

Annual Report GCB 2022

Faculty of Medicine
Faculty of Science
Faculties of Veterinary Medicine (Vetsuisse Faculty)

Figure 3:

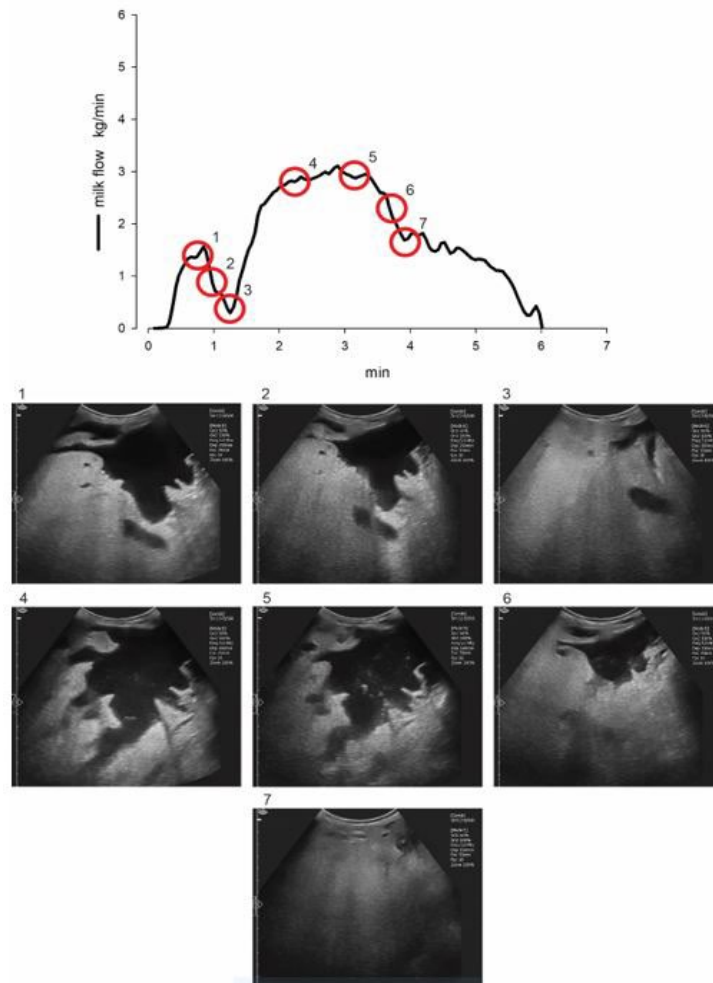


Figure 3. Milk flow curve and corresponding ultrasound images of the cistern of one front quarter of one representative cow. Tuor, Marion, Wellnitz, Olga and Bruckmaier, Rupert M. (2023). The interplay of continuous milk ejection and milking system with and without prestimulation at different vacuum settings. *Journal of Dairy Science* Vol. 106 No. 5, May 2023.

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1. Introduction

Letter from the President

Dear colleagues

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The year 2022 was another successful year for the Graduate School for Cellular and Biomedical Sciences (GCB). The following pages of the annual report will inform you about the most important details of activities of the GCB in 2022. We were able to welcome 127 new applicants, and during the same period celebrated 107 graduations. Again, as in the previous years, the number of registered PhD students grew slightly over the prior year to a total of 549 students enrolled in 2022. This not only translates into an increasing workload for the coordinator and administrative staff, but as well for the PhD committee and the various expert committees and all the colleagues serving as mentors, often for more than a few students in parallel. The excellent collaboration at all levels within the GCB was the key for the optimal support for our students and their supervisors. Still in 2022 several students dealt with project delays and experienced further impacts of the Covid 19 pandemic fallout from 2020 - 2021. GCB leadership was able to find fair solutions for the affected students so they could finalize their projects and graduate with their PhD. We are grateful to the administration of the University of Bern, and to the three faculties (Medicine, Science and Vetsuisse) for tremendous commitment and support for the GCB. With their help we could solve most problems related to the increasing workload. We are proud to be able to have sponsored 78 financial aid packages, allowing our PhD students to attend national and international conferences and present their research to peers in their respective fields to get valuable scientific input while networking. Overall, in 2022, the scientific output resulted in 247 peer reviewed publications. We were fortunate to be able to hire ILUB trained eCoaches to support our staff in creating the new ILIAS eLearning platform with instructional videos and tools intended to increase transparency and improve communication (e.g., GCB processes, news, etc.). This will certainly allow us to focus on pursuing the vision and mission of the GCB. Particularly we will concentrate on raising the recognition and visibility of the GCB to attract highly motivated students, build networks and connections, and to serve as a conduit to agencies and organizations relevant to all students: prospective, current, or recently graduated. I invite you to get to know more about the GCB activities in 2022 by reading the following pages. We are very much looking forward to again holding the GCB Symposium in person (after two years of virtual symposia) on Thursday, June 29, at the University of Bern VonRoll buildings (Fabrikstrasse 6 & 8) and look forward to welcoming you all there.

Prof. Dr. Rupert Bruckmaier



President, GCB PhD Committee

2. Vision & Mission

Vision and Mission Statement

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VISION

The GCB provides comprehensive, internationally competitive training in theory and practice of experimental research as well as in-depth specialist knowledge of the individually selected research area. It directs students towards independent scientific work and enables them to assume scientific responsibility.

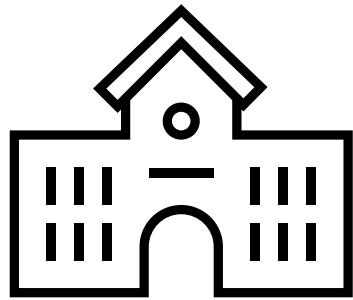
MISSION

The GCB PhD program promotes doctoral program excellence. The graduate school promotes high quality, teaching and training programs combined with rigorous, experimental, translational biomedical research. At the same time, it ensures high standards of integrity and encourages the students to work independently and responsibly while acquiring profound knowledge in selected research areas.

- **Deliver Excellence.** Offer an excellent comprehensive graduate course curriculum that educates students in broad and multidisciplinary areas including the most current biomedical research developments. The graduate school provides opportunities for students to individually tailor their course curriculum to specific needs.
- **Quality and Integrity.** Develop and maintain high quality graduate programs to impart knowledge, foster innovation, and drive creativity while ensuring excellence and integrity in training and research, using state-of-the-art methods in molecular life sciences, biomedical sciences and biomedical engineering.
- **Preparedness.** Prepare graduates for professional careers and post-doctoral studies by steady presence and strong support from the graduate school across all touchpoints in the student life (including academic and professional), such as mentoring resources for professional career development and self-care that enhances experiences, mental and psychological health, and exposing the student to the social, network, culture, and broader practice norms and requirements associated with their selected discipline.
- **Support and Develop.** Provide programs that encourage students coming from other cultures to produce well-trained, skilled, and innovative graduates who are positioned to be successful leaders who will then contribute productively whether here in Switzerland, in their country of origin and on an international level, and whether in academia, industry, government or non-profit organizations.
- Raise the recognition and visibility of the GCB to attract quality students, build networks and connections, and to serve as a conduit to agencies and organizations relevant to all students; prospective, current, or recently graduated.

2.2 GCB Offices, Mittelstrasse 43, 3012 Bern

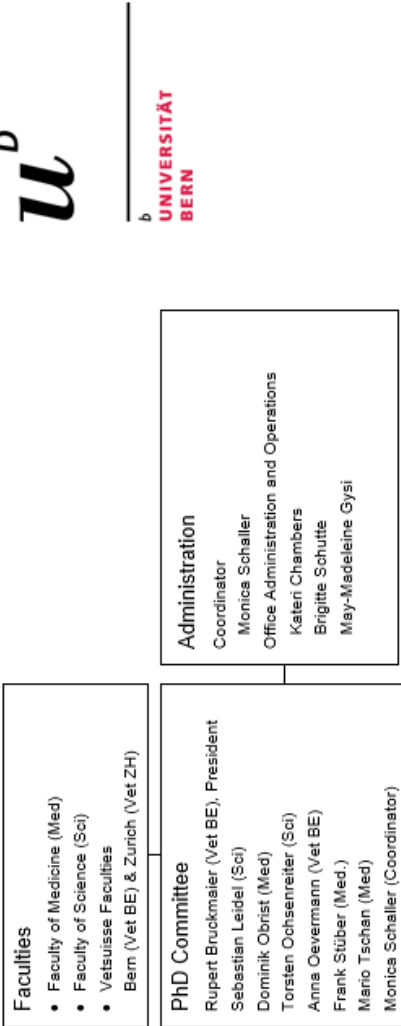
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3. Organization

3.1 Organization Chart

GCB Organization Chart



Expert Committees	Biological Systems	Biomedical Engineering	Biomedical Sciences	Cell Biology	Molecular Biology & Biochemistry	PhD Candidates
Anna Oevermann (Vet BE), Chair Antoine Adamantidis (Med) Irene Adrian-Kalchauer (Vet BE) Selma Aybek (Med) Rupert Bruckmaier (Vet BE) Britta Engelhardt (Med) Volker Enzmann (Med) Marianna Kruthof-de Julio (Med) Thomas Lutz (Vet ZH) Ruth Lyck (Med) Andreina Schoeberlein Stehli (Med) Torsten Seuberlich (Vet BE) Kuangyu Shi (Med.) Deborah Stroka (Med) Hildegard Tanner (Med.) Inhi Zlobec (Med.)	Dominik Obrist (Med), Chair Jessica Bastiaansen (Med) Lorrin Benneker (Med) Philippe Büchler (Med) Jürgen Burger (Med.) Francesco Clavica (Med) Martin Frenz (Sci) Andreas Häberlin (Med.) Sigve Haug (Phil.) Bernd Jung (Med) Roland Kreis (Med) Stavroula Mougliakakou (Med) Tobias Nef (Med) Mauricio Reyes (Med) Raphael Sznitman (Med) Hendrik von Tengg (Med) Wilhelm Wimmer (Med) Witthauer Lilian (Med) Philippe Zysset (Med)	Frank Stüber (Med), Chair Guido Beldi (Med) Véronique Bernier Gosselin (Vet BE) Heiner Bollwein (Vet ZH) Salome Dürr (Vet BE) Benjamin Gantenbein (Med) Carolina Gutierrez Herrera (Med.) Anja Kipar (Vet ZH) Mariusz P. Kowalewski (Vet ZH) Jan Kucera (Med.) Sarah Longnus (Med) Daniel Lottaz (Med) Nicola Low (Med) Mojgan Masoodi (Med.) Stephan Reichenbach (Med) Gertraud Schupbach (Vet BE) Daniela Schweizer (Vet BE) Walter M. Senn (Med) Hanno Würbel (Vet BE)	Mario Tschan (Med), Chair Marco Alves (Vet BE) Martin Bachmann (Med.) Charaf Benarafa (Vet BE) Giuseppe Bertoni (Vet BE) Alexander Eggel (Med.) Stefan Freigang (Med) Siegfried Hapfelmeier (Med) Lucy Jane Hathaway (Med) Thomas Kaufmann (Med) Georgia Konstantinidou (Med) Philippe Krebs (Med) Daniel Legler (BITg) Thomas Marti (Med.) Ren-Wang Peng (Med) Vincent Perreten (Vet BE) Carsten Rietker (Med) Mark Andrew Rubin (Med.) Carlos Ros Bascunana (Sci) Matthias Schweizer (Vet BE) Marcus Thelen (IRB) Monique Vogel (Med.) Stephan von Gunten (Med) Yitzhak Zimmerj(Med)	Torsten Ochsenreiter (Sci), Chair Ramnaniyulu Allam (Med) Rémy Bruggmann (Sci) Ronald Dijkman (Med) Carmen Faso (Sci) Markus Hilty (Med) Carlo Largiadèr (Med) Tosso Leeb (Vet BE) Sebastian Leidel (Sci) Michaela Medova (Med) Peter Meister (Sci) Oliver Mühlmann (Sci) Mariusz Nowacki (Sci) Norbert Polacek (Sci) Sven Rottenberg (Vet BE) André Schaller (Med) Achim Stocker (Sci) Beat Suter (Sci) Volker Thiel (Vet BE) Benjamin Daniel Towbin (Sci) Paul Torgerson (Vet ZH) Christoph von Ballmoos (Sci) Benoit Zuber (Med)	PhD Candidates PhD Candidates PhD Candidates PhD Candidates	



