



## Report 2005/2006

## **Preface by D. Schümperli, first president of the Graduate School**

The *Graduate School for Cellular and Biomedical Sciences* (GCB) was officially launched on 1 September 2005. Since then, doctoral students from three faculties (Science, Medicine, Veterinary Medicine) working in various fields of cellular and biomedical sciences can obtain an interfaculty doctorate in a program that involves training as well as research work, both of which are individualised but conform to common, high quality standards. In the short time since its start, more than 100 PhD students have engaged in the program. Thus, the expected final size of the GCB will be about 400 students. It is therefore not surprising that the GCB plays a central role in the efforts of the university directorate to coordinate the teaching and research activities of these three faculties, to strengthen the already existing contacts and to foster the establishment of focal areas of research of national and international significance.

It now seems appropriate to turn around and consider how it all came about: In March 1995, the "Programm für die Interfakultäre Ausbildung des Forschungsnachwuchses" (PIAF; lit. transl.: program for interfaculty training of young scientists) came to life. It enabled graduates of medical and veterinary studies, in particular, to obtain a PhD degree from the Science faculty. More rarely, the program was used by biologists or biochemists who sought an additional training in medical subjects during their PhD thesis. Although this program was important as a precursor of the current Graduate School, it had been conceived for only a few selected students. Thus, both the Medical and Veterinary faculties soon started their own PhD programs. This multiplication of programs was justly criticised in 1999 by an interfaculty working group which, in the forefield of the replacement of the director of the Theodor Kocher Institute, was exploring the possibilities of establishing an "Interfaculty Department of Cell Biology". The group asked for an integration of these programs into a common graduate school for students from all three faculties.

**Stefanic S**, Palm D, Svard SG, Hehl AB; Organelle proteomics reveals cargo maturation mechanisms associated with Golgi-like encystation vesicles in the early-diverged protozoan *Giardia lamblia*. *Journal of Biological Chemistry* (Vol. 281, Issue 11, 7595-7604, March 17, 2006

**Urwyler Olivier**, Zhang Li, Li Xiaoming, Imboden Hans und Suter Beat; "Tissue dependent subcellular localization of *Drosophila* Arginine methyltransferase 4 (DART4), a coactivator whose over-expression does neither affect viability nor differentiation"; *Differentiation* (in press).

Schneider M, Joncourt F, Sanz , **von Kanel T**, Gallati S.  
Detection of exon deletions within an entire gene (CFTR) by relative quantification on the LightCycler.  
*Clin Chem.* 52, 2005-12, 2006

## **Support**

The GCB is supported by the University of Bern through the programs "Nachwuchsförderung" und "Interfakultäre Projekte"

## **Information**

Additional Information on the GCB can be found on the website [www.gcb.unibe.ch](http://www.gcb.unibe.ch)

high quality in natural sciences and physiology. According to the new guidelines of the National MD-PhD program, candidates should start their training already during their medical studies and follow relevant courses and exams at the Science faculty simultaneously to the medical studies.

In 2006 we had interviews with six medical students in their second to fourth year. An individual training program was put together for each of them. They are to go to courses in cell biology, molecular biology and immunology together with the biology students. The National MD-PhD program which is supported by the Swiss National Foundation (SNF), the Swiss Academy of Medical Sciences (SAMW) and several other foundations supports outstanding candidates with three years fellowships ([www.snf.ch/D/foerderung/personen/MD-PHD-Programm](http://www.snf.ch/D/foerderung/personen/MD-PHD-Programm)). Daniel Sidler who is conducting his MD-PhD studies in the laboratory of Prof. Thomas Brunner, was awarded with such a fellowship in 2006.

## **Publications**

By the end of 2006 most doctoral students were involved in research for less than one year. The list of publications by students of the GCB is therefore still short.

Silvia Olivari , **Tito Cali** , Kirsi E.H. Salo , Paolo Paganetti , Lloyd W. Ruddock , Maurizio Molinari: EDEM1 regulates ER-associated degradation by accelerating de-mannosylation of folding-defective polypeptides and by inhibiting their covalent aggregation. *Biochemical and Biophysical Research Communications* 349 (2006) 12781284

**Nina Kozic**, German Abdo, Daniel A. Rüfenacht, Lutz-Peter Nolte and Miguel A. Gonzalez Ballester: Automated cement segmentation in vertebroplasty based on active contours without edges. *International Journal of Computer Assisted Radiology and Surgery*, Vol.1, pp.192-194, June 2006

Alexandra Lüscher, **Barbara Nerima**, Pascal Mäser, Combined contribution of TbAT1 and TbMRPA to drug resistance in *Trypanosoma brucei*. *Molecular and biochemical parasitology*, 2006, 150(2):364-6.

Unfortunately, this report had no immediate consequences. Although another planning group was asked in 2001 to develop collaborations between the three faculties at the levels of master and doctoral studies, the concepts developed there were also not put into action. All the same, in 2003 (the dough having probably been kneaded sufficiently), things started to move for doctoral studies. Yet another working group, under the auspices of then vice rector Würgler, wrote the regulations for the Graduate School which, after a round of consultation in the three faculties, was signed in April 2004 by the three deans and the university rector.

