

# Annual Report 2017

Faculty of Medicine

Faculty of Science

Faculty of Veterinary Medicine (Vetsuisse Faculty)

## Graduate School for Cellular and Biomedical Sciences

### PhD Program

- ▶ Cell Biology
- ▶ Molecular Biology & Biochemistry
- ▶ Immunology
- ▶ Neuroscience
- ▶ Epidemiology
- ▶ Biomedical Sciences
- ▶ Biomedical Engineering

<http://www.gcb.unibe.ch>







Graduate School  
for Cellular and  
Biomedical Sciences



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UNIVERSITÄT  
BERN

# Annual Report 2017

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(Staff January 2018)

**swissuniversities**

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## Introduction

Time flies—The GCB is already in its 13<sup>th</sup> year of operation and my second term serving as its president started in August 2017. The GCB was not only the first graduate school established at the University of Bern, it has also always been by far the largest with currently 444 enrolled PhD students, and therefore plays a central role in training our future generation of scientists in a way that enhances their career perspectives and increases the reputation of the University of Bern as a place for innovative and competitive life science research. This mission can only be achieved thanks to the continued support of the rectorate and the deans of the Medical, the Science and the Vetsuisse Faculties, and because of the dedication of all GCB staff, committee members, advisors, co-advisors, mentors, external referees and course instructors. Thank you all for your commitment!

Aside from its main purpose of accompanying curious and ambitious students in their development to independent, responsible and innovative scientists, the GCB has been and continues to be invaluable for interconnecting the life science community in Bern across the faculty boundaries. It was through my participation in many different GCB thesis advisory committees over the years that I gained insight into the fascinating work of labs at other institutes in Bern and every now and then revealed common research interests that eventually led to collaborations. Thus, in essence, the GCB not only benefits the PhD students but also its committee members, which is a true win-win situation.

Looking ahead, the «face» of the GCB will change significantly within the next 12 months: our coordinator Marlene Wolf and our secretary Gabrielle Favre will retire and need to be replaced. Both have been on board since the beginnings of the GCB and been instrumental in developing the GCB into today's well-organized and smoothly running enterprise. At this moment, it is still difficult to imagine a GCB without Marlene and Gabrielle and we will certainly miss them. Yet, we are confident to find new personnel that will carry on the daily business in the same spirit and with the same engagement and competence. Alexandra de Peyer will replace Gabrielle from April 2018 onward and I wish Alexandra a good start and much gratification on her new job. The public search for a new coordinator will be launched soon, with the goal of having the succession ready a few months before Marlene's departure in January 2019, in order to ensure a smooth transition of this key position.

I am looking forward to an exciting and successful year,



Prof. Oliver Mühlemann, PhD  
GCB President

Bern, March 7, 2018





## Organization

The Graduate School for Cellular and Biomedical Sciences (GCB) of the University of Bern is headed by the PhD Committee (executive committee), which is composed of two members each of the Faculty of Medicine, the Faculty of Science, and the Vetsuisse Faculty Bern, and the Program Coordinator. Taking turns, each faculty member acts as President. Currently, **Prof. Dr. Oliver Mühlemann** (Science Faculty) serves as President of the GCB for the second time (since August 2017), and **PD Dr. Marlene Wolf** is the Coordinator (since September 2005). Under their leadership, the GCB continues to thrive and prosper, this fact being reflected by an ever-growing number of PhD candidates, enlarged Expert Committees, and an expanding spectrum and range of courses offered within the framework of the PhD program of the GCB.

Five Expert Committees with competences in

- Biological Systems
- Biomedical Engineering
- Biomedical Sciences
- Cell Biology
- Molecular Biology & Biochemistry

are responsible for the admittance, guidance and evaluation of the PhD candidates. Each PhD candidate is assigned to one of the GCB Expert Committees, one of its members acting as his/her mentor. Together with the supervisor, they decide upon the individual training program of the PhD candidate.

In 2017, the supporting staff of the GCB consisted of **Gabrielle Favre** (since 2005, and until April 2018), **Nora Baronian** (since 2015, and until February 2018), and **Edith Imthurn** (since January 2017).

The organization of the GCB is shown in detail on the Organization Chart on the next page, listing the current members of the five Expert Committees.

## GCB Organization Chart

(as of 01.01.2018)

Med: Faculty of Medicine

Sci: Faculty of Science

Vet BE: Vetsuisse Faculty Bern

Vet ZH: Vetsuisse Faculty Zurich

IRB: Institute for Research in Biomedicine,

Bellinzona

BITg: Biotechnology Institute Thurgau,

Kreuzlingen

### Faculties

- Faculty of Medicine (Med)
- Faculty of Science (Sci)
- Vetsuisse Faculties  
Bern (Vet BE) & Zurich (Vet ZH)

### PhD Committee

Oliver Mühlemann (Sci), President  
Rupert Bruckmaier (Vet BE)  
Torsten Ochsenreiter (Sci)  
Petra Roosje (Vet BE)  
Frank Stüber (Med)  
Mario Tschan (Med)  
Marlene Wolf (Coordinator)

### Administration

Marlene Wolf, Coordinator  
Gabrielle Favre, Administration  
Edith Imthurn, Administration  
Nora Baronian, Administration

Expert Committees	Biological Systems	Biomedical Engineering	Biomedical Sciences	Cell Biology	Molecular Biology & Biochemistry	PhD Candidates
	<p>Petra Roosje (Vet BE), Chair Antoine Adamantidis (Med) Rupert Bruckmaier (Vet BE) Andrea De Gottardi (Med) Britta Engelhardt (Med) Volker Enzmann (Med) Brigitte Frey (Med) Daniel Fuster (Med) Marianna Kruthof-de Julio (Med) Thomas Lutz (Vet ZH) Ruth Lyck (Med) Ernst Niggli (Med) Verena Niggli (Med) Torsten Seuberlich (Vet BE) Jürg Streit (Med) Deborah Stroka (Med) Hans Rudolf Widmer (Med)</p>	<p>Dominik Obrist (Med), Chair Lorin Benneker (Med) Philippe Büchler (Med) Martin Frenz (Sci) Bernd Jung (Med) Roland Kreis (Med) Laura Marchal Crespo (Med) Stavroula Mougialakou (Med) Tobias Nef (Med) Mauricio Reyes (Med) Raphael Sznitman (Med) Hendrik von Tengg (Med) Guoyan Zheng (Med) Philippe Zysset (Med)</p>	<p>Frank Stüber (Med), Chair Guido Beldi (Med) Julia Bohlius (Med) Heiner Bollwein (Vet ZH) Benjamin Gantenbein (Med) Willy Hofstetter (Med) Mariusz P. Kowalewski (Vet ZH) Sarah Longnus (Med) Daniel Lottaz (Med) Nicola Low (Med) Anna Oevermann (Vet BE) Stephan Reichenbach (Med) Gertraud Schupbach (Vet BE) Daniela Schweizer (Vet BE) Walter M. Senn (Med) Hanno Würbel (Vet BE)</p>	<p>Mario Tschan (Med), Chair Charaf Benarafa (Vet BE) Giuseppe Bertoni (Vet BE) Stefan Freigang (Med) Siegfried Hapfelmeier (Med) Lucy Jane Hathaway (Med) Thomas Kaufmann (Med) Georgia Konstantinidou (Med) Philipp Krebs (Med) Daniel Legler (BITg) Vincent Perreten (Vet BE) Carsten Riether (Med) Carlos Ros Bascunana (Sci) Matthias Schweizer (Vet BE) Jens Stein (Med) Marcus Thelen (IRB) Stephan von Gunten (Med) Yitzhak Zimmer (Med)</p>	<p>Torsten Ochsenreiter (Sci), Chair Ramanjaneyulu Allam (Med) Rémy Bruggmann (Sci) Jürg Gertsch (Med) Adrian Hehl (Vet ZH) Rory Johnson (Med) Carlo Largiadèr (Med) Tosso Leeb (Vet BE) Peter Meister (Sci) Oliver Mühlemann (Sci) Mariusz Nowacki (Sci) Olivier Pertz (Sci) Norbert Polacek (Sci) Isabel Roditi (Sci) Sven Rottenberg (Vet BE) André Schaller (Med) Achim Stocker (Sci) Volker Thiel (Vet BE) Christoph von Ballmoos (Sci) Benoît Zuber (Med)</p>	PhD Candidates
	PhD Candidates	PhD Candidates	PhD Candidates	PhD Candidates	PhD Candidates	PhD Candidates

## Changes in Committee Memberships During 2017

### PhD Committee

**President:** Prof. Dr. Rupert Bruckmaier (Vet BE) until July 2017  
Prof. Dr. Oliver Mühlemann (Sci) since August 2017

### Expert Committee «Biological Systems»

**Resigned:** Prof. Dr. Christophe von Garnier (Med) October 2017

### Expert Committee «Biomedical Engineering»

**Joined:** Prof. Dr. Raphael Sznitman (Med) April 2017  
Prof. Dr. Laura Marchal Crespo (Med) December 2017  
**Resigned:** Prof. Dr. Matthias Zwicker (Sci) January 2017  
PD Dr. Richard W. Nyffeler (Med) February 2017

### Expert Committee «Biomedical Sciences»

**Joined:** PD Dr. Julia Bohlius (Med) April 2017  
Prof. Dr. Mariusz P. Kowalewski (Vet ZH) October 2017  
Prof. Dr. Anna Oevermann (Vet BE) October 2017  
**Resigned:** Prof. Dr. Olivia Keiser (Med) January 2017

### Expert Committee «Cell Biology»

**Joined:** PD Dr. Lucy Jane Hathaway (Med) April 2017  
Prof. Dr. Georgia Konstantinidou (Med) April 2017  
Prof. Dr. Daniel Legler (BITg) December 2017  
PD Dr. Carlos Ros Bascunana (Sci) December 2017

### Expert Committee «Molecular Biology & Biochemistry»

**Joined:** Prof. Dr. Rory Johnson (Med) April 2017  
Prof. Dr. Olivier Pertz (Sci) April 2017  
Prof. Dr. Ramanjaneyulu Allam (Med) October 2017  
Prof. Dr. Peter Meister (Sci) October 2017  
**Resigned:** Prof. Dr. Michael Altmann (Med) June 2017  
Prof. Dr. Peter Bütikofer (Med) December 2017

## PhD Program

The GCB offers structured training in experimental research in the fields of biochemistry, cell and molecular biology, immunology, biomedical sciences, epidemiology, neuroscience, and biomedical engineering, leading to a PhD, MD,PhD, or DVM,PhD degree.

