



International Graduate Program Medical Neurosciences

www.medical-neurosciences.de

Founding Fathers

Prof. Dr. Ulrich Dirnagl



Prof. Dr. Uwe Heinemann



Prof. Dr. Helmut Kettenmann



Prof. Dr. Robert Nitsch



Why Do We Need the Program?

- Major advances in basic neurobiology
- Increasing burden through neurological/psychiatric disorders worldwide
- Breakthroughs in therapy of CNS disorders have not yet materialized

Objectives

- To bridge the gap between bench and bedside
- To bring together medical and natural science students in one program
- To provide structured education in translational neuroscience



“MedNeuro brings together neurobiology and clinical neuroscience in order to make more neurological disorders treatable, thereby improving the quality of life for patients with neurological disorders.”

Heinemann et al (2005) Induction of sharp wave-ripple complexes in vitro and reorganization of hippocampal networks. Nature Neuroscience

Neuro Institutions in Berlin



NEUROSCIENCE BERLIN

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- Medical Neurosciences
- Berlin School of Mind and Brain
- International Graduate Program Computational Neuroscience
- Helmholtz International Research School Molecular Neurobiology
- GRK 1123: Cellular Mechanisms of Learning and Memory

Berlin Brain Days

- International PhD Symposium since 2004

6th International Ph.D. Symposium

Berlin Brain Days

2009/dec. 9–11

- 0 Opening lecture**
Jörg Geiger
Professor of Neurophysiology, Charité – Universitätsmedizin Berlin
- 1 Opening lecture**
Colleen Whitlock and Robert Malenka
The Plastic Brain
Jilly Trane
Chairman of Department of Physics, Princeton University, Princeton, NJ
- 2 Opening lecture**
Carole Malenka and Robert Malenka
The Plastic Brain
Andrew Barth
Max Planck Institute for Biological Cybernetics, Tübingen
- 3 Opening lecture**
George J. Steward
The University of Chicago
Colleen Whitlock
University of Texas at Austin, UT at Austin
- 4 Opening lecture**
Gregory Barak
The Weizmann Institute, Rehovot, Israel
- 5 Opening lecture**
Regulation of Central Nervous System & Brain of Increasing Complexity
Pradip Kumbhani
University of California, San Diego, La Jolla, CA
- 6 Opening lecture**
Jeffrey J. Gold
The University of Texas at Austin, UT at Austin

9–11 December 2009
Max Delbrück Center for Molecular Medicine
Berlin-Buch

Talks & poster presentations
by Ph.D. students –
apply until Nov. 1!

Awards
Win the Best Poster Award or the Best Ph.D. Talk Award!

Bus shuttle service
from Berlin-Mitte
to MDC Berlin-Buch
will be offered

www.neuroscience-berlin.de/bbd/

MDC
Charité – Universitätsmedizin Berlin
Max Delbrück Center for Molecular Medicine
Berlin-Buch
Charité – Universitätsmedizin Berlin
Logo of the German Research Foundation (DFG)

- Basic Neurobiology
- Neuroanatomy
- Neurophysiology
- Synaptic Plasticity and Neural Excitability
- Neuroimmunology
- Neuroendocrinology

- Sensory and Motor Systems
- Pain
- Neurodegenerative Diseases
- Developmental Neuroscience
- Cognitive Neuroscience
- Behavioral Neuroscience

Research Environment



NeuroCure

12 new research groups
12 Postdocs
12 PhD Stipends
12 MSc Stipends
Guest scientists
Senior-Professorship (Mentoring)
1 Scientific Coordinator
1 Program Officer

Center for Stroke Research Berlin

10+ new research groups
6 MSc Stipends
5 PhD Stipends
Program officer (part time)
Special projects optimizing

- management
- marketing/branding/public relations



“As Director of the Neuroscience Research Center, I am particularly proud of the great basic research infrastructure we offer to our students: MRI, two-photon microscope, small animal imaging center and state of the art electrophysiological equipment.”