Then, for the first time, a directing committee of the Graduate School could be elected and installed. This committee developed the necessary implementation rules as well as a concept for the transition from the PIAF program to the GCB. These implementation rules were again modified based on consultations in the faculties and signed in May 2005 by the rector.

Now, the GCB is up and running since September 2005. For the directing committee, most of its activities involved a lot of "learning by doing". Nonetheless, I can assert today that no major catastrophes happened and that the GCB has become a well functioning and attractive study program that also creates invaluable contacts between the PhD students of the three participating faculties and their research groups. The GCB has its own seminar series which allows the students to have personal discussions with excellent scientists and to learn more about their projects but also about their standpoints on scientific, career-related and broader, societal issues. Moreover, on 16 March 2007, the first GCB student symposium will take place where all the more advanced PhD students will present their work in oral and poster presentations.

That all this could be realised is on the one hand due to the active support by the university directorate. On the other hand, it would not have been possible without the enormous and competent

efforts of the program coordinator, Mrs. PD Dr. Marlene Wolf, and her administrative collaborator, Mrs. Gabrielle Favre. Before handing over the presidency to my colleague Prof. Ernst Peterhans, I would like to express the warmest gratitude to both of them in the name of the entire GCB directing committee. I am quite certain that these thanks are also shared by our students.

Bern, 22 February 2007

Prof. Daniel Schümperli,  
President,  
September 2005 – January 2007

### Organisation

The *Graduate School of Cellular and Biomedical Sciences of the University of Bern (GCB)* started in September 2005.

The GCB offers structured training in experimental research in the fields of cell biology and biomedical sciences leading to a PhD or MD-PhD degree. It is jointly administered by the Faculty of Medicine, the Faculty of Natural Science and the Vetsuisse Faculties of Bern and Zurich. The program started very successfully and, by the end of 2006, consists already of 100 students. The thesis projects are carried out at laboratories of to the three participating faculties or at affiliated institutions (currently the Institute of Virology and Immunoprophylaxis (IVI) in Mithelhäusern, the Institute of Biomedical Research in Bellinzona, the AO Research Institute in Davos) and Research Laboratories at the Federal Veterinary Office (BVet)).

Research projects include topics in the areas of biochemistry, biomedical engineering, cell and molecular biology, clinical research, immunology, pharmacology, physiology and structural biology.

offered in the fields of *Cancer Epidemiology* and *Cardiac Physiology*. Furthermore, the students of the GCB may select among several specialised practical courses. Participation at international workshops and summer schools is encouraged and accepted as training units.

### Graduate School seminar series

The Graduate School organizes its own seminar series which started in October 2006. Internationally renowned specialists from varying fields are invited for giving teaching lectures with small groups of students and presenting research seminars to a broad audience:

- |               |                                                                                                                                                                                                    |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| October 2006: | Thomas Jenuwein, Research Institute of Molecular Pathology, University of Vienna<br><b>Epigenetic control by histone methylation</b>                                                               |
| November 2006 | Elisabetta Dejana, FIRC Institute for Molecular Oncology, Milano<br><b>Intracellular signaling through endothelial cell to cell junctions</b>                                                      |
| December 2006 | Ronen Alon, Department of Immunology, The Weizmann Institute of Science, Rehovot, Israel<br><b>Chemokine signals for lymphocyte adhesion, transendothelial migration and interstitial motility</b> |

### MD-PhD Program

The MD-PhD program is intended for medical graduates interested in experimental research and aiming for an academic career. With a structured training program in the frame of the GCB, they will acquire

## Doctoral students

Students can apply four times annually for admission to the graduate school: 1<sup>st</sup> March, 15<sup>th</sup> June, 15<sup>th</sup> September and 15<sup>th</sup> December.

By the end of 2006, 100 doctoral students were registered with the GCB, almost equally distributed among the four sub-commissions:

<u>Sub-commission</u>	<u>Number of students</u>
Molecular Biology	20
Cell Biology	22
Biological Systems	29
Medical Biology	29

The experimental work is carried out in research groups of the Medical faculty (62 students), the Faculty of Natural Sciences (12 students), the Vetsuisse Faculties in Bern and Zurich (16 students), the Institute for Biomedical Research in Bellinzona (8 students) and the Institute of Virology and Immunoprophylaxis in Mithelhäusern (2 students).

The GCB is internationally oriented and represented by doctoral students from 20 different countries. About 54 % of the GCB students have a degree from a foreign University.

## Seminars & Courses

The PhD program requires theoretical training in addition to the experimental work on the research project. For each student, seminars and courses are individually selected from the teaching units of the faculties. In addition, the GCB is organizing its own advanced courses for the doctoral students. These include tutorials in *Immunology* and in *Cellular and Molecular Biology* (Happy Cell) where a relevant textbook is studied and discussed monthly in small groups with a senior scientist. Such guided book readings are also

Each student is supervised by a **thesis advisor**, a **co-referee** and a member of the appropriate sub-commission (**mentor**).