The thesis projects are carried out at laboratories of the three participating faculties (Faculty of Medicine, Faculty of Science, and Vetsuisse Faculty) or at affiliated institutions. In 2017, these included the Institute of Virology and Immunology (IVI) in Mithelhäusern (as part of the Vetsuisse Faculty Bern), the Institute for Research in Biomedicine (IRB) in Bellinzona, the EMPA Competence Centre in Thun, the Swiss Paraplegic Research in Nottwil, the Biotechnology Institute Thurgau (BITg) in Kreuzlingen, the AO Research Institute in Davos, and the RMS Foundation in Bettlach.

Each PhD candidate is supervised by a thesis committee consisting of the **supervisor**, a **co-advisor**, and a member of the appropriate GCB Expert Committee (**mentor**).

The **supervisor** is responsible for the research project, adequate supervision, the laboratory infrastructure and the salary of the candidate.

The **co-advisor** must not be affiliated with the same institute as the supervisor, but should be an expert in the research area of the thesis project. He meets with the candidate at least twice a year to discuss and assess progress of the thesis work, as well as advising and supporting him/her.

The **mentor** decides, together with the candidate and the supervisor, on the individual, tailor-made training program, taking into account the candidate's previous education and the relevance to the planned research work.

Moreover, in order to promote independent evaluation, an **external co-referee** assesses the PhD thesis of the candidate at the end of the study course.

The training program requires at least 6.0 ECTS of learning credits, which can be obtained by participating in approved, project-related and interdisciplinary courses, workshops, seminars, and lectures. In the course of the second year, candidates must present their work in a scientific seminar in the presence of the thesis committee, to document in-depth knowledge of the research field («Mid-term Evaluation»).

By granting a financial contribution, the GCB actively supports the participation of candidates in national and international conferences and in special training courses offered by recognized institutions in Switzerland and abroad.

Within the framework of the PhD Program of the GCB, two **PhD Specialization Programs** are currently offered. Participants must acquire additional ECTS credit points in the area of specialization and receive a special certificate, complementing their PhD degree:

- **«Cell Migration»**, launched in October 2011 as an inter-university PhD Program on Cell Migration in Immunosurveillance, Inflammation, Tumorigenesis and Metastasis (originally an SNFS-supported ProDoc Program). Due to its success, the program is now supported by swissuniversities (TP1). It includes PhD candidates from the Theodor Kocher Institute in Bern, the Institute for Research in Biomedicine (IRB) in Bellinzona, the Biotechnology Institute Thurgau (BITg) in Kreuzlingen, and from the Universities of Fribourg and Geneva. More information: <http://www.cell-mig.ch/>.
- **«Cutting Edge Microscopy»**, launched in January 2017, is also supported by swissuniversities (TP1), and is jointly coordinated by the GCB and the Microscopy Imaging Center (MIC) of the University of Bern. The PhD candidates in this program focus on high-end microscopic techniques, and on the corresponding image processing and data management. More information: <http://www.mic.unibe.ch/specialization.php>.

A further aim of the structured doctoral program of the GCB lies in the promotion of a lively scientific exchange between PhD candidates and senior scientists, and the stimulation of networking activities, such as regular discussions with the thesis committee and exchange among peers during the annual GCB Symposium. Moreover, PhD candidates have the opportunity to invite internationally renowned scientists for a seminar, or to organize a small workshop or meeting on a specific topic.

## Doctoral Candidates

Candidates can apply three times per year for admission to the GCB: on April 15, August 15, and December 15. In the course of 2017, **140 PhD candidates** were newly admitted to the GCB (Table 1). Nine candidates discontinued their PhD, and one relocated together with the supervisor to another university.

The GCB is currently represented by doctoral candidates with degrees from 37 different countries.

Degree	University of Bern	Other Swiss Universities	Foreign Universities	Total	in %
Human Medicine Degree	6	1	13	<b>20</b>	14.3
Veterinary Medicine Degree	3	3	12	<b>18</b>	12.8
Science Degree	31	16	55	<b>102</b>	72.9
<b>Total</b>	<b>40</b>	<b>20</b>	<b>80</b>	<b>140</b>	100.0
<b>in %</b>	28.6	14.3	57.1	100.0	

Table 1. Admission of new PhD candidates in 2017, specifying the place of origin of their Master's degrees.

At the end of 2017, **444 candidates** were enrolled in the GCB. 235 candidates (52.9%) were holding a degree from a foreign university, and 52.0% of the doctoral candidates were women (Figure 1).

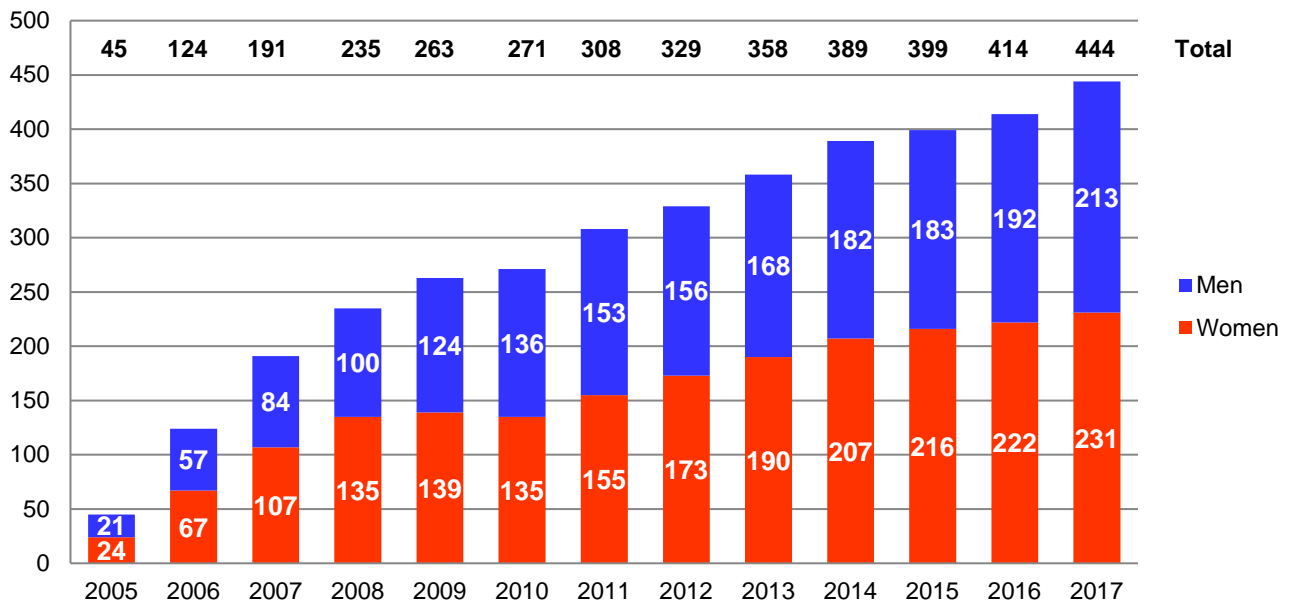
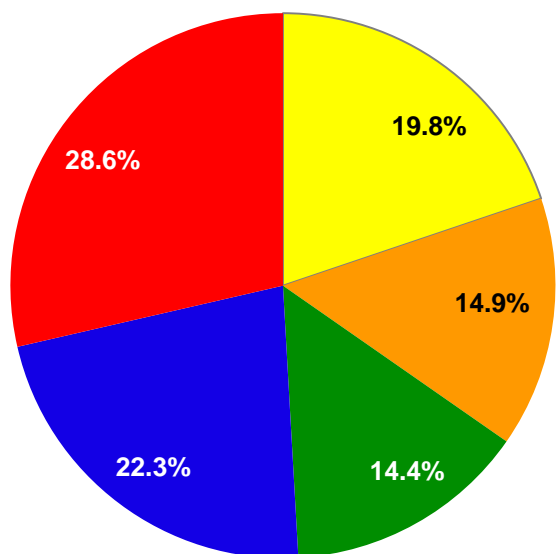


Figure 1. Number of PhD candidates 2005-2017.