3.2 PhD & Expert Committee Organization

The Graduate School for Cellular and Biomedical Sciences (GCB) of the University of Bern, jointly administered by the Faculties of Medicine, Science and Vetsuisse, offers structured, experimental research training programs leading to the following degree titles:

- PhD in Cell Biology
- PhD in Biochemistry and Molecular Biology
- PhD in Biomedical Sciences
- PhD in Immunology
- PhD in Neurosciences
- PhD in Biomedical Engineering
- PhD in Computational Biology
- MD,PhD (Doctor of Medicine and Philosophy)
- DVM,PhD (Doctor of Veterinary Medicine and Philosophy)
- DDS,PhD (Doctor of Dentistry and Philosophy)

The PhD program provides comprehensive, internationally competitive training in the theory and practice of experimental research as well as in-depth specialist knowledge of students' individually selected research areas. It directs students towards independent scientific work, enabling them to assume scientific responsibility.

Research training is available in the areas of biochemistry and molecular biology, biomedical engineering, biomedical sciences, cell biology, immunology, neuroscience, and epidemiology. GCB applicants possess a master's degree or equivalent in life sciences or related areas; engineering, physics or computer science; medicine, dentistry, or veterinary medicine.

The GCB 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, as well as the Program Coordinator. Each faculty member acts as President, alternating every two years.

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, with 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 GCB organization chart showing the expert committee membership in 2022 is shown on the previous page.

2022 Expert committee membership changes

Biological Systems	Biomedical Engineering	Biomedical Sciences	Cell Biology	Molecular Biology & Biochemistry
Joined				
	Lilian Withhauer	Anja Kipar	Mark Rubin	
	Jessica Bastiaansen	Carolina Gutierrez Herrera		
		Mojgan Masoodi		
Departed				
Daniel Guido Fuster			Nageswara Rao Tata	
Petra Roosje				

3.3 Mentor Guidelines

General duties and responsibilities of the mentor

- The mentor is the link between the GCB and each student's thesis advisory committee and must therefore always be a member of one of the GCB expert committees. The mentor ensures that the GCB rules are observed. Thus, s/he must be acquainted with the most important rules of the GCB regulations, in particular the points which relate to course requirements (minimal ECTS) and examination regulations.
- Each expert committee member should be prepared to serve as mentor for several PhD students.
- Interview meetings of the GCB expert committees are conducted three times a year to evaluate prospective PhD candidates. The mentor attends the meetings whenever possible.
- A mentor is assigned to each PhD student immediately after the interview.
- The mentor does not require specific expertise in the research project but monitors the progress of the work in relation to the submitted research plan and intervenes if problems arise.
- The mentor is the primary contact for the PhD student and the supervisor if any conflicts arise between them.

Five main tasks are assigned to the mentor throughout a PhD project:

1. leads the mentor meeting
2. evaluates the annual progress reports
3. chairs the mid-term evaluation
4. chairs the thesis defense
5. mediates if required in case of conflict.

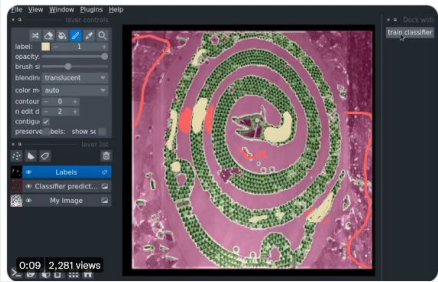


3.4 Mentor Prizes and Honors

CNZ Grant Award

Prof. Olivier Pertz & Lucien Hinderling

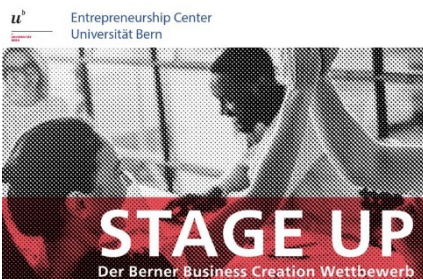
At the start of many bio-image analysis pipelines lies a segmentation step — but the current napari ecosystem lacks a fast and parameter-free segmentation tool for all users. Built in collaboration with non-coding biologists, this project will make image segmentation more accessible by developing an easy to train pixel-classifier for the napari community and improve its documentation for use by a wide audience.



The tool has the advantage that it can be trained on a single image at the beginning of an experiment, on data streamed live from the microscope. Our cells look super different between experiments, so having the possibility to train classifiers for segmentation on the fly is great! We use this real-time segmentation to optogenetically activate sub-cellular regions with high precision. This allows us for example to grow the cytoskeleton of a cell in a specific direction.

Major US Award for Sven Rottenberg

A prestigious grant from the USA goes to the biomedical scientist Sven Rottenberg, University of Bern, and the clinical scientist Intidhar Labidi-Galy, University of Geneva, and University Hospital of Geneva. They received a joint grant from the "Congressional Directed Medical Research Programs" for their project on ovarian cancer. This underlines the high quality of the collaborative research on ovarian cancer in Bern and Geneva.



STAGE UP. The Bernese Business Creation Competition

The grand finale was held at the Award Night on May 10, 2022. The five finalist teams pitched for the last time in front of the jury – on the big stage at the Bierhübeli in Bern and in front of about 200 guests. Congratulations to the STAGE UP 2022 winners! GCB Mentors, Alexander Eggel and Thomas Kaufmann as well as GCB doctoral candidate, Tarcisi Cantieni.

4. 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 2022, these included:

- Agroscope, Veterinary Physiology, Vetsuisse Faculty
- AO Research Institute, Davos
- Biotechnologie Institut Thurgau (BITg)
- CAScination AG, Bern
- Centre for Infectious Disease Research in Zambia
- Center for Translational Medicine and Biomedical Entrepreneurship sitem
- Department of HIV and AIDS
- Malawi Ministry of Health
- Empa (Swiss Federal Laboratories for Materials Science & Technology, CH)
- Institute for Research in Biomedicine (IRB), Bellinzona
- Interfaculty Bioinformatics Unit/Laboratory Spiez
- IVI Mittelhäusern
- Kantonsspital Aarau
- Kantonsspital St. Gallen
- Laboratory for Artificial Intelligence and Translational Theranostics (AITT)
- Laboratory for Biomedical Neurosciences (LBN), Torricella-Taverne
- ProKanDo GmbH
- Schweizer Paraplegiker Zentrum, Radiologie
- Swiss Institute of Equine Medicine, Bern
- Veterinary Public Health Institute (VPH), Liebefeld

4.1 PhD Program Structure

Each PhD candidate is supervised by a thesis committee consisting of supervisor, co-advisor, and mentor (a member of the appropriate GCB expert committee). The roles are specified as follows:

Supervisor. Hires the student and is responsible for the research project, adequate supervision, the laboratory infrastructure, and the salary of the candidate.

Co-advisor. Should not be affiliated with the same institute as the supervisor but should be an expert in the research area of the thesis project. S/he meets with the candidate at least twice a year to discuss and assess progress of the thesis work, as well as to advise and support him/her.

Mentor. Decides on the individual, tailor-made training program together with the candidate and the supervisor, considering the candidate's previous education and relevance to the planned research work.

External Co-referee. Toward the end of the PhD studies, an additional expert is added to the team, to promote independent evaluation of the thesis and oral defense.

4.2 PhD & DVM Curriculum

I	Earn a minimum 6.0 ECTS of scientifically oriented courses, of which at least 3.0 ECTS must be lecture courses or book clubs which include a graded examination. Exams must be passed after a maximum of two attempts, as regulated by the Promotion Regulations, Art. 92 and Art. 191).
II	Participate in Scientific Integrity lecture. Annual Progress Reports.
III	Pass a mid-term evaluation during the 2nd year – students present their work in a scientific seminar in the presence of their PhD thesis committee, to demonstrate in-depth knowledge of their research field.
IV	Attend and participate in the annual GCB Symposium starting with the 2nd year of PhD studies.
V	After three, maximum four years, submit written thesis and successfully defend the thesis orally.

4.3 MD, PhD Program & Curriculum

I	Earn a minimum 25 ECTS, some of which may be obtained through previous laboratory work (MD thesis or other). Generally, the ECTS can be obtained by participating in approved, project-related, and interdisciplinary courses, workshops, seminars, and lectures. Course work for 6 ECTS (3 ECTS of which come from a course with a graded examination) tailored to the research project in addition to the basic 25 ECTS is mandatory (total 31 ECTS).
II	At least 3.0 ECTS must be earned from lecture courses or book clubs which include a graded examination. Exams must be passed after a maximum of two attempts, as regulated by the Promotion regulations, Art. 92 and Art. 191).
III	Participate in the course Scientific Integrity course. Annual Progress Reports.
IV	Pass a mid-term evaluation during the 2nd year – students present their work in a scientific seminar in the presence of their PhD thesis committee, to demonstrate in-depth knowledge of their research field.
V	Attend and participate in the annual GCB Symposium beginning with the 2nd year of PhD studies.
VI	After three, maximum four years, submit written thesis and successfully defend the thesis orally.

A fundamental requirement includes in-depth education in natural science subjects. This basic training consisting of course work of 25 ECTS may be carried out either in parallel to the medical studies during the third to sixth year (Track I), or during the research work for the PhD thesis (Track II). Track I students receive personal mentoring by experienced researchers.

Graduate School for Cellular and
Biomedical Sciences (GCB)

Programm MD-PhD

Die Ärztin als Forscherin
Der Arzt als Forscher



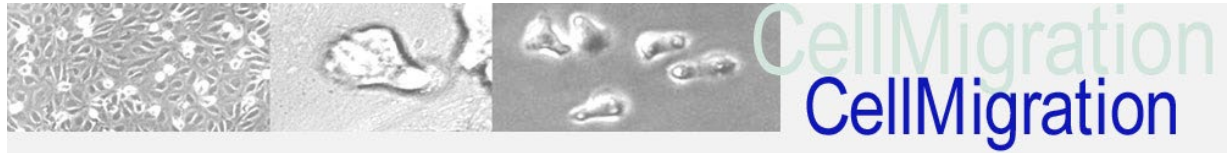
The MD-PhD Program thus consists of basic training (comprising 25 ECTS) and the additional mandatory course work (6 ECTS) in subjects which are suitable for preparing them for their specific research project (cell biology / biochemistry, molecular biology, immunology, neurobiology, tumor biology, etc.), and for the PhD thesis. Comprehensive guidelines are available on the GCB website.

4.3.1 MD-PhD Fellowships

A limited number of fellowships are available for PhD work, which are awarded by the Swiss Academy of Medical Sciences (SAMS) and the Swiss National Science Foundation (SNSF) with the assistance of private foundations within the framework of the [National Md-PhD grants program](#).

