

# Annual Report 2018-2019

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

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







Graduate School  
for Cellular and  
Biomedical Sciences



---

<sup>b</sup>  
UNIVERSITÄT  
BERN

# Annual Report 2018-2019

## Office Address

University of Bern  
Graduate School for Cellular and Biomedical Sciences  
Uni Mittelstrasse  
Mittelstrasse 43  
CH-3012 Bern  
Switzerland  
<https://www.gcb.unibe.ch/>

PD Dr. Monica Schaller, Coordinator  
[monica.schaller@gcb.unibe.ch](mailto:monica.schaller@gcb.unibe.ch), Tel. +41 31 631 59 63

Dr. Tullia Padovani, Co-Coordinator  
[tullia.padovani@gcb.unibe.ch](mailto:tullia.padovani@gcb.unibe.ch), Tel +41 31 631 59 62

Gabrielle Favre, Administration (*ad interim, October 2019-March 2020*)  
[gabrielle.favre@gcb.unibe.ch](mailto:gabrielle.favre@gcb.unibe.ch), Tel. +41 31 631 53 77

Brigitte Schutte, Administration  
[brigitte.schutte@gcb.unibe.ch](mailto:brigitte.schutte@gcb.unibe.ch), Tel. +41 31 631 53 77

Cinzia Marti, Administration  
[cinzia.marti@gcb.unibe.ch](mailto:cinzia.marti@gcb.unibe.ch), Tel. +41 31 631 53 77

Deborah Kölliker, Office Assistant  
[deborah.koelliker@gcb.unibe.ch](mailto:deborah.koelliker@gcb.unibe.ch), Tel. +41 31 631 59 61

**swissuniversities**

## Imprint

**Publisher:** Graduate School for Cellular and Biomedical Sciences (GCB), University of Bern

**Layout:** Roland Hirter, Hirtergrafik (front cover), Gabrielle Favre

**Editors:** Gabrielle Favre, Monica Schaller, Marlene Wolf

**Proof-reading:** Kateri Chambers

**Images:** Photos © 2018-2020 GCB (pp. 9, 22, 23, 46); © 2018-2019 SCRM (pp. 19, 20)

**Print:** Copytrend AG Bern, Länggassstrasse 49, 3012 Bern

**Edition:** 130

**Contact:**

University of Bern

Graduate School for Cellular and Biomedical Sciences

Uni Mittelstrasse

Mittelstrasse 43

3012 Bern

Tel. +41 31 631 59 61

info@gcb.unibe.ch

**Website:** <https://www.gcb.unibe.ch/>

© 2020 Graduate School for Cellular and Biomedical Sciences, University of Bern

## Table of Contents

Introduction.....	5
Organization .....	7
GCB Expert Committees.....	9
GCB Organization Chart .....	10
Changes in Committee Memberships in 2018 and 2019.....	11
PhD Program.....	12
Doctoral Candidates.....	14
Courses and Seminars.....	17
Special Courses Organized for GCB Students.....	17
Lectures, Tutorials, and Book Clubs .....	17
Practical Courses, Workshops, Summer Schools.....	18
Transferable Skills Courses .....	18
GCB Seminars.....	19
GCB Students' Meetings .....	19
GCB Symposia.....	21
GCB Symposium 2018.....	21
GCB Symposium 2019.....	22
Graduations in 2018 and 2019 .....	24
GCB Graduates in 2018: Alphabetical Order .....	26
GCB Graduates in 2019: Alphabetical Order .....	36
Prizes and Awards .....	46
GCB Award for Best PhD Thesis 2018 .....	46
GCB Award for Best PhD Thesis 2019 .....	46
Abstract by Mariana Mota Castro Dias .....	47
Additional Prizes and Awards.....	47
Publications .....	48
National MD-PhD Program and MD-PhD Grants.....	48
Support and Acknowledgments .....	49
Information .....	49



## Introduction

The Graduate School for Cellular and Biomedical Sciences (GCB) experienced significant change of staff when its longstanding coordinator PD Dr. Marlene Wolf, approached her well-deserved retirement. Marlene has been head, heart and soul of the GCB from the very beginning and is the very person with which to associate the School's remarkable success. We send her all our thanks and gratitude for establishing the inter-faculty construct, developed from Marlene's vision, determination, drive and tireless dedication. Not only has the GCB succeeded, it continues to thrive and grow. Under Marlene's leadership, the GCB has developed into a major academic "melting pot" helping to produce unique scientific personalities, each with their individual research projects, yet still embodying the academic spirit of the three Faculties of Medicine, Science and Vetsuisse. So thank you again, Marlene and all the best wishes for your next chapter and your "new life"!

As Marlene prepared for retirement from her position as Coordinator of the GCB and Graduate School for Health Sciences (GHS) in early 2019, the transition period was set in motion. The graduate school PhD Executive Committee agreed on two key elements during the planning and preparation process: 1) the new coordinator should be a scientist still actively involved in research; and, 2) the two graduate school coordinators should be located in the same office to facilitate optimizing the coordination between the two schools. This triggered a leadership search for two part-time coordinators. In the summer of 2018, the Executive Board of the University of Bern, together with the Presidents of the GCB and the GHS, appointed PD Dr. Monica Schaller from the Department of Hematology and Central Hematology Laboratory, Inselspital, Bern University Hospital, and Department for BioMedical Research, as Academic and Administrative Coordinator of the GCB (40%). Dr. Tullia Padovani, a cognitive neuroscientist, and a lecturer of the Institute of Psychology at the University of Bern, was appointed as Coordinator of the GHS (30%), and additionally as Co-Coordinator of the GCB (Administration and Finances, 30%). The new coordinators began in their positions at the beginning of 2019, in order to benefit from a comprehensive introduction by PD Dr. Marlene Wolf.

PD Dr. Monica Schaller accepted the challenge to assume the coordinator role together with Dr. Tullia Padovani as co-coordinator and with it the responsibility of leading the GCB, continuing Marlene's work and further building on the solid foundation. This included building a new team. Fortunately, Gabrielle Favre was able to disrupt her retirement and assist with making the transition smoother. I would like to thank the entire GCB team for a nearly seamless "restart". The effort, empathy and excitement put into the work for the graduate students and the School has been and is extraordinary! Chapeau!

It is noteworthy that at the end of 2019, GCB had a total of 511 PhD candidates registered, 53.6% of whom are women. Ninety (90) graduations were celebrated together with 261 publications throughout that year. The distribution of PhDs across faculties (2019) shows an overwhelming majority of the candidates from the Faculty of Medicine (62.2%, 318; 3.3% of whom are MD-PhDs), followed by next cohort, 16.9% (86) from the Vetsuisse Faculty, Bern, then 12.7% (65) from the Faculty of Science, 4.3% (22) in Vetsuisse Faculty, Zurich and the remaining 3.9% (20) from affiliated institutions. Interestingly, the Expert Committees were somewhat more evenly distributed, with Molecular Biology and Biochemistry having the largest percentage of candidates (26%, 129), followed by Cell Biology (22.5%, 113), Biological Systems (21.7%, 104), Biomedical Engineering (16.3%, 92), and Biomedical Sciences (13.5%, 73).

I am personally impressed with the current status of the GCB. Moreover, I am aware that major effort is required to maintain the School's quality at the customary high standards, which is also an important responsibility and commitment on the part of all of the mentors. Thanks to them, the School can continue to contribute in many ways to the endeavor for excellence at Bern University. It gives me great confidence to see the good work ongoing!

Best regards,

A handwritten signature in blue ink, appearing to read 'Frank Stüber'.

Frank Stüber

Professor Dr. Frank Stüber  
GCB President since Jan. 2019

Bern, May 30, 2020



## Organization

The many and significant personnel and operational changes in the leadership and administration of the Graduate School for Cellular and Biomedical Sciences (GCB) led to the decision to postpone the publication of the Annual Report 2018, and to publish a combined Annual Report 2018 and Annual Report 2019. The GCB Annual Report 2018-2019 is presented here, in the usual quality, with its customary statistics, and further details on the graduate school program and PhD candidates for both years in review.

The GCB of the University of Bern is supervised by the **PhD Committee** (executive committee), comprised of members of the Faculty of Medicine, the Faculty of Science, and the Vetsuisse Faculty Bern, and the **Program Coordinator(s)**. Each faculty member acts as President, typically alternating every two years.

**Prof. Dr. Oliver Mühlemann** (Faculty of Science) served as **GCB President** for a second term since August 2017. Challenging new responsibilities, such as becoming a member of the SNSF Research Council, prompted him to simultaneously step down as President and as member of the PhD Committee in September 2018; but the GCB is fortunate to still count him among the members of one of the Expert Committees. In January 2019, **Prof. Dr. Frank Stüber** (Faculty of Medicine) took over as GCB President, also for his second term in office.

Together with members of the three Faculties, **PD Dr. Marlene Wolf**, has been instrumental in initiating and developing the GCB PhD program, and has acted as its dedicated **Coordinator** since the official start of the GCB in September 2005. At the end of January 2019, she retired. Therefore, the transition period began in January 2019, during which the new GCB coordinators assumed their responsibilities, with **PD Dr. Monica Schaller** as Coordinator (Scientific and Administrative), and **Dr. Tullia Padovani** as Co-Coordinator (Staff and Finances). The GCB continues to thrive and prosper under their leadership and with the assistance of the GCB President and the PhD Committee. This is evidenced by an ever-growing number of PhD candidates and a continuously expanding range of courses offered within the framework of the PhD program.

Equally important for the functioning of the GCB is the administrative office, where there have also been significant changes. **Gabrielle Favre**, main secretary of the GCB since its inception in September 2005, retired in April 2018. During her more than 12 years with the GCB, Gabrielle helped build the Graduate School and worked tirelessly for its benefit. With her wholehearted commitment and signature reliability, she helped the PhD candidates, professors, and PI's to find their way through the myriad GCB procedures. Particularly notable, she almost single-handedly organized the annual symposium with over 250 participants.

Gabrielle's successor, Alexandra de Peyer, joined the GCB team in March 2018, and resigned effective end of March 2020. Gabrielle Favre returned to the GCB beginning October 2019 (through end of March 2020) to support the team, bridging the gap between Alexandra's departure and the arrival of her successor. Mid-March 2020, Kateri Chambers joined the GCB administration team. Edith Imthurn, team member since January 2017, left the GCB at the end of May 2019. That vacancy was filled by Cinzia Marti in February 2019, and Brigitte Schutte, April 2019, who between them share tasks for the GCB and the GHS.

In addition to the core team, the GCB is supported by an administrative student assistant («Hilfsassistentin»). Nora Baronian held this position from August 2015 until the end of February 2018. She was replaced by Maude Waleffe, who served as member of the GCB team until December 2019. Deborah Kölliker, Bachelor student in Educational Science, joined the GCB team in November 2019.

The continued commitment from all and guidance of the GCB Presidents and the past and present Coordinators, has made it possible for the GCB to absorb the changes in personnel, while maintaining the operational continuity, and administrative functioning of the GCB, as well as continued management of the PhD program. The new GCB team is highly motivated and confident in ensuring this continues.

In summer 2018, the University of Bern introduced a new database for the administration of doctoral students intended to replace the GCB's internal local database. The novel, web-based database was developed in close cooperation with all faculties and graduate schools to provide a digital tool for the complex administration of doctoral students. This new system interfaces with the University's student database and the Core Teaching System (CTS/KSL). The GCB team handled the labor-intensive challenge of controlling the data migration. Adjustments and improvements are a work-in-process.

Concurrently with the change of coordinators in December 2018, the GCB moved its offices from its long-time home at the Theodor Kocher Institute (TKI) to the new university building «Uni Mittelstrasse», at Mittelstrasse 43 (offices #232 and #234 on 2<sup>nd</sup> floor).

*For more information, please also see p. 49, section «Support and Acknowledgments».*



**Figure 1.** The GCB team at the GCB Symposium 2020 on January 30, 2020, with, from left to right: Coordinator PD Dr. Monica Schaller, Co-Coordinator Dr. Tullia Padovani, Brigitte Schutte (Administration), Cinzia Marti (Administration), and Gabrielle Favre (Administration *ad interim*).

## GCB Expert Committees

Five **Expert Committees** with competencies in

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

are responsible for the admittance, guidance and evaluation of the PhD candidates. Each research project is assigned to one of the GCB Expert Committees, one of its members acting as mentor to the PhD candidate. The supervisor, mentor and student plan the individual training program of the PhD candidate together.

The organization of the GCB is shown in detail on the Organization Chart on the next page.

# GCB Organization Chart

## GCB Organization Chart (as of 15.03.2020)

- 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 at the University of Konstanz, Kreuzlingen



## Changes in Committee Memberships in 2018 and 2019

### PhD Committee

<b>President:</b>	Prof. Dr. Oliver Mühlemann (Sci) Prof. Dr. Frank Stüber (Med)	until September 2018 since January 2019
<b>Members:</b>	Prof. Dr. Oliver Mühlemann (Sci) Prof. Dr. Sebastian Leidel (Sci)	until September 2018 since May 2019

### Expert Committee «Biological Systems»

<b>Joined:</b>	Prof. Dr. Selma Aybek (Med) PD Dr. Andreina Schoeberlein (Med) Prof. Dr. Hildegard Tanner (Med)	November 2019 April 2019 June 2019
<b>Resigned:</b>	Prof. Dr. Andrea De Gottardi (Med) Prof. Dr. Brigitte Frey (Med) Prof. Dr. Ernst Niggli (Med) Prof. Dr. Verena Niggli (Med) Prof. Dr. Jürg Streit (Med) Prof. Dr. Hans Rudolf Widmer (Med)	September 2019 April 2019 January 2019 December 2018 July 2019 June 2019

### Expert Committee «Biomedical Engineering»

<b>Joined:</b>	Prof. Dr. Jürgen Burger (Med)	January 2019
<b>Resigned:</b>	Prof. Dr. Guoyan Zheng (Med)	December 2018

### Expert Committee «Biomedical Sciences»

<b>Resigned:</b>	Prof. Dr. Willy Hofstetter (Med)	March 2019
------------------	----------------------------------	------------

### Expert Committee «Cell Biology»

<b>Joined:</b>	PD Dr. Ren-Wang Peng (Med)	January 2020
----------------	----------------------------	--------------

### Expert Committee «Molecular Biology & Biochemistry»

<b>Joined:</b>	PD Dr. Markus Hilty (Med) Prof. Dr. Sebastian Leidel (Sci) PD Dr. Michaela Medova (Med) Prof. Dr. Paul Torgerson (Vet ZH)	October 2019 January 2019 January 2019 January 2019
<b>Resigned:</b>	Prof. Dr. Adrian Hehl (Vet ZH) Prof. Dr. Isabel Roditi (Sci)	October 2018 December 2018

## 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 the laboratories of the three participating faculties (Faculty of Medicine, Faculty of Science, and Vetsuisse Faculties, Bern and Zurich) or at affiliated institutions. In 2018-2019, these included, among others: the Institute for Research in Biomedicine (IRB) in Bellinzona, the Biotechnology Institute Thurgau (BITg) in Kreuzlingen, the Empa (Swiss Federal Laboratories for Materials Science and Technology, various divisions and sites), Agroscope (various divisions and sites), the Swiss Paraplegic Research in Nottwil, the AO Research Institute in Davos, and the RMS Foundation in Bettlach.

