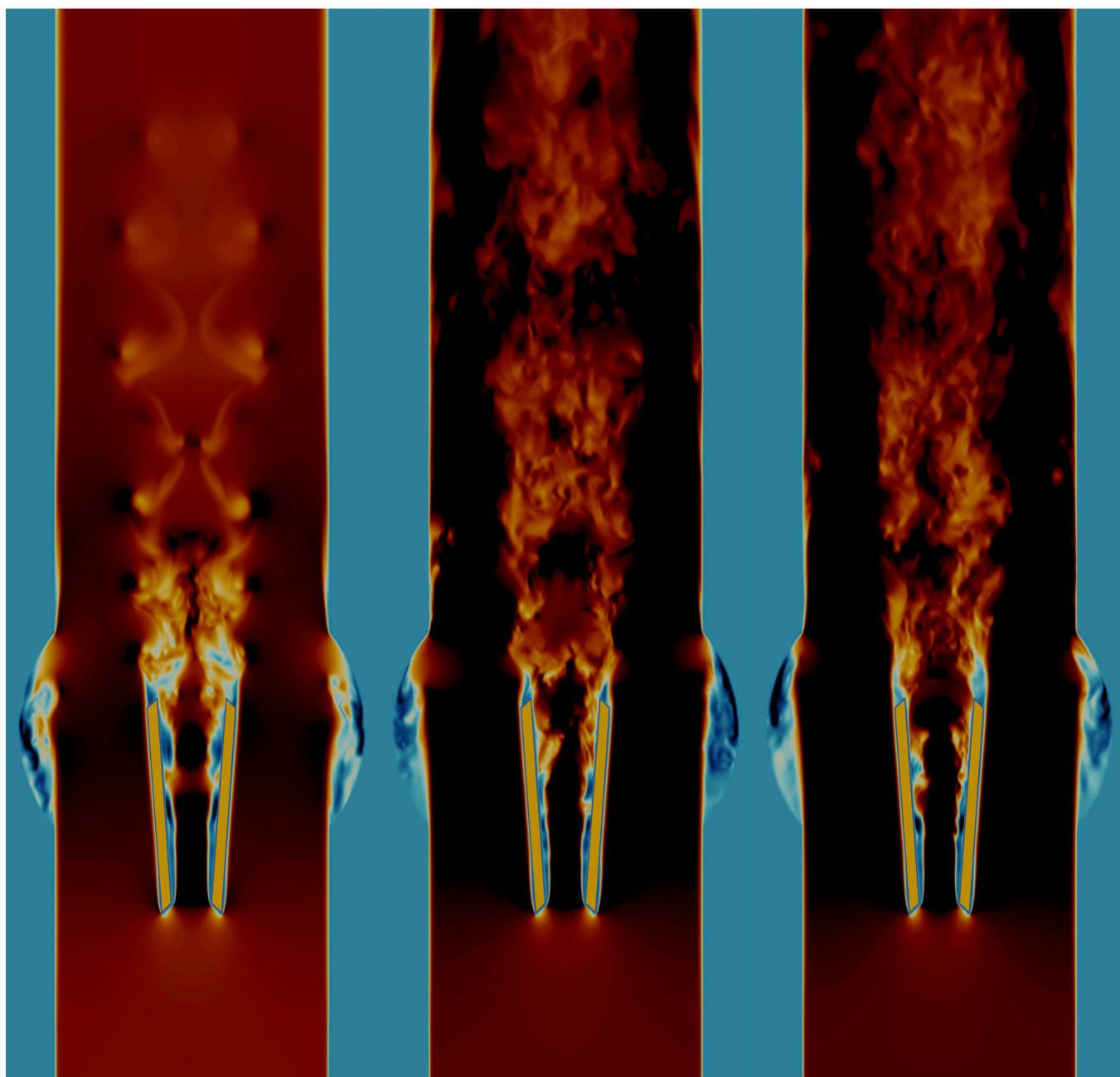


ANNUAL REPORT 2020

Faculty of Medicine

Faculty of Science

Faculty of Veterinary Medicine (Vetsuisse Faculty)



H. Zolfaghari, D. Obrist. Absolute instability of impinging leading edge vortices in a submodel of a bileaflet mechanical heart valve, *Physical Review Fluids* (4), 123901 2019.