4.4 PhD Specializations

Within the framework of the GCB PhD Program, six PhD specialization programs are offered. Participants acquire ECTS in the specialization which will be listed as a separate achievement on the diploma supplement, thus complementing their PhD degree.



Cell Migration

The PhD Program Cell Migration started as an SNF-supported ProDoc program on October 1st, 2011. It has brought together a growing group of highly innovative and successful Swiss research groups in the field of cell migration in morphogenesis, immunosurveillance, inflammation and cancer. The presently participating institutions with their principal investigators bring together complementary scientific expertise and methodological skillsets in the field of cell migration that permit for embedding a cutting-edge Swiss training program on Cell Migration for highly qualified and motivated PhD and MD-PhD students in the fields of biology, biochemistry, (molecular) human and veterinary medicine, immunology, pharmaceutical sciences, chemistry, physics, bioinformatics and mathematics with a focus on life sciences.

More information on the [Cell Migration website](#).



Cutting Edge Microscopy (CEM)

The main aim of the CEM program is to provide an interdisciplinary training program to PhD students to become first-class experts in biological imaging. Here, the unique and interdisciplinary framework established by the Microscopy Imaging Center (MIC) provides the necessary infrastructure and expert knowledge.

The profile of PhDs at the end of their training is that of a life science researcher with a deep insight into advanced microscopy and image analysis and with the necessary know-how to develop automated image analysis protocols. By providing this complementary training in different disciplines, the Cutting-Edge Microscopy PhD program educates young researchers with the ability to bring innovative approaches to academia and industry, closing an exciting knowledge gap amongst the life science experts in advanced microscopy.

More information on the CEM website:

[Cutting Edge Microscopy PhD Program](#)



Stem Cells and Regenerative Medicine (SCRM)

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 on the [SCRM website](#).



Tumor Biology

The Tumor Biology curriculum is embedded in the Graduate School for Cellular and Biomedical Sciences of the University of Bern (GCB) and will benefit from the existing Bern Cancer Research Cluster (BCRC) network. PhD students registered to the program will benefit from: basic knowledge in molecular and cell biology, as well as advanced cancer research methods and concepts from the 20 cancer research groups currently participating in BCRC activities. These cancer research groups are part of 8 different Departments and Institutes at the University of Bern (DBMR, Institute of Pharmacology, Medical Oncology, Institute of Pathology, Institute of Anatomy, Vetsuisse, TKI and the Department of Nuclear Medicine).

More information on the [GCB PhD Specializations website page](#).

New PhD Specializations



Cardiovascular PhD Program (from 2023)

The Cardiovascular PhD Program will offer PhD students the opportunity to receive in-depth cardiovascular education and to complement their PhD degree with a specialization certificate in Cardiovascular Research. As cardiovascular diseases are the leading cause of death globally, a greater understanding of cardiovascular physiology and pathophysiology is of utmost importance. Consequently, a great number of different teams of the University of Bern and of the Inselspital, Bern University Hospital are actively involved in research concerning the function of the heart, arteries and veins, as well as the underlying mechanisms, in healthy and diseased states. This research ranges from fundamental science to pre-clinical and clinical studies and relies on a multitude of different experimental models. To promote cardiovascular research teams in Bern as leaders in the understanding of cardiovascular (patho)physiology and in the development of approaches to reduce disease burden, the Cardiovascular Research Cluster (CVRC) Bern was established in 2015 for all UniBE and Inselspital members with an interest in cardiovascular research. One of the CVRC's aims is to enrich the training environment of junior researchers. Another goal of the CVRC is to promote interactions and collaborations among clinical and fundamental cardiovascular research, which will be addressed with the development of this dynamic PhD Specialization option by incorporating students from the MD, PhD program.

[GCB PhD Specializations website page](#).



Neuroscience PhD Program (from 2023)

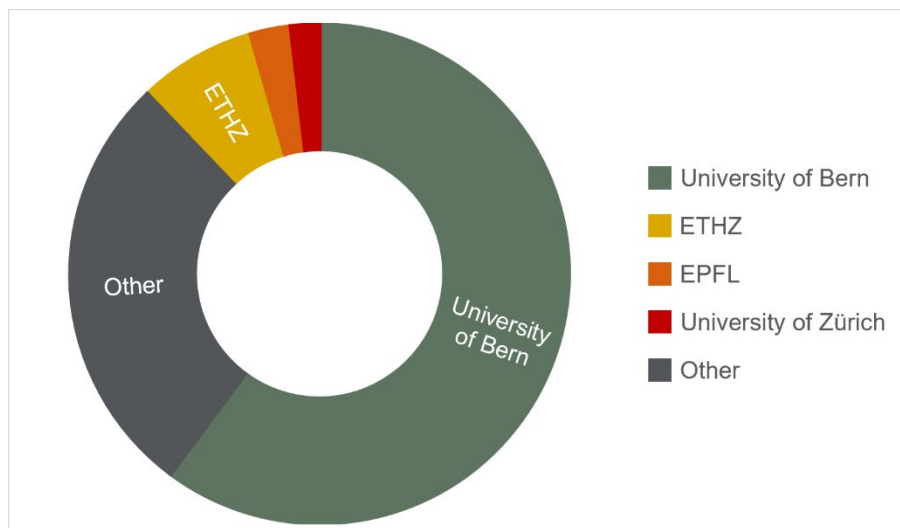
The Neuroscience PhD specialization program supports training for GCB doctoral students in neuroscience during their doctorate. It includes a basic training in neurophysiology, with an optional neuro-anatomy course, and provides an up-to-date teaching in current areas of neuroscience research and techniques through the BENEFRI Neuroscience Workshop and the BENEFRI Hands-on Workshop, respectively. The BENEFRI Neuroscience program is integrated into the course offered by both the Graduate Schools for Health Science

(GHS) and Graduate School for Cellular and Biomedical Sciences (GCB) including the BENEFRI program between the University of Bern and the University of Fribourg. The theoretical and practical teaching are organized in the Universities of Bern and Fribourg and include external international-standing lecturers from Swiss or European academic institutions. GCB students who apply will be granted admission at the request of the doctoral student by the Program Committee of the Specialized Neuroscience Program consisting of two representatives from the Universities of Bern and Fribourg without any additional evaluation or selection of the doctoral students or their projects. The program is open to students with background in Neuroscience including Neurology, Psychiatry, Physiology, Anatomy, Biology, Neuropsychology.

[GCB PhD Specializations website page.](#)

5. Courses & Seminars

5.1 Individual Study Program



The individual training program assigned to each PhD candidate considers the student's previous training and relevance to the research work. PhD candidates may attend courses at the University of Bern or external courses and summer schools offered by other recognized institutions. Acknowledgement of external courses for the PhD are subject to the agreement of the mentor.

Approved courses listed on Doctoral Agreements included 535 Lectures, Tutorials, and Book Clubs. Of those, 322 (60%) were offered by the University of Bern institutes, 41 (8%) took place at ETH Zürich (Eidgenössische Technische Hochschule Zürich), 14 (3%) at EPFL (École Polytechnique Fédéral de Lausanne), 10 (2%) University of Zurich and 148 (28%) were fewer than 3 instances from other institutions.

5.2 Lectures, Tutorials, Book Clubs

Despite the disruption caused by the pandemic, new courses were added and held in 2022 and popular courses were offered twice to accommodate higher registrations than usual. Most of the GCB teaching events were administered using the University of Bern Core Teaching System ([CTS/KSL](#)) to administer courses and manage grades, making study progress more transparent to students and the GCB.

Popular Lectures, Tutorials, and Book Clubs

- **Immunology Tutorial** (9-10 senior scientists)
- Cell Biology («Happy Cell») Tutorial, (9-10 senior scientists)
- **Principles in Transgenic Mouse Technology** (C. Benarafa, U. Deutsch, & P. 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)
- **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)
- **Book Clubs, Journal Clubs and Seminars** (Institute of Social and Preventive Medicine ISPM)
- **R Bootcamp** (S. Haug)

- **Introduction to R** (D. Stroka, D. Sanchez-Taltavull)
- **DNA Sequencing and Variant Analysis: Basics of Sanger and Next Generation group laboratory** (V. Jagannathan, T. Leeb)

5.3 Transferable Skills Courses

- **Scientific Integrity***, T. Ochsenreiter
- **Scientific Communications for PhD Students**, S. Longnus
- **Presenting with Confidence**, D. Levine, C. Winfield
- **Basics of Ethics in Health Sciences Research**, V. Wild
- **Effective Grant-Writing for Young Scientists**, M. Toscano, J. Bailoo
- **Communicating Science - Scientific Writing Course**, Inselspital

*mandatory lecture for all GCB PhD students



9th SCRM PhD Students Retreat

As per tradition, the location of Gurten Park in Bern hosted our annual PhD students retreat on September 2, 2022. We were very happy to have Prof. Alexandre Reymond, Director of the Center for Integrative Genomics from University of Lausanne, as our academic mentor, and Dr. Adrian Zürcher, Head of Research Europe and Head of Plasma Protein Research at CSL Behring, as our industry mentor. The possibility of meeting other students and spending the day together was very exciting. Many students told us they have been looking forward to participating in in-person meetings. A very high attendance was confirmed also this year, with 18 participants, including 13 who presented their work in a talk. Each talk was followed by an interesting scientific discussion, in which everybody got involved, leading to a fruitful exchange of ideas. In addition, coffee breaks, lunch and the closing Apéro were also nice opportunities to get to know each other and network in a relaxed environment with the other students as well as with the mentors and other professors from the SCRM committee. We are thrilled about the success of the event and hope students will continue to enthusiastically participate in the future. Importantly, we would like to thank both our mentors for valuable support during the retreat. We really enjoyed the keynote lecture of our industry mentor Dr. Zürcher, especially for learning more about potential translation of our research into practical applications. We really appreciated his commitment in discussing with young researchers and his enthusiasm in illustrating to us future opportunities. Our academic mentor Prof. Reymond ended the meeting with a very inspiring and enthusiastic motivational talk. A special thanks goes to Prof. Eliane Müller, to Prof. Volker Enzmann, and to René Aeberhard (SCRM secretary), who joined us for the key lecture, contributed to a stimulating discussion and gave us precious guidance. We are deeply grateful to the Stem Cell Research and Regenerative Medicine Platform and to the GCB for financially supporting us to organize our retreat. We are grateful and happy to also have received additional funds from several companies that agreed to sponsor us. Special thanks also to the SCRM Office (Rene Aeberhard) for organizational support and to all the students who have enthusiastically participated. We are looking forward to welcoming interested students to our next retreat, which will take place in September 2023.

On behalf of the Organizing Committee 2022

(Elisa Rodrigues Sousa, Ainhoa Asensio Aldave, Siavash Rahimi, Vedat Burak Ozan),

Elisa Rodrigues Sousa

6. GCB Academic Events

6.1 Symposium

As part of the doctoral training, the GCB organizes an annual academic research symposium for its 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). The presentations are intended to illustrate the wide range of research projects, as well as to demonstrate the candidates' high level of competence and in-depth knowledge in the fields of cellular and biomedical sciences, 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 GCB candidates, as well as for their supervisors and mentors to engage in mutually rewarding and highly stimulating discussions. Additionally, the symposium facilitates opportunities for active networking among peers and senior researchers.

The PhD Committee decided to host the symposium for a second year using a virtual platform due to the volatile situation with the Covid-19 pandemic to protect participants while preserving the perennial event.