In 2017, the University of Zurich decided that from 2018, candidates holding a degree in Veterinary Medicine and supervised for their PhD at the Vetsuisse Faculty Zurich, would be matriculated and perform their doctorate at the University of Zurich, and would be awarded the title «Dr. sc. med. vet». A joint agreement was signed between the Universities of Bern and Zurich in early 2018, providing these candidates the opportunity to continue to participate in the GCB's doctoral program. During a transition period, those candidates who had joined the PhD program of the GCB before the agreement came into effect, could opt for completing their PhD according to the rules of the GCB. Thus, the first three graduates to receive the title «Dr. sc. med. vet.» from the University of Zurich, completed their studies in 2019 (see section «GCB Graduates in 2019: Alphabetical Order», pp. 36-44).

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/she 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 on the individual, tailor-made training program together with the candidate and the supervisor, 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 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 GCB PhD Program, 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:

- **«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: [https://www.mic.unibe.ch/phd\\_program.php](https://www.mic.unibe.ch/phd_program.php).
- **«Stem Cells and Regenerative Medicine (SCRM)»**, launched in August 2018, is jointly offered by the GCB and the Platform for Stem Cells in Regenerative Medicine (SCRM). The program aims at fostering a new and innovative multidisciplinary approach to unravel the communication network of cells within the tissue and throughout the body during tissue regeneration.  
More information: <http://www.stemcellsbern.ch/wb/pages/mainpage/teaching.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.

The PhD committee requested and obtained an increased budget to support the new GCB leadership (an additional 20% workload for the Coordinator/Co-Coordinator) in 2019. Unfortunately the budget is still not keeping pace with the continued growth of student matriculations. As a result, the GCB leadership faces difficult decisions stemming from budget constraints. Currently, the coordinators are considering the financial and operational impact reducing course offerings and/or levying additional charges per PhD candidate would have on the quality of the program. These decisions are weighed, bearing in mind the GCB team priority is to uphold the quality of the doctoral program, ensuring the excellence of the PhD training.

## Doctoral Candidates

Candidates can apply three times during a calendar year for admission to the GCB. Deadlines fall on the following dates: April 15, August 15, and December 15. **127 new PhD candidates** were admitted to the GCB in 2018, and **140 PhD candidates** were admitted in 2019 (see Tables 1 and 2 below). Thirteen (13) candidates withdrew from the PhD program in 2018, and nine (9) in 2019.

The GCB is currently represented by candidates of 67 different nationalities, of whom hold Master's degrees from 52 different countries.

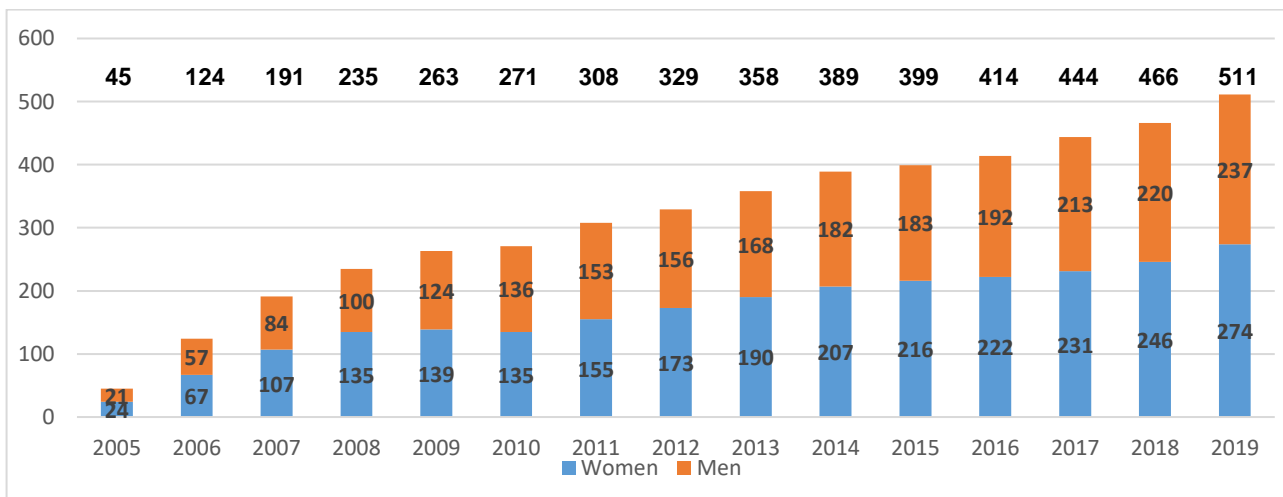
Enrolments 2018	University of Bern	Other Swiss Universities	Foreign Universities	Total	in %
Human Medicine Degree	3	2	4	9	7.1
Veterinary Medicine Degree	3	0	9	12	9.4
Science Degree	36	11	59	106	83.5
<b>Total</b>	<b>42</b>	<b>13</b>	<b>72</b>	<b>127</b>	100.0
<b>in %</b>	33.1	10.2	56.7		100.0

**Table 1.** Enrolments of PhD candidates in 2018, specifying the place of origin of their Master's degrees.

Enrolments 2019	University of Bern	Other Swiss Universities	Foreign Universities	Total	in %
Human Medicine Degree	2	1	9	12	8.6
Veterinary Medicine Degree	1	1	6	8	5.7
Science Degree	38	25	57	120	85.7
<b>Total</b>	<b>41</b>	<b>27</b>	<b>72</b>	<b>140</b>	100.0
<b>in %</b>	29.3	19.3	51.4		100.0

**Table 2.** Enrolments of PhD candidates in 2019, specifying the place of origin of their Master's degrees.

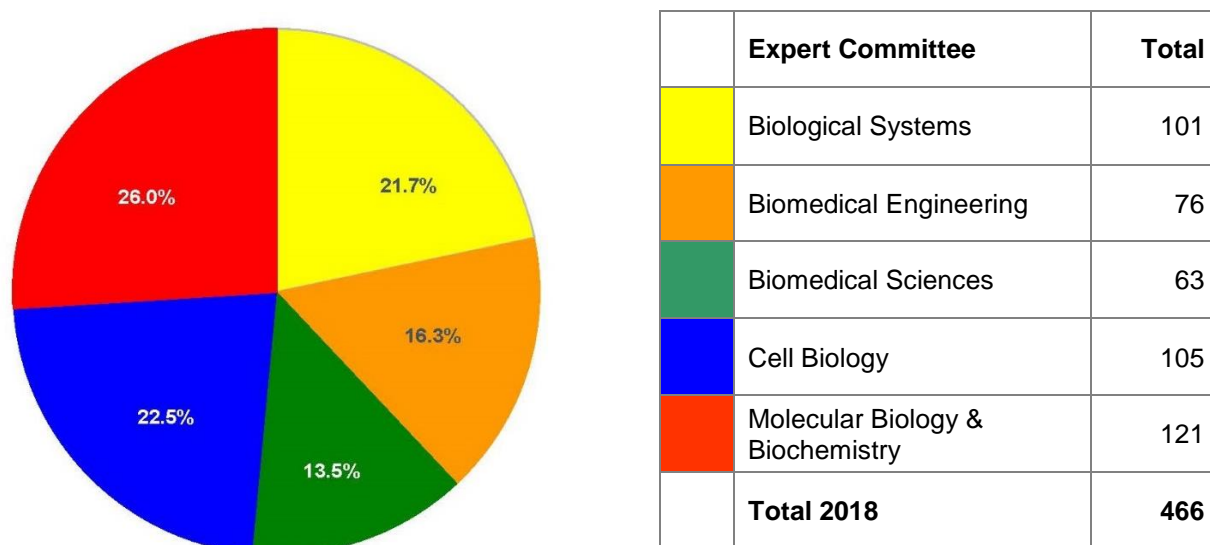
At year-end 2018, **466 candidates** were enrolled in the GCB, of which 52.8% were women. By the end of 2019, student numbers had further increased to **511 candidates** enrolled in the GCB. 281 candidates (55.0%) held degrees from a foreign university, and 53.6% of the doctoral candidates were women (see Figure 2 below for both years).



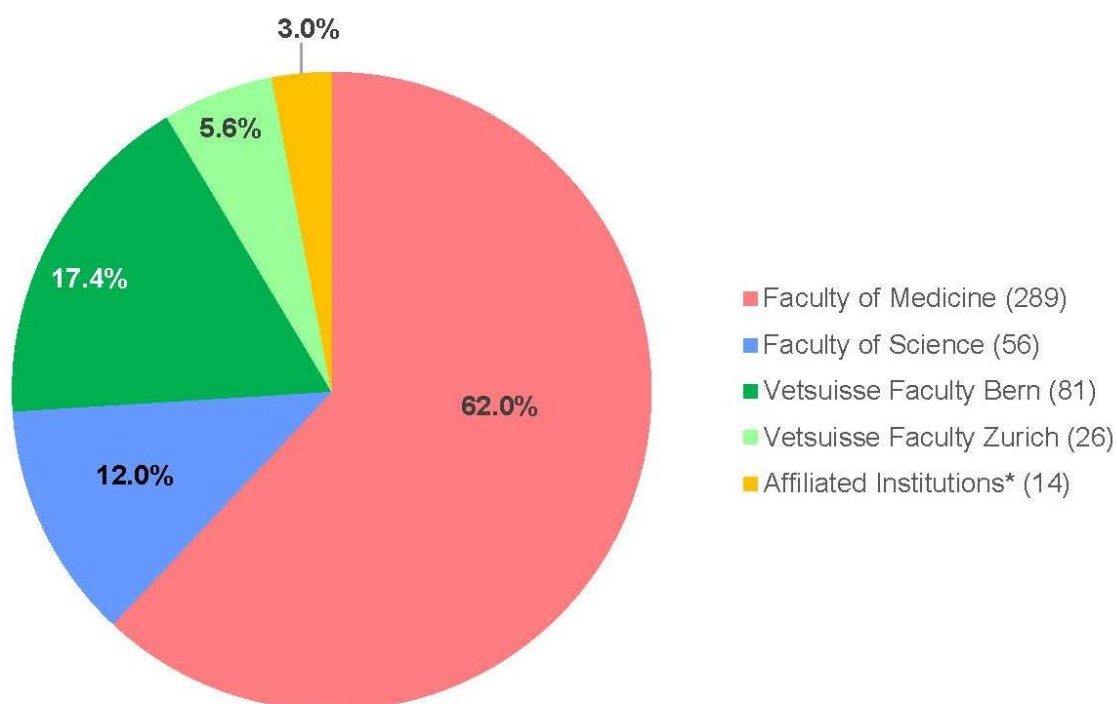
**Figure 2.** Number of PhD candidates 2005-2019.



**Figures 3 to 6 and Tables 3 and 4** highlight the distribution of the doctoral candidates in 2018 and 2019 within the various research fields, i.e., the five GCB Expert Committees, and within the Faculties/Institutions, respectively.

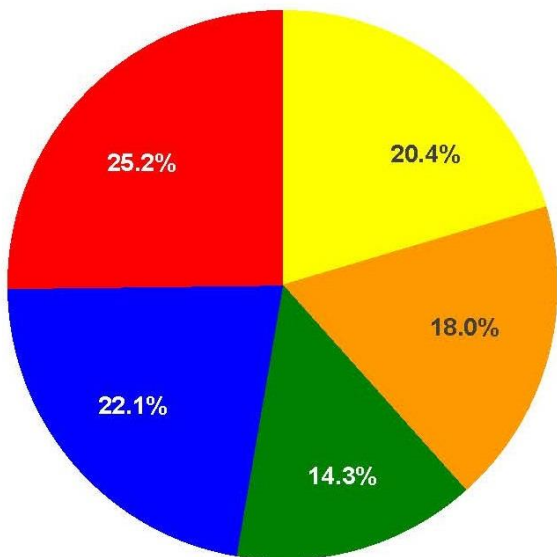


**Figure 3 & Table 3.** Distribution of PhD candidates within the five GCB Expert Committees in 2018. *Left: Percentage. Right: Number of candidates.*



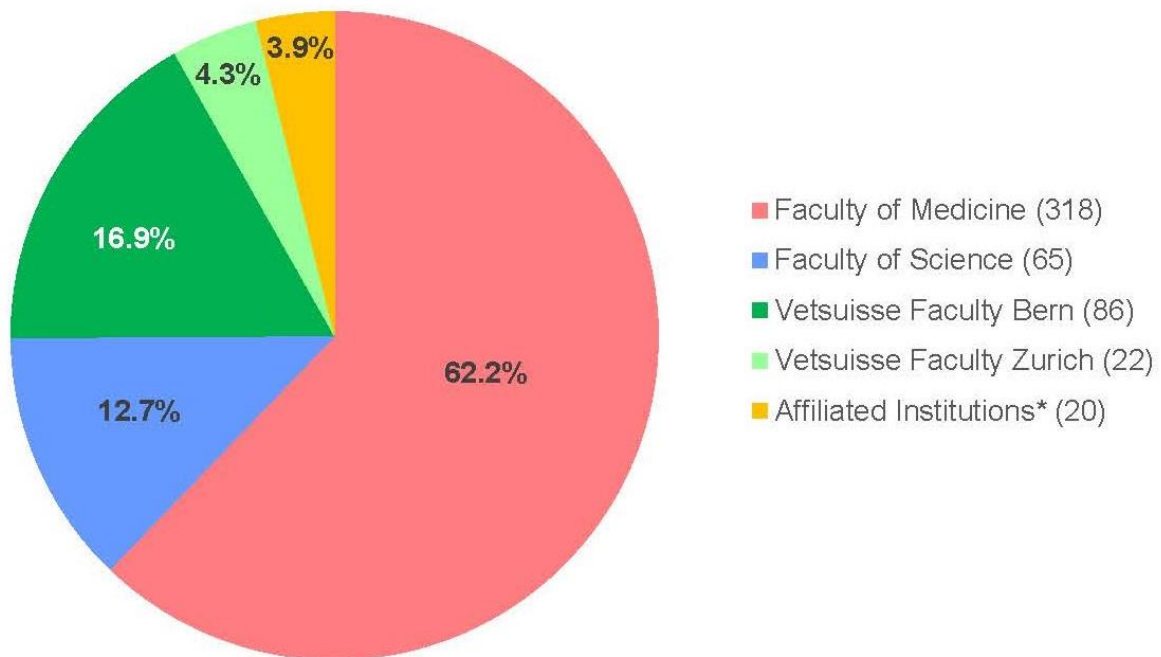
**Figure 4.** Distribution of PhD candidates within the Faculties/Institutions in 2018. *In parentheses: number of candidates; in chart: percentage.*

\*Affiliated Institutions: Institute for Research in Biomedicine IRB, Bellinzona; Biotechnology Institute Thurgau (BITg), Kreuzlingen; Empa (Swiss Federal Laboratories for Materials Science and Technology, various divisions and sites); AO Research Institute, Davos; RMS Foundation, Bettlach; Swiss Paraplegic Centre, Nottwil.



