

**A QU** Monitoring the Doctorate programme: indicators (II)

**Satisfaction**

- Satisfaction of doctorate candidates
- Satisfaction of supervisors

**Academic results**

- Number of theses finished (at full time; at part time)
- Mean duration of the theses
- Abandonment rate
- Percentage of thesis with the maximum qualification
- Percentage of thesis with international recognition
- Number and quality indexes of scientific outputs from doctoral theses

**Integration into the labour market**

- Employability: occupation rate
- Suitability of the professional work to the learning outcomes



**A QU** Agència per a la Qualitat del Sistema Universitari de Catalunya

**Standards of quality in doctorate programs**

**Miquel Vidal**

Universitat de Girona, November 23<sup>rd</sup>, 2015

**VERITAS** Structural Development of the Third Cycle Based on Salzburg Principles

EUROPEAN UNION

**OUR VISIT TO UdG IN PHOTOS**



# *University of Heidelberg (UHMF)*

*Heidelberg, Germany*  
*25-29 November 2015*



UNIVERSITÄT  
 HEIDELBERG  
 ZUKUNFT  
 SEIT 1386

## OVERVIEW

Heidelberg University, founded in 1386, is Germany's oldest university and one of the strongest research universities in all of Europe. The successes in both rounds of the Excellence Initiative and in internationally recognized rankings prove that Heidelberg's excellent reputation and leading role in the scientific community are well deserved.

Heidelberg University is a comprehensive university, offering the full spectrum of disciplines in the humanities, law and the social sciences alongside the natural and life sciences, including medicine. As a comprehensive university, it aims to continue to strengthen the individual disciplines and to further interdisciplinary cooperation, as well as to carry research results over into society and industry.

The University defines itself as a research university with a strong focus on research-oriented teaching. Its self-appointed task is to investigate the major issues facing mankind through interdisciplinary cooperation.

With independent junior research groups and structured PhD programmes, the University is breaking new ground in providing research-oriented teaching and early research experience for young scientists.

The University informs scientists about support programmes, offers advice regarding application procedures and the legal issues

of research funding, and supports researchers in the administration of their projects.

Heidelberg University also aims at making scientific findings available to the whole of society. To this end, the university promotes the continuous exchange of knowledge with businesses, industry, local authorities and associations.

## **THE MAIN STRENGTHS OF PhD EDUCATION AT HEIDELBERG UNIVERSITY**

The following issues were presented and discussed at HU: Heidelberg Graduate School for Mathematical and Computational Methods, Heidelberg Graduate School of Fundamental Physics, European Learning Laboratory for the Life Sciences, Research cluster “Asia and Europe in a Global Context”.

The main points of PhD education at HU can be summed up as follows:

1. All graduate programs at HU are aimed at attracting the best possible applicants in terms of their skills, expertise and abilities. Graduate programs are organized in schools that facilitate the coordination of the overall admission and study process. This, in its turn, ensures the application of equally high standards to all programs. Finally, graduate schools are very active at information dissemination and supporting prospective applicants.

2. Admission. Admission to PhD schools and research institutions of Heidelberg University is a multi-stage process. Another important point is the transparency of all the stages of the admission.

3. PhD schools. PhD research work at Heidelberg University is carried out mainly in the postgraduate schools and the number of individual PhD researchers is very limited. This is one of the ways of creating and promoting sustainable research environments where the consistent multilateral research work on related topics within one

direction create the prerequisites of being internationally competitive. On the other hand, Heidelberg University is open to individual initiatives, one may submit a dissertation for defense even without being admitted and enrolled as a PhD student.

4. An important component of administration of PhD school is keeping track of the graduates. This enables to measure the international impact of the PhD program.

5. One can receive a PhD from Heidelberg University without publications, only on the basis of dissertation defence (many researchers usually extend and publish the results of the dissertation in the Postdoc period). The examining board usually consists of 2-3 persons, one of which should be an invited specialist; the other is the supervisor of the dissertation: it's a good example of "academic honesty".

## FEEDBACK FROM UHMF

Delegates from all Armenian HEIs involved in the project came to Heidelberg University in November 2015 for an intense 2-days program. Heidelberg's structured PhD programs of the life sciences, of fundamental physics and of mathematics & computational sciences presented their strategies of organizing large international PhD programs. The delegates also got to see the largest PhD program in the humanities, had a discussion with Heidelberg's Vice Rector for International Affairs and visited the internationally renowned European Molecular Biology Laboratory.