On January 27, 2022, the GCB held its 2nd successful, fully virtual academic research symposium. Again Prof. Tobias Nef, Dr. Stephan Gerber, and PhD students (Myla Van Wegen, Nicole Rüttgers, Narayan Schütz, Michael Graeme Falkner, and Oriella Gnarra) from ARTORG organized the virtual platforms and assisted with technical troubleshooting throughout the event. The Zoom and GatherTown platforms were used again in 2022. Students and faculty alike rated the event very positively. During the morning, 39 Talks and 189 Flash Talks were presented. The poster session showcased 257 Posters and a new *PhD Specialization* booth where the Cutting-Edge Microscopy, Stem Cells and Regenerative Medicine program, and Cell Migration program displayed posters, as well as the Microscopy Imaging Center attended with a poster.

6.1.1 Keynote Address



Professor Michael S. Sacks

W.A. Moncrief Chair in Simulation Based Engineering and Sciences

James T. Willerson Center for Cardiovascular Modelling and Simulation
Oden Institute for Computational Engineering and Sciences
Department of Biomedical Engineering
<https://wccms.odn.utexas.edu/>

The keynote address was given by Prof. Michael Sacks. Professor Sacks is a world authority on cardiovascular modeling and simulation, particularly on developing patient-specific, simulation-based approaches for the understanding and treatment of heart and heart valve diseases. His research is based on multi-scale modeling, quantification, and simulation of the biophysical behavior of the constituent cells as well as tissues and translation to the organ level in health, disease, and treatment. For example, he has developed novel non-invasive methods to quantify pre- and post-surgical state of the mitral valve from pre-surgical clinical images.

He has determined how local stress environments of heart valve interstitial cells alter their biosynthetic responses in the context of altered heart and valvular organ-level responses. His research also includes developing novel cardiac models to simulate growth and remodeling of the myocardium in pulmonary hypertension, the first full 3D approach for left ventricular myocardium mechanical behavior. Dr. Sacks is also active in modeling replacement heart valve materials and in understanding the in-vivo remodeling processes.

Neural Network Finite Element Modeling of the Heart Mechanics

A new look at an old problem

The full characterization and modeling of three-dimensional (3D) mechanical behaviour the myocardium is essential in understanding the function of the heart in health and disease. The hierarchical structure of the myocardium results in their highly anisotropic mechanical behaviors, with the spatial variations in fiber structure giving rise to heterogeneity. We have developed a novel numerical-experimental approach to determine the optimal parameters for 3D constitutive models of the myocardium using optimal design of full 3D kinematically controlled (triaxial) experiments coupled to an inverse model of the experiment and local fibrous structure. Due to the natural variations in structures, the mechanical behaviors of myocardium can vary dramatically within the heart. Thus, to obtain the responses of the myocardium with different realizations of structures, the resulting hyperelastic problem needs to be solved with spatially varying parameters and in certain cases different boundary conditions. To alleviate the associated computational costs at the time of simulation, we have developed a neural network based direct PDE solution method. The resulting neural network was then trained in a physics-informed approach by searching for θ that minimizes the potential energy of the hyperelastic problem on the training dataset generated by sampling over the physiological range. The present method is intended for the low data problem; it does not require generating a large, labelled training datasets, which are also computationally intractable. The neural network model was trained with satisfactory convergence, it can be used to give fast predictions of complex 3D deformations in full kinematic space with population-based fiber structures by forward passes in the neural network. Due to their transfer learnability characteristics, the neural network on subsequent specimens more quickly. I will also present scaled up for complete organ-level cardiac models to provide efficient and robust computational models for to improve patient outcomes in clinically relevant timeframes.



Congratulations to the 107 graduates in 2022. Only one candidate was required to rewrite and resubmit his thesis, postponing his ultimately successful oral thesis defense by some months.

A

Philipp Aebischer, PhD in Biomedical Engineering (April 28)
ARTORG Center for Biomedical Engineering Research, Hearing Research Laboratory, Medical Faculty (PD Dr. Wilhelm Wimmer)
«SMART Insertions for Cochlear Implant Electrode Arrays A Sleeve-based, Micromotion Avoiding, Retractable and Tear-opening Insertion Tool»

Salome Johanna Aeschlimann, PhD in Biochemistry and Molecular Biology (December 15)
Department of Chemistry and Biochemistry, Faculty of Science (Prof. Dr. André Schneider)
«From the basal body to the mitochondrial genome: linking up the tripartite attachment complex subunits in *Trypanosoma brucei*»

Simon April-Monn, PhD in Biomedical Sciences (December 13)
Institute of Pathology, Faculty of Medicine (Prof. Aurel Perren)
«Insight on neuroendocrine neoplasms from patient-derived cell culture systems»

B

Stefano Bagatella, DVM PhD (Doctor of Veterinary Medicine and Philosophy) (October 31)
Div. of Experimental Clinical Research, DCR-VPH, Vetsuisse Bern (Prof. Dr. Anna Oevermann)
«Bovine neutrophils and *Listeria monocytogenes*: investigations on chemotactic factors, dynamics of interaction and bacterial persistence»

Katalin Bartos, PhD in Biomedical Sciences (July 04)
Insel, Medical Faculty (Prof. Dr. Uyen Huynh-Do, PD Dr. med. et phil. Matthias Moor)
«Role of Memo in osteoblast biology during health and disease»

Cecilia Bazzini, PhD in Immunology (May 06)
Department for BioMedical Research (DBMR) Dermatology, Medical Faculty (Prof. Dr. Christoph Schlapbach)
«TH9 cells depend on cystine uptake and PPAR- γ signaling to prevent unchecked lipid ROS and cell death»

Verena Marleen Betzler, PhD in Cell Biology (April 04)
Biotechnology Institute Thurgau (BITg), Medical Faculty (Dr. Jérémie Rossy)
«Investigating Force Generation by Dendritic Cells at the Immunological Synapse»

Annina Flavia Bindschedler, PhD in Cell Biology (June 22)
Institute of Cell Biology, Faculty of Science (Prof. Dr. Volker Heussler)
«The Plasmodium Parasitophorous Vacuole Membrane: from Autophagic Targeting to Signaling Platform»

Angela Amira Botros, PhD in Biomedical Engineering (February 15)
ARTORG Center for Biomedical Engineering Research, Medical Faculty (Prof. Dr. Tobias Nef)
«Unsupervised health monitoring in home-like environments»

Ivan Bozic, MD PhD (Doctor of Medicine and Philosophy) (October 26)
Department of Neurology, Medical Faculty (Prof. Dr. Antoine Roger Adamantidis)

«The coordinating influence of thalamic nucleus reuniens on sleep oscillations in cortical and hippocampal structures – relevance to memory consolidation and sleep structure»

Rebecca Brogli, PhD in Biochemistry and Molecular Biology (September 09)
Department of Chemistry and Biochemistry, Faculty of Science, Prof. Dr. Norbert Polacek
«Biogenesis and Mechanisms of tRNA-derived RNAs (tDRs) in *Trypanosoma brucei*»

Andrew Francis Brown, PhD in Biomedical Sciences (December 13)
Institute of Bee Health, Vetsuisse Faculty Bern (Prof. Dr. Peter Neumann)
«Honey Bee Nutrition and Microbiota»

Dominik Marcel Brügger, PhD in Biomedical Engineering (May 12)
Department of Ophthalmology, Medical Faculty (Prof. Dr. Mathias Abegg)
«Locking visual stimuli to the phase of intrinsic cortical oscillation in humans: the impact on the visual response»

Dominique Yvonne Brunssen, PhD in Biochemistry and Molecular Biology (January 20)
Institute of Cell Biology, Faculty of Science (Prof. Dr. Beat Suter)
«Neuronal and possibly gut specific larval intestinal cells over-expression of phenylalanyl-tRNA synthetase restricts food uptake and growth, and induces larval roaming»

Eric Jacques Buffle, MD PhD (Doctor of Medicine and Philosophy) (December 14)
Insel, Cardiology, Medical Faculty (PD Dr.med. Stefano De Marchi)
«Opening behaviour of normal and stenotic aortic valves in low-flow situations»

C

D

Moushumi Das, PhD in Biochemistry and Molecular Biology (May 31)
Institute of Cell Biology, Faculty of Science (Prof. Dr. Georgia Konstantinidou)
«Role of Structural Maintenance of Chromosomes (SMC) complexes in interphase genome folding in *Caenorhabditis elegans*»

Elena de Martin, DVM PhD (Doctor of Veterinary Medicine and Philosophy) (June 02)
Institute of Virology and Immunology, Vetsuisse Faculty Bern (Prof. Dr. Matthias Schweizer)
«RNA seco ergo sum: constraints and variability of pestiviral Erns»

Sabina Deutschmann, PhD in Biochemistry and Molecular Biology (February 22)
Department of Chemistry and Biochemistry, Faculty of Science (Prof. Dr. Christoph von Ballmoos)
«The interplay of lipids and respiratory enzymes in synthetic ATP producing systems»

Nicolas Dolder, PhD in Biochemistry and Molecular Biology (March 31)
Department of Chemistry and Biochemistry, Faculty of Science (Prof. Dr. Christoph von Ballmoos)
«The Challenges of Measuring Membrane Protein Function in Giant Unilamellar Vesicles»

Dzhangar Dzhumashev, PhD in Biomedical Sciences (October 21)
Hematology/Oncology, Department for BioMedical Research (DBMR), Medical Faculty (Prof. Dr. Jochen Karl Rössler, PD Dr. sc. nat. Michele Bernasconi)
«Liposomal targeted drug delivery to rhabdomyosarcoma»

Martyna Dziadosz, PhD in Biomedical Engineering (July 4)
Department for BioMedical Research (DBMR), Medical Faculty (Prof. Dr. Roland Kreis)
«Enhancing Magnetic Resonance Spectroscopy (MRS) by relaxation enhancement and machine learning.»

E

F

Sarah Ahmed Ibrahim Farag, MD PhD (Doctor of Medicine and Philosophy) (March 30)
Department of Medical Oncology, Medical Faculty (Prof. Dr. Thomas Niklaus Pabst)
«High-Dose Bendamustine and Melphalan vs Melphalan Alone as Conditioning Regimen for Autologous Stem-Cell Transplantation (ASCT) in Patients with Myeloma»

Dario Ferrari, PhD in Biomedical Engineering (December 9)
Department of Chemistry and Biochemistry, Faculty of Science (Prof. Dr. Olivier Thierry Guenat)
«Development of Organs-On-Chip: Complex Microvasculature, Tissue Stiffening Detection, and Suspended Biomembranes»

G

Ana Bélen Garcia Martin, PhD in Biochemistry and Molecular Biology (February 08)
Institute of Veterinary Bacteriology, Vetsuisse Faculty, Bern (Prof. Dr. Vincent Perreten)
«Antimicrobial resistance and molecular typing of *Brachyspira hyodysenteriae*: from traditional techniques to high-throughput sequencing»

Camille Michel Jean-Claude Gontier, PhD in Neuroscience (September 19)
Institute of Physiology, Medical Faculty (Prof. Dr. Jean Pascal Pfister)
«Statistical approaches for synaptic characterization»

Vaiva Gradauskaite, DVM PhD (Doctor of Veterinary Medicine and Philosophy) (May 03)
Div. of Experimental Clinical Research, DCR-VPH, Vetsuisse Faculty Bern (PD Dr. Philippe Plattet)
«Towards NextGen Precision Cancer Immunotherapy with Canine Distemper Virus»

Philipp Grossenbacher, PhD in Biochemistry and Molecular Biology (December 16)
Department für Chemie und Biochemie, Medical Faculty (PD Dr. Martin Locher)
«Development of Synthetic Research Tools for Structural and Functional Studies of Mitochondrial Carriers and Other Membrane Proteins»