	Expert Committee	W	M	Total
	Biological Systems	64	40	104
	Biomedical Engineering	28	64	92
	Biomedical Sciences	49	24	73
	Cell Biology	63	50	113
	Molecular Biology & Biochemistry	70	59	129
	<b>Total 2019</b>	<b>274</b>	<b>237</b>	<b>511</b>

**Figure 5 & Table 4.** Distribution of PhD candidates across the five GCB Expert Committees in 2019. *Left: Percentage. Right: Number of candidates (W = women, M = men).*



**Figure 6.** Distribution of PhD candidates across the Faculties/Institutions in 2019.

*In parentheses: number of candidates; in chart: percentage.*

\*Affiliated Institutions: Institute for Research in Biomedicine IRB, Bellinzona (6); Biotechnology Institute Thurgau (BITg), Kreuzlingen (4); Empa (Swiss Federal Laboratories for Materials Science and Technology, various divisions and sites) (6); AO Research Institute, Davos (1); RMS Foundation, Bettlach (2); Swiss Paraplegic Centre, Nottwil (1).

## Courses and Seminars

Seminars and courses are individually selected for each candidate from courses organized and supported by the GCB and from the teaching units of the faculties, as well as from courses offered by other Swiss universities. These include, in particular: the ETH Zurich or the EPFL for the field of Biomedical Engineering, the IRB International PhD Program at the Institute for Research in Biomedicine, Bellinzona (USI), or inter-university programs such as the NCCRs «TransCure» and «RNA and Disease», the Doctoral Programs in Microbial Sciences and «StarOmics» (both CUSO), the Forum for Genetic Research (sc | nat, Swiss Academy of Sciences), the «BENEFRI Neuroscience» Program (Universities of Bern and Fribourg), the «Cell Migration» program in Immunosurveillance, Inflammation, Tumorigenesis and Metastasis (Universities of Bern, Fribourg, Geneva, and associated institutes), the Swiss Institute of Bioinformatics (SIB), or the SSPH+ PhD Program in Public Health (Swiss School of Public Health). Some candidates also participate in EU framework programs or 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)
- *Antibiotic-Resistant Bacteria and One Health: From the Plate to the Bedside* (A. Endimiani 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)
- *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 [https://www.ispm.unibe.ch/continuing\\_education/phd\\_programs/courses\\_for\\_phd\\_students/index\\_eng.html](https://www.ispm.unibe.ch/continuing_education/phd_programs/courses_for_phd_students/index_eng.html)
- *Statistical Literature Seminar* (2018, B. Voelkl)
- *How to think as a statistician* (2019, B. Voelkl)

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

- *Cell Migration* (B. Engelhardt & R. Lyck)
- *Vascular Cell Biology* (B. Engelhardt, U. Deutsch, & R. Lyck)
- *Molecular Biological Methods in Clinical Research* (V. Schröder & M. Schaller)
- *Microscopy: Basic and Advanced/Special Modules* (Microscopy Imaging Center MIC), see <https://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)
- *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/mainpage/events/retreat.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 provide PhD candidates the opportunity to invite internationally renowned specialists from their research field for an interactive teaching lecture and a research seminar intended for a broader audience. The graduate school provides administrative and financial support. Regrettably, no GCB seminars were organized by PhD candidates in 2018 or 2019.

*This is indeed a unique opportunity offered by the GCB to PhD candidates, and we encourage our students to take the initiative to organize seminars with distinguished scientists and capitalize on yet another occasion to exchange ideas with experts in their respective fields.*

## GCB Students' Meetings

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

In 2018 and 2019 respectively, the **5<sup>th</sup> and 6<sup>th</sup> «SCRM PhD Student Retreats»** received financial funding from the GCB, as well as from the Platform for Stem Cell Research in Regenerative Medicine (SCRM), and other institutions.

The **«5<sup>th</sup> SCRM PhD Student Retreat»** took place on August 31, 2018, at the «Zentrum Paul Klee» (ZPK) in Bern. The retreat was organized by a committee of four GCB PhD candidates (Felix Baier, Magdalena Brunner, William Hariton, and Rahel May). The program included two sessions of PhD project presentations, two keynote lectures given by Professor Dr. Joerg Huelsken (EPF Lausanne), and Dr. Susan Kirkland (Novartis Pharma), and offered many opportunities for networking and discussions during breaks.



**Figure 7.** The participants of the «5<sup>th</sup> SCRM PhD Student Retreat 2018» at the Paul Klee Zentrum in Bern.



The «6<sup>th</sup> SCRM PhD Student Retreat» took place on August 30, 2019, at the «Gurten-Park im Grünen» on the Gurten mountain in Wabern, near Bern.

Viviana Rubino reports on the 2019 SCRM retreat:

*«PhD students met for their annual retreat in the beautiful location of Gurten Park in Bern on the 30<sup>th</sup> of August 2019. With 15 PhD students presenting and discussing their projects and two valuable mentors accompanying them through the day with insights and advices, the retreat was indeed successful. As per tradition, it represented a great opportunity for networking and expanding our knowledge.*

*PhD students working in a variety of different fields were able to present their projects in a short talk during a morning and an afternoon session. Each presentation was followed by an active discussion involving the other students and the two invited mentors. Coffee breaks, lunch and the closing Apéro were as well opportunities to further discuss and share ideas in a get together and relaxed environment.*

*This year, we were very happy to have **Professor Fiona M. Watt** from the King's College London as our academic mentor, and **Dr. Caroline Blumer Toti** from Miltenyi Biotec as our industry mentor.*

*As in the previous years, the mentors gave two interesting keynote lectures, sharing their career paths and experiences. Their willingness to share their expertise with young researchers, with a special focus on pursuing everybody's objectives and on gender equality, was highly appreciated. We would like to thank them for their commitment and for having been really inspiring for all of us.*

*We believe the retreat has given a great chance to all PhD students to fruitfully discuss about present research and future plans. In a pleasant atmosphere, they have learnt more about benefits and drawbacks of academic research compared to industry and about the opportunities to pursue after the PhD.*

*We express deep gratitude to the Stem Cell Research in Regenerative Medicine Platform and to the GCB for the generous financial support which made possible the retreat to take place. We also thank all the students who have enthusiastically participated and we are looking forward to welcoming interested students to our next retreat, due on the 4<sup>th</sup> of September 2020.»*

*On behalf of the Organizing Committee 2019 (Viviana Rubino, Carla Pernaci, Mahmoud Hallal and Silvan Heeb), Viviana Rubino.*



**Figure 8.** The participants of the «6<sup>th</sup> SCRM PhD Student Retreat 2019» on the Gurten, near Bern.

## GCB Symposia

As part of the doctoral training, the GCB organizes an annual symposium for all PhD candidates and their thesis committees. From the second year of study onwards, doctoral candidates are offered the opportunity to present their research projects in the form of brief lectures (posters - many of them combined with an additional «Poster Flash» presentation), or an electively selected «GCB Slam» presentation. All presentation types are considered to be equal scientific quality and are intended to illustrate the wide range of topics covered by the GCB, as well as to demonstrate the candidates' high level of competence and in-depth knowledge in the fields of cellular and biomedical sciences, epidemiology, and biomedical engineering. The presentations are thematically grouped according to the five competency areas («GCB Expert Committees») to which the research projects belong.

The symposium also offers opportunities for inspiration for GCB candidates, as well as for their supervisors and mentors to engage in mutually rewarding and highly stimulating discussions on the research being conducted at the GCB. Additionally, the symposium facilitates opportunities for active networking among peers and senior researchers.

For an overview of past GCB Symposia, visit the archive on the GCB website: [https://www.gcb.unibe.ch/research/gcb\\_symposium/gcb\\_symposia\\_archive/index\\_eng.html](https://www.gcb.unibe.ch/research/gcb_symposium/gcb_symposia_archive/index_eng.html).

### GCB Symposium 2018

On February 1, 2018, the GCB Symposium 2018 was held once again in the Department of Chemistry and Biochemistry (DCB), and in the Department of Physiology facilities, supported by the efficient and accommodating staff from both The DCB and Department of Physiology. The GCB doctoral candidates each presented their research projects, across **40 short talks**, in two sets of five parallel sessions. Each set was followed by a series of six to eight one-minute «**Poster Flash**» **presentations (75 total)**, a concept newly introduced that year. The Flash presentations were followed by two subsequent poster sessions including **182 posters** altogether.

The afternoon featured several highlights:

- (1) the «GCB Award for Best PhD Thesis 2017» was conferred on **Cristina Leoni**, PhD of Science in Biochemistry and Molecular Biology, Institute for Research in Biomedicine, Bellinzona, for her work entitled «**DNA methylation and hydroxymethylation regulate mast cell proliferation and effector functions**». (For details, see GCB Annual Report 2017, p. 31, or refer to the GCB website at [https://www.gcb.unibe.ch/about\\_us/archive/annual\\_reports/index\\_eng.html](https://www.gcb.unibe.ch/about_us/archive/annual_reports/index_eng.html).),
- (2) the keynote lecture, was delivered by the distinguished guest speaker, Professor Dr. Martin E. Schwab, Brain Research Institute, University of Zürich, and Department of Health Sciences and Technology, ETH Zurich, who gave a captivating talk on «**Neurobiological Mechanisms of Functional Recovery After Spinal Cord Injury or Stroke; the Long Way from the Lab Bench to the Clinic with a Neurite Growth Enhancing Therapy**».
- (3) a successful third «GCB Slam», consistent with the success of the previous two years' Slam sessions. Crazy David was the 2018 Session Master of Ceremonies. Ten PhD candidates participated (the forum required them to explain their research projects to a non-specialist audience in 4-minute "slams"). Prizes were awarded to the three best performances (determined by audience vote) in the competition. The creative and highly

praised prize-winners were **Pascal Näf**, Tumor Immunology, Department. for BioMedical Research, (1st prize, «**Cell Wars**»), **Merve Mutlu**, Institute of Animal Pathology, Vetsuisse Faculty Bern (2<sup>nd</sup> prize, «**Lethally Ever After**»), and **Hélène Clémentine Margareta Baudouin**, Institute of Cell Biology (3<sup>rd</sup> prize, «**Mr Trypli Is Making Biold**»).

The GCB sponsored an apéro riche to round off this eventful GCB Day, allowing participants to celebrate in a relaxing atmosphere, and providing everyone another opportunity for informal and scientific exchange. This was thoroughly enjoyed by the participants.



**Figure 9.** «GCB Slam» prize ceremony on occasion of the GCB Symposium 2018.

## GCB Symposium 2019

The GCB Symposium 2019 took place on January 31, 2019, in the Department of Chemistry and Biochemistry and the Department of Physiology. The PhD candidates presented **40 short talks** in two sets of five parallel sessions, each set followed by a series of eight to nine one-minute «**Poster Flash**» presentations, **82** in all. In the two poster sessions, a total of **206 posters** were displayed, and all participants took advantage of the breaks for further discussions and networking.

According to GCB tradition, the first event in the afternoon was dedicated to the award ceremony of the «**GCB Award for Best PhD Thesis 2018**» (CHF 3.000.–), which was conferred on **Anina Bauer**, PhD in Biomedical Sciences, Institute of Genetics, Vetsuisse Faculty Bern, for her work entitled «**Genetic Analysis of Genodermatoses**». Anina Bauer conducted her research work under the supervision of Professor Dr. Tosso Leeb within the framework of the GCB, and defended her thesis successfully on December 12, 2018. Professor Dr. Tosso Leeb provided a brief summary of Anina Bauer's work on her behalf, as the laureate was traveling abroad, while she joined the audience via videoconference.

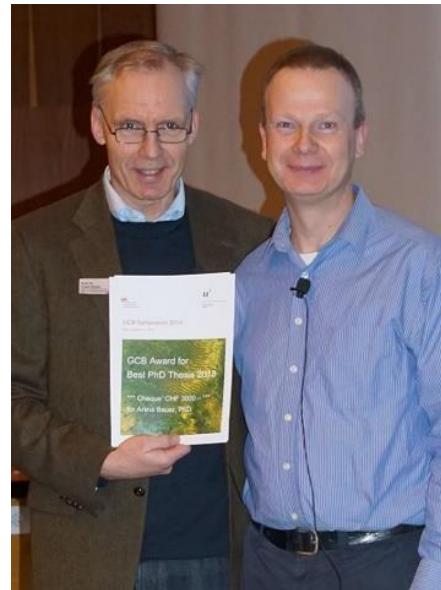
Following the ceremony, was highly acclaimed keynote lecturer, **Professor Dr. Dominique Soldati-Favre**, Department of Microbiology and Molecular Medicine, University of Geneva, who presented «**Prison Break**»—«**Toxoplasma Egress from Infected Cells is a Tightly Programmed Event Controlled by a Lipid Mediator**». Professor Soldati-Favre was succeeded by, **Anna Severin**, from the ISPM and SNSF, who presented «**Predatory Publishing: Shedding light on the deceptive publishing industry**». Both presentations were well-received and were much appreciated by the entire audience. **PD Dr. Marlene Wolf**, the departing Coordinator of the GCB, wrapped up the day's events followed by the



two Coordinators-elect, **PD Dr. Monica Schaller** (Coordinator) and **Dr. Tullia Padovani** (Co-Coordinator), who provided overviews of the past, present, and new developments within the GCB. Finally, Professor Dr. Rupert Bruckmaier gave a farewell address for PD Dr. Marlene Wolf on behalf of the PhD Committee, in which he very warmly thanked her for her wonderful work and contributions to the GCB. This was followed by a standing ovation from the entire audience in recognition of Marlene's exceptional achievements. The day concluded with the customary apéro riche, allowing participants to continue discussions and initiate new conversations in a relaxed and convivial atmosphere.