Schmitz et al (2006) Experimental febrile seizures are precipitated by a hyperthermia-induced respiratory alkalosis. Nature Medicine

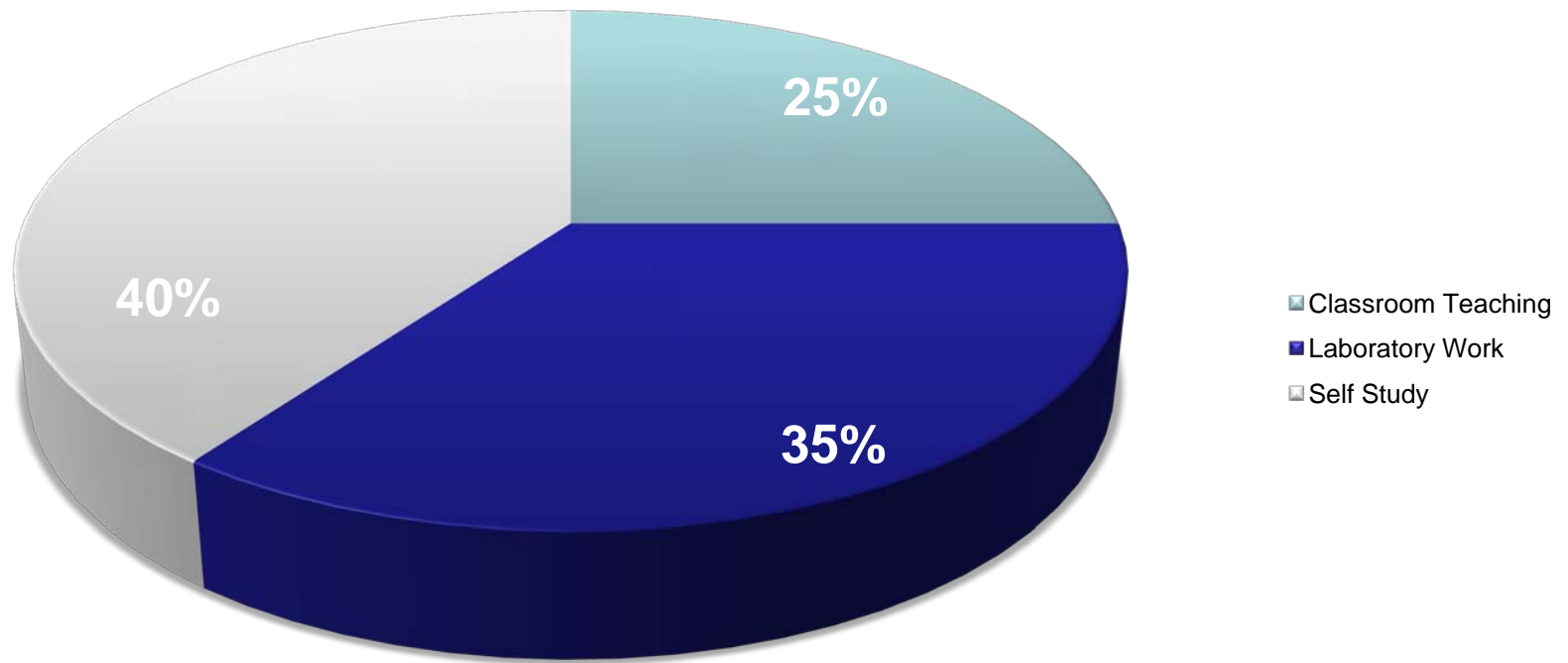
Degrees and Admission

Master of Science (2 years)	Admission requirement: medical degree or BSc in relevant discipline
PhD MD/PhD (3 years)	Admission requirement: MSc in Medical Neurosciences other MSc degrees Medical degree (Arzt, MD)