After all, we were convinced that the visit provided a lot of interesting and useful "best practice" examples for the Armenian delegates. Many ideas were further discussed. In particular the following topics came up consistently in all the group discussions:

### Funding

- Funding is a key issue, in particular for the experimental sciences;

- In general, institutions have core funding that is guaranteed for a foreseeable time (i.e. many years);
  - On top of that, they competitively apply for external funds (e.g. German Research Foundation, which supports the German University System with 2 billion € a year). This money is highly competitive and drives the German research system;
  - The balance of internal and external resources varies quite a lot;
  - Top institutions have a percentage of internal funds, such as EMBL or Max Planck institutions.

### **Selection**

- Transparent, open advertisement of positions is of key importance;
  - The selection procedure should also be transparent to all candidates;
  - The selection should be open to international candidates;
  - The selection should take place solely on the basis of scientific excellence and not be restricted by formal, administrative or political.

### **Motivation**

- PhD candidates will feel motivated when they are treated as early stage researchers, i.e. young colleagues who try to become independent researchers;
  - Competition for good research fellowships motivates the candidates and labels those who succeed in the competition.

### **Environment**

- The research environment needs to provide state of the art technology;
  - This is ideally organised in core facilities shared between many researchers (costs effective, specialised)

### **Legal and administrative limits**

- Freedom of research and teaching is a fundamental benefit of

the German university system;

- Researchers need to pay-back the trust society gives them, i.e. be highly responsible in spending public money.

### **Follow up of alumni**

- The structured PhD programs of Heidelberg University and EMBL keep track of their PhD alumni;
- This is important to document the quality of the program (quality of jobs reached by successful PhDs);
- Candidates start their careers with a very good network.

### **Master-PhD**

- The master phase is an important part of the European education system;
- It should prepare students for the PhD phase, i.e. to become independent researchers working on original experimental research;
- To open up the strict boundaries between Master and PhD phase can make sense, e.g. to support the most talented students in an early phase and to give them more time for experimental research (start of PhD project as part of the masters' education in experimental sciences).

### **Research oriented education**

- Individual, original research is in the heart of every PhD thesis work;
- Regulations should not limit research (see above: administration and politics);
- It is certainly very important, that a structured PhD education, besides the experimental work, should not take up more than 10% of the time of the candidates.

## UHMF BEST PRACTICE IN PRESENTATIONS<sup>4</sup> (some of them)



Wednesday, 25.11.15: Arrival of Armenian Delegates

Thursday, 26.11.15:  
9:30: Greeting in the Centre for Molecular Biology (ZMBH) with Q&A Session  
*Prof. Dr. Oliver Gruss, Scientific Coordinator (HBIGS)*



11:00 Presentation of the Heidelberg Graduate School for Mathematical and Computational Methods for the Sciences with Q&A Session  
*Dr. Michael Winckler, Administrative Director of HGS MathComp*

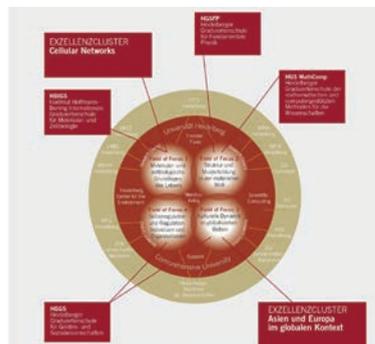
12:30 Lunch at central university cafeteria

14:00 Presentation of Heidelberg Graduate School of Fundamental Physics (HGSFP) with Q&A Session  
*Prof. Dr. Sandra Klevansky, Administrative Director*

15:30 Feedback in groups at the Old University with discussion about institutional strategy plans

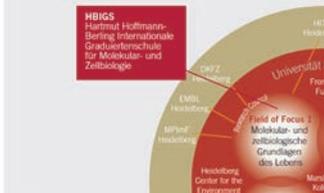
16:00 Welcome address:  
*Prof. Dr. Dieter W. Heermann  
Vice-President International Affairs*

18:00 Get-together at Heidelberg's christmas market, individual dinners



<sup>4</sup>For more presentations please visit: [http://tempusveritas.am/?page\\_id=514](http://tempusveritas.am/?page_id=514)

GSC 249  
HARTMUT HOFFMANN-BERLING  
INTERNATIONALE GRADUIERTENSCHULE  
FÜR MOLEKULAR- UND ZELLBIOLOGIE



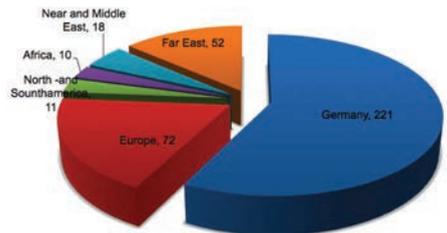
Vision in 2007

- Establish an internationally visible Graduate School of Molecular and Cellular Biology
- Establish transparent recruitment and assessment criteria to aid PIs in recruit qualified PhD students
- Implement innovative mentoring and training concepts for doctoral researchers
- Retain female researchers in science
- Prepare graduates for leadership positions in academia and beyond

