



Form Follows Function - Comparing Doctoral Training
in Europe and North America

Session I: Universities and Inter-Sectoral Co-operation
and Doctoral Schools

The International Max Planck Research School for Molecular Biology and Neurosciences at the University of Göttingen



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„Twin Programs“ Molecular Biology & Neurosciences



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GEORG-AUGUST-UNIVERSITÄT
GÖTTINGEN
GERMANY

MSc / PhD
Program
**Molecular
Biology**

International Max Planck
Research School



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GEORG-AUGUST-UNIVERSITÄT
GÖTTINGEN
GERMANY

MSc/PhD/MD-PhD
Program
**Neuro
sciences**

International Max Planck
Research School



Max Planck Institutes for
▶ Biophysical Chemistry
▶ Experimental Medicine



European Neuroscience
Institute Göttingen



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The Goals of International Max Planck Research Schools (IMPRS)

- Join forces with the University to provide top-level research-oriented training
- Attract excellent students from all over the world to Germany
- Opening up the manpower and resources of the MPG for scientific education
- Overcoming the traditional boundaries (and frictions) between Max Planck Institutes and University Faculties

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MAX-PLANCK-GESellschaft

Research Schools

About the International Max Planck Research Schools
The Research Schools (IMPRS) are an initiative involving the Max Planck Society and its partner universities and strive to advance junior scientists and researchers. [more]

Section: all | Region: Lower Saxony | OK

Schleswig-Holstein
Hamburg
Bremen
Lower Saxony
North Rhine-Westphalia
Rhineland-Palat.
Hesse
Saarland
Baden-Württemberg

Berlin
Brandenburg
Mecklenburg-Western Pomerania
Saxony-Anhalt
Saxony
Thuringia
Bavaria
Abroad

Research Schools in Lower Saxony:

A

- ▶ **IMPRS on Gravitational Wave Astronomy**, Hannover

M

- ▶ **IMPRS for the History and Transformation of Cultural and Political Values in Medieval and Modern Europe**, Göttingen
- ▶ **IMPRS for Molecular Biology**, Göttingen

N

- ▶ **IMPRS for Neurosciences**, Göttingen

P

- ▶ **IMPRS on Physical Processes in the Solar System and Beyond**, Göttingen



Our specific goals in Göttingen.... (1998)

- to attract excellent students from all over the world to Göttingen for a scientific training of highest standards
- to shorten and streamline the education towards the PhD

... which asked for radically new concepts

(at least for Germany at that time)

- individual selection of student applicants
- development of new international screening procedures
- completely new curriculum according to highest international standards (Yale model)
- structured PhD phase, with thesis committees as central element of quality assurance
- overcoming the traditional boundaries (and frictions) between Max Planck Institutes and University Faculties, and allowing for interdisciplinary studies
- overcoming major obstacles imposed by conservative structures



Participating Institutions

- Georg August University Göttingen: Faculties / Schools

- Biology
- Medicine
- Physics
- Chemistry
- Agriculture



- Georg August University Göttingen: Research Centers / Institutes

- DFG Research Center for the Molecular Physiology of Brain (CMPB)
- European Neuroscience Institute (ENI)
- Bernstein Center for Computational Neurosciences (BCCN)
- Göttingen Center for Molecular Biosciences (GZMB)

- Max Planck Institute for Biophysical Chemistry
- Max Planck Institute for Experimental Medicine
- Max Planck Institute for Dynamics and Self-organization
- German Primate Center





Governance

- *Molecular Biology / Neuroscience Programs*
 - Plenary Faculty Assemblies
 - Program Committees
 - Examination Board
(admission / study / examination regulations)

Participation of biology, medicine and Max Planck representatives in each decision-making body

- *Georg August University School of Science*
 - Mathematics and Natural Science Faculties
 - Executive Board
(framework regulations / degrees)