Figures 2 and 3 document the distribution of the doctoral candidates in 2017 within the different research fields (GCB Expert Committees) and Faculties/Institutions, respectively.



	Expert Committee	F	M	Total
■	Biological Systems	49	39	88
■	Biomedical Engineering	17	49	66
■	Biomedical Sciences	46	18	64
■	Cell Biology	51	48	99
■	Molecular Biology & Biochemistry	68	59	127
	<b>Total</b>	<b>231</b>	<b>213</b>	<b>444</b>

Figure 2 & Table 2. Distribution of PhD candidates within the five GCB Expert Committees. Left: Percentage. Right: Number of candidates (F = women, M = men).

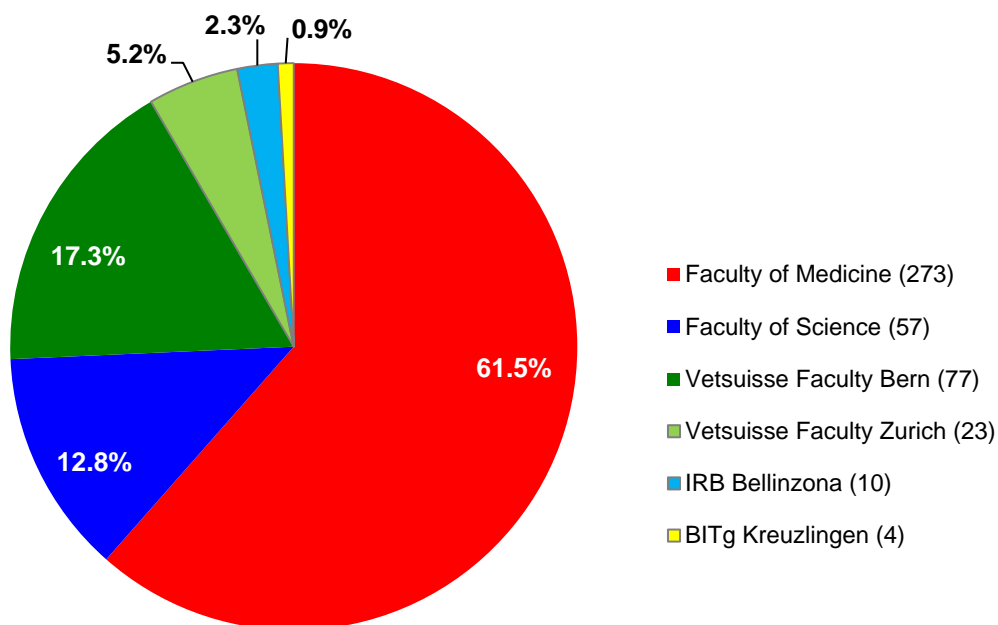


Figure 3. Distribution of PhD candidates within the Faculties/Institutions. In parentheses: number of candidates; in chart: percentage.

IRB: Institute for Research in Biomedicine, Bellinzona, at the Università della Svizzera italiana  
 BITg: Biotechnology Institute Thurgau, Kreuzlingen, at the University of Konstanz

## Courses and Seminars

For each candidate, seminars and courses are individually selected from courses organized and supported by the GCB, from the teaching units of the faculties, and also from courses offered by other Swiss universities, in particular by the ETHZ or the EPFL for the field of Biomedical Engineering, or by inter-university programs like the NCCRs «TransCure» and «RNA and Disease», the Doctoral Program in Biology and StarOmics (both CUSO), the Forum for Genetic Research (sc|nat, Swiss Academy of Sciences), the BENEFRI Neuroscience Program (Universities of Bern, Neuchâtel & Fribourg), the Swiss Institute of Bioinformatics (SIB), or the Swiss School of Public Health PhD program (SSPH+). Some candidates also take part in internationally organized Summer Schools, which provide high quality training in specific fields.

### Special Courses Organized for GCB Students

#### Lectures, Tutorials, and Book Clubs

- *Immunology Tutorial* (several senior scientists)
- *Cell Biology («Happy Cell») Tutorial*, (several senior scientists)
- *Principles in Transgenic Mouse Technology* (C. Benarafa, U. Deutsch, & Ph. Krebs)
- *Stem Cells & Regenerative Medicine* (V. Enzmann and others)
- *Translational Cancer Research: Crosstalk in Academic, Clinical and Pharmaceutical Cancer Research: Willing to improve? ...* (M. P. Tschan & N. Leupin)
- *Topics in Tumor Biology* (D. Stroka, M. P. Tschan, & Y. Zimmer)
- *Evolution of Adaptive Mechanisms in Vertebrates—Physiology, Behaviour and Implications for Health and Welfare* (R. Bruckmaier & H. Würbel)
- *Environment-related Diseases: From Climate Change to Nanotoxicology* (H. Krug, EMPA St. Gallen)
- *Excitation-Contraction Coupling and Cardiac Contractile Force* (E. Niggli)
- *Lecture Course: International PhD Program in Immunology, Cell Biology and Biochemistry* (S. Monticelli, IRB Bellinzona)
- *Introduction to Epidemiology & Biostatistics* (G. Schüpbach & J. Berezowski)
- *Book Clubs, Journal Clubs and Seminars* (Institute of Social and Preventive Medicine ISPM), see [http://www.ispm.unibe.ch/continuing\\_education/phd\\_programs/courses\\_for\\_phd\\_students/index\\_eng.html](http://www.ispm.unibe.ch/continuing_education/phd_programs/courses_for_phd_students/index_eng.html)
- *Biostatistics for Non-Statisticians: Good Practices, Misuse and Pitfalls* (R.-D. Gosselin, Biotelligences LLC)
- *Statistical Literature Seminar* (B. Voelkl)
- *Module in Metabolomics: Introduction to the major aspects of metabolomics* (C. R. Largiadèr and others)



## **Practical Courses, Workshops, Summer Schools**

- *Cell Migration* (B. Engelhardt, J. Stein, & R. Lyck)
- *Vascular Cell Biology* (B. Engelhardt, U. Deutsch, & R. Lyck)
- *Molecular Biological Methods in Clinical Research* (V. Schröder & M. Schaller Tschan)
- *Microscopy: Basic and Advanced/Special Modules* (Microscopy Imaging Center MIC), see <http://www.mic.unibe.ch/education.php>
- *Microscopy Applications for Immunological Research* (M. Thelen, IRB Bellinzona)
- *DNA Sequencing and Mutation Analysis: Basics of Sanger and Next Generation Sequencing* (T. Leeb, M. Drögemüller, & V. Jagannathan)
- *Flow Cytometry Course* (S. Müller, C. Vallan, & A. Kopitar)
- *Concepts and Methods in Programmed Cell Death and Autophagy Training Course* (bi-annually, T. Kaufmann)
- *International Summer School on Inflammation, Immunomodulation, Inspiration* (H.-U. Simon)
- *PhD Symposium @ Vetsuisse Faculty* (bi-annually, organized by PhD students of applied ethology & H. Würbel), see [http://www.tierschutz.vetsuisse.unibe.ch/about\\_us/events/index\\_eng.html](http://www.tierschutz.vetsuisse.unibe.ch/about_us/events/index_eng.html)
- *SCRM PhD Student Retreat* (annually, organized by PhD students of the Stem Cell Research in Regenerative Medicine group SCRM), see <http://www.stemcellsbern.ch/wb/pages/intropage.php>

## **Transferable Skills Courses**

- *Scientific Integrity* (T. Ochsenreiter), mandatory lecture for all GCB candidates
- *Scientific Writing* (R. Greif)
- *Scientific Communications for PhD Students* (S. Longnus)
- *The Art of Lecturing* (R. Greif)
- *Presenting with Confidence* (C. Winfield & D. Levine)
- *Project Management for Researchers* (D. Krstic)
- *Effective Grant-Writing for Young Scientists* (M. Toscano & J. Bailoo)

## GCB Seminars

GCB Seminars give PhD candidates the possibility to invite internationally renowned specialists from their field of research for an interactive teaching lecture and a research seminar intended for a broad audience. The GCB provides administrative help and financial support.

In 2017, one GCB Seminar was organized and hosted by **Kristin Uth**, PhD candidate at the Institute of Pathology, Translational Research Unit:

June 26, 2017 **Dr. Eberhard Krauss**, Vlaams Instituut voor Biotechnologie (VIB), Flanders, Belgium

**Teaching Seminar:** «Good Practice in Developing (Cell-Based) Assays»

**Public Lecture:** «VIB Discovery Sciences—From Target to Translation: Facilitating Early Drug & Agrochemical Discovery»

We are pleased to report that 22 PhD candidates took part in this GCB seminar.

*Kristin Uth reports (excerpts):*

*[...] In the morning from 10h00 to 12h00, Dr. Eberhard Krauss performed a Workshop for GCB students entitled «Good Practice in Developing (Cell-Based) Assays», and in the afternoon from 16h00 to 17h00 he held a seminar, entitled «VIB Discovery Sciences—From Target to Translation: Facilitating Early Drug & Agrochemical Discovery».*

*Dr. Krauss introduced himself and asked the students about their background regarding cell based assays and how to properly set these up.*

*He split his workshop into two parts. During the first part, he was addressing the importance of research and result quality in order to smoothly transfer them to industry. Dr. Krauss in particular emphasized the importance of the experimental design and how results affect their further development either in biotech or pharma industry.*

*In general, the workshop got a positive feedback from the students. Constructive criticism was also provided by the students. [...]*



Figure 4: Guest lecturer Dr. Eberhard Krauss, and host Kristin Uth, PhD candidate.