Vision in 2007

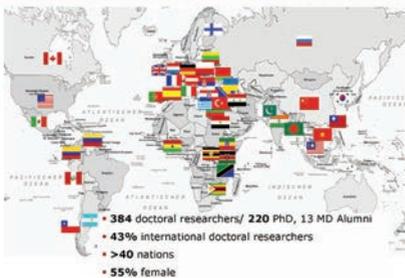
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Origin of HBIGS doctoral researchers (by nationality)



September 2015: 384 students

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### HBIGS: Application and Admission

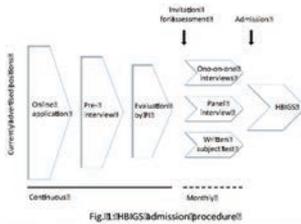
The screenshot shows the HBIGS website interface. On the left is a navigation menu with categories like 'Home', 'Admission and Admission', 'Open PhD Positions', 'Scientific Program', 'Career Service', 'HBIGS Faculty', 'HBIGS PhD students', 'Bachelors', 'PostDoc Fellowship Program', 'MSc/PhD Program', 'Cooperation Partners', 'News', 'HBIGS PhD Student Support', 'Public Outreach Activities', 'FAQ', 'HBIGS Forum', and 'Contact'. The main content area features a 'Welcome!' message with a group photo and a 'News' section with several articles dated from 2014 to 2015. A 'Links and Downloads' section is also visible at the bottom.

### HBIGS: Application and Admission

#### Open PhD positions:

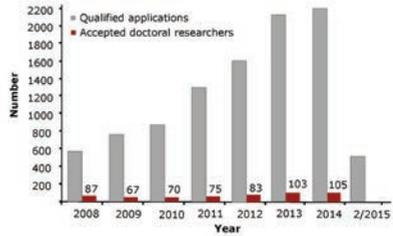
Project leader	Project No.	Deadline
Kuner, Rohini	KunerR_Agrawal0114	Deadline: 15. Oct 2015
Role of post translation modification in protein activity regulation in disease state		
Bading, Hilmar	Sprengel, Rolf	Bading_Sprengel0115
Characteristics and consequences of subcellular calcium signaling in spinal neurons and glia in chronic inflammatory and neuropathic pain		
Kuner, Rohini	SFB1158_KunerR_Gangachari	Deadline: 15. Oct 2015
Structural and functional analyses of peripheral nerves in diabetic neuropathy in transgenic mice		
Baumgaertner, Ulf	SFB1158_Baumgaertner	Deadline: 15. Oct 2015
Cortical signature of nociception and pain		
Carr, Richard	SFB1158_Carr	Deadline: 15. Oct 2015
Structural and functional interactions between nociceptive and non-nociceptive systems within the spinal trigeminal nucleus		

### HBIGS: Application and Admission

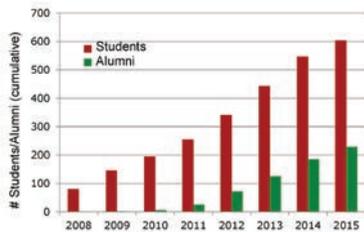


2014: more than 2.000 qualified applications

### Application and admission statistics



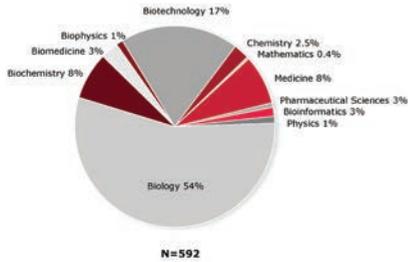
### Students/Alumni



### Vision in 2007

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### Entry degree of doctoral researchers



### Training Concept

#### Training activities

- PhD Core Course (twice per year)
- Accompanying training measures (all year)
- HBIGS Lecture & Annual Meeting
- Summer schools
- Student organized initiatives



- >180 different training courses in:
  - Advanced Molecular & Cellular Biology
  - Imaging & Microscopy
  - Model Systems
  - Bioinformatics, Modelling & Simulation
  - Scientific writing & complementary skills

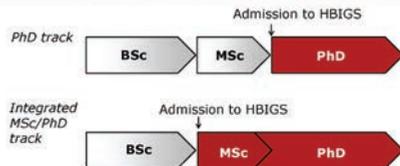
-> All courses are evaluated by doctoral researchers