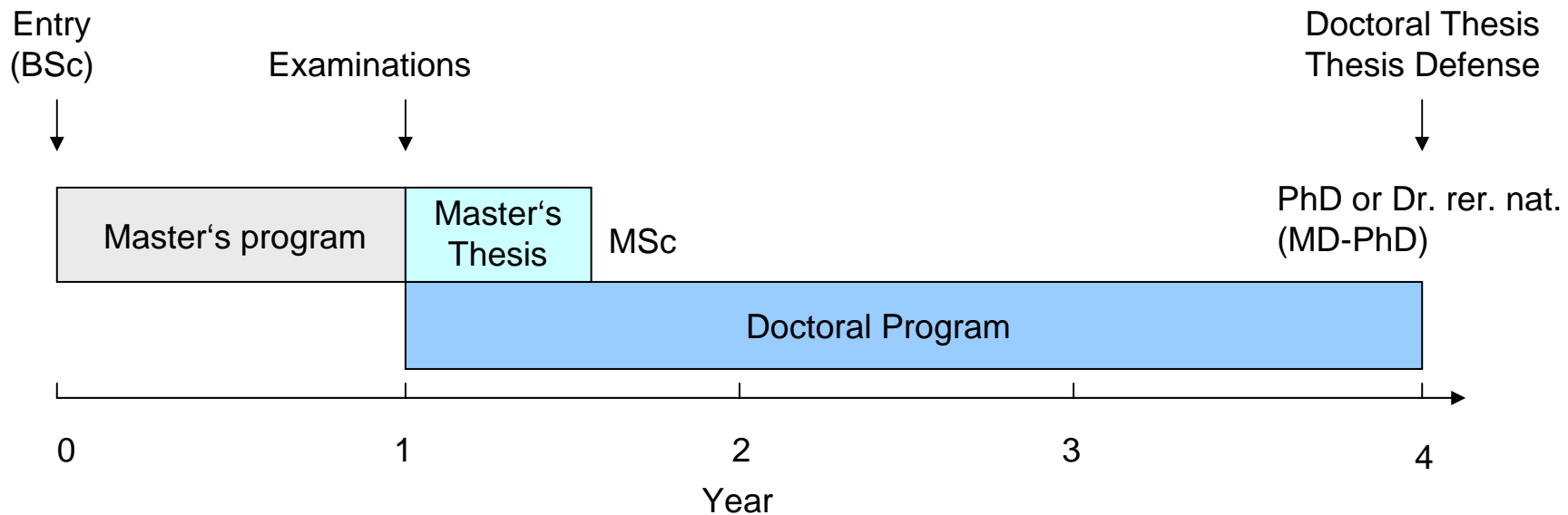


All faculty members of the Molbio/Neuro programs (elected for 5 years) are members of GAUSS and have the right to teach and take MSc / PhD examinations in the school



Key Features

- Four year program from BSc to PhD
- International
 - 50-70% students from abroad
 - in English
 - MSc / PhD degrees
- 20 students per year, individually selected by a three-step evaluation procedure
- Intensive course program (1st year)
 - no semester structure
- All courses newly established
 - lectures (open to all university students)
 - tutorials (10 students)
 - methods courses (5 students)
 - lab rotations (3 individual projects)
 - seminars (2 presentations per student)
- Research-oriented training
- Direct admission to PhD program after 1 year (without MSc thesis; based on examinations)





Doctoral Program: Overview

- Emphasis on doctoral research project

new collaborations between university and non-university groups!

- Supervision by doctoral advisory committee

3 members; Uni / MPI

Curricular requirements

- Scientific colloquia and seminars
- Advanced methods courses
- Key competences, electives
- International research conferences
- Teaching

Examples

- Lecture series of university institutes and MPis, PhD seminars (retreats)
- ~ 35 courses (2-3 d) jointly offered by Molbio, Neuro, GRK 521, NEUREST
- Scientific communication, Intercultural communication, Ethics, Languages, ...
- “Horizons in Molecular Biology”, “Neurizons” (student-organized)
- Tutorials, methods course, lab rotations