GCB

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GRADUATE SCHOOL FOR CELLULAR AND BIOMEDICAL SCIENCES (GCB)

LETTER FROM THE PRESIDENT

Prof. Dr. med. Frank Stüber

Dear Reader

The Graduate School for Cellular and Biomedical Sciences has experienced quite a special year. Due to the corona pandemic, the GCB faced unexpected as well as unprecedented challenges.

Shortly after specific hygiene measures for lab work had been defined and established, the University decided to shut down scientific work at University facilities. This included a stop for projects, careers and extension of funding periods. This also meant a stop of teaching for that time being, which required establishing new methods of teaching and examining online instead of face to face.

This has changed all our professional lives and each one of us tried to bring out the best in this difficult situation. And yes, the GCB succeeded in continuing activities low key and running the program again after the lockdown.

Many thanks to Monica Schaller and her team, many thanks to all the examiners, mentors, and last but not least, many thanks to our graduate students who suffered most from uncertainties facing a stop in their young careers. They all kept the GCB going.

So, at the end of 2020, the GCB has a total of 534 enrolled PhD candidates, 51% of whom are women. 108 graduations were celebrated together with 254 publications that have been accepted throughout the year 2020.

I am again impressed with the drive and enthusiasm of the GCB team together with the graduate students who managed to handle the crisis of 2020. We all will grab the positives we learnt and take them into the future of our work.

For the next GCB presidency, I welcome Rupert Bruckmaier and wish him the best of luck for his term!



Prof. Dr. med. Frank Stüber
President, GCB PhD Committee

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 doctoral 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 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.
- **Visibility of the Graduate School.** 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.

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 a PhD, MD, PhD or DVM, PhD degree.

The PhD program aims to provide comprehensive, internationally competitive training in the theory and practice of experimental research as well as in-depth specialist knowledge of the individually selected research area. It directs the students towards independent scientific work and enables 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, Biomedical Engineering, 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, and 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

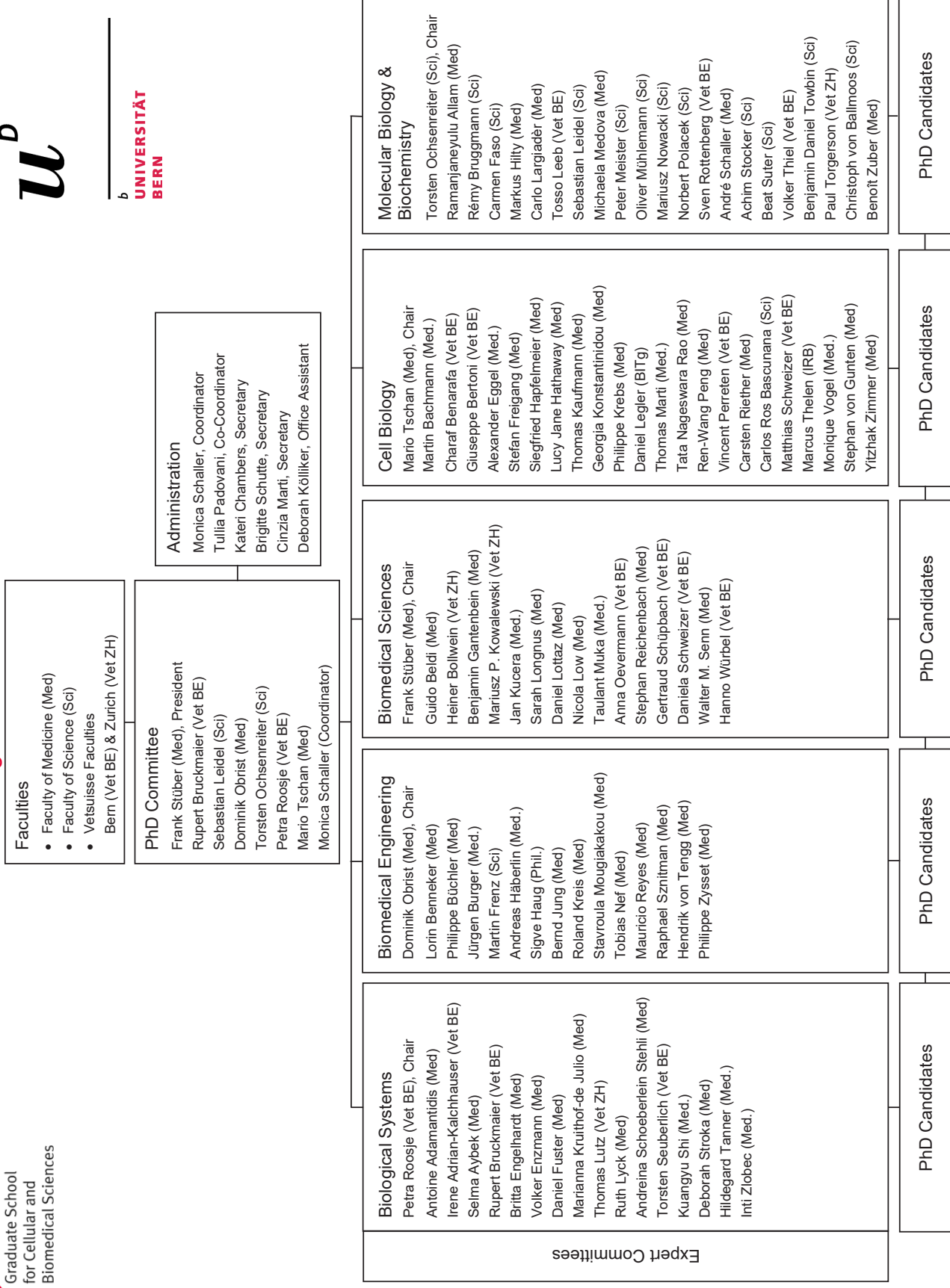
are responsible for the admittance, guidance, and evaluation of the PhD candidates. Each research project is assigned to one of the GCB Expert Committees, with one of its members acting as mentor to the PhD candidate. The supervisor, mentor and student plan the individual training program of the PhD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