Total workload is less than 5% of PhD working time

### New Challenges



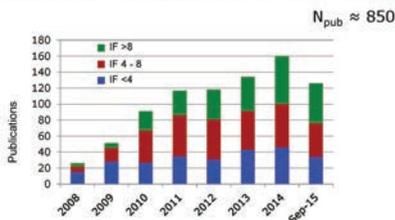
### New HBIGS Tracks: Integrated MSc/PhD



- Ample time for research oriented education, experimental experience, critical thinking, Profound scientific discussion

- Excellent perspective for integration of our best talents into the scientific career

### Publication Record of HBIGS PhD students



- 350 PhD students have at least one publication
- 211 PhD students have at least one 1st author publication

The Hartmut Hoffmann-Berling  
International Graduate School of  
Molecular & Cellular Biology  
**HBIGS**



## OUR VISIT TO UHMF IN PHOTOS



## GENERAL RECOMMENDATIONS

It should be mentioned that some of procedures and practices mentioned above are applied in Armenia, but they are not properly observed, thus failing to provide adequate quality assurance.

One of them is monitoring the progress of the research, which is an essential part of PhD education in European universities and helps more stakeholders to be involved in the process. Thus, Armenian universities should put more emphasis on the monitoring process via special seminars and workshops or question-and-answer formats to check their PhD students' progress, find out the possible problems that they may encounter and give them useful recommendations. In addition, the individual plans should be scrutinized and a PhD student/research applicant's compliance with it strictly monitored.

The following recommendations can be made based on the practice of European universities:

1. The duration of PhD studies can be extended from 3 to 4 years.
2. The practice of having at least two supervisors for PhD students can be introduced. Joint supervision ensures shared responsibilities and diversity of views.
3. It is advisable to organize training courses for supervisors on regular and systematic basis to raise their professional qualities. A special course "Supervision of Research" for scientific supervisors can be introduced.
4. The introduction of submitting dissertation theme proposals by the applicants as an essential component of admission process can be helpful in selecting PhD students/research applicants who possess proper research skills and are less dependent on the themes suggested by supervisors. It can also provide variety of research topics.

5. The introduction of multi-stage admission process can reveal the research skills of prospective PhD students, which in its turn will contribute to the realistic and optimal planning of the research work.

6. PhD student-supervisor relations should be based on a written agreement where the responsibilities of both parties are set out.

7. The first three-month experimental (probation) stage and LNA (Learning Needs Analysis) can be effective practices.

8. The practice of shifting the educational component to master programs can also be effective in preparing more independent research students from initial stages of PhD studies, thus enabling them to allocate more time to research and to complete it in a shorter period of time. Moreover, there should be systematic integration of transferable competences in both Master and PhD program courses.

9. The following courses can be included in the mandatory course list for PhD students – “Teaching and Learning”, “Research Methods and Ethics”, “Principles of Writing Research Papers”, “Organizational and Leadership Skills”.

10. Organization of specific courses by invited or foreign professors based on special needs of PhD students can prove effective.

11. Another good practice is launching new master and PhD programs with Erasmus funding.

12. PhD programs should be redesigned to meet the needs of labor market.

13. The promotion of PhD programs should be conducted at a wider scale through awareness raising and dissemination of information.

14. The practice of Heidelberg University regarding computer modeling in each research educational component can be introduced as it may prove very effective in the provision of PhD education.

15. The procedure of forming specialized councils should be made more flexible. The council should consist of 3-5 members whose research interests are the closest to the research topic. The practice of inviting a foreign expert can also be applied.

## STUDY VISIT IN PHOTOS



## ***SUMMARY***

The structures of Armenian HEIs are very different from those of our partner EU universities; the research environments are different as well. Hence, local HEIs can integrate in their PhD education only those procedures which are not in conflict with our educational system. However, the quality standards employed in EU universities prove to be the basis for the best practices in the field of PhD education over Europe. These standards should be taken into account by the education systems of developing countries if they are willing to integrate into European area of higher education.

## **ACKNOWLEDGEMENT**

The VERITAS consortium extends its gratitude to all project partners (AM and EU HEIs) for contributing to the development of this booklet on the lessons learnt.

VERITAS team would also like to thank YSULS and NASRA teams for editing this booklet.

Special thanks go to 4 EU higher education institutions (KTH, UdG, BSU and UHMF) for warm welcome, support and hosting the Armenian delegation, as well as sharing their experience on PhD Education.

*For further information please contact us at **Yerevan State Medical University** and for more detailed information about the project please use the project web-site ([www.tempusveritas.am](http://www.tempusveritas.am)) or e-mail address ([veritas.mngt@gmail.com](mailto:veritas.mngt@gmail.com)).*