H

Redona Hafizi, PhD in Biomedical Sciences (June 08)
Institute of Pharmacology, Medical Faculty (Prof. Dr. Andrea Huwiler)
«The role of Sphingosine-1-phosphate on fibrotic processes and erythropoietin production in renal cells»

Irene Monika Häfliger, PhD in Computational Biology (January 17)
Institute of Genetics, Vetsuisse Faculty Bern (Prof. Dr. Cord Drögemüller)
«Forward vs. reverse genetics: a bovine perspective based on visible and hidden phenotypes of inherited disorders»

Max Heydasch, PhD in Cell Biology (March 16)
Institute of Cell Biology, Faculty of Science (Prof. Dr. Olivier Pertz)
«Characterization of a mechanosensitive feedback controlling RhoGTPase signaling»

Christian Horvat, PhD in Computational Biology (December 15)
Department für Chemie und Biochemie, Medical Faculty (Prof. Dr. Jean Pascal Pfister)
«Density estimation on low-dimensional manifolds»

I

Michael Indermaur, PhD in Biomedical Engineering (June 01)
Musculoskeletal Biomechanics, ARTORG Center for Biomedical Engineering Research, Medical Faculty (Prof. Dr. Philippe Zysset)
«Osteogenesis Imperfecta does not compromise the micromechanical properties of human bone extracellular matrix»

Marine H  l  ne Fanny **Inglebert**, PhD in Biochemistry and Molecular Biology (November 18)
Institute of Animal Pathology, Vetsuisse Bern (Prof. Dr. Sven Rottenberg)
«Investigating canine mammary tumors and patient-derived organoids as a preclinical model for breast cancer»

J

Marc-Antoine Fr  d  ric Rom  o Jacques, PhD in Computational Biology (March 3)
Institute of Cell Biology, Faculty of Science (Prof. Dr. Olivier Pertz)
«The code of signaling dynamics: how to decipher it and its significance for cells and tissues»

Chaonan Jin, MD PhD (Doctor of Medicine and Philosophy) (September 13)
DBMR Department for BioMedical Research, Medical Faculty
«Novel insights in non-alcoholic fatty liver disease pathophysiology: endoplasmic reticulum-mitochondria contacts & protein acetylation»

Fredrick Johnson Joseph, PhD in Biomedical Engineering (August 03)
ARTOG Center for Biomedical Engineering Research: Image-guided Therapy, Medical Faculty (Prof. Dr. Stefan Weber)
«Mimicking brain microsurgical and endovascular procedures through additively manufactured dynamic and life-like phantoms»

K

Lyna Emma Sunna Kabbani, PhD in Biochemistry and Molecular Biology (May 23)
Institute of Cell Biology, Faculty of Science (Prof. Dr. Mariusz Nowacki)
«Investigating the roles of DNA: RNA hybrids in the genome of Paramecium tetraurelia during genomic rearrangements»

Ana Kalichava, PhD in Biochemistry and Molecular Biology, (October 10)
Institute of Cell Biology, Faculty of Science (Torsten Ochsenreiter)
«Establishing Ultrastructure Expansion Microscopy in Trypanosoma brucei »

Darya Karatkevich, MD PhD (Doctor of Medicine and Philosophy) (November 24)
Division of General Thoracic Surgery, Inselspital Bern, Medical Faculty (Prof. Dr. med. Ralph Schmid, PD Dr. phil. nat. Thomas Marti)
«Increasing the efficiency of chemotherapy for malignant pleural mesothelioma»

Andrea Stephanie Karolin, PhD in Biomedical Sciences (March 7)
Department for BioMedical Research (DBMR), Nephrology and Hypertension, Medical Faculty (PD Dr. Daniel Sidler)
«Mechanisms of Calcineurin Inhibitor Toxicity of the Kidney»

Amjad Khan, PhD in Biomedical Sciences (November 22)
Institute of Pathology, Medical Faculty (Prof. Dr. Inti Zlobec)
«Computational Analysis of Colorectal Cancer Metastasis in Lymph Nodes using Deep Learning Techniques»

Elham Kashani, PhD in Biochemistry and Molecular Biology (August 17)
Institute of Pathology, Medical Faculty (Prof. Dr. Erik Vassella)
«Novel resistance mechanisms of temozolomide in Glioblastomas, a translational and functional investigation»

Alicia Michelle Kemble, PhD in Neuroscience (September 15)
F. Hoffman La-Roche, Basel, Medical Faculty
«Pharmacological investigation of novel Monoacylglycerol Lipase (MAGL) inhibitors for neurovascular inflammation»

Samuel Elia Johannes Knobel, PhD in Biomedical Engineering (June 08)
ARTOG Center for Biomedical Engineering Research, Medical Faculty (June 08)
«Development and evaluation of an adaptive neglect therapy tool with visual, auditive and tactile modalities using virtual reality technology»

Maria Angeliki Komninou, PhD in Biomedical Sciences (October 13)
Department of Ophthalmology, Medical Faculty (Prof. Dr. Volker Enzmann, PD Dr med. Günter Theodor Michael Seiler)
«Optimization of oxygen dynamics during corneal cross-linking and their biomechanical characterization»

Annika Kratzel, PhD in Cell Biology (April 14)
Institute of Virology and Immunology, Vetsuisse Faculty Bern (Prof. Dr. Volker Earl Thiel)
«Analysis of cellular and viral factors that impact coronavirus replication and tropism»

Mirela Kremenovic, PhD in Immunology (February 21)
Institute of Pathology, Medical Faculty (Prof. Dr. Mirjam Schenk)
«Targeting tumor-associated myeloid cells in immunotherapy of melanoma»

Patrycja Kucharczyk, PhD in Cell Biology (June 21)
Department for BioMedical Research (DBMR), Nephrology and Hypertension, Medical faculty (Prof. Dr. Daniel Guido Fuster)
«Mechanisms of thiazide induced glucose intolerance»

Jasmin Kuratli, DVM PhD (Doctor of Veterinary Medicine and Philosophy) (July 25)
Institute of Veterinary Pathology Zürich, Vetsuisse Zurich (Prof. Dr. Nicole Borel)
«Anti-chlamydial treatment strategies and drug interactions»

L

Ngoc Dung Le, PhD in Biomedical Sciences (June 03)
Institute for Infectious Diseases, Medical Faculty
«Shedding light on the pathophysiology of pneumococcal meningitis by complementary disease models and non-invasive methods to evaluate novel therapeutics»

M

Josephine Angelo Mapunda, PhD in Neuroscience (June 08)
Theodor Kocher Institute, Medical Faculty (Prof. Dr. Britta Engelhardt)
«Imaging the central nervous system immune privilege: The role of CNS barriers in regulating trafficking of immune cells and immune mediators in the CNS»

Nikita Markov, PhD of Science in Biochemistry and Molecular Biology (May 2)
Institute of Pharmacology, Medical Faculty (Prof. Dr. Hans-Uwe Simon)
«OPA1-deficiency in neutrophils and macrophages: Crossroads of innate immunity and mitochondrial dysfunction»

Serena Melgrati, PhD in Immunology (November 14)
Institute for Research in Biomedicine, Medical Faculty (Prof. Dr. Marcus Thelen)
«Old and new Atypical Chemokine Receptors: role of ACKR3 in the Marginal Zone and characterization of GPR182 as a novel chemokine scavenger»

Alessandro Mirra, DVM PhD (Doctor of Veterinary Medicine and Philosophy) (December 16)
Vetsuisse Faculty Bern (Prof. Dr. Claudia Spadavecchia)
«The pig as experimental model: are we ensuring animal welfare during anaesthesia?»

Mohana Mukherjee, PhD in Biochemistry and Molecular Biology (August 22)
Institute for Infectious Diseases, University of Bern, Medical Faculty (Prof. Dr. Siegfried Hektor Hafelmeier)
«Investigation of Microbiota-dependent Biotransformations, Body Distribution and Excretion of Arsenic in Mouse Models»

Elias Tarek Constantin Mulky, PhD in Biomedical Engineering (August 23)

RMS Foundation, Medical Faculty (Prof. Dr. Martin Frenz)

«Engineering Absorbable Fiber Reinforced Bone Substitute Materials»

Fabian Matthias Müller, PhD in Biomedical Engineering (April 28)

ARTORG Center for Biomedical Engineering Research, Medical Faculty (Prof. Dr. Stefan Weber)

«Inner ear access during robotic cochlear implantation – concept and validation of a minimally traumatic approach»

N

Matheus Notter Dias, PhD in Immunology (May 11)

Institute for Infectious Diseases, Medical Faculty (Prof. Dr. Siegfried Hektor Hapfelmeier)

O

Oluwaseun Rume-Abiola Oyewole, PhD in Biomedical Sciences (January 31)

Institute for Infectious Diseases, Medical Faculty (PD Dr. Markus Hilty)

«The post-vaccine epidemiology of pneumococcal carriage and invasive disease in Switzerland: A genomics- and population-based study with insights on the emergence of hybrid serotypes and strain-level carriage dynamics.»

P

Joaquin Alvaro Peñalver de Andrés, PhD in Neuroscience (November 3)

Motor Learning and Neurorehabilitation Laboratory, ARTORG Center for Biomedical Engineering Research, Medical Faculty (Prof. Dr. Laura Marchal Crespo)

«EEG-based Imaging of Cognitive-Attentional Processes Related to Motor Performance»

Carla Pernaci, PhD in Neuroscience (October 28)

Department for BioMedical Research, Medical Faculty (Prof. Dr. Antoine Roger Adamantidis)

«Dysregulated PC's Ca²⁺ homeostasis drives Spinocerebellar ataxia-1 (SCA1) pathology»

Leonardo Pietrasanta, PhD in Biomedical Engineering (April 28)

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

«Experimental Investigation of the Three-dimensional Flow Field of Novel Aortic Valve Prosthesis Designs»

Federica Pilotto, PhD in Neuroscience (July 01)

Department for BioMedical Research (DBMR), Medical Faculty (Prof. Dr. Smita Saxena)

«Adaptive to Vulnerability Mechanisms in Neurodegeneration»

Joao Filipe Pinheiro Marques, PhD in Neuroscience (November 7)

Department for Biomedical Research, Medical Faculty (Prof. Dr. Antoine Roger Adamantidis)

«C9ORF72-ALS/FTD associated DPRs disrupt Na⁺/K⁺-ATPase function and promote TDP43 proteinopathy»

Chiara Pozzato, PhD in Biomedical Sciences (May 25)

Institute of Pharmacology, Medical Faculty (Prof. Dr. Georgia Konstantinidou)

«The role of focal adhesion kinase in lung cancer progression»

Q

R

Nicole Raad, PhD in Biochemistry and Molecular Biology (April 05)
Department of Chemistry and Biochemistry, Faculty of Science (Prof. Dr. Norbert Polacek)
«Functional characterization of sRNAs in stationary phase Escherichia coli»

Jana Silke Remlinger, PhD in Neuroscience (November 29)
Department Neurology, Inselspital Bern, Medical Faculty (PD Dr.med. Anke Salmen)
«Investigation of Antibody-driven Central Nervous System Autoimmunity with Focus on Involvement of the Visual Pathway»

Patricia Verena Renz, PhD in Biomedical Sciences (June 01)
Department for BioMedical Research (DBMR), Prenatal Medicine, Medical Faculty (Prof. Dr. med. Daniel Surbek)
«Understanding astrocyte polarization in perinatal white matter injury and its contribution to disease outcomes»