**Figure 10.** The laureate Anina Bauer skyping from New Zealand.



**Figure 11.** Anina Bauer's supervisor Prof. Dr. Tosso Leeb (right) receiving the GCB Award from GCB President Prof. Dr. Frank Stüber.

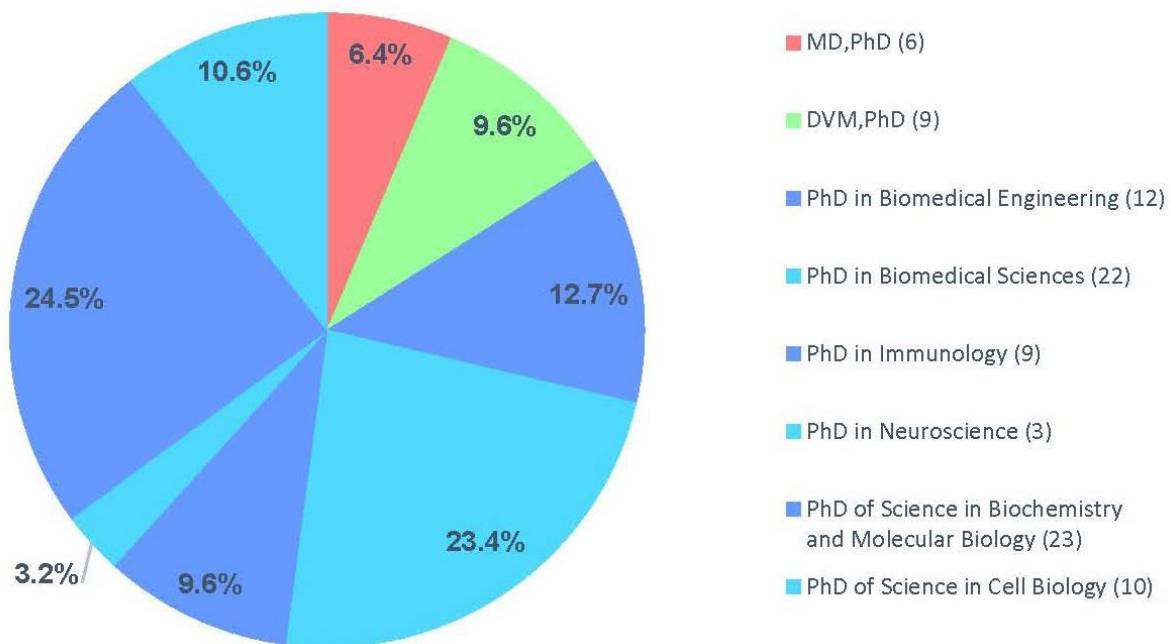
## Graduations in 2018 and 2019

In 2018, **94 candidates** successfully completed the GCB PhD program and obtained their doctoral degree, jointly issued by the Faculty of Medicine, the Faculty of Science, and the Vetsuisse Faculty. Of the graduates, 48 or 51.1% of the candidates held a degree from a foreign university.

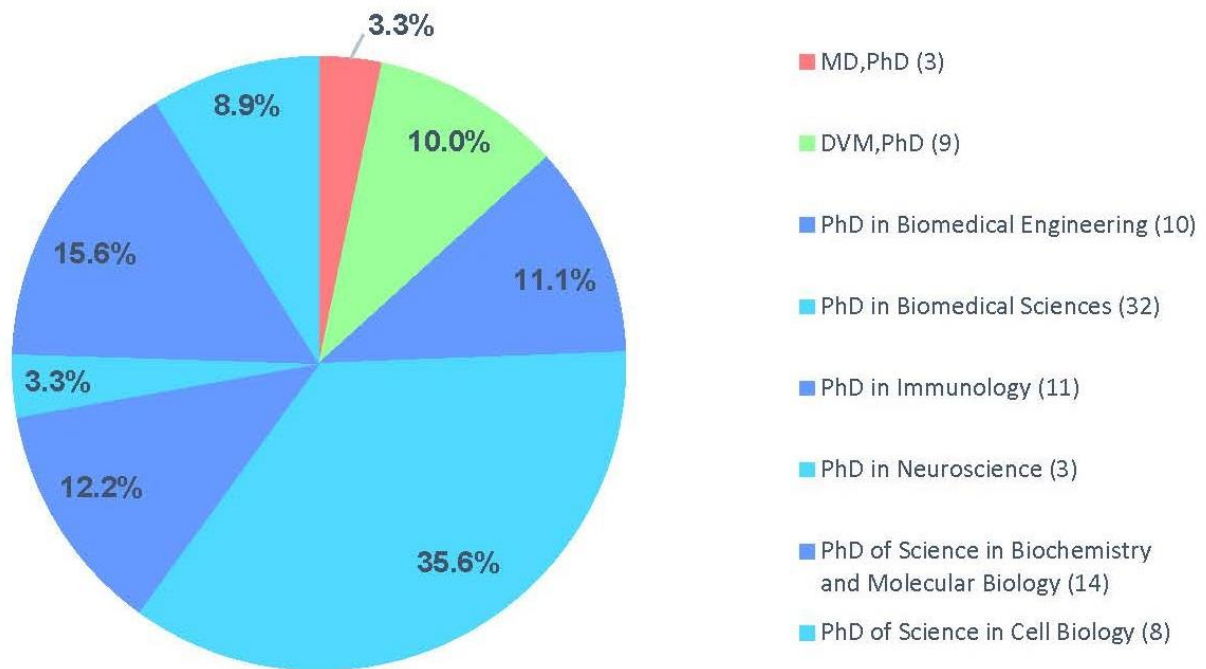
In 2019, **90 candidates** successfully completed the PhD program of the GCB and obtained their doctoral degree, jointly issued by the Faculty of Medicine, the Faculty of Science, and the Vetsuisse Faculty Bern. Three diplomas were issued by the Vetsuisse Faculty Zurich (*for more details, refer to p. 12, section «PhD Program»*). Of the graduates, 43 or 47.8% held a degree from a foreign university.

Since the start of the PhD program in 2005, a total of **850 candidates** have successfully completed their studies and obtained a doctoral degree.

**Figures 12 and 13** (below and next page) show the different types of PhD titles obtained in the years 2018 and 2019.



**Figure 12.** PhD degree types of the 94 graduates of the year 2018. *In parentheses: number of graduates; in chart: percentage.*



**Figure 13.** PhD degree types of the 90 graduates of the year 2019.  
*In parentheses: number of graduates; in chart: percentage.*

## GCB Graduates in 2018: Alphabetical Order

**Lisandra Aguilar Bultet, PhD of Science in Biochemistry and Molecular Biology** (July 4)

Institute of Veterinary Bacteriology, Vetsuisse Faculty Bern (Prof. Dr. Joachim Frey)  
«**Genetic separation of *Listeria monocytogenes* causing central nervous system infections in animals**»

**Aurélie Allemann, PhD in Biomedical Sciences** (March 2)

Institute for Infectious Diseases (PD Dr. Markus Hilty)  
«**The nasopharynx of infants: Epidemiology of pneumococcal serotypes and the investigation of the microbial resistome**»

**Michael Amrein, MD, PhD** (June 22)

Tumor Immunology, Department for BioMedical Research (Prof. Dr. Adrian Ochsenbein)  
«**A functional characterization of TNIK in stem cells and cancer stem cells**»

**Manuel Anderegg, MD, PhD** (May 22)

Nephrology and Hypertension, Department for BioMedical Research (Prof. Dr. Daniel Fuster)

«**Physiological role of the sodium/proton exchanger NHA2 in the kidney**»

**Nick Arndt, PhD of Science in Biochemistry and Molecular Biology** (May 29)

Institute of Biochemistry and Molecular Medicine (Prof. Dr. Michael Altmann)  
«**Properties of the ternary complex formed by yeast eIF4E, p20 and mRNA**»

**Hannah Ayrlé, DVM, PhD** (December 14)

Division of Veterinary Pharmacology & Toxicology, Vetsuisse Faculty Bern  
(Prof. Dr. Meike Mevissen)

«**Medicinal plants—A possible alternative therapy for emerging diseases in calves and piglets**»

**Anina Estrella Bauer, PhD in Biomedical Sciences** (December 12)

Institute of Genetics, Vetsuisse Faculty Bern (Prof. Dr. Tosso Leeb)  
«**Genetic analysis of genodermatoses**»

**Lukas David Bereuter, PhD in Biomedical Engineering** (December 14)

Cardiovascular Engineering, ARTORG Center for Biomedical Engineering Research  
(Dr. Andreas Häberlin, Prof. Dr. Hildegard Tanner)

«**Leadless Cardiac Multisite Pacing**»

**Odette Joëlle Bernasconi, PhD of Science in Biochemistry and Molecular Biology** (November 23)

Institute for Infectious Diseases (Prof. Dr. Andrea Endimiani)  
«**Understanding and Responding to the Polymyxins Crisis while Considering Bacteriophages as New Prospect for a Post-Antibiotic Era**»

**Seraina Martina Beyeler, PhD in Biomedical Sciences** (September 25)

Pulmonary Medicine, Department for BioMedical Research (Prof. Dr. Christophe von Garnier)

«**Immunomodulatory and adverse effects of inhaled multi-walled carbon nanotubes (MWCNT) in chronic obstructive pulmonary disease (COPD): An occupational health hazard?**»

**Beatrice Bianchi, PhD in Biomedical Sciences** (June 15)

Institute of Biochemistry and Molecular Medicine (Prof. Dr. Hugues Abriel)  
«**TRPM4 in cardiovascular and neurological disorders: Physiology, pathophysiology and pharmacology**»

**Oliver Felix Biner, PhD of Science in Biochemistry and Molecular Biology** (June 28)  
Department of Chemistry and Biochemistry (Prof. Dr. Christoph von Ballmoos)  
«**Co-reconstitution of respiratory chain enzymes and characterisation of *Escherichia coli* cytochrome *b*<sub>561</sub>**»

**Andrea Simone Bischofberger, DVM, PhD** (January 23)  
Clinic for Equine Surgery, Equine Department, Vetsuisse Faculty Zurich (Prof. Dr. Patrick Kircher)  
«**Early detection of degeneration of the equine joint cartilage using quantitative MRI techniques**»

**Alberto Bisco, PhD in Neuroscience** (March 16)  
Department of Physiology (Prof. Dr. Thomas Nevian)  
«**Alterations and modulation of single cell and network properties in Anterior Cingulate Cortex in neuropathic pain**»

**Joaquim Blanch i Salvador, PhD in Biomedical Sciences** (September 28)  
Department of Physiology (Prof. Dr. Marcel Egger)  
«**IP<sub>3</sub>-induced Ca<sup>2+</sup> release in ventricular pathophysiology: A novel anti-arrhythmogenic role in a scenario of IP<sub>3</sub>R overexpression**»

**Oliver Blanchard, PhD in Biomedical Sciences** (July 18)  
Institute of Pharmacology (Prof. Dr. Andrea Huwiler)  
«**The Role of Sphingosine-1-Phosphate in Renal Proximal Tubular Epithelial Cell Inflammation and Fibrosis**»

**Sohvi Blatter, DVM, PhD** (January 24)  
Institute of Animal Pathology, Vetsuisse Faculty Bern (Prof. Dr. Sven Rottenberg)  
«**Targeting drug tolerance of residual *Brca1*-mutated mouse mammary tumors**»

**Elias Bühner, MD, PhD** (July 12)  
Tumor Immunology, Department for BioMedical Research (Prof. Dr. Adrian Ochsenbein)  
«**Extrinsic and Intrinsic Regulation of Cancer Stem Cells**»

**Mariana Bustamante Eduardo, PhD of Science in Biochemistry and Molecular Biology** (August 24)  
Molecular Biology, Department for BioMedical Research (Prof. Dr. Rolf Jaggi)  
«**A comparison of molecular signatures for breast cancer and analysis of the role of the progesterone receptor in breast cancer cells**»

**Joana Carlevaro Fita, PhD in Biomedical Sciences** (October 26)  
RNA & Cancer (NCCR RNA & Disease), Department for BioMedical Research (Prof. Dr. Rory Johnson)  
«**Classification and functional prediction of long noncoding RNA**»

**Francesca Coraggio, PhD of Science in Biochemistry and Molecular Biology** (June 27)  
Institute of Cell Biology (Prof. Dr. Peter Meister)  
«**Involvement of epigenetic factors and metabolism in pluripotency maintenance in *C. elegans***»

**Anand David, PhD in Biomedical Sciences** (April 5)  
Department of Physiology (PD Dr. Sonja Kleinlogel)  
«**Evolution of recombinant adeno-associated viral vectors for application in ocular gene therapy**»

**Ladan Dawoody Nejad, PhD of Science in Biochemistry and Molecular Biology**

(January 25)

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

«**Essentiality of lipid biosynthetic pathways in *Trypanosoma brucei***»

**Stefano Andrea De Simone, PhD in Biomedical Sciences** (December 14)

Department of Physiology (Prof. Dr. Stephan Rohr)

«**Optogenetic Approach to Characterize Stromal-Parenchymal Interaction in Cardiac Tissue**»

**Silvia Desy, PhD of Science in Biochemistry and Molecular Biology** (November 15)

Department of Chemistry and Biochemistry (Prof. Dr. André Schneider)

«**Characterization of subunits of the mitochondrial outer membrane translocase of *Trypanosoma brucei***»