The **thesis advisor** is responsible for the research project, adequate supervision, the laboratory infrastructure and the salary of the student.

The **co-referee** must not be from the same institute as the thesis advisor, but be well acquainted with the subject area of the research project. The co-referee meets with the student at least twice a year to discuss and assess progress of the thesis work and advise and support him/her.

The **mentor** decides with the student and the thesis advisor upon the individual training program taking into account the students previous training.

The training program requires a certain number of learning credits which can be obtained by participating in approved, project related and interdisciplinary courses, workshops, seminars and lectures during the doctoral training period. Prior to graduation, candidates must pass two exams: (I) End of the first year, documenting an adequate knowledge of cell and /or medical biology or physiology. (II) End of 2<sup>nd</sup> year, documenting an in-depth knowledge of the research field.

## Commissions

The GCB is headed by the PhD commission which is constituted by two members of the faculty of Medicine, the faculty of Natural Sciences, the Vetsuisse faculty and the program coordinator. One faculty member acts as president for a one year period.

Four sub-commissions (Molecular Biology, Cell Biology, Biological Systems and Medical Biology) ensure that the different research fields are represented by experts.

PhD commission 2005/2006

Daniel Schümperli, Institute of Cell Biology (Sci), President  
Dirk Dobbelaere\*, Institute of Animal pathology (Vet)  
Mireille Meylan, Clinic for Ruminants (Vet)  
Oliver Mühlemann, Institute of Cell Biology (Sci)  
Primus Mullis, Paediatric Endocrinology (Med)  
Ernst Peterhans\*, Institute of Virology (Vet)  
Andrew Ziemiecki, Department of Clinical Research (Med)  
Marlene Wolf, Coordinator

Sub-commission "Molecular Biology" 2005/2006

Daniel Schümperli, Institute of Cell Biology (Sci), Head  
Ulrich Baumann, Department of Chemistry and Biochemistry (Sci)  
Peter Bütikofer, Inst. of Biochemistry and Molecular Medicine (Med)  
Robert Häner, Department of Chemistry and Biochemistry (Sci)  
Hanspeter Nägeli, Institute of Pharmacology & Pathology, ZH (Vet)  
Isabel Roditi, Institute of Cell Biology (Sci)  
Beat Trueb, Institute for Dental and Skeletal Biology (Med)

Sub-commission "Cell Biology" 2005/2006

Oliver Mühlemann, Institute of Cell Biology (Sci), Head  
Thomas Brunner\*, Institute of Pathology (Med)  
Matthias Chiquet\*, Institute for Dental and Skeletal Biology (Med)  
Dirk Dobbelaere\*, Institute of Animal pathology (Vet)  
Andrew Hemphill, Institute of Parasitology (Vet)  
Ernst Peterhans, Institute of Virology (Vet)  
Doris Rentsch\*, Institute of Plant Physiology (Sci)  
Thomas Seebeck, Institute of Cell Biology (Sci)  
Erwin Sigel, Inst. of Biochemistry and Mol. Medicine (Med)  
Beat Suter, Institute of Cell Biology (Sci)

Sub-commission "Biological Systems" 2005/2006

Andrew Ziemiecki, Department of Clinical Research (Med), Head  
Britta Engelhardt, Theodor Kocher Institute (Sci & Med)  
Brigitte Frey, Department of Clinical Research (Med)  
Urs Frey, Department of Clinical Research (Med)  
Peter Gehr, Institute of Anatomy (Med)  
Thomas Lutz, Institute of Veterinary Physiology, (Vet)  
Kathrin Mühlemann, Institute of Infectious Disease (Med)  
Christoph Müller, Institute of Pathology (Med)  
Ernst Niggli, Institute of Physiology (Med)  
Marc Vandeveld, Division of Animal Neurology (Vet)

Sub-commission "Medical Biology" 2005/2006

Primus Mullis, Paediatric Endocrinology (Med), (Head)  
Anne-Catherine Andres, Department of Clinical Research (Med)  
Matthias Egger, Department of Social and Preventive Medicine (Med)  
Stephen Ferguson, M.E. Müller Institute of Biomechanics (Med)  
Martin Frenz, Institute of Applied Physics (Sci.)  
Mireille Meylan, Clinic for Ruminants (Vet)  
Klaus-Arno Siebenrock, Clinic for Orthopaedic Surgery (Med)  
Hans-Uwe Simon, Institute of Pharmacology (Med)  
Jukka Takala, Department of Intensive Care Medicine (Med)  
Brigitte von Rechenberg, Equine Hospital, Vetsuisse ZH (Vet)

\* only for part of the period

Med: Medical Faculty

Sci: Faculty of Natural Science

Vet: Vetsuisse Faculties of Bern & Zurich