Michael Rieger, PhD in Biomedical Engineering (January 19)
Department of Physiology, Medical Faculty (Prof. Dr. Stephan Rohr)
«Development of a Panoramic Electro-Optical Recording System for Whole Heart Electrophysiology»

Christopher Roepstorff, PhD in Biomedical Engineering (September 27)
UZH Zürich, Department für Pferde, Vetsuisse Faculty Zürich, PD Dr. Michael Weishaupt
«An approach to applied weight-bearing asymmetry quantification using upper body kinematics in trotting horses»

Pascal Claudio Oliver Rossatti, PhD in Cell Biology (April 07)
Biotechnology Institute Thurgau (BITg), Medical Faculty (Dr. Jérémie Rossy)
«Investigating endosomes in activated T cells»

Marianna Rosso, PhD in Biomedical Sciences (June 20)
VPHI Vetsuisse Bern, Vetsuisse Faculty Bern (Prof. Dr. Hanno Würbel, PD Dr. Bernhard Völkl)
«Construct Validity of Behavioural Tests Assessing Anxiety in Mice»

Viviana Rubino, PhD in Immunology (March 31)
Department for BioMedical Research (DBMR), Medical Oncology, Medical Faculty (Prof. Dr. Carsten Riether)
«Immune receptors as stemness regulators in acute myeloid leukemia»

Alba Rudolf Vegas, DVM PhD (Doctor of Veterinary Medicine and Philosophy) (February 4)
Department for Farm Animals, Genetics and Functional Genomics, University of Zurich, Vetsuisse Faculty Zurich (Dr. Stefan Bauersachs)
«Deciphering maternal recognition of pregnancy in the mare»

Lorenz Timo Ryser, PhD in Biochemistry and Molecular Biology (May 24)
Department of Biology, Faculty of Science (PD Dr. Rémy Bruggmann)
«Biogenic amine formation by Morganella morganii and anticlostridial activity of Lactococcus lactis»

S

Fatemeh Safari, PhD in Biomedical Sciences (December 19)
Department for BioMedical Research (DBMR), Medical Faculty (Prof. Wilhelm Hofstetter)
«Exogenous and intrinsic regulators of bone remodelling»

Kadir Şimşek, PhD in Biomedical Engineering (July 04)
Magnetic Resonance Methodology, Institute of Diagnostic and Interventional Neuroradiology, Medical Faculty (Prof. Dr. Roland Kreis)
«Extending Diffusion-Weighted Magnetic Resonance Spectroscopy»

Raluca-Maria Sandu, PhD in Biomedical Engineering (May 05)
ARTORG Center for Biomedical Engineering Research, Medical Faculty (Prof. Dr. Raphael Sznitman)
«Quantitative assessment of ablation treatments for liver tumors – image-based efficacy analysis and predictive modelling»

Denis Elia Schenk, PhD in Biomedical Engineering (February 11)
Musculoskeletal Biomechanics, ARTORG Center for Biomedical Research, Medical Faculty (Prof. Dr. Philippe Zysset)
«Personalized Homogenized Finite Element Analysis for the Reproducible Assessment of Bone Strength»

Laetitia Irène Scherler, PhD in Biomedical Sciences (September 02)
DBMR, Faculty of Medicine, Prof. Dr. Geneviève Escher
«Role of vitamin D and vitamin D metabolizing enzymes in the prevention of atherosclerosis»

Jens Alexander Schröder, PhD in Biochemistry and Molecular Biology (March 28)
Institute of Plant Sciences, Faculty of Science (Prof. Dr. Pauline Emilie Jullien)
«Investigation of small RNA movement and pathways in Arabidopsis reproductive tissues»

Narayan Schütz, PhD in Biomedical Engineering (February 16)
ARTORG Center for Biomedical Engineering Research, Medical Faculty (Prof. Dr. Tobias Nef)
«Towards Unobtrusive Sensor-Derived Digital Measures of Health in Aging»

Raphaëla Isabelle Marianne Seeger, PhD in Biochemistry and Molecular Biology
Institute of Anatomy, Medical Faculty, Prof. Dr. Benoît Zuber
«Investigating synaptic vesicle exocytosis by structural studies of rat synaptosomes»

Chandrima Shrivastava, PhD in Biomedical Engineering (July 27)
EMPA - Swiss Federal Laboratories for Materials Science and Technology, Medical Faculty (July 27)
«Digital twins to reduce quality loss in supply chains of perishable biological products»

Therese Solberg, PhD in Biochemistry and Molecular Biology (November 22)
Institute of Cell Biology, Faculty of Science (Prof. Dr. Mariusz Nowacki)
«The role of small RNAs, chromatin modifiers and readers in Paramecium tetraurelia sexual development»

Andras Laszlo Soti, MD PhD (Doctor of Medicine and Philosophy) (January 11)
Department for BioMedical Research (DBMR), Medical faculty (Prof. Dr. med. Philipp Latzin)
«The significance of environmental and genetic factors for the developing immune system»

Lotte Johanna Elisabeth Spierenburg, PhD in Neuroscience (September 15)
Department of Physiology, Medical Faculty, Prof. Dr. Thomas Nevian
«Neuromodulation and plasticity in layer 5 pyramidal neurons in the anterior cingulate cortex»

Beatrice Lisa Steiner, PhD in Neuroscience (February 03)
Department for BioMedical Research (DBMR), Medical Faculty (Prof. Dr. Pascal Escher)
«Visual Cycle and Photoreceptor Development»

Silvio Steiner, PhD in Biochemistry and Molecular Biology (March 09)
Institute of Virology and Immunology, Vetsuisse Bern (Prof. Dr. Volker Earl Thiel)
«Virus-Host Interactions: How Coronaviruses Subvert Cellular Defense Systems»

T

Vito Andrea Timpanaro, PhD in Biomedical Sciences (November 29)
Hematology/Oncology, Department for BioMedical Research (DBMR), Medical Faculty (PD Dr.sc.nat.)

Michele Bernascon, Prof. Dr. Jochen Karl Rössler)
«Chimeric Antigen Receptor (CAR) T cell therapy for rhabdomyosarcoma: novel targets identified by surfaceome profiling and promising pre-clinical efficacy targeting CD276 and FGFR4»

Ioanna Tsioti, PhD in Biochemistry and Molecular Biology (June 13)
Universität für Augenheilkunde, Inselspital Bern, Medical Faculty (Prof. Dr. Martin Sebastian Zinkernagel)
«Targeting microglia/macrophages in retinal diseases»

U

V

Corinne von Känel, PhD in Biochemistry and Molecular Biology (August 11)
Department of Chemistry and Biochemistry, Faculty of Science (Prof. Dr. André Schneider)
«The peculiar inner mitochondrial membrane protein import machinery of *Trypanosoma brucei* and its evolutionary history»

Michelle Andrea von Siebenthal, PhD in Cell Biology (June 28)
Department for BioMedical Research (DBMR), Inselspital, Medical Faculty (Prof. Dr. Katia Monastyrskaya-Stäuber)
«Identification of Molecular Targets to Treat Obstructed and Neurogenic Bladder Dysfunction»

Luca Gabriele Valente, MD PhD (Doctor of Medicine and Philosophy) (January 26)
IFIK, Medical Faculty (Prof. Dr. Yok-Ai Que, Prof. Stephen Leib)
«Prophylaxis and Treatment of Staphylococcal and Pneumococcal Infections with Bacteriophages and their Endolysins»

Adrienne Nina Vancura, PhD in Biomedical Sciences (March 08)
DBMR Department for BioMedical Research, Medical Oncology, Medical Faculty (Dr. med. Simon Häfliger)
«Characterizing lncRNAs in cancer and investigating the role of miRNAs in lung cancer detection and therapy resistance»

W

Jasmin Anke Walter, DVM PhD (Doctor of Veterinary Medicine and Philosophy) (July 08)
Department for Farm Animals, Clinic of Reproductive Medicine, Vetsuisse Faculty Zurich (Prof. Dr. Ulrich Bleul)
«"CUMULOMICS" Unraveling cumulus-oocyte complex metabolism during maturation Unraveling cumulus-oocyte complex metabolism during maturation»

Joseph Mwaniki Wambui, PhD in Biochemistry and Molecular Biology (November 28)
Institute for Food Safety and Hygiene, University of Zurich, Vetsuisse Faculty Zurich (Prof. Dr. med. vet. Roger Stephan, PD Dr. Taurai Tasara)
«Genotypic and Phenotypic Characterization of the Psychrophilic *Clostridium estertheticum* Complex to Unravel Genes Involved in Blown-Pack Spoilage and Bacteriocin Production».

Samantha Weber, PhD in Neuroscience (December 16)
Department of Neurology, Medical Faculty (Prof. Dr. Selma Aybek Rusca)
«The Role of Stress in Neuropathophysiological Mechanisms of Functional Neurological Disorders»

Guodong Weng, PhD in Neuroscience (November 28)
Institute for Diagnostic and Interventional Neuroradiology, Medical Faculty (Prof. Dr. Johannes Slotboom)
«Robust Spectral Editing of J-Coupled Quantum Spin Systems at Ultra High Magnetic Field: Theory, Practical Limitations and Clinical Application»

Carmen Alexandra Widmer, PhD in Biochemistry and Molecular Biology
Institute of Animal Pathology, Vetsuisse Faculty Bern, Prof. Dr. Sven Rottenberg
«Investigating Platinum Drug Resistance using BRCA1;p53-deficient Mouse Mammary Tumor»

Sarah Widmer, PhD in Computational Biology (December 21)
Institute of Genetics, Vetsuisse Bern (Prof. Dr. Cord Drögemüller)
«Genetic analysis of female fertility focussing on multiple birth events in Swiss cattle»

Christoph Corin Willers, MD PhD (Doctor of Medicine and Philosophy) (July 11)
Department of Paediatrics, Medical Faculty (Prof. Dr. Med., Dr. phil. Philipp Latzin)
«Translation and validation of functional lung MRI as a clinical tool in paediatric lung disease»

Jie Wu, PhD in Biochemistry and Molecular Biology (August 12)
DCB Department for Chemistry and Biochemistry, Faculty of Science (Prof. Dr. Sebastian Leidel)
«The roles of tRNA modifications and ribosome-associated chaperones in translation dynamics and protein homeostasis»

Madeleine Wyss, PhD in Immunology (January 19)
Department for BioMedical Research (DBMR), Medical Faculty (Dr. Kathy McCoy)
«Effects of Microbial and Diet Composition on the Immune System»

Patric Wyss, PhD in Biomedical Sciences (November 22)
University Hospital of Old Age Psychiatry and Psychotherapy (UPD), Faculty of Science (Prof. Dr. David Ginsbourger)
«Data-driven diagnosis and prognosis of dementia»

X

Song Xue, PhD in Biomedical Sciences (October 13)
Department for BioMedical Research, Nuclear Medicine, Medical Faculty (Prof. Dr. Kuangyu Shi)
«Dose Optimization in Nuclear Medicine with Artificial Intelligence»⁷

6.3 Student Awards & Recognitions

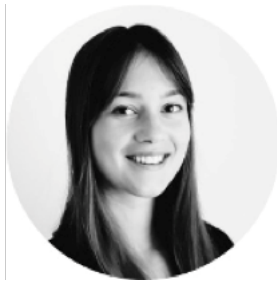
Finally, being able to do an onsite meeting, we are excited to announce that the GCB Symposium will take place on June 29, 2023, at the VonRoll Building. This location allows us to welcome more students to actively present in a new event format. Thus the 2022 best GCB thesis will be announced 6 months later.