The GCB organization chart is shown on the following page.

2020 Expert Committee Membership Changes

Biological Systems	Biomedical Engineering	Biomedical Sciences	Cell Biology	Molecular Biology & Biochemistry
Welcomed				
Inti Zlobec	Sigve Haug	Jan Kucera	Thomas Marti	Carmen Faso
Kuangyu Shi		Muka Taulant	Martin Bachmann	Andreas Häberlin
			Monique Vogel	Beat Suter
			Alexander Eggel	Benjamin Towbin
			Tata Nageswara Rao	
Bid Farewell				
		Julia Bolius		Oliver Pertz
				Jürg Gertsch
				Rory Johnson

GCB Organization Chart



PHD PROGRAM

PHD

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 2020, these included:

AFFILIATED INSTITUTIONS

Institute for Research in Biomedicine (IRB), Bellinzona
 CAScination AG, Bern
 Empa (Swiss Federal Laboratories for Materials Science & Technology, CH
 Laboratory for Biomedical Neurosciences (LBN), Torricella-Taverne
 AO Research Institute, Davos
 RMS Foundation, Bettlach
 Swiss Institute of Equine Medicine, Bern
 Veterinary Public Health Institute (VPH), Liebfeld

PROGRAM STRUCTURE

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

Supervisor is hiring 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.

PHD AND DVM CURRICULUM & PROGRAM REQUIREMENTS

I	Earn a minimum 6.0 ECTS of scientifically oriented courses. ECTS must be lecture courses or book clubs which include exams. Exams must be passed after a maximum of two attempts (Promotionsreglement, Art. 92 and Art. 191).
II	Participate in Scientific Integrity course.
III	Pass a mid-term evaluation during the 2nd year – student presents a scientific seminar in the presence of their PhD thesis advisor to demonstrate in-depth knowledge of their research field.
IV	Attend and participate in the annual GCB Symposium on the topic of PhD studies.

PROMOTION REGULATIONS NEW FROM FEBRUARY 2020

SPECIALIZATIONS

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

1. Cutting Edge Microscopy (CEM)

The PhD program Cutting Edge Microscopy received funding by swissuniversities and University of Bern during the period 2017 to 2020. An extension of the CEM PhD program was granted by the vice-rectorate Development of University of Bern for the two years period 2021 – 2022. The CEM program was launched in January 2017 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/studies_phd_trainings/phd_program_cutting_edge_microscopy/

2. 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/>

3. Cell Migration

The PhD Program Cell Migration started as an SNF-supported ProDoc program on October 1st, 2011 (<https://cell-mig.ch>). 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. The current program can be found under the following link: https://www.tki.unibe.ch/continuing_education/bern_immunology_club/index_eng.html

These modifications were made to improve the quality of the PhD program.