Funding sources for PhD phase

DFG-grants

- Research Training Groups (Graduiertenkollegs)
- Collaborative Research Centers (Sonderforschungsbereiche)
- Research Center Molecular Physiology of the Brain (Forschungszentrum)
- Single grants awarded to individual faculty members

MPG Grants

- IMPRS stipends
- Budgets of the Max Planck Institutes

EU-grants

- Marie Curie Early Stage Research Training Sites

Other grants

- Georg Christoph Lichtenberg stipends (Lower Saxony)
(only for the participating University groups)

Personal student fellowships (Studienstiftung, Boehringer Ingelheim, others)






External Evaluations of the Programs

- DAAD: annual reports & evaluations 2001, 2003
- DAAD / Mummert Consulting: 2005
- ZEvA Hannover: evaluation and accreditation 12/03
- MWK (Lower Saxony Ministry): evaluation 2004
- Max Planck Society (IMPRS): evaluation 2005

DAAD

IPP made in Germany 

 Niedersächsisches Ministerium
für Wissenschaft und Kultur





Awards

- Federal Foreign Office (2004)
Prize for Excellent Support Services for Foreign Students
- Stifterverband für die Deutsche Wissenschaft & DAAD (2006):
“Top 10 International Master’s Degree Courses made in Germany“

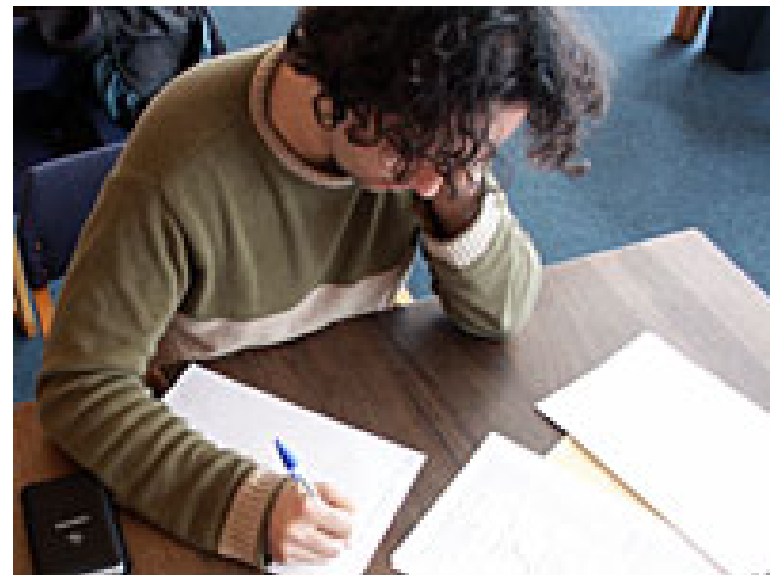


Applications: 293 → 315 → 408 → 494 → 525 → 572 → 542
(Molbio) (2000) (2001) (2002) (2003) (2004) (2005) (2006)

➤ 20 positions per year

Selection / Admission

- application documents
- subject tests (200)
- interviews (70)
(in Göttingen or by video conference)