**Dzhuliya Vihrenova Dzhonova, PhD in Biomedical Sciences** (May 18)

Cardiovascular Research, Department for BioMedical Research (Prof. Dr. Robert Rieben)

«**Local immunosuppression in Vascularized Composite Allotransplantation using self-assembled hydrogel drug delivery systems**»

**Patric Eichelberger, PhD in Biomedical Engineering** (September 5)

Health Division, Bern University of Applied Sciences (PD Dr. med. Fabian Krause)

«**Foot function assessment by three-dimensional foot kinematics—A straightforward and clinically more feasible approach**»

**Yağmur Farsakoğlu, PhD in Immunology** (January 26)

Institute for Research in Biomedicine, Bellinzona (Dr. Dr. Santiago F. González)

«**Role of Innate Immune Cells in Response to Influenza Vaccination**»

**Xenia Maria Ficht, PhD in Immunology** (January 22)

Theodor Kocher Institute (Prof. Dr. Jens V. Stein)

«**Mechanisms underlying tissue-resident memory T cell surveillance of non-lymphoid tissues**»

**Daniela Angelika Frauchiger, PhD in Biomedical Engineering** (January 12)

Institute for Surgical Technology and Biomechanics (Prof. Dr. Benjamin Gantenbein)

«**Engineered Silk, Reinforced Hydrogel and Progenitor Cell Therapy for Intervertebral Disc Repair**»

**Sabrina Frey, PhD in Biomedical Engineering** (August 7)

Cardiovascular Engineering, ARTORG Center for Biomedical Engineering Research (Prof. Dr. Dominik Obrist)

«**Hemodynamics in peripheral arterio-venous malformations**»

**Nora Merete Gerhards, DVM, PhD** (June 8)

Institute of Animal Pathology, Vetsuisse Faculty Bern (Prof. Dr. Sven Rottenberg)

«**Exploring mechanisms of anti-cancer therapy response using haploid insertional mutagenesis screens**»

**Asimina Gkratsou, PhD of Science in Biochemistry and Molecular Biology** (July 6)

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

«**Molecular implications of NMD-related factors in health and disease**»

**Felix R. M. Graubner, DVM, PhD** (September 12)

Institute of Veterinary Anatomy, Vetsuisse Faculty Zurich (Prof. Dr. Mariusz P. Kowalewski)

«**Endocrine and cellular mechanisms of decidualization in the early pregnant canine uterus: Remodeling processes and role of PGE2**»

**Sandra Gsponer, PhD of Science in Cell Biology** (March 8)  
Rheumatology, Department for BioMedical Research (Dr. med. Stefan Kuchen)  
«**The Immuno-Regulatory Function of Small Nucleolar RNA 104**»

**William Vincent Jacques Hariton, PhD of Science in Cell Biology** (March 7)  
Dermatology, Department for BioMedical Research (Prof. Dr. Eliane J. Müller, Dr. Arnaud Galichet)  
«**Investigation of Molecular Repair Mechanisms Following Disruption of Desmoglein 3 Adhesion in the Hair Follicle Stem Cell Niche**»

**Michel Hauser, PhD in Biomedical Sciences** (June 18)  
Bone Biology and Orthopaedic Research, Department for BioMedical Research (Prof. Dr. Willy Hofstetter)  
«**Bisphosphonate-treatment in osteoporosis—Mechanisms of bone repair**»

**Michael Herren, PhD of Science in Biochemistry and Molecular Biology** (September 14)  
Division of Experimental Clinical Research, DCR-VPH, Vetsuisse Faculty Bern (PD Dr. Philippe Plattet)  
«**The morbillivirus linker domain and its role in the activation of receptor binding induced cell invasion**»

**Echrak Hichri, PhD in Biomedical Engineering** (September 10)  
Department of Physiology (Prof. Dr. Jan Kucera)  
«**Ephaptic coupling in the heart: A myth or a practical reality?**»

**Anneliese Hoffmann, PhD of Science in Biochemistry and Molecular Biology** (January 19)  
Institute of Cell Biology (Prof. Dr. Torsten Ochsenreiter)  
«**Mitochondrial DNA Maintenance: Dynamics and Protein Interactions in *Trypanosoma brucei***»

**Cristina Höhener, PhD of Science in Biochemistry and Molecular Biology** (August 17)  
Institute of Cell Biology (Prof. Dr. Mariusz Nowacki)  
«**Characterization of Dicer-like enzymes in *Paramecium tetraurelia***»

**Sandra Huber, PhD of Science in Cell Biology** (March 27)  
Institute of Animal Pathology, Vetsuisse Faculty Bern (Prof. Dr. Sven Rottenberg, Dr. Kerry Woods)  
«**Protein interactions at the host-parasite interface in *Theileria annulata* infected leukocytes**»

**Maryam Hussain, PhD in Immunology** (December 4)  
Institute of Pathology (Dr. Mario Noti)  
«**Role and regulation of the microbiota and innate immune cells in the pathogenesis of food allergy**»

**Michelle Amanda Jackson, DVM, PhD** (July 12)  
Clinic for Equine Surgery, Equine Department, Vetsuisse Faculty Zurich (Prof. Dr. Anton Fürst)  
«**The use of recombinant human bone morphogenetic protein 2 (rhBMP-2) in horses: in-vitro and in-vivo study of a new treatment of subchondral cystic lesions (SCLs)**»

**Silje Ekroll Jahren, PhD in Biomedical Engineering** (November 30)  
Cardiovascular Engineering, ARTORG Center for Biomedical Engineering Research  
(Prof. Dr. Dominik Obrist)  
«**Impact of aortic root asymmetry and compliance upon performance of aortic valve bioprosthesis**»

**Rahel Kasteler, MD, PhD** (March 28)  
Institute of Social and Preventive Medicine (Prof. Dr. Claudia Kuehni)  
«**Pulmonary health in Swiss childhood cancer survivors: Burden, risk factors and monitoring**»

**Ivonne Köck, PhD of Science in Cell Biology** (April 30)  
Urology, Department for BioMedical Research (Prof. Dr. Katia Monastyrskaya)  
«**TNF- $\alpha$ : Key regulator of bladder remodeling during outlet obstruction-induced lower urinary tract dysfunction**»

**Norbert Krebs, PhD in Neuroscience** (November 6)  
Department of Physiology (Prof. Dr. Thomas Nevian)  
«**Neuropathic Pain Impairs Spike-Timing Dependent Long-Term Depression in Layer 5 Pyramidal Neurons of the Anterior Cingulate Cortex**»

**Olivia Lorello, DVM, PhD** (February 26)  
Equine Clinic, Department of Clinical Veterinary Science, Vetsuisse Faculty Bern  
(Prof. Dr. Vinzenz Gerber)  
«**Cardiovascular and Autonomic Tone Variables in Eventing and Endurance Horses**»

**Carmela Lussi, PhD of Science in Biochemistry and Molecular Biology** (July 5)  
Institute of Virology and Immunology, Vetsuisse Faculty Bern (Prof. Dr. Matthias Schweizer)  
«**Pestiviral E<sup>rns</sup>: A multifaceted glycoprotein ensures innate immunotolerance**»

**Anne-Laure Maigrot, PhD in Biomedical Sciences** (September 10)  
Division of Animal Welfare, VPH Institute, Vetsuisse Faculty Bern (Prof. Dr. Hanno Würbel)  
«**Vocal expression of emotions in Przewalski's horses and wild boars: Encoding and decoding**»

**Ulisses Marti-Mengual, PhD in Neuroscience** (February 15)  
Department of Physiology (Prof. Dr. Thomas Nevian, Prof. Dr. Walter Senn)  
«**Layer 5 Pyramidal Cell of the Frontal Brain: Efficient Dendro-somatic Coupling**»

**Matteo Maria Mauri, MD, PhD** (April 17)  
Institute for Research in Biomedicine, Bellinzona (Prof. Dr. Antonio Lanzavecchia)  
«**Exploring the limits of self tolerance to discover new anti-tumor antibodies**»

**Claire Micossé, PhD in Immunology** (January 18)  
Department of Dermatology, Inselspital, Bern University Hospital (Prof. Dr. Christoph Schlapbach)  
«**IL-4- and TGF- $\beta$ -induced PPAR- $\gamma$  promotes the IL-9-expressing subpopulation of T<sub>H</sub>2 cells**»

**Katharyn Jean Mitchell, DVM, PhD** (July 12)  
Clinic for Equine Medicine, Equine Department, Vetsuisse Faculty Zurich  
(Prof. Dr. Colin C. Schwarzwald)  
«**Exercise-induced arrhythmias and the presence of myocardial N-methyl D-aspartate receptors and their amino acid agonists in the horse**»



**Catherine Mooser, MD, PhD** (November 6)  
Gastroenterology/Mucosal Immunology, Department for BioMedical Research  
(Prof. Dr. Andrew J. Macpherson)  
«**A novel gnotobiotic mouse model as a tool to study dietary effects on the microbiota, the host, and their interplay**»

**Michel Moser, PhD of Science in Cell Biology** (January 26)  
Institute of Plant Sciences (Prof. Dr. Cris Kuhlemeier)  
«**Speciation genomics in *Petunia***»

**Melissa Alexandra Yvonne Oddie, PhD in Biomedical Sciences** (June 21)  
Institute of Bee Health, DCR-VPH, Vetsuisse Faculty Bern (Prof. Dr. Peter Neumann)  
«**Survival of European honey bee (*Apis mellifera*) populations infested with the ectoparasitic mite *Varroa destructor* and associated viruses by means of natural selection**»

**Corinne P. Oechslin, PhD in Biomedical Sciences** (August 31)  
Institute for Infectious Diseases (Prof. Dr. Stephen Leib)  
«**A Straightforward Shotgun Metagenomics Workflow to Detect Bacteria and Viruses in Eukaryotic Samples**»

**Eleonora Orlando, PhD of Science in Biochemistry and Molecular Biology** (June 5)  
Radiation Oncology, Department for BioMedical Research (PD Dr. Yitzhak Zimmer, Prof. Dr. Ruedi Aebersold)  
«**Proteomic and phosphoproteomic investigations for dissecting the interplay between oncogene addiction and DNA damage response signaling**»

**Miguel Palomino Segura, PhD in Immunology** (October 30)  
Institute for Research in Biomedicine, Bellinzona (Dr. Dr. Santiago F. González)  
«**Role of Innate Immunity in the Protection against Influenza Infection**»

**David Pavlicek, PhD in Biomedical Sciences** (April 9)  
Swiss Paraplegic Research, Nottwil (PD Dr. Jivko Stoyanov)  
«**Immunosenescence in Spinal Cord Injured People from the Perspective of Urinary Tract Infections**»

**Nuno Pedrosa de Barros, PhD in Biomedical Engineering** (February 2)  
Department of Diagnostic and Interventional Neuroradiology, Inselspital, Bern University Hospital (PD Dr. Johannes Slotboom)  
«**Improving the Clinical Use of Magnetic Resonance Spectroscopy for the Analysis of Brain Tumours Using Machine Learning and Novel Post-Processing Methods**»

**Michaela Poliaková, PhD of Science in Cell Biology** (November 6)  
Radiation Oncology, Department for BioMedical Research (PD Dr. Michaela Medová, Prof. Dr. Yitzhak Zimmer)  
«**A systems biology approach for characterization of the MET signaling-associated metabolome**»

**Duilio Michele Potenza, PhD in Biomedical Sciences** (September 25)  
Department of Physiology (Prof. Dr. Ernst Niggli)  
«**Modulation of ryanodine receptors in ventricular cardiomyocytes: Role of PKA and CaMKII phosphorylation sites in Ca<sup>2+</sup> signalling**»

**Marine Potez, PhD in Biomedical Sciences** (September 11)  
Institute of Anatomy (Prof. Dr. Valentin Djonov)  
«**Effects of experimental Synchrotron Microbeam Radiation Therapy on mouse melanoma and normal skin**»

**Egle Radice, PhD in Immunology** (May 25)

Institute for Research in Biomedicine, Bellinzona (Prof. Dr. Marcus Thelen)

«**Functional expression of the scavenger ACKR3 on B Lymphocytes of Secondary Lymphoid Organs**»

**Raviprasadh Rajasekaran, PhD of Science in Cell Biology** (December 4)

Hepatology, Department for BioMedical Research (Prof. Dr. Jean-François Dufour)

«**Influence of HINT-2 on Mitochondrial Protein Acetylation: Mechanism and Significance**»

**Christoph Rathgeb, PhD in Biomedical Engineering** (September 26)

Hearing Research Laboratory, ARTORG Center for Biomedical Engineering Research (Dr. Wilhelm Wimmer)

«**Computer-Assisted Personalized Cochlear Implantation**»

**Stefan Reber, PhD of Science in Biochemistry and Molecular Biology** (July 20)

Department of Chemistry and Biochemistry (Prof. Dr. Oliver Mühlemann, Dr. Marc-David Ruepp)

«**Towards Understanding of Selective Motor Neuron Death in Fused in Sarcoma-associated Amyotrophic Lateral Sclerosis**»

**Matthias Andreas Rölli, PhD of Science in Biochemistry and Molecular Biology** (February 2)

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

«**Assessment of Therapies for the Fight Against Aggressive Thyroid Cancer and ATC in a Mouse Model**»

**Martina Rothenbühler, PhD in Biomedical Sciences** (January 11)

Clinical Trials Unit (CTU Bern) (Prof. Dr. Peter Jüni, PD Dr. Dik Heg.)