Thesis Defense Format

1. External Co-referee required. The thesis defense still consists of a public presentation of 40-45 minutes after which the public can ask questions, but the 60 minutes discussion part is now transformed into a closed discussion with the examiners only.
2. The oral presentation may be held on a separate day than the closed discussion if this is desirable or both parts can be held one after each other. In any case, all four examiners need to be present on both days.
3. The examiners are the supervisor(s), the co-advisor and the mentor and the external co-referee. This external co-referee can be the same as the one for the written thesis or can be another external co-referee. Important, the external co-referee can be present either in person or by video conference. All four examiners will give one grade for the oral defense (regardless of whether the public and closed defense take place on different days).

PhD Title

1. The title "PhD of Science in..." is modified to PhD in... which are now:
 - PhD in Biochemistry and Molecular Biology
 - PhD in Cell Biology
 - PhD in Biomedical Sciences
 - PhD in Immunology
 - PhD in Neuroscience
 - PhD in Biomedical Engineering
 - MD,PhD (Doctor of Medicine and Philosophy)
 - DVM,PhD (Doctor of Veterinary Medicine and Philosophy)
 - DDS,PhD (Doctor of Dentistry and Philosophy)
2. PhD in Computational Biology-new title

German Translation

The diploma with the doctoral title will include a German translation: doctor scientiae naturalis (Dr.sc.nat) without discipline. This also holds true for MD,PhDs and DVM, PhDs

MD-PHD PROGRAM

The MD-PhD program enables scientifically interested medical students biomedical training, which prepares them for an academic career. The Faculty of Medicine of the University of Bern offers numerous opportunities to work in research groups of the international top class to be integrated.

MD-PHD CURRICULUM & PROGRAM REQUIREMENTS

I	Earn a minimum 25 ECTS of which part may be obtained through previous laboratory work (MD thesis or other, to discuss with the coordinator of the GCB) which can be obtained by participating in approved, project-related and interdisciplinary courses, workshops, seminars, and lectures. Course work in the range of 6 ECTS is a requirement tailored for the research project is mandatory in addition to the basic 25 ECTS (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.
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.

Graduate School for Cellular and
Biomedical Sciences (GCB)

Programm MD-PhD

Die Ärztin als Forscherin
Der Arzt als Forscher



gcb
Graduate School
for Cellular and
Biomedical Sciences



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 fourth 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.

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 particular research project (cell biology/biochemistry, molecular biology, immunology, neurobiology, tumor biology, etc.), and of the PhD thesis. Comprehensive [guidelines](#) are available on the GCB Website.

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 program www.samw.ch/en/Funding/MD-PhD-Program.

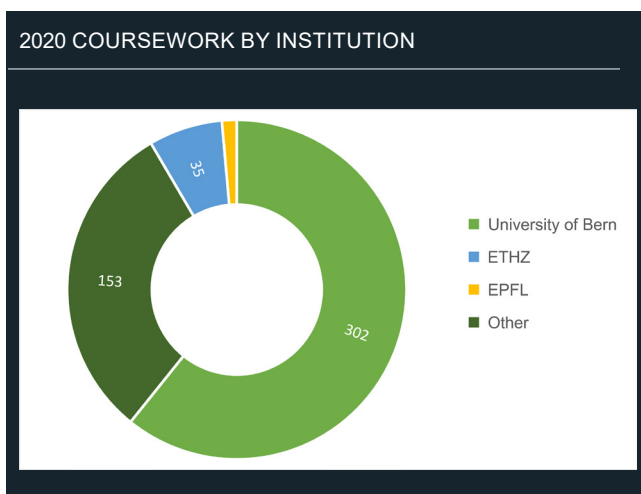
COURSES & SEMINARS

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. Doctoral students also participate in EU framework programs or in internationally organized Summer Schools, which provide high quality training in specific fields. These include, in particular:

- ETH, Zürich
- EPFL, Lausanne
- NCCRs, e.g., TransCure, RNA & Disease
- Forum for Genetic Research (sc | nat, Swiss Academy of Sciences)
- Doctoral Programs in Microbial Sciences and «StarOmics» (both CUSO)
- BENEFRI Neuroscience, Program (Universities of Bern and Fribourg)
- Cell Migration program in Immunosurveillance, Inflammation, Tumorigenesis and Metastasis (Universities of Bern, Fribourg, Geneva, and associated institutes)
- Swiss Institute of Bioinformatics (SIB)
- SSPH+ PhD Program in Public Health (Swiss School of Public Health)
- SLKMB Courses & Meetings – LS2
- Science IT Support
- Doctoral Programs in Biology - CUSO

INDIVIDUAL STUDY PROGRAMS

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. By 2020 the list of approved courses had grown to nearly 500 Lectures, Tutorials, and Book Clubs (497) approved for GCB PhD candidates. Of those, 302 (67%) were offered by the University of Bern. 35 (7%) took place at ETH Zürich (Eidgenössische Technische Hochschule Zürich), 1% at EPFL and 153 (31%) were fewer than 3 instances from other institutions.