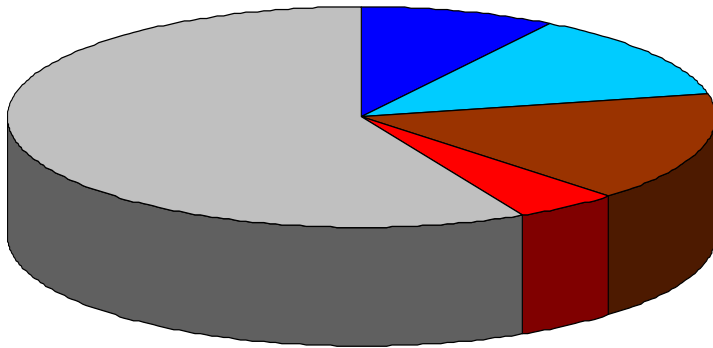


Admissions board composed of university and non-university faculty members

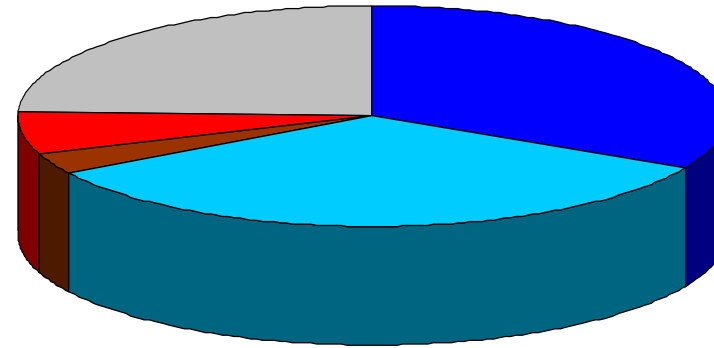


Applications vs. Admissions 2000 - 2006

Applications



Admissions



■ W-Europe ■ E-Europe ■ Africa ■ America ■ Asia

Admissions
Applications

14 %

10 %

1 %

5 %

2 %



Where do our students go?

- 55 PhD graduates since 2003
- 93 % currently in postdoctoral research positions
- **Germany (51%)**
 - Göttingen, University
 - Göttingen, GZMB
 - Göttingen, MPI-bpc
 - Göttingen, MPI-em
 - Göttingen, DPZ
 - Berlin, Free University
 - Freiburg,
 - Heidelberg, EML Research GmbH
 - Magdeburg, University of Magdeburg
 - Tübingen, University of Tübingen
- **USA (24%)**
 - Aurora, CO, University of Colorado
 - Boston, MA, Harvard Medical School
 - Chicago, IL, University of Chicago
 - Frederick, MD, National Cancer Institute
 - Ithaca, NY, Cornell University
 - Los Angeles, CA, University of California
 - Lincoln, NE, University of Nebraska
 - New Haven, CT, Yale University
 - San Francisco, CA, University of California
- **UK (7%)**
 - Cambridge, MRC Laboratory of Molecular Biology
 - Cambridge, Babraham Institute
 - Dundee, University of Dundee
 - Belfast, Andor Technology
- **Hungary (4%)**
 - Budapest, National Institute of Neurosurgery
 - Kaposvár, Pécs University
- **Singapore (4%)**
 - Genome Institute of Singapore
 - GlaxoSmithKline Pte. Ltd.
- **Switzerland (4%)**
 - Swiss Institute of Technology, BMI
- **Mexico (3%)**
 - Queretaro, Institute of Neurobiology, UNAM
- **Netherlands (3%)**
 - Amsterdam, University of Amsterdam
- **Sweden (3%)**
 - Stockholm, Karolinska Institute



Industry Partnerships / Industry Excursions

- Sartorius: Lab rotation projects (Master's program)
 - Sartorius research laboratories, Göttingen
- Olympus: Advanced microscopy courses
 - Microscopy facilities at the MPI for Dynamics and Self-organization

Excursions to pharmacy, biotechnology and optics companies (2-3 / year)





Cooperation with Weizmann Institute of Science – Feinberg Graduate School

- Short-term exchange of PhD students
(specific research projects)
- Mutual invitations for methods courses
- Long-term exchange of MSc students
(“external“ thesis projects)
- Shared website: student fora, information
on collaborative projects, courses, etc.
- Mutual invitations to scientific events
(e.g. Life Sciences Open Day, Horizons &
Neurizons Symposia)
- Other activities





Conclusions

(have the goals of the IMPRS been reached?)

Close scientific and administrative collaboration between the university and the local non-university institutes (MPIs, DPZ) ...

- increases the availability of top-level research facilities for pre-doctoral training.
- increases the attractiveness of Göttingen for PhD students from all over the world.
- leads to new collaborations and joint research projects through mutual supervision of IMPRS students.
- integrates independent junior group leaders in pre-doctoral teaching and supervision.
- enables non-university scientists to take examinations.
- serves as a model for university-wide reforms (graduate schools).