*The seminar in the evening was a success, as the speaker was able to get his message across effectively. It was a relatively small audience, despite my widespread efforts to announce it, but this turned out nonetheless to be highly efficient. This way, questions could be asked about future career perspectives and further possibilities to deepen the assay development knowledge. In turn, Dr. Krauss proposed the opportunity to attend further workshops in Belgium provided by his institute.*

*The invitation of an external researcher from industry who actually has a strong academic background was an excellent experience for me, and a great opportunity for those who were interested in this particular subject.*

*I would like to express my deepest gratitude for Mrs. Favre and Mrs. Wolf for your support and advice throughout the application process.*

*Thanks a lot, and I hope students will continue to take the opportunity to invite speakers from around the world to broaden their horizons.*

*[...]*

*Kristin Uth*

Indeed, the GCB welcomes such initiatives and would like to encourage PhD candidates to take advantage of this unique opportunity more often, and motivate them to organize seminars with distinguished scientists.

### **GCB Students' Meetings**

PhD candidates also have the possibility to get financial support for the organization of workshops or small meetings among their peers on a specific topic.

In 2017, the «**4<sup>th</sup> SCRM PhD Student Retreat**» received financial support from the GCB and from the Platform for Stem Cell Research in Regenerative Medicine (SCRM, <http://www.stemcellsbern.ch/wb/pages/intropage.php>). On behalf of the organizing committee (Felix Baier, William Hariton and Magdalena Brunner), Felix Baier reports on the retreat:

*PhD students with interest in stem cell research continued the tradition to meet and discuss their projects in an informal and friendly atmosphere, with the exceptional opportunity to receive valuable questions and suggestions from two experienced researchers. Twelve PhD students and three master student guests attended this year's retreat.*

*The retreat took place on September 1, 2017, on top of the Gurten mountain in Bern. The day was comprised of 11 PhD project presentations and two keynote lectures given by the two invited speakers, Dr. Christine Weber and Prof. Fredric Manfredsson.*

*Dr. Christine Weber is an associate editor at Nature Cell Biology and came from London to join the event. It was one of the highlights of this year's retreat to hear Dr. Weber's talk on publishing processes, to get advice on writing manuscripts towards acceptance and to receive comments on the projects from an actual editor of one of the most impactful journals. Professor Fredric Manfredsson came from the Michigan State University and gave a great talk on current state of the art research on viral gene therapy for neurological disorders.*

*In addition to the presentations, the retreat included several breaks for networking and further discussions on the projects. The day was concluded by an address given by the SCRM steering committee and the Apéro riche.*

*A special acknowledgement is addressed to the keynote speakers for taking the journeys to Switzerland, presenting two remarkable keynote lectures and providing excellent comments for the projects. Also, great gratitude is expressed towards the Platform for Stem Cell Research in Regenerative Medicine and the Graduate School for Cellular and Biomedical Sciences Bern, which made the retreat possible by their generous financial support for the fourth time already.*

*We thank everyone for their participation, which made the retreat again a very fruitful and pleasant experience. Also, we would like to invite every interested PhD student to join the next retreat, which will take place on August 31, 2018.*



Figure 5. Participants of the «4<sup>th</sup> SCRM PhD Student Retreat», September 1, 2017, on the Gurten, Bern.

## GCB Symposium 2017

On February 2, 2017, the GCB Symposium 2017 was held once again on the premises of the Department of Chemistry and Biochemistry, and additionally, at the Department of Physiology, enjoying the efficient and helpful support of the staff of both departments. The GCB doctoral candidates presented their research projects in **50 short talks** in two sets of five parallel sessions, and in two poster sessions of **156 posters** altogether. The presentations illustrated the wide range of topics covered by the GCB, and demonstrated the candidates' high level of competence in the fields of cellular and biomedical sciences, epidemiology, and biomedical engineering. The day also offered an excellent opportunity for both GCB candidates and their supervisors and mentors to engage in reciprocally rewarding and highly stimulating discussions on the research work going on at the GCB, and for active networking among peers.

The afternoon was dedicated to several highlights: Firstly, the keynote lecture, this time delivered by the distinguished invited speaker, **Prof. Dr. Elsbeth Stern**, Institute for Research on Learning and Instruction, ETH Zurich, who captivated her audience in her talk on «**The Challenge of Learning Transfer**». Secondly, the «GCB Award for Best PhD Thesis 2016» was conferred on **Mariana De Niz, PhD of Science in Cell Biology**, for her work entitled «Imaging of malaria: conserved mechanisms of *Plasmodium* sequestration and virulence factor export in rodents and humans». (For details, see GCB Annual Report 2016, p. 31.) Finally, a rich and rewarding day concluded with the second «**GCB Slam**», taking up on the success of the previous year's first edition. Presided over by Masters of Ceremonies **Crazy David** and **Nicola von Greyerz**, twelve PhD candidates ventured into this unfamiliar type of presentation, with the task of explaining their research projects to a non-specialist audience. In their concise, 4-minute slams, they competed for the prizes awarded to the three best performances by voting members of the audience. The creative and highly acclaimed prize-winners were **Sabrina Burgener**, Theodor Kocher Institute (1<sup>st</sup> prize, «Suicided in the Paradise»), **Cristina Leoni**, Institute for Research in Biomedicine, Bellinzona (2<sup>nd</sup> prize, «When Mast Cells Play out of Key»), and **Christina Rufener**, Division of Animal Welfare, VPH Institute, Vetsuisse Faculty Bern (3<sup>rd</sup> prize, «Chickens, Eggs and Broken Bones»).

To round off this eventful GCB day, to celebrate in a relaxing atmosphere, and to give everyone another opportunity for informal and scientific exchange, the GCB offered an apéro riche, which all participants thoroughly enjoyed.

## Graduations

In the course of 2017, **96 candidates** successfully completed the PhD program of the GCB and obtained their doctoral degree, jointly issued by the Faculty of Medicine, the Faculty of Science, and the Vetsuisse Faculty. Figure 6 shows the different types of PhD titles obtained.

Of the graduates, 46 or 47.9% were candidates with a degree from a foreign university who joined the GCB for their PhD studies.

Since the start of the PhD program in 2005, **666 candidates** have successfully completed their studies and obtained a doctoral degree.

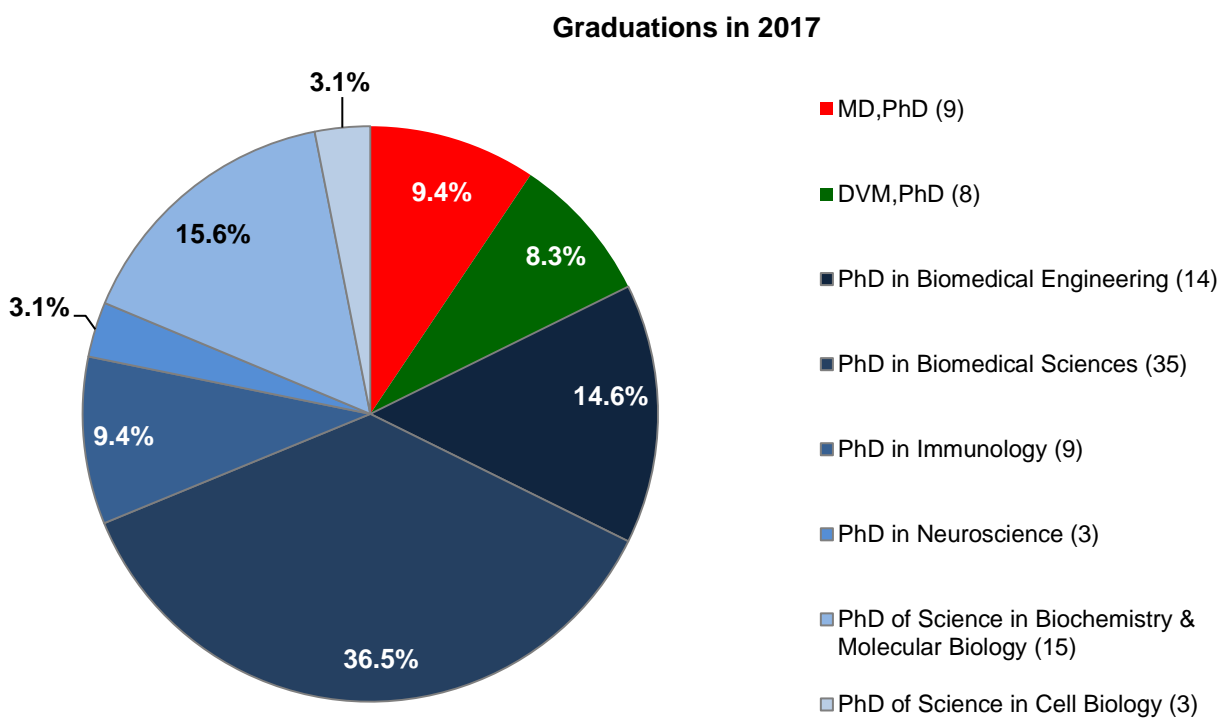


Figure 6. PhD degree types of the 96 GCB graduates of the year 2017.  
*In parentheses: number of graduates; in chart: percentage.*