«**Advanced statistical methods in cardiovascular research**»

**Christina Barbara Rufener, PhD in Biomedical Sciences** (December 7)

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

«**Keel Bone Fractures in Laying Hens: Effects on Individual Productivity and Mobility**»

**Iwona Rzeszutek, PhD of Science in Biochemistry and Molecular Biology**

(August 23)

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

«**Investigating the function of germline-specific proteins: Spo11, Msh4-1 and Msh5 during genome reorganization process in *Paramecium tetraurelia* and beyond**»

**Cilly Bernardette Schnider, PhD of Science in Cell Biology** (March 15)

Institute of Cell Biology, University of Bern, and Faculty of Medicine and Health Sciences, Macquarie University, Sydney, Australia (Prof. Dr. Volker Heussler, Bern, and Prof. Dr. Roger Chung, Sydney—cotutelle)

«**Parasite-host interactions during the blood and liver stage of rodent malaria parasites**»

**Lars Marius Schwalbe, PhD in Biomedical Engineering** (January 19)

Image-Guided Therapy, ARTORG Center for Biomedical Engineering Research (Prof. Dr. Stefan Weber)

«**Vascular Image Guidance to Aid Endovascular Treatments**»

**Riccardo Sfriso, PhD in Biomedical Sciences** (November 27)  
Cardiovascular Research, Department for BioMedical Research (Prof. Dr. Robert Rieben)  
«**Endothelial Cell Protection in Xenotransplantation and Ischemia/Reperfusion Injury: Assessing the Effect of Multiple Transgenes and the Pathophysiological Role of the Plasma Cascade Systems**»

**Janja Širovnik Koščica, DVM, PhD** (February 1)  
Division of Animal Welfare, VPH Institute, Vetsuisse Faculty Bern (Prof. Dr. Hanno Würbel)  
«**Optimizing feeder positioning and feeder space for laying hens in loose housing systems**»

**Marcel Sorribas Olivera, PhD in Immunology** (December 14)  
Gastroenterology/Mucosal Immunology, Department for BioMedical Research (Prof. Dr. Reiner Wiest)  
«**Intestinal mucus and vascular barrier in liver cirrhosis: Entry site for bacterial translocation independent from portal hypertension and lymphatic route**»

**Marc André Stadelmann, PhD in Biomedical Engineering** (June 22)  
Institute for Surgical Technology and Biomechanics (Prof. Dr. Philippe Zysset)  
«**Finite element modeling of the human spine: Applications on metastatic vertebral bodies and intervertebral discs**»

**Flavian Thelen, PhD in Immunology** (March 28)  
Theodor Kocher Institute (Prof. Dr. Jens V. Stein)  
«**Tissue resident memory T cell surveillance of exocrine gland is guided by three dimensional macrophage scaffold**»

**Justin A. Varholick, PhD in Biomedical Sciences** (December 4)  
Division of Animal Welfare, VPH Institute, Vetsuisse Faculty Bern (Prof. Dr. Hanno Würbel)  
«**Effects of the organization and stability of social dominance relationships on phenotypic outcomes in laboratory mice**»

**Sara Vidal López, PhD of Science in Biochemistry and Molecular Biology** (January 26)  
Institute of Veterinary Bacteriology, Vetsuisse Faculty Bern (Prof. Dr. Vincent Perreten, Dr. Sabrina Rodríguez Campos)  
«**Broad-spectrum analyses of bovine abortion: Deciphering neglected agents**»

**Sara Vimercati, PhD of Science in Biochemistry and Molecular Biology** (December 6)  
Division of Veterinary Pharmacology & Toxicology, DCR-VPH, Vetsuisse Faculty Bern (Prof. Dr. Meike Mevissen)  
«**Characterization of Equine CYP3A94, CYP3A95 and CYP3A97 Isoenzymes**»

**Philip V'kovski, PhD of Science in Biochemistry and Molecular Biology** (June 13)  
Institute of Virology and Immunology, Vetsuisse Faculty Bern (Prof. Dr. Volker Thiel)  
«**The coronavirus replication complex and its microenvironment**»

**Ioannis Vogiatzis Oikonomidis, PhD in Biomedical Engineering** (September 13)  
Institute of Anatomy (Prof. Dr. Johannes C. Schittny)  
«**Synchrotron X-ray tomographic microscopy and analysis of the rat pulmonary acinus at the micrometer scale—A close look deep into the acinar dynamics and development**»

**Rahel Wacker, PhD of Science in Cell Biology** (April 26)

Institute of Cell Biology (Prof. Dr. Volker Heussler)

«**The Host Cell Cytosolic Immune Response During the *Plasmodium berghei* Liver Stage Follows a Noncanonical Autophagy Pathway**»

**Lei Wang, PhD of Science in Biochemistry and Molecular Biology** (August 24)

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

«**A novel assay to measure phospholipid scrambling and the discovery of a new scramblase**»

**Limei Wang, PhD in Biomedical Sciences** (July 20)

Thoracic Surgery, Department for BioMedical Research (Prof. Dr. Ralph A. Schmid, Dr. Sean R. R. Hall)

«**Distinct mesenchymal and epithelial lineages in human lung and diverse settings of lung diseases**»

**Marie-Hélène Christin Wasmer, PhD in Immunology** (December 7)

Institute of Pathology (PD Dr. Philippe Krebs)

«**The role of IL-33/ST2 signaling in tumorigenesis and immunopathology**»

**Simon L. Wüest, PhD in Biomedical Engineering** (June 4)

Institute of Medical Engineering IMT, Lucerne School of Engineering and Architecture, Lucerne University of Applied Sciences and Arts (Prof. Dr. Benjamin Gantenbein)

«**Cartilage Tissue Engineering and Electrophysiological Recordings on Microgravity Platforms**»

**Leander Nicolas Wyss, PhD of Science in Biochemistry and Molecular Biology**

(September 3)

Department of Chemistry and Biochemistry (Prof. Dr. Norbert Polacek)

«**Ribosome associated non-coding RNAs in the archaeon *Haloferax volcanii***»

**Tural Yarahmadov, PhD of Science in Biochemistry and Molecular Biology**

(December 20)

Institute of Plant Sciences (Prof. Dr. Cris Kuhlemeier)

«**A workflow for discovery of candidate speciation genes in non-model species**»

**Stefan Patrick Zahnd, PhD in Biomedical Sciences** (August 20)

Institute of Pathology (Prof. Dr. Inti Zlobec)

«**A Digital Pathology based Shotgun-Proteomics Approach to Biomarker Discovery in Colorectal Cancer**»

Tables 5 and 6 shows the distribution of the graduations in 2018 within the five GCB Expert Committees, and within the Faculties/Institutions, respectively.

Degree 2018	Biological Systems	Biomedical Engineering	Biomedical Sciences	Cell Biology	Molecular Biology & Biochemistry	Total
MD,PhD	1	0	1	4	0	6
DVM,PhD	2	0	6	0	1	9
PhD in Biomedical Engineering	1	8	3	0	0	12
PhD in Biomedical Sciences	9	0	6	2	5	22
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	1	0	21	23
PhD of Science in Cell Biology	1	0	0	4	5	10
<b>Total</b>	<b>18</b>	<b>8</b>	<b>17</b>	<b>19</b>	<b>32</b>	<b>94</b>
<b>Total in %</b>	<b>19.2</b>	<b>8.5</b>	<b>18.1</b>	<b>20.2</b>	<b>34.0</b>	<b>100.0</b>

Table 5. Graduations in 2018, according to GCB Expert Committees.

Degree 2018	Faculty of Medicine	Faculty of Science	Vetsuisse Faculty BE	Vetsuisse Faculty ZH	IRB Bellinzona	Total
MD,PhD	5	0	0	0	1	6
DVM,PhD	0	0	5	4	0	9
PhD in Biomedical Engineering	12	0	0	0	0	12
PhD in Biomedical Sciences	17	0	5	0	0	22
PhD in Immunology	6	0	0	0	3	9
PhD in Neuroscience	3	0	0	0	0	3
PhD of Science in Biochemistry & Molecular Biology	7	10	6	0	0	23
PhD of Science in Cell Biology	6	3	1	0	0	10
<b>Total</b>	<b>56</b>	<b>13</b>	<b>17</b>	<b>4</b>	<b>4</b>	<b>94</b>
<b>Total in %</b>	<b>59.6</b>	<b>13.8</b>	<b>18.0</b>	<b>4.3</b>	<b>4.3</b>	<b>100.0</b>

Table 6. Graduations in 2018, according to Faculties/Institutions.

## GCB Graduates in 2019: Alphabetical Order

### **Rafet Ameti, PhD Immunology** (July 8)

Institute for Research in Biomedicine, Bellinzona (Prof. Dr. Marcus Thelen)

«**Role of ACKR3 in leukocyte migration and the microarchitecture of mouse spleen**»

### **Giuditta Annibaldis, PhD of Science in Biochemistry and Molecular Biology**

(June 18)

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

«**Making sense of nonsense: Mechanistic insights into aberrant translation termination and nonsense-mediated decay (NMD)**»

### **Stefanos Apostolopoulos, PhD in Biomedical Engineering** (January 17)

Ophthalmic Technology Laboratory, ARTORG Center for Biomedical Engineering Research (Prof. Dr. Raphael Sznitman)

«**Reliable Registration and Tracking Framework for Disease Progression Monitoring Using Optical Coherence Tomography**»

### **Felix Alexander Baier, PhD in Biomedical Sciences** (June 14)

Visceral and Transplantation Surgery, Department for BioMedical Research (Prof. Dr. Deborah Stroka)

«**Tight Junctions of the Liver: Expression, Regulation and Function in Native, Regenerating and Cholestatic Livers**»

### **Pierre Balmer, PhD of Science in Cell Biology** (March 28)

Department of Clinical Veterinary Science, Vetsuisse Faculty Bern (Prof. Dr. Eliane J. Müller, Prof. Dr. Petra Roosje)

«**Unravel molecular and cellular functions of *SUV39H2* and *FAM83G* in skin homeostasis**»

### **Hélène Clémentine Margareta Baudouin, PhD of Science in Biochemistry and Molecular Biology** (September 12)

Institute of Cell Biology (Prof. Dr. Torsten Ochsenreiter)

«**Biochemical approaches to identify and characterize proteins involved in kDNA maintenance in *Trypanosoma brucei***»

### **Barna E. M. Becsek, PhD in Biomedical Engineering** (August 21)

Cardiovascular Engineering, ARTORG Center for Biomedical Engineering Research (Prof. Dr. Dominik Obrist)

«**High-Performance Computing Numerical Fluid-Structure Interaction Framework for the Simulation of Aortic Valve Hemodynamics**»

### **Aniela Bittner, DVM, PhD** (December 18)

Division of Veterinary Pharmacology & Toxicology, Vetsuisse Faculty Bern (Prof. Dr. Meike Mevissen)

«**Do nanoparticles used in laser tissue soldering interfere with endothelial cells and the blood-brain barrier?**»

### **Céline Louise Boujon, DVM, PhD** (June 24)

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

«**Characterization of mammalian astroviruses and development of molecular tools for their study**»

### **Magdalena Anna Theresa Brunner, DVM, PhD** (April 3)

Institute of Animal Pathology, Vetsuisse Faculty Bern (Prof. Dr. Monika Maria Welle)

«**Molecular pathways affecting hair follicle cycling and differentiation in canine alopecic disorders**»

**Andrea Buccarello, PhD in Biomedical Sciences** (December 16)  
Department of Physiology (Prof. Dr. Jan P. Kucera)  
«**How does mechanical deformation affect action potential propagation in cardiac tissue?**»

**Romina Silvia Cabra, PhD in Biomedical Sciences** (December 12)  
Bone Biology & Orthopaedic Research, Department for BioMedical Research  
(Prof. Dr. Willy Hofstetter)  
«**The Roles of Iron in Osteoclast and Osteoblast Lineage Cells**»

**Sabrina Casella, PhD of Science in Cell Biology** (August 27)  
Institute for Research in Biomedicine, Bellinzona (Prof. Dr. Marcus Thelen)  
«**The biochemistry of ACKR3 and its role in diffuse large B cell lymphoma**»

**Simone Cazzaniga, PhD in Biomedical Sciences** (November 13)  
Department of Dermatology, Inselspital, Bern University Hospital (Prof. Dr. Dagmar Simon)  
«**Semantic Connectivity Maps: A novel approach for the exploration of health care databases**»

**Farouk Chrif, PhD in Biomedical Engineering** (June 6)  
Gerontechnology and Rehabilitation, ARTORG Center for Biomedical Engineering Research (Prof. Dr. Tobias Nef)  
«**Technological development and usability evaluation of a novel interactive training robot for children with neuromuscular impairments**»

**Stergios Christodoulidis, PhD in Biomedical Engineering** (March 7)  
AI in Health and Nutrition, ARTORG Center for Biomedical Engineering Research (Prof. Dr. Stavroula Mougiakakou)  
«**Lung Pattern Analysis Using Artificial Intelligence for the Diagnosis Support of Interstitial Lung Diseases**»

**Federica Maria Conedera, PhD in Neuroscience** (November 20)  
Ophthalmology, Department for BioMedical Research (Prof. Dr. Volker Enzmann, Dr. med. Markus Tschopp)  
«**Glial involvement in retinal degeneration and regeneration in zebrafish and mouse**»

**Dimitrios Damopoulos, PhD in Biomedical Engineering** (February 1)  
Institute for Surgical Technology and Biomechanics (Prof. Dr. Guoyan Zheng)  
«**Machine Learning-based Medical Image Computing for the Skeletal System: Detection, Segmentation and Disease Diagnosis**»

**Momota Rani Debi, PhD in Biomedical Sciences** (June 4)  
Institute of Animal Nutrition, Vetsuisse Faculty Zurich (Prof. Dr. Annette Liesegang)  
«**Improving the nutritive value of some agro industrial by-products (wheat bran and rice bran) through anaerobic fermentation using rumen liquor to use as poultry feed**»

**Ntoya Dolores Dina Manuel, PhD in Immunology** (April 16)  
Department of Rheumatology, Immunology and Allergology, Inselspital, Bern University Hospital (Dr. Daniel Yerly, Prof. Dr. Martin Bachmann)  
«**Metamizole-Induced Neutropenia: Investigations of the adaptive immune system involvement**»

**André Döring, PhD in Biomedical Sciences** (September 17)

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

«**Methods of Diffusion-Weighted MR Spectroscopy as a Probe for Brain-Tissue-Microstructure**»

**Michel Ernest Jean-Pierre Dosch, PhD in Immunology** (July 2)

Visceral and Transplantation Surgery, Department for BioMedical Research (Prof. Dr. Guido Beldi)

«**ATP release mechanisms modulating inflammatory responses**»

**Dorota Magdalena Dudka, PhD in Biomedical Sciences** (February 26)

Radiation Oncology, Department for BioMedical Research (PD Dr. Kathrin Zaugg, PD Dr. Michaela Medová)

«**Unravelling the molecular response to dose-rate and delivery time of ionising radiation in 2D vs 3D cell culture**»

**Stefan Emming, PhD in Immunology** (April 3)

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

«**Mechanisms of regulation of human T cell activation and GM-CSF production**»

