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
Neuro Institutions in Berlin
- 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
# Research Environment

<table>
<thead>
<tr>
<th>NeuroCure</th>
<th>Center for Stroke Research Berlin</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 new research groups</td>
<td>10+ new research groups</td>
</tr>
<tr>
<td>12 Postdocs</td>
<td>6 MSc Stipends</td>
</tr>
<tr>
<td>12 PhD Stipends</td>
<td>5 PhD Stipends</td>
</tr>
<tr>
<td>12 MSc Stipends</td>
<td>Program officer (part time)</td>
</tr>
<tr>
<td>Guest scientists</td>
<td>Special projects optimizing</td>
</tr>
<tr>
<td>Senior-Professorship (Mentoring)</td>
<td>• management</td>
</tr>
<tr>
<td>1 Scientific Coordinator</td>
<td>• marketing/branding/public relations</td>
</tr>
<tr>
<td>1 Program Officer</td>
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</tbody>
</table>

**NeuroCure**
- Towards a better outcome of neurological disorders

**CSB**
- Center for Stroke Research Berlin
“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.”

### Degrees and Admission

<table>
<thead>
<tr>
<th>Program</th>
<th>Admission requirement</th>
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</thead>
<tbody>
<tr>
<td><strong>Master of Science</strong></td>
<td>medical degree or BSc in relevant discipline</td>
</tr>
<tr>
<td>(2 years)</td>
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<tr>
<td><strong>PhD MD/PhD</strong></td>
<td>MSc in Medical Neurosciences, other MSc degrees, Medical degree (Arzt, MD)</td>
</tr>
<tr>
<td>(3 years)</td>
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</tr>
<tr>
<td>Modules</td>
<td>Semester 1</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Basic Neurobiology</td>
<td>20</td>
</tr>
<tr>
<td>Individual Focus</td>
<td>5</td>
</tr>
<tr>
<td>Working with Data</td>
<td>5</td>
</tr>
<tr>
<td>Neuropathophysiology</td>
<td></td>
</tr>
<tr>
<td>Advanced Problems in Neuroscience</td>
<td></td>
</tr>
<tr>
<td>Clinical Neuroscience</td>
<td></td>
</tr>
<tr>
<td>Academic Writing</td>
<td></td>
</tr>
<tr>
<td>Experimental Design</td>
<td></td>
</tr>
<tr>
<td>Master Thesis</td>
<td></td>
</tr>
<tr>
<td><strong>Total CP</strong></td>
<td><strong>30</strong></td>
</tr>
</tbody>
</table>
Structure MSc

Elements of MSc Training

- Classroom Teaching: 35%
- Laboratory Work: 40%
- Self Study: 25%
Structure PhD

Elements of PhD Training

- Thesis Research: 83%
- Science Training: 11%
- Soft Skills Training: 6%
Research Areas

- Basic Neurobiology
- Neuroanatomy
- Neurophysiology
- Neurosurgery
- Neuropathology
- Synaptic Plasticity and Neural Excitability
- Neuroimmunology
- Neuroendocrinology
Research Areas

- Neuroprotection and Regeneration
- Neurogenesis
- Sensory and Motor Systems
- Pain
- Neurodegenerative Diseases
- Developmental Neuroscience
- Cognitive Neuroscience
- Behavioral Neuroscience
Student Organized Courses

- Experimental design (Zille MSc)
- Drugs and addiction (Schmidt MSc)
- Programming in Matlab (Riabinska MSc; Lapilover PhD, Kovalenko MSc, Mamer MSc, Carlowitz MSc)
- Data acquisition in electrophysiology (Papageorgiou PhD)
- Introductory lectures and tutoring for new students (Many MSc and PhD)
Questions?

Our Student Representatives

- Marietta Zille (MSc)
- Christin Schmidt (MSc)
- Ismini Papageorgiou (PhD)
- Michael Kintscher (PhD)
Target Group

- 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: 34
- PhD: 65

Academic Background

- 35% nat sci
- 65% med

International Students

- 47% int
- 53% Ger

Gender Distribution

- 51% male
- 49% female
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…

- Bachelor
- Master
- PhD
- PostDoc
- Professor!
Our Focus…

- 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
Career Services

- Monthly career day
- “Students Only” Tours
- Newsletter
- Alumni network
- Thesis supervision
- Personal career counseling
- Peer mentoring
- Announcing open positions
Estradiol does not influence strategy choice but place strategy choice is associated with increased cell proliferation in the hippocampus of female rats

<table>
<thead>
<tr>
<th>Year</th>
<th># of Publications</th>
</tr>
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<tbody>
<tr>
<td>2010</td>
<td>31</td>
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<tr>
<td>2009</td>
<td>17</td>
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<tr>
<td>2008</td>
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<td>2007</td>
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<td>2006</td>
<td>5</td>
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<tr>
<td>2005</td>
<td>4</td>
</tr>
<tr>
<td>2004</td>
<td>1</td>
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</tbody>
</table>

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 30% 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 estradiol or estradiol plus estradiol hormones influence strategy choice in the cue-competition paradigm and whether cell proliferation was related to strategy choice. We tested hormone-untreated ovariectomized (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 if strategy (hippocampus-independent) if they swam to the visible platform. All groups showed a preference for the cue strategy. However, hormone-treated 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 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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Newsletter

- Edited by our students

- Featuring:
  - Neuroscience
  - Neuroscientists
  - Special topics like technology transfer or women in neuroscience
  - Food, entertainment, travel…

- Available online: About Us/Newsletter
Experience Abroad

- Master Thesis in a lab abroad
- NENS Stipends
- Partner programs in Bordeaux, Amsterdam, Coimbra, Québec
- Vertical mobility
Alumni – Campus Ambassadors

Online: Students/CampusAmbassadors
“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.”

Student Services

- Extensive orientation upon program start
- Handbook
- Administrative assistance (visa, residence permit, insurance, matriculation...) 
- Housing
- German classes
- Intercultural training
- Extra curricular activities
MSc Students 2010
Quick Facts

• 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.”

Apply Now!

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

More information online: Admission/Master
“Thorough and objective analysis of findings, their physiological and clinical relevance as well as critical but constructive and creative thinking – this is what MedNeuro stands for.”

Thank you!

Lutz Steiner
lutz.steiner@charite.de

www.medical-neurosciences.de