## GCB Graduates in 2017: Alphabetical Order

**Mai Moustafa Ahmed Abd El Hafez, PhD in Biomedical Sciences** (October 18)  
Department for BioMedical Research, Cardiovascular Research (Prof. Dr. Robert Rieben)  
«**Role of complement and coagulation in ischemia/reperfusion injury**»

**Víctor Adalid López, PhD in Biomedical Sciences** (July 4)  
Department for BioMedical Research, Magnetic Resonance Spectroscopy and Methodology (Prof. Dr. Roland Kreis)  
«**Generalizing the modeling of interrelated datasets in magnetic resonance spectroscopy**»

**Olivia Joan Adams, PhD in Biomedical Sciences** (July 21)  
Institute of Pathology (Prof. Dr. Rupert Langer, Prof. Dr. Mario P. Tschan)  
«**The role of autophagy in the biology of esophageal adenocarcinomas, including the impact on chemo- and HER2 targeted therapeutic response**»

**Maher Alsaad, DVM, PhD** (June 8)  
Department of Clinical Veterinary Medicine, Clinic for Ruminants, Vetsuisse Faculty Bern (Prof. Dr. Adrian Steiner)  
«**Development and validation of objective measurement tools of the locomotion behavior for assessment of welfare and lameness in cattle**»

**Juan Ansó, PhD in Biomedical Engineering** (March 17)  
ARTORG Center for Biomedical Engineering Research, Image-Guided Therapy (Prof. Dr. Stefan Weber)  
«**Nerve Monitoring Approaches for Image-Guided Robotic Surgery in the Lateral Skull Base**»

**Nivedita Awasthi Mishra, PhD in Biomedical Sciences** (March 9)  
Institute of Genetics, Vetsuisse Faculty Bern (Prof. Dr. Tosso Leeb)  
«**Genetic Analysis of the Belt Phenotype in Cattle**»

**Lia Bally, MD, PhD** (March 16)  
Department of Endocrinology, Diabetes and Clinical Nutrition, Inselspital, Bern University Hospital (Prof. Dr. Christoph Stettler)  
«**Multi-Modal Approaches for the Management of Type 1 Diabetes**»

**Ulrich Baumgartner, PhD of Science in Biochemistry and Molecular Biology** (December 8)  
Institute of Pathology (Prof. Dr. Erik Vassella)  
«**microRNAs as modulators of cell-signaling and their role in chemoresistance in solid cancer**»

**Steve Berger, PhD in Biomedical Engineering** (March 21)  
Institute for Surgical Technology and Biomechanics (Prof. Dr. Philippe Büchler)  
«**Patient-specific quantification of spinal flexibility in AIS patients: Methods for pre- and intra-operative assessment**»

**Lilli Bittner, DVM, PhD** (May 23)  
Department for Farm Animals, Clinic of Reproductive Medicine, Vetsuisse Faculty Zurich (Prof. Dr. Heiner Bollwein)  
«**Effect of oxidative stress on bovine sperm function and subsequent *in vitro* embryo development**»

**Tobia Brusa, PhD in Biomedical Engineering** (July 13)  
Institute for Surgical Technology and Biomechanics (Prof. Dr. Philippe Büchler)  
«**The In Vivo Biomechanics of the Human Anal Continence Organ**»

**Sabrina Sofia Burgener, PhD in Immunology** (September 28)

Theodor Kocher Institute (PD Dr. Charaf Benarafa)

**«Cytosolic clade B serpins, Serpinb1a, Serpinb6a and Serpinb9a regulate granule serine protease-induced cell death and inflammation in myeloid cells by cooperative and distinct mechanisms»**

**Ludmila Cardoso Alves, PhD in Immunology** (August 29)

Institute of Pathology (PD Dr. Philippe Krebs)

**«Regulation of CD8<sup>+</sup> T cell response during infectious and sterile inflammation»**

**Vimal Chandran, PhD in Biomedical Engineering** (February 27)

Institute for Surgical Technology and Biomechanics (Prof. Dr. Mauricio Reyes)

**«Comprehensive and Effective Machine Learning Based Computational Modelling of the Human Proximal Femur»**

**Morgan Chevalier, PhD in Biomedical Sciences** (December 4)

Institute of Biochemistry and Molecular Medicine (Prof. Dr. Hugues Abriel)

**«Regulation of the cardiac sodium channel Nav1.5 by CASK and calcineurin»**

**Martino Colombo, PhD of Science in Biochemistry and Molecular Biology** (May 23)

Department of Chemistry and Biochemistry (Prof. Dr. Oliver Mühlemann, Dr. Rémy Bruggmann)

**«The use of next generation sequencing in the study of the activity of fused in sarcoma and the mechanism of nonsense-mediated mRNA decay»**

**Silvia Crespo Pomar, PhD of Science in Biochemistry and Molecular Biology**

(October 31)

Institute of Biochemistry and Molecular Medicine (Prof. Dr. Roch-Philippe Charles)

**«Involvement of PI3KC2 $\beta$  in the resistance of human cancer cells to inhibitors targeting the epidermal growth factor receptor (EGFR) tyrosine kinase»**

**Joachim Dehais, PhD in Biomedical Engineering** (January 20)

ARTORG Center for Biomedical Engineering Research, Diabetes Technology (PD Dr. Stavroula Mougiakakou)

**«Segmentation and 3D reconstruction of food from images for carbohydrate content estimation»**

**João Pedro do Couto Pires, PhD of Science in Biochemistry and Molecular Biology**

(September 15)

Institute for Infectious Diseases (Prof. Dr. Andrea Endimiani)

**«Intestinal Carriage of Extended-Spectrum Cephalosporin-Resistant *Enterobacteriaceae* among People and Pets in Households: Descriptive Epidemiology and Role of Microbiota»**

**Chantal-Simone Dysli, MD, PhD** (September 25)

Department for BioMedical Research, Ophthalmology (Prof. Dr. Martin Zinkernagel, Prof. Dr. Sebastian Wolf)

**«Fluorescence Lifetime Imaging Ophthalmoscopy (FLIO) from Bench to Bedside»**

**Denise-Muriel Dysli, MD, PhD** (January 23)

Department of Ophthalmology, Inselspital, Bern University Hospital (PD Dr. Mathias Aegg, Prof. Dr. Sebastian Wolf)

**«Plasticity in the Vergence System»**

**Younes El Fersioui, PhD in Biomedical Sciences** (March 8)

Department of Orthodontics and Dentofacial Orthopedics, School of Dental Medicine (Prof. Dr. Matthias Chiquet)

**«The role of Bmp7 in craniofacial osteogenesis and secondary palate formation in a mouse model»**



**Oussama El Mokh, PhD of Science in Biochemistry and Molecular Biology** (March 9)  
Institute of Biochemistry and Molecular Medicine (Prof. Dr. Roch-Philippe Charles)  
«**Targeting MAPK and PI3K pathways in anaplastic thyroid carcinoma and potential treatments**»

**Angela Fadda, DVM, PhD** (November 21)  
Division of Experimental Clinical Research, DCR-VPH, Vetsuisse Faculty Bern  
(Prof. Dr. Anna Oevermann)  
«**Neuroinvasion by *Listeria monocytogenes***»

**Martin Richard Faderl, PhD in Immunology** (December 15)  
Institute of Pathology (Prof. Dr. Christoph Müller)  
«**Host-microbial interactions during steady state and intestinal inflammation in a gnotobiotic mouse model of remitting-relapsing colitis**»

**Emilie Farine, PhD in Biomedical Engineering** (June 30)  
Department for BioMedical Research, Cardiovascular Surgery (Prof. Dr. Hendrik Tevæearai, PD Dr. Sarah Longnus)  
«**Cardioprotective reperfusion strategies and recovery monitoring in donation after circulatory death: Studies in the isolated working rat heart**»

**Arne Niklas Feldmann, PhD in Biomedical Engineering** (March 2)  
Institute for Surgical Technology and Biomechanics (Prof. Dr. Philippe Zysset)  
«**Thermal and Drilling Properties of Bone**»

**Yuniel Fernández Marrero, PhD of Science in Biochemistry and Molecular Biology**  
(June 6)  
Institute of Pharmacology (Prof. Dr. Thomas Kaufmann)  
«**Insights into the biophysical and functional characterization of the BCL2 family member BOK**»

**Nicole Damara Fichtner, PhD in Biomedical Sciences** (July 6)  
Department for BioMedical Research, Magnetic Resonance Spectroscopy and Methodology (Prof. Dr. Roland Kreis)  
«**Effects of Exchange in Magnetic Resonance Spectroscopy and Imaging at Ultra-High Fields**»

**Sunniva Förster, PhD in Biomedical Sciences** (August 21)  
Institute of Social and Preventive Medicine (Dr. Christian Althaus, PD Dr. Lucy Jane Hathaway, Prof. Dr. Nicola Low)  
«**Pharmacodynamic evaluation of antimicrobials and combination therapy for the future treatment of *Neisseria gonorrhoeae***»