Sara Çaku, PhD candidate, was awarded the best presentation prize at this year's Blood Research Program Research Day.

Sara Çaku's presentation was titled: "Characterization of the role of Gas6 at the interface between coagulation and inflammation as a basis for a novel therapeutic approach for sepsis".

The various projects of the program were briefly presented in a total of 36 lectures. Prof. Mario Tschan (Pathology) also presented an ongoing project.



UniBE DoC.Mobility Fellowship The program of "8x8' - Young Martina Reichmuth, a PhD student enrolled at the GCB, received a one-year UniBE DoC.Mobility fellowship to study the SARS-CoV-2 dynamics at CERI within the School of Data Science and Computational Thinking at Stellenbosch University, South Africa.



SNSF 1st Prize in Scientific Photography Best free Oral Translating data with sensitivity and poetry

Lara Indra of the University of Bern snagged first prize in the "Women and men of science" category for a shot of a decomposed pig cadaver taken by a surveillance camera while she was studying the process of decomposition in the forest. The jury declared the work an "authentic and uncontrived glimpse of fieldwork". Says Indra, "What I like about this photo is that for once, the camera wasn't photographing a fox or a mouse, but me doing my work".



The 19th Annual ENETS conference and the 1st World NET Forum took place in Barcelona, Spain, in March 2022. A world-class line up of renowned clinicians and distinguished neuroendocrine tumor researchers from all over the world participated in this year's edition. With >2500 attendees, >80 speakers, and >180 posters the event was a huge success and remains a cornerstone in the agenda of the neuroendocrine tumor science community. For his research in the field of personalized medicine using ex vivo patient-derived tumor models, Mr. Simon April-Monn, a PhD Student at the Institute of Pathology Bern, was selected for an oral presentation and awarded for his findings and his presentation in the category "basic science".



Best Presentation Award: Vaccines for Covid-19 at WIRM

Anne-Catherine Vogt

<https://ssai.ch/en/events/wirm-world-immune-regulation-meeting-xvi>



Young Researchers Talk 8 x 8

The program of "8x8" - Young Researchers Talk, the abstracts and the coverage in Unilink give an insight into the breadth of events funded by the project pool.

The conversations of pain and sleep: The modulation of pain processing by sleep and how pain decreases sleep quality.

Presented by: Raquel Adaia Sandoval Ortega, Institut für Physiologie, University of Bern



SSPP Annual Assembly SSPP 2022 Luzern

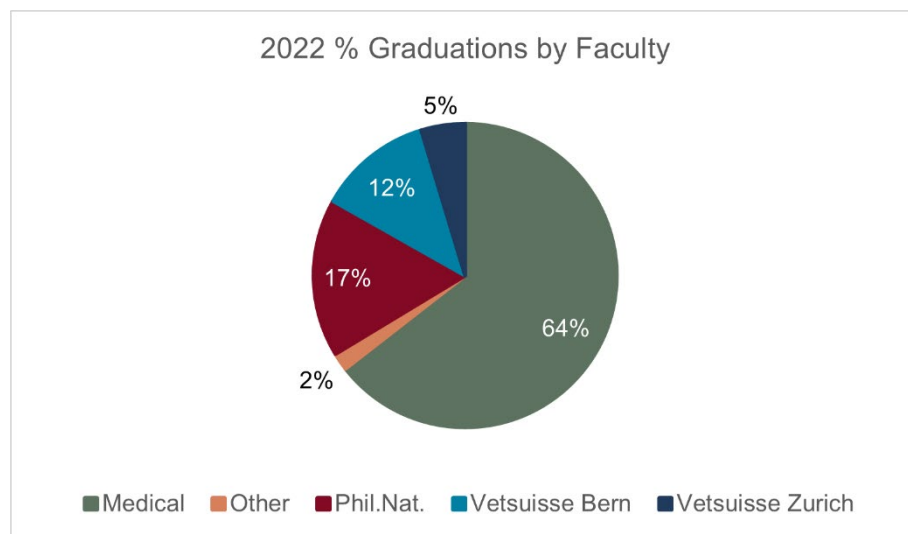
Best free Oral communication (NR):

Sinonasal features in patients with Primary Ciliary Dyskinesia - an EPIC-PCD study, by Yin Ting Lam.

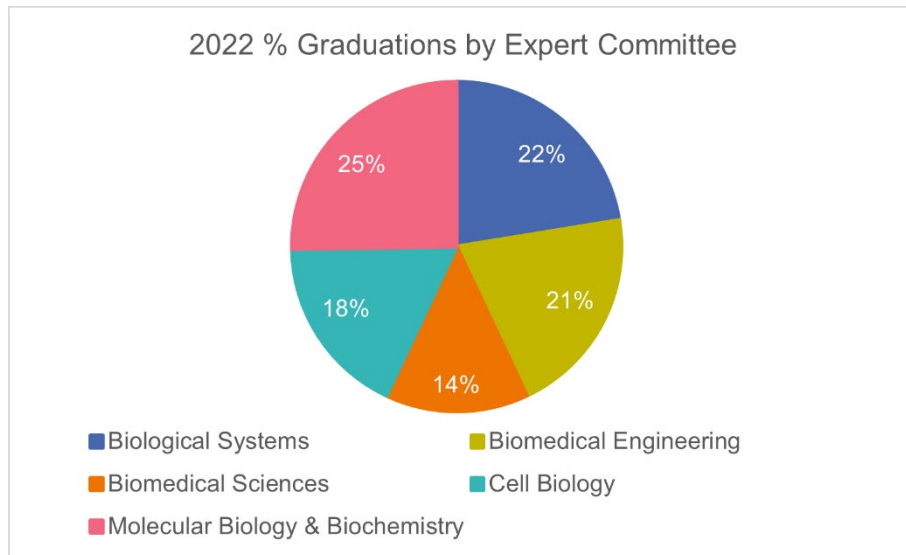
7. Facts and Figures



7.1.1 Graduations by Faculty



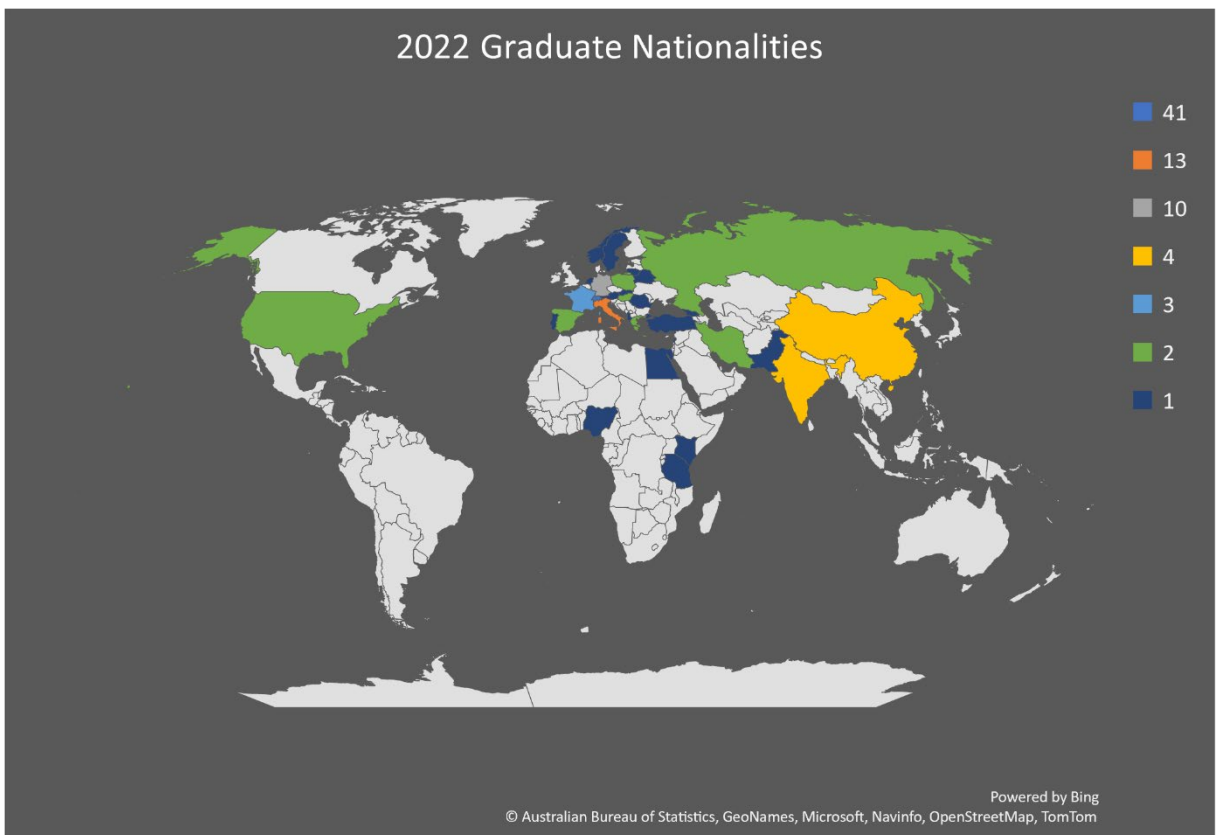
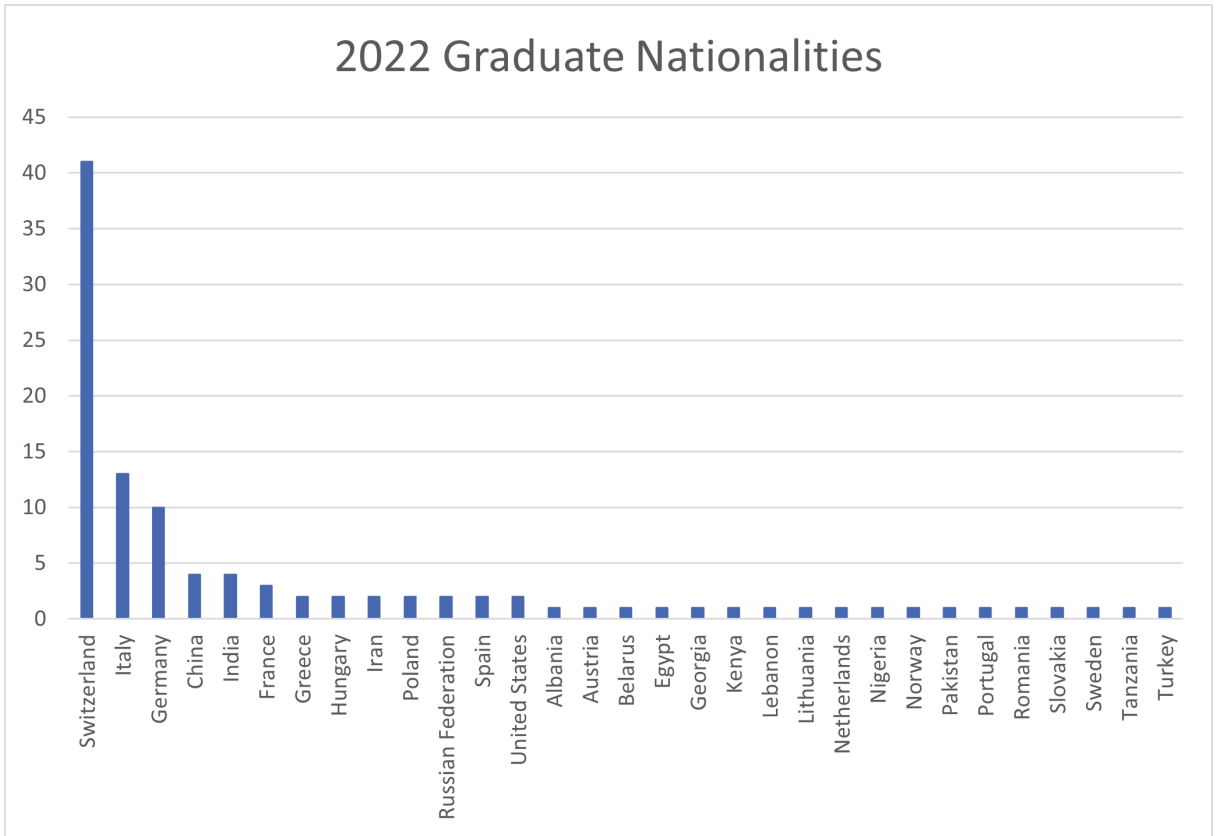
7.1.2 Graduations by Expert Committee