LECTURES, TUTORIALS, AND BOOK CLUBS

Special Courses Organized for GCB Students

Despite the disruption caused by the pandemic, new courses were added and held in 2020 and popular courses were offered twice to accommodate higher registrations than usual. Between mid-March and September and again from October through December, courses were moved from presence to online. Although some practical courses were not able to take place, most of the GCB courses and tutorials continued to the credit of dedicated and innovative faculty and students.

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)
- 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)
- Intro. to Epidemiology & Biostatistics (G. Schüpbach & J. Berezowski)
- Book Clubs, Journal Clubs and Seminars (Institute of Social and Preventive Medicine ISPM)
- Statistical Data Analysis 1 and 2 (S. Haug)
- R Bootcamp (S. Haug)

GCB SEMINARS

In 2020, as in past years, 7th «SCRM PhD Student Retreat» received financial funding from the GCB, as well as from the program for Stem Cell Research in Regenerative Medicine (SCRM), and other institutions.

Photo Right
SCRM Retreat
2020
Sept. 4, 2020



New Courses in 2020

- **Introduction to R** (Prof. D.M. Keogh-Stroka and Dr. D. Sánchez Taltavull)
- **Cytogenetics Diagnostics** (Dr. A. Pieńkowska-Schelling)

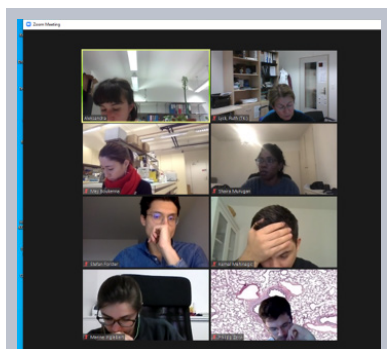
Added 2nd session to accommodate increased demand from pandemic restrictions on presence teaching.

- **Scientific Integrity** (Prof. T. Ochsenreiter)
- **DNA Sequencing and Variant Analysis: Basics of Sanger and Next Generation Sequencing** (Dr. V. Jagannathan and Prof. Dr. rer. nat. T. Leeb)

Transferrable Skills Courses

- Scientific Communications for PhD Students
- Presenting with Confidence
- Basics of Ethics in Health Sciences Research
- Effective Grant-Writing for Young Scientists
- Scientific Writing Course

Photo Right
Cell Biology
Happy Cell
Tutorial
Attendance
Confirmation,
Dec. 15, 2020



PhD students met for their annual retreat on the 4th of September 2020 in the beautiful location of Gurten Park in Bern. We were very happy to have Prof. Catherine Verfaillie from the Stem Cell Institute of Leuven, Belgium, as our academic mentor, and Dr. Roland Leathers from ThermoFisher, as our industry mentor. As every aspect of our lives in the past year, our retreat had to face new challenges related to the Covid-19 pandemic too. Thanks to the protection measures in place and to the limited number of participants, holding the retreat was still possible. However, due to travel restrictions, our academic mentor was not able to reach Bern. In replacement, Dr. Amiq Gazdhar and Prof. Deborah Keogh-Stroka were so kind to join us on very short notice, offering their valuable contribution and inputs to our discussion. We really enjoyed interacting with them and we deeply thank them. With 20 PhD students participating including 11 presenting their work in a talk, the retreat was indeed successful. In particular, there was great enthusiasm over the possibility to network again with our peers, discuss our projects and get insights and advices, after some tough months. As usual, coffee breaks, lunch and the closing apéro were nice opportunities to get to know each other and share ideas and future plans in a relaxed environment. Our industry mentor Dr. Leathers gave a very interesting keynote lecture, sharing his career path and personal experiences. We really appreciated his enthusiasm and commitment in discussing with young researchers about future opportunities and the capacity of always reinventing ourselves. The keynote lecture of our academic mentor was postponed to another date and organized via Zoom. Prof. Verfaillie was very keen to share her expertise and advices with us despite not being able to attend in person. We would like to thank them both for having been so inspiring for all of us. 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 again. Special thanks goes to the Fund for the Promotion of Young Researchers of the Mittelbauvereinigung of the University of Bern for granting us financial support too. Thanks also to all the students who have enthusiastically participated. We are looking forward to welcoming interested students to our next retreat, which will take place on September 3, 2021.