**Fiorenza Fumagalli, PhD of Science in Biochemistry and Molecular Biology**  
(March 16)  
Institute for Research in Biomedicine, Bellinzona (Dr. Maurizio Molinari)  
«**Unraveling the molecular pathways controlling recovery from a transient ER stress in mammalian cells**»

**Dominique Furrer, PhD of Science in Biochemistry and Molecular Biology**  
(January 13)  
Institute of Cell Biology (Prof. Dr. Mariusz Nowacki)  
«**Analysis of Piwi proteins involved in RNA-mediated elimination of germline-specific DNA in *Paramecium tetraurelia***»

**Astrid Andreina Glück, PhD of Science in Cell Biology** (June 19)  
Department for BioMedical Research, Radiation Oncology (PD Dr. Yitzhak Zimmer)  
«**Investigations over the role of MET signaling in the HIF-1 $\alpha$  pathway and in H2AX-related ubiquitinations**»

**Agata Górecka, PhD in Biomedical Sciences** (April 5)  
Department for BioMedical Research, Visceral and Transplantation Surgery (PD Dr. Lukas Brügger)

«**Adipose Derived Stem Cells for skeletal muscle regeneration**»

**Maricruz Guevara Soto, DVM,PhD** (December 15)  
Centre of Fish and Wildlife Health, Vetsuisse Faculty Bern (Prof. Dr. Helmut Segner, PD Dr. Heike Schmidt-Posthaus)

«**Emerging disease which threatens sustainable aquaculture and wild fish population: Epitheliocystis**»

**Ludivine Guillaume, PhD in Biomedical Sciences** (November 24)  
ARTORG Center for Biomedical Engineering Research, Organs-on-Chip Technologies, University of Bern, and Institut des Technologies Avancées en Sciences du Vivant (ITAV), Université de Toulouse (Prof. Dr. Olivier T. Guenat & Dr. Valérie Lobjois—cotutelle)

«**Intrinsic mechanical properties research of in vitro micro-tumor model**»

**Pascal Häfliger, PhD in Biomedical Sciences** (April 7)  
Institute of Biochemistry and Molecular Medicine (Prof. Dr. Roch-Philippe Charles)

«**Role of LAT1 in thyroid cancer and role of CAP1 in skin/prostate cancer**»

**David Hasler, PhD in Biomedical Engineering** (October 19)  
ARTORG Center for Biomedical Engineering Research, Cardiovascular Engineering (Prof. Dr. Dominik Obrist)

«**Experimental Investigation of the Three-dimensional Flow Field in the Vicinity of Aortic Valve Prostheses**»

**Sara Hintze, DVM,PhD** (March 15)  
Division of Animal Welfare, VPH Institute, Vetsuisse Faculty Bern (Prof. Dr. Hanno Würbel)

«**Beyond words... Cognitive and behavioural approaches to assess emotions in horses**»

**Morteza Jafari, MD,PhD** (December 20)  
Department for BioMedical Research, Dermatology (Prof. Dr. Robert Hunger)

«**Efficacy of electroporation-mediated gene delivery on survival of skin flaps**»

**Stephen Philip Jenkinson, PhD in Biomedical Sciences** (March 24)  
Institute for Infectious Diseases (Prof. Dr. Stephen Leib)

«**Development of an *In Vitro* Stem Cell-Based Bioassay for the Detection of *Clostridium Botulinum* Neurotoxins**»

**Maja Jurca, MD,PhD** (August 14)  
Institute of Social and Preventive Medicine (Prof. Dr. Claudia Kuehni)

«**Cough in childhood: Prevalence, risk factors and prognosis**»

**David Kalbermatter, PhD of Science in Biochemistry and Molecular Biology** (March 30)

Institute of Biochemistry and Molecular Medicine (Prof. Dr. Dimitrios Fotiadis)

«**Structural Biology of Selected Membrane Proteins by X-Ray Crystallography and Cryo-Electron Microscopy**»

**Andreas Keil, PhD in Biomedical Sciences** (September 25)  
Department for BioMedical Research, Thoracic Surgery (PD Dr. med. Steffen Frese)

«**The mechanism of topoisomerase I inhibition in the treatment of lupus nephritis**»

**Marcus Johann Kind, PhD in Biomedical Sciences** (October 23)  
Institute of Biochemistry and Molecular Medicine (Prof. Dr. Roch-Philippe Charles)

«**Analysing the role of PI3K isoforms in chemotherapeutic resistance and the oncogenic potential of *PIK3C2B* mutations**»

**Christian Kropf, PhD of Science in Biochemistry and Molecular Biology** (January 20)  
Centre of Fish and Wildlife Health, Vetsuisse Faculty Bern (Prof. Dr. Helmut Segner,  
Prof. Dr. Karl Fent)

**«ATP-binding cassette transporters in gills of rainbow trout (*Oncorhynchus mykiss*)»**

**Jan Michael Kümmerle, DVM, PhD** (March 6)

Equine Department, Clinic for Equine Surgery, Vetsuisse Faculty Zurich (Dr. Peter J. Richards)

**«Identification of novel tendon specific molecular markers in the horse»**

**Sreenath Pruthviray Kyathanahally, PhD in Biomedical Sciences** (August 21)

Department for BioMedical Research, Magnetic Resonance Spectroscopy and Methodology (Prof. Dr. Roland Kreis)

**«Quality aspects of clinical magnetic resonance spectroscopy: Quantification issues, quality prediction, and quality assessment by machine learning»**

**Jessica Frances Lampe, PhD in Biomedical Sciences** (November 21)

Division of Animal Welfare, VPH Institute, Vetsuisse Faculty Bern (Prof. Dr. Hanno Würbel)

**«Play behaviour, positive emotions and emotional contagion in rats»**

**Cristina Leoni, PhD of Science in Biochemistry and Molecular Biology** (August 7)

Institute for Research in Biomedicine, Bellinzona (Dr. Silvia Monticelli)

**«DNA methylation and hydroxymethylation regulate mast cell proliferation and effector functions»**

**Shunqing Liang, PhD in Biomedical Sciences** (August 24)

Department for BioMedical Research, Thoracic Surgery (Prof. Dr. Ralph A. Schmid, PD Dr. Ren-Wang Peng)

**«Targeting Chemoresistance in Non-Small Cell Lung Cancer»**

**Ping Lu, PhD in Biomedical Engineering** (May 18)

Institute for Surgical Technology and Biomechanics (Prof. Dr. Mauricio Reyes)

**«Advanced Medical Image Analysis of the Human Facial Nerve Based on Machine Learning Technologies»**

**Paul-Henry Mackeprang, MD, PhD** (August 28)

Department of Radiation Oncology, Division of Medical Radiation Physics, Inselspital, Bern University Hospital (Dr. Peter Manser)

**«Calculation of temporal and spatial dose distributions and its consequences for quality assurance and clinical use of MLC based SBRT techniques»**

**Nesa Magdalena Marti, PhD in Biomedical Sciences** (March 15)

Department for BioMedical Research, Endocrinology/Diabetology/Metabolism (Prof. Dr. Christa E. Flück)

**«Pathways and Mechanisms of Androgen Biosynthesis»**

**Raphael Meier, PhD in Biomedical Engineering** (April 28)

Institute for Surgical Technology and Biomechanics (Prof. Dr. Mauricio Reyes)

**«Towards Automatic Segmentation of Longitudinal Brain Tumor Imaging Data»**

**Moana Mika, PhD in Biomedical Sciences** (March 17)

Institute for Infectious Diseases (PD Dr. Markus Hilty)

**«The Respiratory Tract Microbiota in Health and Disease»**

**Sarah Moeschler, PhD in Biomedical Sciences** (June 22)

Institute of Virology and Immunology, Mittelhäusern (Dr. Gert Zimmer)

**«Development of a virus neutralization test for lyssaviruses and identification of antiviral compounds using vesicular stomatitis virus replicons»**

**Petra Niederberger, PhD in Biomedical Sciences** (July 4)

Department for BioMedical Research, Cardiovascular Surgery (Prof. Dr. Hendrik Tevaearai, PD Dr. Sarah Longnus)

«**Metabolic-based strategies to improve cardiac recovery after ischemia in an isolated rat heart model of donation after circulatory death**»

**Adriani Nikolakopoulou, PhD in Biomedical Science** (July 13)

Institute of Social and Preventive Medicine (Prof. Dr. Georgia Salanti)

«**Design of randomised control trials according to the principles of evidence based medicine**»

**Lluís Nisa, MD, PhD** (April 21)

Department for BioMedical Research, Radiation Oncology (PD Dr. Yitzhak Zimmer)

«**Mechanisms of invasion and therapeutic resistance in head and neck cancer: Emphasis on MET signaling**»

**Erik Nygren, PhD in Neuroscience** (March 21)

Department of Physiology (Prof. Dr. Walter Senn)

«**Autonomous learning of a stable neural integrator**»

**Melanie Parejo, PhD of Science in Biochemistry and Molecular Biology** (June 13)

Swiss Bee Research Center, Agroscope Bern (Prof. Dr. Peter Neumann)

«**Honeybee Conservation and Population Genetics Using Whole-Genome Sequence Data**»

**Julia Parts, PhD in Biomedical Sciences** (May 19)

Institute of Pathology (Prof. Dr. Mario P. Tschan)