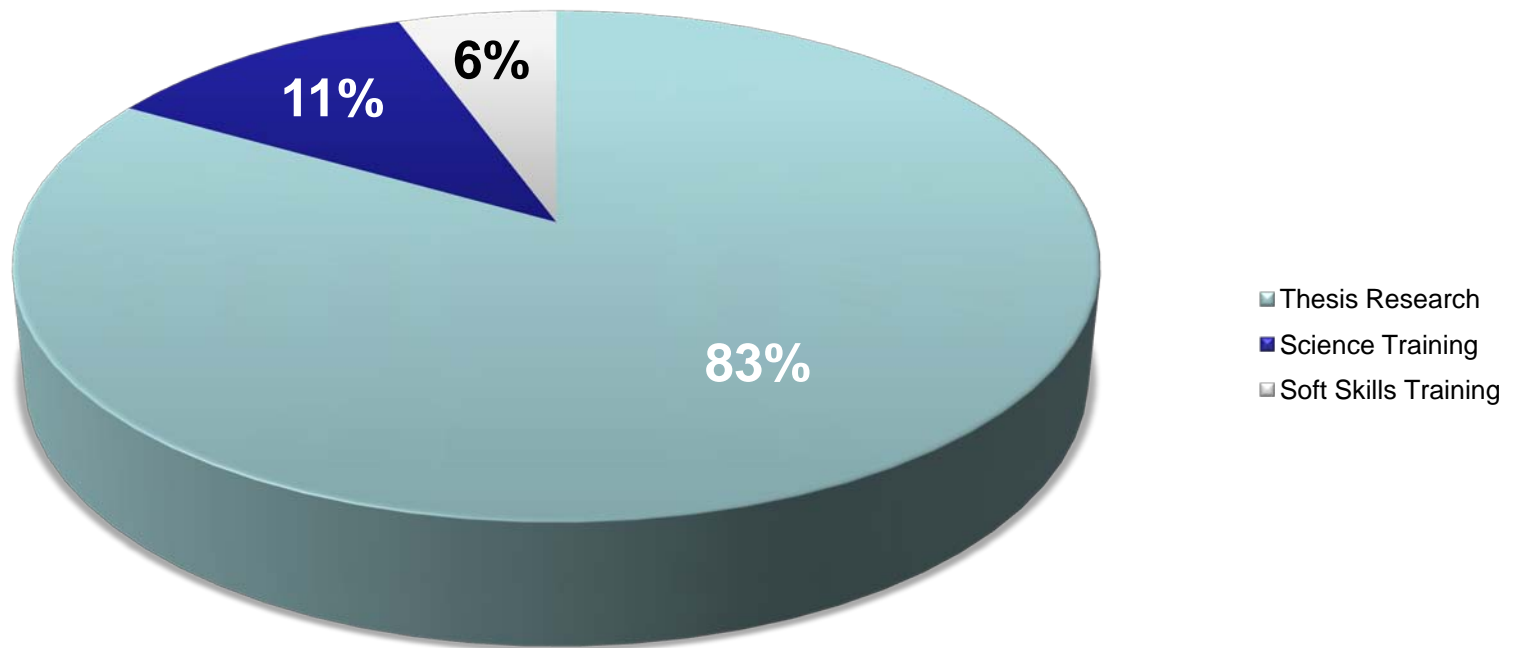
Structure MSc

Modules	Semester 1	Semester 2	Semester 3	Semester 4
Basic Neurobiology	20			
Individual Focus	5	5		
Working with Data	5	3		
Neuropathophysiology		20		
Advanced Problems in Neuroscience		2	3	
Clinical Neuroscience			16	
Academic Writing			5	
Experimental Design			6	
Master Thesis				30
Total CP	30	30	30	30

Elements of MSc Training



Elements of PhD Training





HUMBOLDT | GRADUATE | SCHOOL

Leitlinien:

Fachliches und nicht-fachliches Ausbildungsprogramm,
Individuelle Betreuung, Internationalität, Chancengleichheit

GRADUATE
SCHOOL

GRADUATE
SCHOOL

GRADUATE SCHOOL

SCHULE

FORSCHUNG

MANAGEMENT

- Wissenschaftliche/r Direktor/in
- Wissenschaftlicher Rat
- Auswahlgremium

- Interdisziplinäres Curriculum
- Sommerschule
- Spezialkurse

- Professorinnen/Professoren
- Postdoktorandinnen/
Postdoktoranden
- Doktorandinnen/Doktoranden

