Berlin. For one, applicants had several opportunities to meet current MedNeuro students, thus getting first hand information and experiences about the program. Furthermore, a number of faculty presented short “taster courses”, i.e. they gave a mini lecture on a topic of their choice. Special thanks go to: Martin Holtkamp for his talk on epilepsy, Uli Dirnagl for his talk on stroke, Benedikt Salmen for his talk on the development of the nervous system, Jörg Breustedt for his talk on the synaptic plasticity-memory hypothesis.

Thirdly, some of the PhD students were nice enough to guide the applicants through their labs. Thank you Ișminı Papageorgiou (Dept. of Physiology), Ferah Yıldırıım (Dept. of Experimental Neurology) and Michael Kintscher (Neuroscience research Center NWFZ)! And those applicants who still couldn’t get enough were able to sit in on the Block B lecture “Axon guidance, layer formation, corticogenesis” by Ina Kahus.

Feedback from the applicants was very positive and appreciative. Not only did they have to present themselves, but the program really made an effort to show what neuroscience in Berlin has to offer.

**Graduation and Alumni Meeting 2010**

(ls) This year’s graduation will be part of the Berlin Brain Days opening on 1 November at the very festive lecture hall of the Kaiserin Friedrich Stiftung. Opening speaker will most likely be Prof. Edvard Moser of the Norwegian University of Science and Technology, Trondheim. The 2nd alumni meeting will take place at the same time as well: 1 to 3 November. So safe the date!

**TEAM Staffel 2010**

(ls) A number of ambitious MedNeuro athletes have registered for this year’s 5x5k relay on 10 June 2010. Start and Finish is on the great lawn in front of the Reichstag. Our teams, MedNeuro Feed Forward and MedNeuro Fast Forward, start at 18.30. So everyone who is not at the BNF in Liebenwalde, come on by and cheer them on!

**Sommerfest**

(ls) A MedNeuro summer BBQ is planned for Thu 17 June in the little park behind HGS. Mark the date and tell your friends. More detailed information will follow via e-mail.

**Impressum**

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