**Paul Engeroff, PhD in Immunology** (February 20)

Department of Rheumatology, Immunology and Allergology, Inselspital, Bern University Hospital (PD Dr. Monique Vogel, Prof. Dr. Martin Bachmann)

«**On the interaction of IgE with its two receptors FcεRI and CD23**»

**Silvia Talitha Erni, PhD in Biomedical Sciences** (November 22)

Institute for Infectious Diseases (Prof. Dr. Stephen Leib, PD Dr. Marta Roccio)

«**Novel Drug-Based Approaches to Treat Pneumococcal Meningitis-Induced Hearing Loss**»

**Francesca Florini, PhD of Science in Biochemistry and Molecular Biology** (March 29)

Institute of Cell Biology (Prof. Dr. Isabel Roditi)

«**Functional analysis of the retrotransposon hotspot (RHS) family in *Trypanosoma brucei***»

**Živa Frangež, PhD in Biomedical Sciences** (December 16)

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

«**Expression and function of autophagy-regulating proteins in primary and metastatic melanomas**»

**Olivier Friedli, PhD in Immunology** (March 28)

Institute of Pathology (PD Dr. Stefan Freigang)

«**Impact of mitochondrial uncoupling protein 2 on the generation and functionality of distinct T lymphocyte subsets**»

**Jacobo Gavini, PhD in Biomedical Sciences** (April 26)

Visceral and Transplantation Surgery, Department for BioMedical Research (PD Dr. Vanessa Banz)

«**Lysosomal compartment dysregulation as a treatment strategy for hepatocellular carcinoma**»

**Stephan Moreno Gerber, PhD in Biomedical Engineering** (June 20)

Gerontechnology and Rehabilitation, ARTORG Center for Biomedical Engineering Research (Prof. Dr. Tobias Nef)

«**Development and Evaluation of a Virtual Reality Setup for Cognitive Stimulation in Critically Ill Patients**»



**Yulia Gonskikh, PhD of Science in Biochemistry and Molecular Biology** (June 24)  
Department of Chemistry and Biochemistry (Prof. Dr. Norbert Polacek)  
«**Modulation of translation by ribosome-associated non coding RNAs in mammalian cells**»

**Stefanie Rebecca Graeter, PhD in Biomedical Sciences** (October 1)  
Institute of Pharmacology (Prof. Dr. Stephan von Gunten)  
«**Death-inducing properties of intravenous immunoglobulin (IVIg) in neutrophil populations during severe inflammatory conditions**»

**Katharina Elisabeth Grafinger, PhD of Science in Biochemistry and Molecular Biology** (February 22)  
Institute of Forensic Medicine (Prof. Dr. Wolfgang Weinmann)  
«**New Psychoactive Substances—Studies on their metabolism and cytotoxicity**»

**Simon Habegger, PhD in Biomedical Engineering** (January 10)  
Department of Diagnostic and Interventional Neuroradiology, Inselspital, Bern University Hospital (Prof. Dr. Roland Wiest)  
«**Quantitative Measures for Stroke Recovery and Outcome**»

**Mohsin Hassan, PhD in Biomedical Sciences** (September 13)  
Hepatology, Department for Biomedical Research (Prof. Dr. Andrea De Gottardi)  
«**Role of Intestinal Microbiota and Paneth Cells in the Development of Liver Fibrosis and Portal Hypertension**»

**Stephan Walter Hirschi, PhD of Science in Biochemistry and Molecular Biology** (June 25)  
Institute of Biochemistry and Molecular Medicine (Prof. Dr. Dimitrios Fotiadis)  
«**Characterization and engineering of protein components for the assembly of biomolecular nanoreactors**»

**Manh Tin Ho, PhD of Science in Cell Biology** (December 17)  
Institute of Cell Biology (Prof. Dr. Beat Suter)  
«**Phenylalanyl-tRNA synthetase, a non-canonical function in regulating tissue homeostasis**»

**Elmar Carlos Hulliger, PhD in Biomedical Engineering** (April 3)  
Department of Physiology (PD Dr. Sonja Kleinlogel)  
«**Design and evaluation of synthetic promoters for ON-bipolar cell-targeted optogenetic gene therapies**»

**Barbara Doris Jakobs, PhD of Science in Cell Biology** (December 3)  
Biotechnology Institute Thurgau (BITg), Kreuzlingen (Prof. Dr. Daniel F. Legler)  
«**Engineering of Nanobodies for the Human Chemokine Receptor CCR7**»

**Ariane Félice Janser, PhD in Biomedical Sciences** (August 30)  
Institute of Pathology (Prof. Dr. Rupert Langer, Prof. Dr. Mario P. Tschan)  
«**The role of macro- and chaperone mediated autophagy in therapeutic response and resistance formation to HER2 targeted treatment**»

**Christoph Josi, PhD of Science in Biochemistry and Molecular Biology** (January 18)  
Institute of Veterinary Bacteriology, Vetsuisse Faculty Bern (PD Dr. Paola Pilo)  
«**Cellular and Molecular Interactions of *Mycoplasma bovis* with Bovine Epithelial Cells**»

**Sampada Kallol, PhD in Biomedical Sciences** (July 30)  
Institute of Biochemistry and Molecular Medicine (Prof. Dr. Christiane Albrecht)  
«**Role of the placenta in materno-fetal nutrient transport and steroid release**»

**Jonas Paul Koch, PhD of Science in Biochemistry and Molecular Biology** (March 26)  
Radiation Oncology, Department for BioMedical Research (PD Dr. Michaela Medová)  
«**Characterization of a novel putative ATM/ATR/DNA-PK phosphorylation site on the MET receptor tyrosine kinase**»

**Michel Christoph Koch, DVM, PhD** (October 28)  
Division of Experimental Clinical Research, DCR-VPH, Vetsuisse Faculty Bern  
(Prof. Dr. Torsten Seuberlich)  
«**Virus discovery in animals using Next-Generation Sequencing**»

**Insa Korten, MD, PhD** (February 22)  
Division of Respiratory Medicine, Department of Paediatrics, Inselspital, Bern University  
Children's Hospital (Prof. Dr. Philipp Latzin)  
«**The microbiota, viruses and lung function in the first year of life in infants with  
cystic fibrosis and healthy controls**»

**Caroline Claire Krüger, PhD in Immunology** (April 3)  
Rheumatology, Immunology Research, Department for BioMedical Research  
(Prof. Dr. Martin Bachmann)  
«**Memory B and secondary plasma cell generation against virus-like particles**»

**Şerife Seda Kucur, PhD in Biomedical Engineering** (September 20)  
Ophthalmic Technology Laboratory, ARTORG Center for Biomedical Engineering  
Research (Prof. Dr. Raphael Sznitman)  
«**Exploration and Exploitation of Visual Fields: From Acquisition to Prediction of  
Glaucoma**»

**Andrés Arturo Lanzós Camaioni, PhD in Biomedical Sciences** (November 5)  
RNA & Cancer (NCCR RNA & Disease), Department for BioMedical Research  
(Prof. Dr. Rory Johnson)  
«**Bioinformatic analysis of cancer driver long non-coding RNAs**»

**Till Dominic Lerch, MD, PhD** (November 13)  
Department of Orthopaedic Surgery and Traumatology, Inselspital, Bern University  
Hospital (Prof. Dr. Moritz Tannast)  
«**Torsional deformities of the hip as a new entity of femoroacetabular impingement  
and hip osteoarthritis—From virtual simulation to improved patient outcome**»

**Nicole Liechti, PhD of Science in Biochemistry and Molecular Biology** (September 4)  
Interfaculty Bioinformatics Unit, Department of Biology (Dr. Rémy Bruggmann)  
«**Next Generation Sequencing applied to the human pathogenic amoeba *Naegleria  
fowleri* and its closest relative *N. lovaniensis***»

**Alexandra Julie Malbon, Dr. sc. med. vet.** (February 4)  
Institute of Veterinary Pathology, Vetsuisse Faculty Zurich (Prof. Dr. Anja Kipar)  
«***In Situ* Dissection of the Virus-Cell and Cell-Cell Interplay in Granulomatous  
Lesions in Feline Infectious Peritonitis**»

**Luca Marchetti, PhD in Immunology** (December 10)  
Theodor Kocher Institute (Prof. Dr. Britta Engelhardt)  
«**Combining live cell imaging and RNA-seq analysis to unveil cellular and molecular  
mechanisms directing T-cell migration across the blood-brain barrier**»

**Rahel Deborah May, PhD in Biomedical Sciences** (September 11)  
Institute for Surgical Technology and Biomechanics (Prof. Dr. Benjamin Gantenbein)  
«**At the Interphase of Bone, Cartilage and the Intervertebral Disc: BMPs and BMP  
Antagonists and their Relevance for Improved Spinal Fusion**»

**Patricia Meyer, PhD in Biomedical Sciences** (August 30)  
Institute for Infectious Diseases (Prof. Dr. Stephen Leib)  
«**Strategies for regenerative therapies following prolonged cardiac arrest: *In vivo* and *ex vivo* studies**»

**Axel Alexandre Meyrat, PhD of Science in Biochemistry and Molecular Biology**  
(June 17)

Department of Chemistry and Biochemistry (Prof. Dr. Christoph von Ballmoos)  
«**Investigations on the ATP synthase proton motive force**»

**Mariana Mota Castro Dias, PhD in Neuroscience** (October 18)  
Theodor Kocher Institute (Prof. Dr. Britta Engelhardt)  
«**The role of brain-barrier tight junctions in neuroinflammation**»

**Michael Müller, PhD in Biomedical Engineering** (December 17)  
Department of Diagnostic and Interventional Neuroradiology, Inselspital, Bern University Hospital (PD Dr. Christian Rummel)  
«**Quantitative Analysis of Intracranial EEG and Post-surgical Seizure Control in Epilepsy Patients**»

**Lukas Kilian Muri, PhD in Biomedical Sciences** (June 7)  
Institute for Infectious Diseases (Prof. Dr. Stephen Leib)  
«**Novel Therapeutic Approaches to Improve the Outcome of Paediatric Pneumococcal Meningitis: Single and Combined Adjuvant Therapies**»

**Fauzy Negiub Ali Nasher, PhD of Science in Cell Biology** (February 1)  
Institute for Infectious Diseases (PD Dr. Lucy J. Hathaway)  
«**Specific peptide recognition by *Streptococcus pneumoniae* to detect and respond to other bacterial species of the nasopharyngeal microbiota**»

**Livia Niklaus, PhD of Science in Cell Biology** (February 11)  
Institute of Cell Biology (Prof. Dr. Volker Heussler)  
«**Host cell autophagic and lysosomal defence mechanisms against the *Plasmodium* liver stage and parasite evasion mechanisms**»

**Marta Nowak, Dr. sc. med. vet.** (July 4)  
Institute of Veterinary Anatomy, Vetsuisse Faculty Zurich (Prof. Dr. Mariusz P. Kowalewski)  
«**Maintenance and termination of canine pregnancy: Spatio-temporal expression of the utero-placental relaxin system and initiation of the parturition luteolytic cascade**»

**Sylvia Nyilas, MD, PhD** (March 28)  
Division of Respiratory Medicine, Department of Pediatrics, Inselspital, Bern University Children's Hospital (Prof. Dr. Philipp Latzin)  
«**Comparison of different approaches to analyse lung diseases with imaging and functional methods**»

**Camille Madeleine Carmen Raoult, PhD in Biomedical Sciences** (May 15)  
Division of Animal Welfare, VPH Institute, Vetsuisse Faculty Bern (Prof. Dr. Hanno Würbel)  
«**Effect of mood on cognitive judgement and attention biases in animals**»

**Henning Richter, Dr. sc. med. vet.** (June 11)  
Diagnostic Imaging Research Unit (DIRU), Clinic for Diagnostic Imaging, Vetsuisse Faculty Zurich (Prof. Dr. Patrick Kircher)  
«**MRI for use in clinical research with animal models**»

**Maurane V. J. Riesen, PhD in Biomedical Sciences** (January 29)  
Institute of Social and Preventive Medicine (PD Dr. Christian L. Althaus, Prof. Dr. Nicola Low)

«**Human papillomavirus vaccination in Switzerland: Uptake heterogeneity, impact and costs**»

**Elisa Simone Roesti, PhD in Immunology** (July 1)  
Rheumatology, Immunology Research, Department for BioMedical Research (Prof. Dr. Martin Bachmann)

«**New therapeutic approaches against Type 2 Diabetes mellitus using Virus-Like Particles**»

**Lionel Rohner, PhD in Immunology** (June 21)  
Department of Clinical Chemistry, Inselspital, Bern University Hospital (PD Dr. Michaela Fux)

«**Influence of the Activation Status of Human Basophils on Apoptosis**»

**Selina Moara Roth, PhD in Biomedical Sciences** (April 29)  
Radiation Oncology, Department for BioMedical Research (PD Dr. Michaela Medová, Prof. Dr. Yitzhak Zimmer)

«**Radiosensitization strategies in head and neck squamous cell carcinomas: Emphasis on DNA-PK inhibition and TPX2 targeting**»

**Andrea Alejandra Salm, PhD in Biomedical Sciences** (December 10)  
Institute of Biochemistry and Molecular Medicine (Prof. Dr. Jürg Gertsch)

«**Ethnomedical concepts about Chagas disease in Bolivia and bioprospecting for antitrypanosomal agents**»

**Marcos Sande-Melón, PhD in Biomedical Sciences** (August 16)  
Institute of Anatomy (Prof. Dr. Nadia Mercader Huber)

«**Cardiac regeneration in the zebrafish: Cardiomyocytes progenitors**»

**Thomas Schick, PhD of Science in Biochemistry and Molecular Biology** (October 18)  
Department of Chemistry and Biochemistry (Prof. Dr. Christoph von Ballmoos)

«**Incorporation of membrane proteins into giant unilamellar vesicles: Towards complex cell mimetic systems**»

**Lukas Schneider, PhD of Science in Biochemistry and Molecular Biology** (June 28)  
Department of Chemistry and Biochemistry (Prof. Dr. Norbert Polacek)

«**rancRNAs in yeast: The multifaceted role as translation regulators**»

**Vaishnavi Shankar, PhD of Science in Biochemistry and Molecular Biology** (April 12)  
Department of Chemistry and Biochemistry (Prof. Dr. Norbert Polacek)

«**The role of eukaryotic-specific rRNA expansion segments in protein synthesis**»