Internationaler
wissenschaftlicher Beirat

GRADUATE
SCHOOL

Services & Training

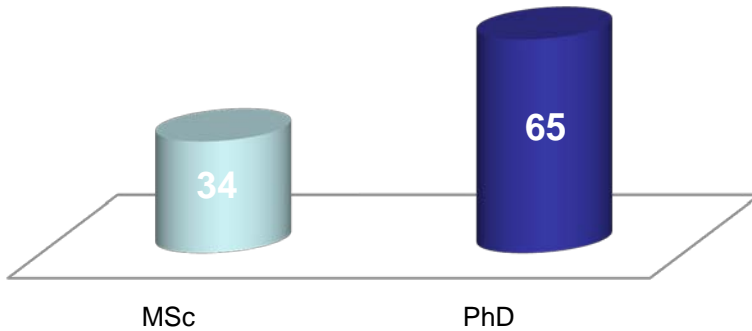
Qualitätssicherung / Ausbildung / Services / Öffentlichkeitsarbeit

- Bachelor graduates of life science disciplines:
 - Medicine, medical sciences, medical engineering, veterinary medicine
 - Biology, biophysics, biochemistry, biomedical engineering
 - Chemistry
 - Physics
 - Psychology
 - Neuroscience

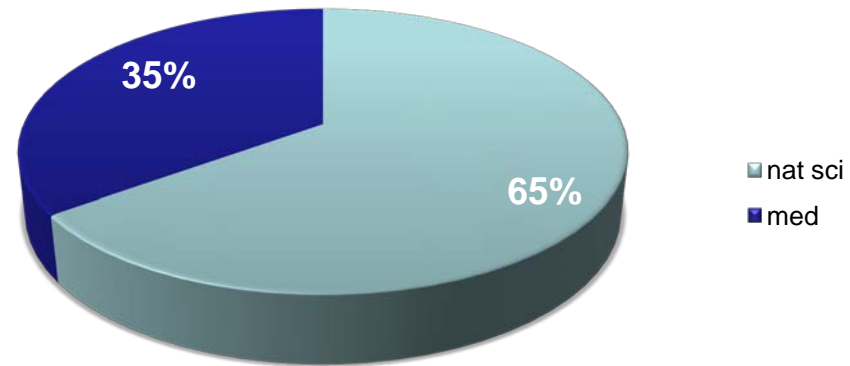
Student Population

Total Students

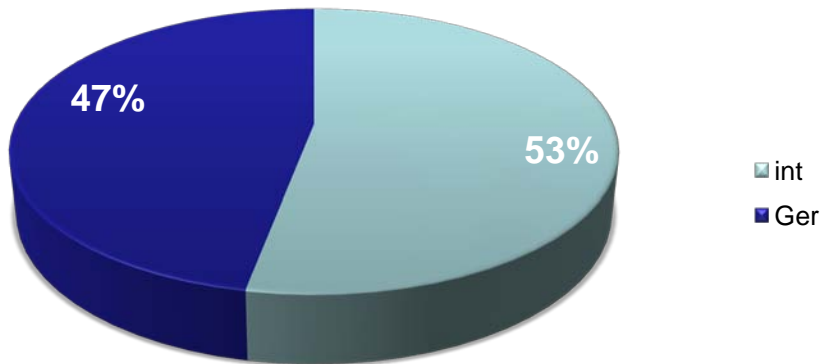
■ MSc ■ PhD



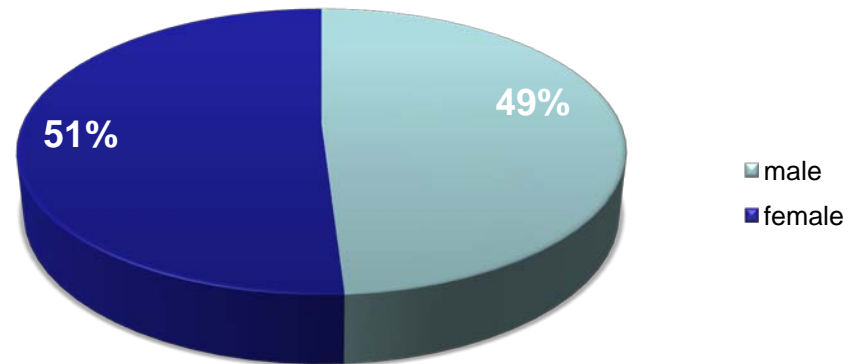
Academic Background



International Students



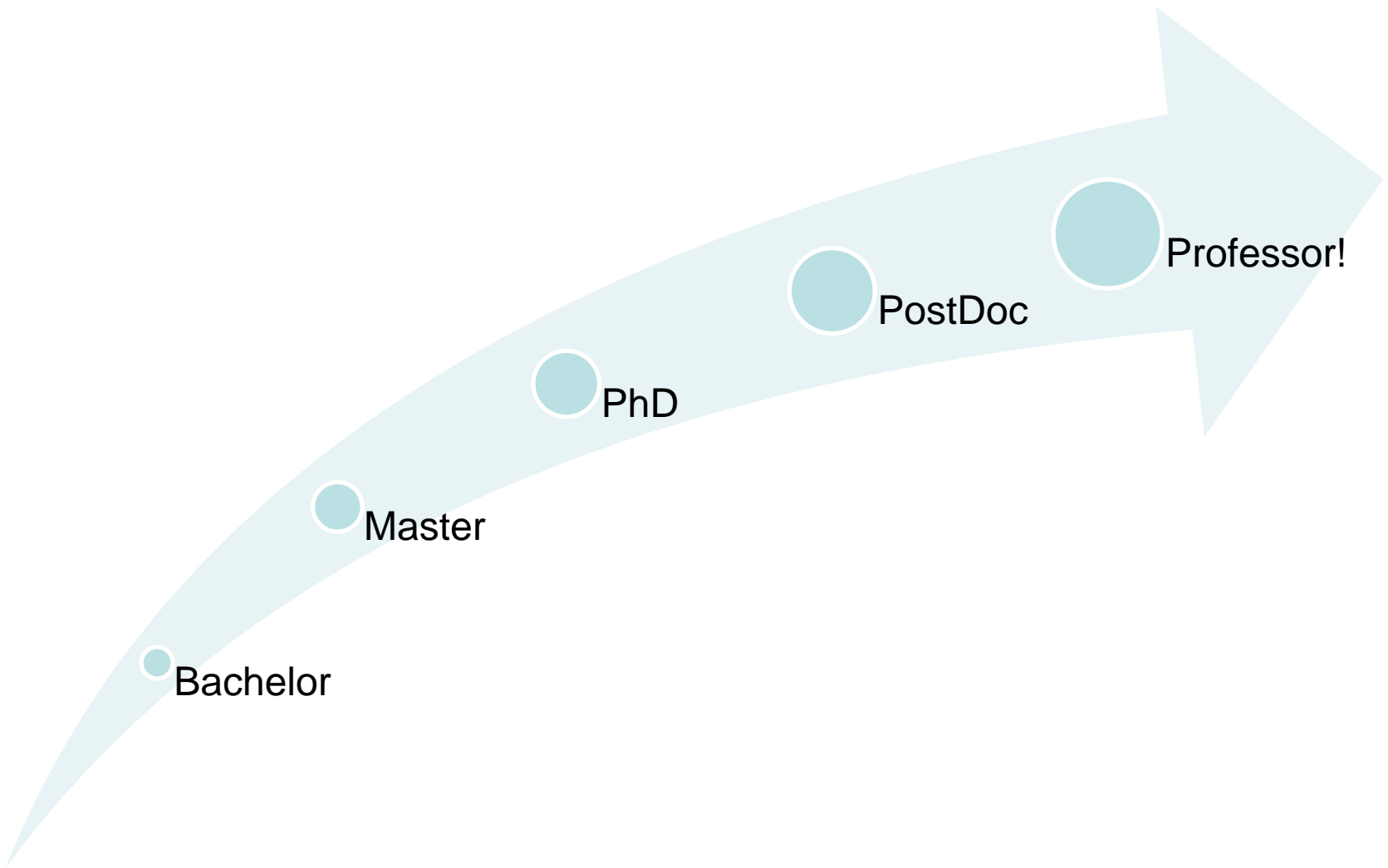
Gender Distribution



The Ideal Student...