7.1.3 Degree Titles by Faculties

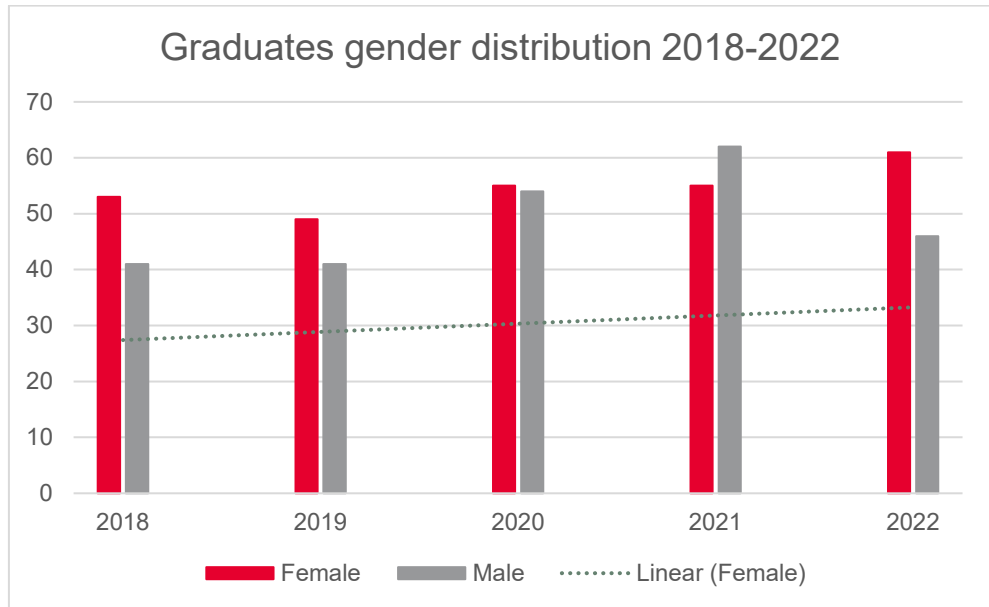
Degree Titles by Faculty						
2022 Degree Titles	Faculty of Medicine	Faculty of Science	Vetsuisse Faculty BE	Vetsuisse Faculty ZH	Affiliated Institutions*	Total Titles
MD, PhD	8					8
DVM, PhD			4	3		7
PhD in Biomedical Engineering	18			1		19
PhD in Biomedical Sciences	17	1	3			21
PhD in Immunology	6					6
PhD in Neuroscience	11					11
PhD of Science in Biochemistry and Molecular Biology	5	14	4	1		24
PhD of Science in Cell Biology	3	2			2 ¹	7
PhD in Computational Biology	1	1	2			4
Total	69 (61%)	18 (10%)	13 (22%)	5 (4%)	2 (3%)	107 (100%)
*Biotechnology Institute Thurgau (BITg) ¹						

7.1.4 Nationalities of 2022 Graduates

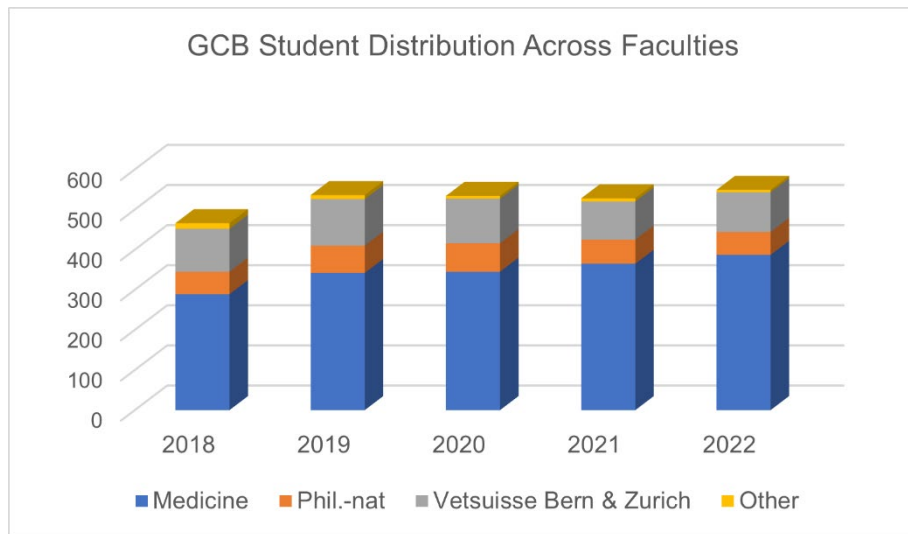


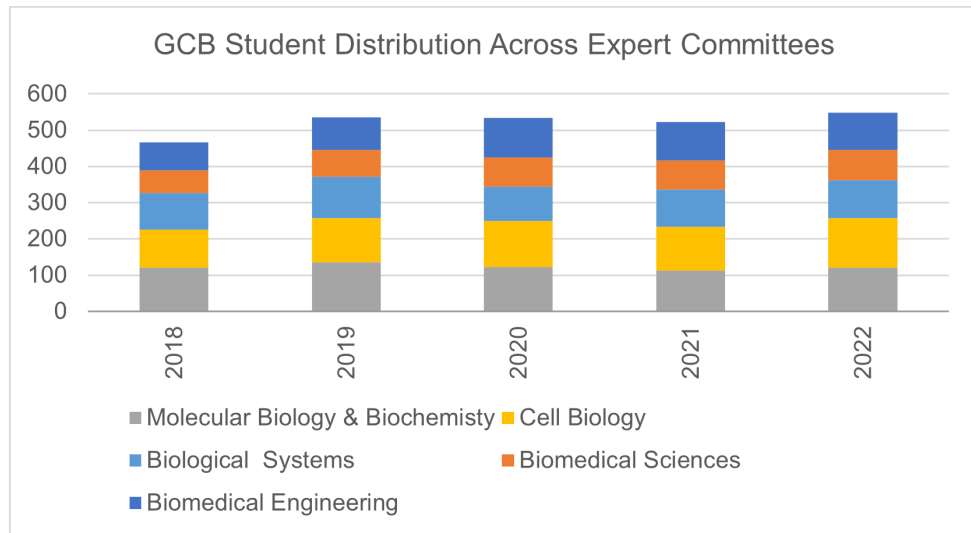
7.2 Five-Year Figures (2018-2022)

7.2.5 Graduates's Gender Distribution



7.2.6 Student Distribution Across Faculties





8. Acknowledgments

The **University of Bern Leadership** and **Deans** of the three GCB Faculties of Medicine, Science and Vetsuisse that jointly administer the graduate school. The support the graduate school receives allows the GCB administration and partners to continue to offer excellence throughout its structured graduate program.

The **GCB PhD Committee** for their ongoing support that continued without disruption due to the Covid-19 pandemic and despite the many challenges the graduate school faced in 2022. It is a credit to the Committee and their practical approach to problem-solving and decisiveness as a team, that the GCB could continue to maintain its daily business, welcome 127 new students, graduate 107 students and navigate a myriad of difficult situations with successful outcomes. The committee's support made the 2nd fully virtual symposium a possibility. Instead of having to cancel the highly anticipated and valued annual event, the symposium could not only be held online, but with resounding success.

The year 2022 was **Prof. Rupert Bruckmaier's** last full year as Vetsuisse Faculty representative on the Interfaculty PhD committee. Rupert will retire after the GCB Symposium in June 2023. We would like to use the opportunity to thank him in this annual report for his great commitment to the GCB. Rupert has held this position with dedication for more than 10 years, since June 2012, and is thus one of the more experienced members of the GCB. During these 11 years, Rupert served twice as GCB President in rotation, from August 2015 to July 2017 and from January 2021 until now. In addition, he represented the PhD committee in the Biological Sciences Expert Committee, which could count on his high competence in the field of physiology, especially in endocrinological regulatory mechanisms and mammary immune responses.

As a representative of the Vetsuisse Faculty, he was naturally particularly involved in the PhD studies of veterinary graduates from both the Vetsuisse Faculty of Bern and Zurich. During his first presidency, he was instrumental in reaching a landmark agreement with the Vetsuisse Faculty of Zurich on the participation of its veterinarians in the Bernese GCB PhD program.

During Rupert's time in the GCB, he was dedicated to helping young scientists develop their future careers. He has been an engaged supervisor, co-advisor, and mentor for 22 PhD candidates of the GCB. With his down-to-earth Bavarian humor, Rupert contributed significantly to an open and relaxed atmosphere at the GCB; however, he never wavered on or compromised the high value he placed on quality and excellence in PhD training. The doctoral students knew they could always rely on his support, whether it was when something went wrong, or they experienced problems with supervision or even when they simply needed advice. He will be missed. (The current GCB administration extends our gratitude PD Dr. Marlene Wolf, GCB Coordinator from the inception of the GCB through to her retirement in January 2019, for her contribution to this section.)

Tobias Nef and **Stephan Gerber** from ARTORG Center for Biomedical Engineering Research for agreeing to take on and take over the planning of the virtual GCB Symposium again in 2022. Without your efforts, the GCB PhD Committee faced the decision of potentially having to cancel the GCB Symposium due to the pandemic. Your proposal to provide not only a virtual option, but a robust one, allowed staff and students to look forward to this fundamentally important and integral part of the GCB. Thank you, as well to the ATORG PhD students who provided technical support during the symposium: **Michael Single, Michael Graeme Falkner, Oriella Gnarra, Nicole Rüttgers, Narayan Schütz, Myla Van Wegen.**

The **GCB PhD students** who have rallied and continued with their research and studies despite the additional challenges presented to them resulting from ongoing uncertainties still due to the pandemic.

Raffaele Battaglia and the **Institute of Social and Preventive Medicine (ISPM) IT Support team** for their unflappable support throughout varying levels of IT-literacy, and many urgent requests; you have kept us in business and prevented us from having serious work-stoppages due to IT challenges.

Barbara Järmann of IBMM for supporting the GCB in all matters concerning the Bridge Program and supporting us in all questions relating to “Bridge”.

The CTS/KSL team (**Jeff Slater, Roger Hasler, Norbert Wernicke**) have been a great support throughout the year with their expertise, quick responses to our questions and issues and not infrequently their quick wit has mitigated any system-related frustration.

We would like to thank **Barbara Engel** and her **University of Bern HR** team for their valuable expertise and support with employment and management issues of our students throughout the year.

The **ILUB team** and **Sibylle Reichel** for her guidance and advice and Sevgi Isaak for training the eCoaches. The GCB eCoaches, **Minh Lam** and **Jessica Riediker** have applied their IT skills, student perspective, and keen organizational and editing skills to creating the GCB101 eLearning platform and elevating the original idea into a more useful resource for all GCB stakeholders.