«**Exploring metabolic pathways in acute myeloid leukemia**»

**Camille Peitsch, PhD of Science in Biochemistry and Molecular Biology** (March 14)

Institute of Anatomy (Prof. Dr. Benoît Zuber)

«**Cutting Edge Electron Microscopy for Calcium-Dependent Exocytosis and Trypanosome Morphology Studies**»

**Michael Perny, PhD in Biomedical Sciences** (April 28)

Institute for Infectious Diseases (Prof. Dr. Stephen Leib)

«**Pneumococcal Meningitis-induced Hearing Loss: From Basic Pathologies Towards a Stem Cell-based Therapy**»

**Vanessa Petrucci, PhD of Science in Cell Biology** (July 13)

Institute of Biochemistry and Molecular Medicine (Prof. Dr. Jürg Gertsch, Dr. Andrea Chicca)

«**Pepcan-12 (RVD-hemopressin) is a CB2 receptor positive allosteric modulator constitutively secreted by adrenals and in liver upon tissue damage**»

**Silvio Pflugi, PhD in Biomedical Engineering** (October 20)

Institute for Surgical Technology and Biomechanics (Prof. Dr. Guoyan Zheng)

«**Development and Validation of Cost-effective Navigation Technology for Peri-acetabular Osteotomy Surgery**»

**Bertrand Michel Marie Pouymayou, PhD in Biomedical Engineering** (February 24)

Department for BioMedical Research, Magnetic Resonance Spectroscopy and Methodology (Prof. Dr. Chris Boesch)

«**Multi-Nuclear MRS for the Elucidation of Insulin Resistance (IR) in Humans: Lipid Characterization and Magnetization Transfer (MT) Methods**»

**Maria Christina Precht, DVM, PhD** (October 17)

Division of Experimental Clinical Research, DCR-VPH, Vetsuisse Faculty Bern  
(Prof. Dr. Peter Vermathen)

**«Magnetic Resonance Imaging and Spectroscopy in small ruminants affected by listeria rhombencephalitis»**

**Julika Radecke, PhD in Neuroscience** (May 2)

Institute of Anatomy (Prof. Dr. Benoît Zuber)

**«Structural analysis of synaptic vesicle exocytosis and of microvesicles shed upon pneumolysin attack, visualized by cryo-electron tomography»**

**Susanne Radonjic-Hoesli, MD, PhD** (March 28)

Institute of Pharmacology (Prof. Dr. Hans-Uwe Simon)

**«Adhesion-induced eosinophil cytolysis requires the RIPK3-MLKL signaling pathway which is counter-regulated by autophagy»**

**Ramona Reinhart, PhD in Biomedical Sciences** (October 27)

Institute of Pharmacology (Prof. Dr. Thomas Kaufmann)

**«The importance of BCL-2 family members in cell survival and cell death regulation of basophils»**

**Carla Alicia Ruckstuhl, PhD in Immunology** (May 29)

Department for BioMedical Research, Tumor Immunology (Prof. Dr. Adrian Ochsenbein)

**«Regulation of "stemness" in immune cells and leukemia stem cells»**

**Nina Ruef, PhD in Biomedical Sciences** (January 17)

Department for BioMedical Research, Bone Biology & Orthopaedic Research Group  
(Prof. Dr. Willy Hofstetter)

**«Inflammatory Cytokines in the Modulation of Osteoclastogenesis and Bone Resorption»**

**Corinne Ruppen, PhD in Biomedical Sciences** (July 7)

Institute for Infectious Diseases (PD Dr. Parham Sendi)

**«Synergy of Penicillin plus Gentamicin in Group B Streptococci Revisited: From Bed to Bench»**

**David Lukas Schädeli, PhD of Science in Biochemistry and Molecular Biology**  
(December 20)

Institute of Biochemistry and Molecular Medicine (Prof. Dr. Peter Bütikofer)

**«Discovery of Novel Cardiolipin-Dependent Proteins in *Trypanosoma brucei*»**

**Alexandra Schröck, PhD in Biomedical Sciences** (May 19)

Institute of Forensic Medicine (Prof. Dr. Wolfgang Weinmann)

**«Phosphatidylethanol—a promising biomarker for the detection of alcohol consumption in various fields of application»**

**Senija Selimović-Hamza, PhD in Biomedical Sciences** (February 27)

Division of Experimental Clinical Research, DCR-VPH, Vetsuisse Faculty Bern  
(Prof. Dr. Torsten Seuberlich)

**«Astrovirus Infection in European Sporadic Bovine Encephalitis»**

**Fabienne Heirangi Serra, DVM, PhD** (May 16)

Division of Experimental Clinical Research, DCR-VPH, Vetsuisse Faculty Bern  
(Prof. Dr. Torsten Seuberlich)

**«Truncated prion protein fragments in healthy and BSE affected cattle: Interference with laboratory diagnosis and implications for disease control»**

**Aditi Singh, PhD of Science in Biochemistry and Molecular Biology** (August 3)

Institute of Cell Biology (Prof. Dr. Mariusz Nowacki)

«**Identification of epigenetic factors involved in targeting DNA elimination during development**»

**Magdalena Skowrońska, PhD in Immunology** (August 25)

Department for BioMedical Research, and Department of Hematology and Central Hematological Laboratory, Inselspital, Bern University Hospital (Prof. Dr. Johanna A. Kremer Hovinga, PD Dr. Monica Schaller Tschan)

«**Antibody repertoire of immune mediated thrombotic thrombocytopenic purpura (iTTP)—towards the development of a targeted therapy**»

**Anna Steinert, PhD in Immunology** (August 14)

Department for BioMedical Research, Gastroenterology/Mucosal Immunology, University of Bern, and Department of Biomedicine, University of Basel (Prof. Dr. Jan Hendrik Niess)

«**Regulation and Function of the Interleukin 19 in Intestinal Immunity**»

**Michael Stoller, MD, PhD** (June 28)

Department of Cardiology, Inselspital, Bern University Hospital (Prof. Dr. Christian Seiler)

«**Physical coronary arteriogenesis of cardiac and extracardiac origin**»

**Lars Straub, PhD in Biomedical Sciences** (September 25)

Institute of Bee Health, DCR-VPH, Vetsuisse Faculty Bern (Prof. Dr. Peter Neumann)

«**Pesticides and Mites: The impact of the neonicotinoid thiamethoxam and the ectoparasitic mite *Varroa destructor* on honey bees**»

**Jonas Streit, PhD in Neuroscience** (September 11)

Department of Physiology (PD Dr. Sonja Kleinlogel)

«**All-optical drug screening with a versatile optogenetic toolbox targeting recombinant cardiac ion channels**»

**Nicolas Studer, PhD in Immunology** (June 30)

Institute for Infectious Diseases (Prof. Dr. Siegfried Hapfelmeier)

«**Reconstitution of bile acid 7 $\alpha$ -dehydroxylation in a gnotobiotic *Clostridium difficile* infection model**»

**Beat Thomann, PhD in Biomedical Sciences** (September 14)

Veterinary Public Health Institute, Vetsuisse Faculty Bern (Prof. Dr. Gertraud Schüpbach)

«**Economic and epidemiologic evaluation of animal disease control programs in Switzerland**»

**Rahel Thomi, PhD in Immunology** (June 26)

Department of Dermatology, Inselspital, Bern University Hospital (Prof. Dr. Robert Hunger)

«**Interleukin-32, Interleukin-36 and LL-37 in the Pathogenesis of Hidradenitis Suppurativa**»

**Colin Tièche, PhD of Science in Cell Biology** (November 24)

Department for BioMedical Research, Thoracic Surgery (Prof. Dr. Ralph A. Schmid, Dr. Thomas Michael Marti)

«**Discovery and characterization of plastic subpopulations associated with distinct hallmarks of cancer in the NSCLC cell line A549**»

**Manuel Tritschler, PhD in Biomedical Sciences** (April 25)

Institute of Bee Health, DCR-VPH, Vetsuisse Faculty Bern (Prof. Dr. Peter Neumann)

«**Bee health and temperature**»

**Jingying Wang, PhD in Biomedical Sciences** (August 28)

Institute of Social and Preventive Medicine (Prof. Dr. Claudia Kuehni)

«**Breastfeeding with Childhood Respiratory Tract Infections, Eczema and Wheeze**»

**Tabea Wiedmer, PhD in Biomedical Sciences** (May 16)

Institute of Pathology (Prof. Dr. Aurel Perren, Prof. Dr. Mario P. Tschan)

**«Autophagy inhibition improves current pancreatic neuroendocrine tumor therapy via a lysosome-dependent mechanism»**

**Marcel Wullschleger, PhD in Biomedical Sciences** (May 9)

Department of Physiology (Prof. Dr. Marcel Egger)

**«Ca<sup>2+</sup> signaling in atrial myocytes: Interdependency of CICR and InsP<sub>3</sub>-induced Ca<sup>2+</sup> release under physiological and pathophysiological conditions»**

**Thomas Wyss Balmer, PhD in Biomedical Engineering** (July 26)

Institute for Surgical Technology and Biomechanics (Prof. Dr. Philippe Büchler, Prof. Dr. Andreas Stahel)

**«Electrical Bone Properties to Enable Modelling of Functional Guidance Using Neuro-Monitoring»**

**Weimin Yu, PhD in Biomedical Engineering** (June 9)

Institute for Surgical Technology and Biomechanics (Prof. Dr. Guoyan Zheng)

**«Hardware Accelerated, Non-rigid Intensity-based 2D-3D Registration for Orthopaedic Applications»**

**Gunnar Zoch, PhD in Immunology** (July 14)

Department for BioMedical Research, Rheumatology (Dr. med. Stefan Kuchen)

**«The influence of B cells on the tolerance induction via bee venom immunotherapy»**

We congratulate all graduates on their achievement and wish them all the very best for their future careers. Many of them have already moved on to new, challenging postdoctoral positions at universities all over the world.