- ...is fascinated by cellular and molecular neurobiology
- ...has a strong interest in translational research
- ...can ask complex questions and is tireless in finding answers - at least some!
- ...has some practical lab experience (BSc thesis)
- ...is independent-minded and shows a great deal of self sufficiency
- ...speaks very good English

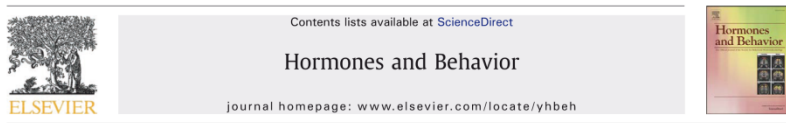
Your Career...



- Intensive academic training in neuroscience
 - Basic neurobiology
 - Neuropathophysiology
 - Clinical neuroscience
- Methods training – theory and hands on
- Handling data
- Working with original literature
- Writing and publishing

- Monthly career day
- “Students Only” Tours
- Newsletter
- Alumni network
- Thesis supervision
- Personal career counseling
- Peer mentoring
- Announcing open positions

Nature Neuroscience, Cell, Brain, Stroke, EJM Neuroimage, Journal of Neuroscience...



Estradiol does not influence strategy choice but place strategy choice is associated with increased cell proliferation in the hippocampus of female rats

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Estradiol
Proestrus
Ovarian hormones

ABSTRACT

Adult neurogenesis occurs in the hippocampus of most mammals. While the function of adult hippocampal neurogenesis is not known, there is a relationship between neurogenesis and hippocampus-dependent learning and memory. Ovarian hormones can influence learning and memory and strategy choice. In competitive memory tasks, higher levels of estradiol shift female rats towards the use of the place strategy. Previous studies using a cue-competition paradigm find that 36% of male rats will use a hippocampus-dependent place strategy and place strategy users had lower levels of cell proliferation in the hippocampus. Here, we used the same paradigm to test whether endogenous or exogenous ovarian hormones influence strategy choice in the cue-competition paradigm and whether cell proliferation was related to strategy choice. We tested ovariectomized estradiol-treated (10 µg of estradiol benzoate) or sham-operated female rats on alternating blocks of hippocampus-dependent and hippocampus-independent versions of the Morris water task. Rats were then given a probe session with the platform visible and in a novel location. Preferred strategy was classified as place strategy (hippocampus-dependent) if they swam to the old platform location or cue strategy (hippocampus-independent) if they swam to the visible platform. All groups showed a preference for the cue strategy. However, proestrous rats were more likely to be place strategy users than rats not in proestrus. Female place strategy users had increased cell proliferation in the dentate gyrus compared to cue strategy users. Our study suggests that 78% of female rats chose the cue strategy instead of the place strategy. In summary the present results suggest that estradiol does not shift strategy use in this paradigm and that cell proliferation is related to strategy use with greater cell proliferation seen in place strategy users in female rats.

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Year	# of Publications
2009	17
2008	17
2007	6
2006	5
2005	4
2004	1

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Newsletter

MedNeuro

- Edited by our students
- Featuring:
 - Neuroscience
 - Neuroscientists
 - Special topics like technology transfer or women in neuroscience
 - Food, entertainment, travel...
- Available online: [About Us/Newsletter](#)



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- Vertical mobility

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“It's great fun to pass on the latest in molecular and cellular neuroscience to such a responsive audience, and then to bring the students into our own research labs to have a crack at it themselves.”

Plested et al (2010) Domain organization and function in GluK2 subtype kainate receptors. Proc Natl Acad Sci

- Extensive orientation upon program start
- Handbook
- Administrative assistance (visa, residence permit, insurance, matriculation...)
- Housing
- German classes
- Intercultural training
- Extra curricular activities

MSc Students 2009



- 2-year master's program – 3-year PhD
- Focus on basic science and translational research
- Intensive theoretical and practical training
- For students with a degree in natural sciences, medicine or psychology
- Excellent faculty
- Entirely taught in English
- Broad range of student services



“To me, MedNeuro is the perfect amalgam of teachers and students: the absolute pleasure for teaching and the unlimited enthusiasm for learning.”

Piña et al (2008) Protein Expression of Pigment-Epithelium-Derived Factor in Rat Cochlea. Cell Tissue Res

Apply Now!

- Application Deadline: 15 January 2011
- Program start: October 2011
- 2-step Application
- Admission tests
- Admission symposium

More information online: [Admission/Master](#)

Thank you!

MedNeuro 

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www.medical-neurosciences.de