**Sebastian Shaw, PhD of Science in Cell Biology** (May 17)  
Institute of Cell Biology (Prof. Dr. Isabel Roditi)

«**Unbiased and targeted approaches to unravel social motility and its role in trypanosomes**»

**Inga K. E. Siebke, PhD in Biomedical Sciences** (November 28)  
Department of Physical Anthropology, Institute of Forensic Medicine (PD Dr. Sandra Lösch)

«**In life and death—Osteological and biochemical analyses of Neolithic human remains from Switzerland**»

**Paulina Agnieszka Stokłosa, PhD of Science in Cell Biology** (December 4)  
Institute of Biochemistry and Molecular Medicine (Prof. Dr. Christine Peinelt)

«**The role of TRPM4 ion channel in colorectal cancer**»

**Gierin Florence Thomi, PhD in Biomedical Sciences** (May 15)  
Prenatal Medicine, Department for BioMedical Research, and Department of Obstetrics and Gynecology, Inselspital, Bern University Hospital (Prof. Dr. Daniel Surbek, PD Dr. Andreina Schoeberlein)

**«Exosomes from Wharton's jelly mesenchymal stromal cells as a treatment for preterm brain injury»**

**Carolyn Mary Trepp, PhD in Neuroscience** (January 28)  
Ophthalmology, Department for BioMedical Research (Prof. Dr. Volker Enzmann)  
**«Novel insights into disease mechanisms and suitability of different stem cell sources for cell replacement in retinal degeneration»**

**Lukas Jeremiah Troxler, PhD in Biomedical Sciences** (September 19)  
Institute for Infectious Diseases (PD Dr. Markus Hilty)  
**«Nuclear Magnetic Resonance (NMR) Spectroscopy Methods for Analysis of *Streptococcus pneumoniae* Polysaccharide Capsule Composition and Metabolism»**

**Bettina Salome Trüeb, PhD in Biomedical Sciences** (March 14)  
Institute of Veterinary Bacteriology, Vetsuisse Faculty Bern (Prof. Dr. Peter Kuhnert)  
**«Host-pathogen interaction and underlying genetics of porcine mycoplasmas»**

**Sarah Helena Vermij, PhD in Biomedical Sciences** (August 30)  
Institute of Biochemistry and Molecular Medicine (Prof. Dr. Hugues Abriel)  
**«Characterizing Nav1.5 expression, organization, and electrical behavior in cardiomyocyte domains»**

**Nathalie Jane Vielle, PhD in Biomedical Sciences** (June 21)  
Institute of Virology and Immunology, Vetsuisse Faculty Bern (Dr. Marco Alves, Prof. Dr. Artur Summerfield)  
**«Aspects of cellular tropism and antiviral response during flavivirus infection»**

**Núria Vizcaíno Revés, DVM, PhD** (November 18)  
Small Animal Clinic, Department of Veterinary Clinical Medicine, Vetsuisse Faculty Bern (Prof. Dr. Franck Forterre)  
**«Polarization of macrophages in epidural inflammation induced by canine intervertebral disc herniation»**

**Katrin Voelter, DVM, PhD** (January 21)  
Division of Veterinary Ophthalmology, Equine Department, Vetsuisse Faculty Zurich, (Prof. Dr. Simon Pot)  
**«Investigation of the ocular permeability, intraocular fibrinolytic capacity and toxicity of Desmoteplase compared to tissue plasminogen activator»**

**Karl-Leonhard von Meyenn, PhD in Immunology** (September 13)  
Dermatology, Department for Biomedical Research (Prof. Dr. Christoph Schlapbach)  
**«PPAR $\gamma$  modulates IL-9 expression in T<sub>H</sub>2 cells by regulating glucose metabolism»**

**Zizun Wang, PhD in Biomedical Sciences** (August 26)  
Institute of Biochemistry and Molecular Medicine (Prof. Dr. Hugues Abriel, PD Dr. Jean-Sébastien Rougier)  
**«Nav1.5 in cardiac disorders: Expression, function, and subcellular localization with *in vitro* cell models»**

**Elena Wernicke von Siebenthal, PhD in Biomedical Sciences** (March 8)  
Centre for Fish and Wildlife Health, Vetsuisse Faculty Bern (Prof. Dr. Helmut Segner)  
**«It is all about priorities: Interactions between the reproductive system and the immune system in rainbow trout (*Oncorhynchus mykiss*)»**

**Jessica Willi, PhD of Science in Biochemistry and Molecular Biology** (August 27)  
Department of Chemistry and Biochemistry (Prof. Dr. Norbert Polacek)  
«**Rusty Ribosomes: How oxidation affects ribosomal RNA and translation**»

**Rahel Kathrin Wyss, PhD in Biomedical Sciences** (November 29)  
Cardiovascular Surgery, Department for BioMedical Research, and Department of  
Cardiovascular Surgery, Inselspital, Bern University Hospital (PD Dr. Sarah L. Longnus,  
Prof. Dr. Hendrik Tevæearai Stahel)  
«**Mitochondria-based Approaches to Facilitate Donation after Circulatory Death  
Heart Transplantation**»

**Tables 7 and 8** show the distribution of the graduations in 2019 within the five GCB Expert Committees, and within the Faculties/Institutions, respectively.

Degree 2019	Biological Systems	Biomedical Engineering	Biomedical Sciences	Cell Biology	Molecular Biology & Biochemistry	Total
MD,PhD	0	2	1	0	0	3
DVM,PhD	3	1	0	1	4	9
PhD in Biomedical Engineering	1	9	0	0	0	10
PhD in Biomedical Sciences	12	1	8	7	4	32
PhD in Immunology	1	0	0	10	0	11
PhD in Neuroscience	3	0	0	0	0	3
PhD of Science in Biochemistry & Molecular Biology	0	0	0	0	14	14
PhD of Science in Cell Biology	0	0	0	4	4	8
<b>Total</b>	<b>20</b>	<b>13</b>	<b>9</b>	<b>22</b>	<b>26</b>	<b>90</b>
<b>Total in %</b>	<b>22.2</b>	<b>14.4</b>	<b>10.0</b>	<b>24.5</b>	<b>28.9</b>	<b>100.0</b>

**Table 7.** Graduations in 2019, according to GCB Expert Committees.

Degree 2019	Faculty of Medicine	Faculty of Science	Vetsuisse Faculty BE	Vetsuisse Faculty ZH	IRB Bellinzona/BITg*	Total
MD,PhD	3	0	0	0	0	3
DVM,PhD	0	0	5	4	0	9
PhD in Biomedical Engineering	10	0	0	0	0	10
PhD in Biomedical Sciences	27	0	4	1	0	32
PhD in Immunology	9	0	0	0	2	11
PhD in Neuroscience	3	0	0	0	0	3
PhD of Science in Biochemistry & Molecular Biology	3	10	1	0	0	14
PhD of Science in Cell Biology	2	3	1	0	2	8
<b>Total</b>	<b>57</b>	<b>13</b>	<b>11</b>	<b>5</b>	<b>4</b>	<b>90</b>
<b>Total in %</b>	<b>63.4</b>	<b>14.4</b>	<b>12.2</b>	<b>5.6</b>	<b>4.4</b>	<b>100.0</b>

**Table 8.** Graduations in 2019, according to Faculties/Institutions.

\*Institute for Research in Biomedicine (IRB), Bellinzona: 2 PhD in Immunology and 1 PhD of Science in Cell Biology; Biotechnology Institute Thurgau (BITg), Kreuzlingen: 1 PhD of Science in Cell Biology.

The GCB congratulates all 2018 and 2019 graduates on their achievement and wish them all the very best for their future careers. Congratulations, as well to all of you who have already moved on to new, challenging postdoctoral positions at universities all over the world or started on an equally exciting, non-academic career.



## Prizes and Awards

### GCB Award for Best PhD Thesis 2018

*For details on the GCB Award for Best PhD Thesis 2018, please refer to p. 22, section «GCB Symposium 2019».*

### GCB Award for Best PhD Thesis 2019

The GCB congratulates **Mariana Mota Castro Dias, PhD in Neuroscience**, on winning the «**GCB Award for Best PhD Thesis 2019**». Mariana Castro Dias received the GCB Award (CHF 3.000.–) on January 30, 2020, during the GCB Symposium 2020, for her work entitled «**The role of the brain-barrier tight junctions in neuroinflammation**». Mariana performed her research work under the supervision of Professor Dr. Britta Engelhardt at the Theodor Kocher Institute (TKI), within the GCB PhD Program, and defended her PhD thesis successfully on October 18, 2019.

Mariana is currently pursuing her career as Scientific Communicator at Roche Diagnostics in Rotkreuz, Switzerland.



**Figure 14.** The laureate Mariana Castro Dias, PhD, receiving the GCB Award for Best PhD Thesis 2019 from Professor Dr. Frank Stüber, President of the GCB.



**Figure 15.** The laureate Mariana Castro Dias, PhD, together with her supervisor, Professor Dr. Britta Engelhardt.

## Abstract by Mariana Mota Castro Dias

The homeostasis of the central nervous system (CNS) is ensured by the blood-brain barrier (BBB), which strictly controls the passage of molecules, solutes and immune cells from the bloodstream into the CNS parenchyma. Paracellular diffusion of molecules across the BBB is ensured by complex and continuous tight junctions (TJs) between brain microvascular endothelial cells. However, during neurological disorders, such as in multiple sclerosis (MS), immune cell infiltration into the CNS and BBB breakdown associated with alterations in TJs are described.

In addition to claudin-5, expression of claudin-3 and claudin-12 has been described in TJs of brain endothelial cells and, despite being suggested to be involved in regulating BBB TJ integrity, the precise role of claudin-3 and claudin-12 have remained unknown. Thus, this prompted us to study the role of claudin-3 and claudin-12 in the regulation of BBB TJ integrity in health and in inflammation, by establishing claudin-3 knockout and claudin-12-lacZ knock in C57BL/6J mice. Surprisingly, RNA sequencing and direct comparative qRT-PCR analysis of brain microvascular samples from WT and claudin-3<sup>-/-</sup> mice showed beyond doubt that brain endothelial cells do not express claudin-3 mRNA. On the other hand, our study confirmed expression and junctional localization of claudin-3 at the blood-cerebrospinal-fluid barrier (BCSFB) of the choroid plexus, but its absence did not impair BCSFB properties during health and neuroinflammation. Making use of our reporter claudin-12<sup>lacZ/+</sup> C57BL/6J mouse we observed that claudin-12 expression is not limited to blood vessels, but it is mainly expressed by CNS parenchymal cells. Moreover, claudin-12<sup>lacZ/lacZ</sup> C57BL/6J mouse, which lacked claudin-12, displayed an intact BBB and thus we conclude that claudin-12 is not essential in establishing or maintaining BBB TJs integrity.

Besides BBB TJ alterations in the context of autoimmune neuroinflammation, autoaggressive T cells cross the BBB and enter the CNS parenchyma, which can occur paracellular, through the endothelial junctions, or transcellular, via a pore through the endothelial cell body. However, the precise mechanisms underlying paracellular versus transcellular CD4<sup>+</sup>T<sub>EM</sub> cell diapedesis across the BBB remain unknown. By combining serial block face scanning electron scanning microscopy (SBF-SEM) with *in vitro* live cell imaging, we analyzed, in a 3D ultrastructural level, the interactions between CD4<sup>+</sup>T<sub>EM</sub> cell and mouse brain microvascular endothelial cells that favor paracellular versus transcellular diapedesis under physiological flow. Here, we describe that junctional modifications by targeting protein components of paracellular junctions in BBB endothelial cells reduced paracellular T cell diapedesis while favoring transcellular diapedesis under low inflammatory conditions, with no effects on barrier integrity.

Taken together, our studies suggest that claudin-5 is the only critical TJ claudin known to date that contributes to the mouse BBB function. Moreover, we argue that the BBB endothelium and specifically its junctional complexes act as an active player in the regulation of the extravasation of T-cells across the BBB, during immunosurveillance and in inflammatory conditions.

## Additional Prizes and Awards

We are very pleased to report that throughout 2018 and 2019, many GCB candidates and GCB graduates received various research prizes and awards, including numerous poster prizes, awarded by local and international institutions.

## Publications

The scientific output of the PhD candidates and graduates also demonstrates the extensive research work being conducted within the framework of the GCB. According to BORIS (Bern Open Repository and Information System, accessed on March 29, 2020), GCB candidates and graduates contributed as first authors or co-authors to **278 papers** in 2018, and **257 papers** in 2019.

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

## National MD-PhD Program and MD-PhD Grants

The National MD-PhD Program is intended for young medical graduates who are interested in research in natural sciences, public health sciences, clinical sciences, or biomedical ethics, and who are aiming to pursue a career combining research and clinical work in an academic setting. A structured training program within the framework of the GCB enables these graduates 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 during 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 private foundations, awards a limited number of competitive individual grants every year in Human Medicine, Veterinary Medicine and Dentistry to outstanding candidates, 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 2019, one of the prestigious 3-year MD-PhD Grants was awarded to an MD-PhD candidate of the University of Bern:

- **Ranjana Gigi-Briner**, research group of Professor Dr. Nicola Low, Institute of Social and Preventive Medicine

The GCB congratulates Ranjana Gigi-Briner very warmly on her success and wishes her all the very best for the pursuit and completion of her 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, and until its relocation to the «Uni Mittelstrasse» at the end of 2018 (see p. 8), the GCB has benefitted from the generous hospitality of the Theodor Kocher Institute (TKI). The GCB program coordination and administration were located in dedicated rooms of the TKI, and the GCB members were allowed to share and use the entire infrastructure of the institute. Moreover, the GCB Expert Committees, the PhD Committee, and PhD candidates were frequent guests at the TKI Clubroom and TKI labs for meetings, interviews, tutorials, practical courses, exams, and PhD thesis defenses.

The GCB leadership would like to take the opportunity here to express its deep gratitude to the TKI director, Professor Dr. Britta Engelhardt, as well as to the entire TKI team, for their continuous support during the thirteen years of partnership, and for offering the GCB a «home» and center for many of its activities. Special thank you and recognition go to the human resources division of the TKI Administration Office, to Ursula Zingg and Marianne Schori, for their enduring support and commitment to the GCB.

Finally, the GCB coordinators would like to thank the GCB administration team for their support, dedication and tenacity throughout the leadership, technological, and staff changes.

## Information

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