Tables 3 and 4 show the distribution of the graduations in 2017 within the five GCB Expert Committees, and within the Faculties/Institutions, respectively.

Degree	Biological Systems	Biomedical Engineering	Biomedical Sciences	Cell Biology	Molecular Biology & Biochemistry	Total
PhD in Biomedical Engineering	0	13	1	0	0	14
PhD in Biomedical Sciences	12	2	8	7	6	35
PhD in Immunology	0	0	0	9	0	9
PhD in Neuroscience	3	0	0	0	0	3
PhD of Science in Biochemistry & Molecular Biology	1	0	0	1	13	15
PhD of Science in Cell Biology	0	0	0	2	1	3
MD,PhD	3	1	4	1	0	9
DVM,PhD	3	2	3	0	0	8
<b>Total</b>	<b>22</b>	<b>18</b>	<b>16</b>	<b>20</b>	<b>20</b>	<b>96</b>
<b>Total in %</b>	<b>22.9</b>	<b>18.8</b>	<b>16.7</b>	<b>20.8</b>	<b>20.8</b>	<b>100.0</b>

Table 3. Graduations per GCB Expert Committee in 2017.

Degree	Faculty of Medicine	Faculty of Science	Vetsuisse Faculty BE	Vetsuisse Faculty ZH	IRB Bellinzona	Total
PhD in Biomedical Engineering	14	0	0	0	0	14
PhD in Biomedical Sciences	28	0	7	0	0	35
PhD in Immunology	9	0	0	0	0	9
PhD in Neuroscience	3	0	0	0	0	3
PhD of Science in Biochemistry & Molecular Biology	8	3	2	0	2	15
PhD of Science in Cell Biology	3	0	0	0	0	3
MD,PhD	9	0	0	0	0	9
DVM,PhD	0	0	6	2	0	8
<b>Total</b>	<b>74</b>	<b>3</b>	<b>15</b>	<b>2</b>	<b>2</b>	<b>96</b>
<b>Total in %</b>	<b>77.1</b>	<b>3.1</b>	<b>15.6</b>	<b>2.1</b>	<b>2.1</b>	<b>100.0</b>

Table 4. Graduations in 2017, according to Faculties/Institutions.



## Prizes and Awards

### GCB Award for Best PhD Thesis 2017

The GCB congratulates **Cristina Leoni, PhD of Science in Biochemistry and Molecular Biology**, on winning the «**GCB Award for Best PhD Thesis 2017**». Cristina Leoni received the GCB Award (CHF 3.000.–) on February 1, 2018, on occasion of the GCB Symposium 2018, for her work entitled «**DNA methylation and hydroxymethylation regulate mast cell proliferation and effector functions**». Cristina performed her research work under the supervision of Dr. Silvia Monticelli at the Institute for Research in Biomedicine (IRB), Bellinzona, within the PhD Program of the GCB, and defended her PhD thesis successfully on August 7, 2017.

Cristina is currently pursuing her career as a postdoctoral fellow in Dr. Silvia Monticelli's lab at the IRB, on projects related to her main interest, namely the role of epigenetic modifications in regulating gene expression and immune cell functions. More specifically, she is focusing her attention on the role of DNA-modifying enzymes and DNA modifications in human T lymphocyte responses.



Figure 7. The laureate Cristina Leoni, PhD, receiving the GCB Award for Best PhD Thesis 2017 from the hands of Prof. Dr. Oliver Mühlemann, President of the GCB.

## Abstract by Cristina Leoni

Methylation of the 5' carbon residue of cytosine (5mC) in genomic DNA is a key epigenetic modification which regulates gene expression by recruiting protein involved in gene repression or impairing the binding of transcriptional activators at regulatory regions of genes. 5mC deposition is catalyzed by DNA methyltransferases (DNMTs) enzymes and can be further oxidized by the action of Ten-Eleven-Translocation (TET) enzymes into 5-hydroxymethylcytosine (5hmC) and further oxidized products. While the iterative oxidation of 5mC followed by deamination and DNA repair can result in DNA demethylation, 5mC oxidation can also influence directly gene transcription through the recruitment of specific binding-factors. Importantly, alteration of DNA methylation and hydroxymethylation landscape as well as mutations affecting DNA-modifying enzymes (most commonly DNMT3A and TET2) are frequently observed in several types of myeloid disorders, including systemic mastocytosis, a myeloproliferative neoplasm of mast cells. Mast cells are innate immune cells known to play an important role in modulating immune responses as well as allergic reactions. Although some genetic variants have been associated with the occurrence of mast cell disorders, the molecular mechanisms underlying their pathogenesis remain still largely unknown, and growing evidences suggest that epigenetic processes (including 5mC and 5hmC) could play a role in the pathogenesis of these diseases. In line with this, we found that patients with systemic mastocytosis present low levels of both 5mC and 5hmC as compared to healthy controls (Leoni et al., 2015). We therefore investigated the role of DNA methylation and hydroxymethylation in regulating mast cell biology. First, we found that 5hmC and TET enzymes activity are primarily involved in regulating mast cell differentiation and proliferation (Montagner et al., 2016). Instead, 5mC appeared to be mostly involved in restraining mast cell responses to acute and chronic stimuli, both *in vitro* and *in vivo* (Leoni et al., 2017). In summary, our work showed that both DNA methylation and hydroxymethylation are important to shape biological and physiological process in mast cells, pointing towards a possible role for these epigenetic modifications in influencing mast cell-related diseases and potentially providing new entry point for therapy for all types of mast cell-related disorders.

## References

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## Additional Prizes and Awards

We are very pleased to report that in the course of 2017, many GCB candidates and GCB graduates received various research prizes and awards, including many poster prizes, awarded by local and international institutions.

## Publications

The scientific output of the PhD candidates and graduates also demonstrates the extensive research work going on within the framework of the GCB: According to BORIS (Bern Open Repository and Information System), more than 200 papers were published in the course of 2017 in peer-reviewed journals, with GCB candidates and graduates contributing as first authors or co-authors.

A list of GCB publications is available on the BORIS platform (<http://boris.unibe.ch/>) of the University of Bern, and can be called up via «Advanced Search» ⇒ select «Graduate School for Cellular and Biomedical Sciences (GCB)» in the Graduate Schools box of the electronic form.

## MD-PhD Program and MD-PhD Scholarships

The MD-PhD Program is intended for medical graduates who are interested in research in basic sciences, in public health sciences, in clinical sciences, or in biomedical ethics, and who are aiming at pursuing a career combining research and clinical work in an academic setting. A structured training program within the framework of the GCB enables them to acquire a high standard in research methods and project-related theoretical competence. According to the guidelines of the National MD-PhD Program, candidates should already start their training in the course of their medical studies and follow relevant courses concurrently with their medical curriculum (Track I).

The National MD-PhD Program, which is supported by the Swiss National Science Foundation (SNSF), the Swiss Academy of Medical Sciences (SAMW), and several other foundations, awards 9 to 12 scholarships every year to outstanding candidates in Human Medicine, Veterinary Medicine and Dentistry, with residency in Switzerland. For more information, see <https://www.samw.ch/en/Funding/MD-PhD-Program.html> (SAMW) and <http://www.snf.ch/en/funding/careers/md-phd-programme/Pages/default.aspx> (SNSF).

In 2017, two of the prestigious 3-year MD-PhD Scholarships were awarded to MD-PhD candidates of the University of Bern:

- **Ivan Bozic**, research group of Prof. Dr. Antoine Adamantidis, Department of Neurology, Inselspital, Bern University Hospital
- **Kristina Seiler**, research group of Prof. Dr. Mario P. Tschan, Institute of Pathology, University of Bern

The GCB congratulates the two candidates very warmly on their success and wishes them all the very best for their PhD studies.

## Support and Acknowledgments

The GCB is supported by the University of Bern and by the Faculty of Medicine of the University of Bern.

Since its launch in September 2005, the GCB has been offered the generous hospitality of the Theodor Kocher Institute (TKI): The GCB program coordination and administration are located in dedicated rooms of the TKI, and its members are allowed to share the full infrastructure of the institute. Moreover, the GCB Expert Committees, the PhD Committee, and PhD candidates are frequent guests at the TKI Clubroom and TKI labs for meetings, interviews, tutorials, practical courses, exams, and PhD thesis defenses. Our special thanks go to the director, Prof. Dr. Britta Engelhardt, and to the whole team of the TKI, for their continuous support, for making this «joint venture» possible, and for giving the GCB a perfectly suitable «home» and center for many of its activities.

## Information

<http://www.gcb.unibe.ch/>



PD Dr. Marlene Wolf



Gabrielle Favre

April 11, 2018