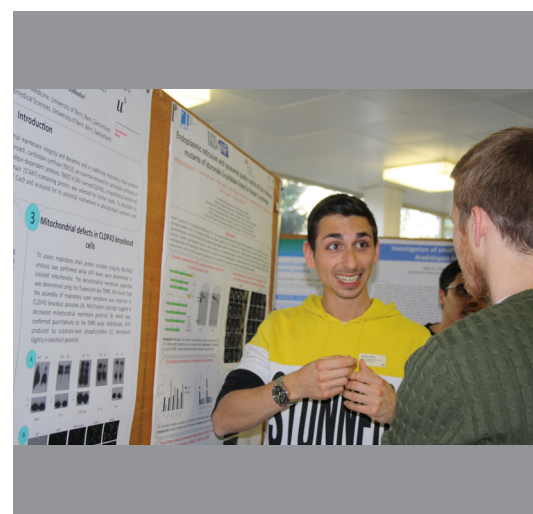
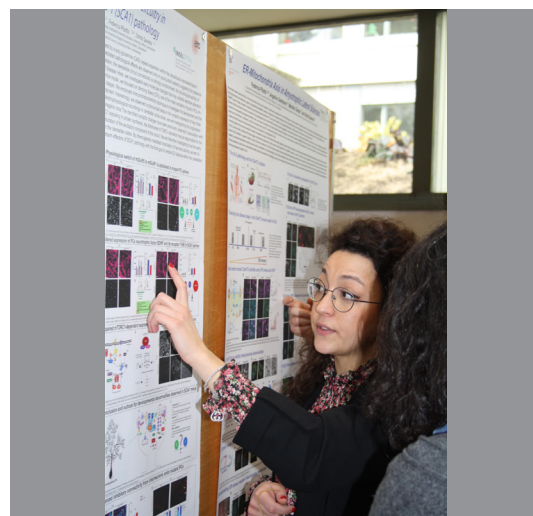
On behalf of the Organizing Committee 2020

*Viviana Rubino, Chantal Bachmann,
Cristina Kalbermatter, João Marques*

Photo left

GCB Symposium 2020
Refreshments

Photos right

GCB Symposium 2020
Poster Session

GCB 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), or a Poster Slam 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. In 2020, PhD candidates presented 40 Talks, 76 Poster Flash presentations, 282 Posters.

Photo Right

Sylviane Muller
2020 Keynote Presentation



Mechanism-guided novel therapies for treating inflammatory diseases
Sylviane Muller, School of Biotechnology, University of Strasbourg, France

Nowadays, pharmacologic treatments of inflammatory and autoimmune diseases are largely palliative rather than curative. They result in non-specific immunosuppression, which can be associated with disruption of natural and induced immunity with significant, sometimes dramatic, adverse effects. Among the novel strategies that are under development, tools that target specific molecular pathways and cells, and more precisely modulate the immune system to restore normal tolerance mechanisms, are central. In these approaches, peptide therapeutics represent a class of agents that display many physicochemical advantages. Among them, the phosphopeptide P140 is very promising for treating patients with systemic lupus, and probably more largely patients with chronic inflammatory diseases. P140/Lupuzor is currently evaluated in phase III-clinical studies worldwide. This peptide targets key elements of chaperone-mediated autophagy, which are hyperactivated in lupus. The “correcting” effect of P140 on autophagy results in a weaker signaling of autoreactive T and B cells, leading to a significant improvement of physiopathological conditions. These findings open novel avenues of therapeutic intervention in pathological conditions in which reduction of autophagy activity is desired. Promising data have been obtained in animal models mimicking Sjögren's syndrome and neurological autoimmune diseases. After the era of drugs classified as “disease-modifying” therapeutics, a new type of “mechanism-guided” therapies starts to emerge for treating inflammatory diseases.



Thesis Defense proceedings were held in person January through mid-March. The remainder of 2020, the defense proceedings were held online. Additionally, the new promotion regulations came into effect from February 1, 2020.

2020

Joyce Odeke Akello, PhD in Biochemistry and Molecular Biology (October 21)
Institute for infectious diseases, Faculty of Medicine (Prof. Stephen Leib)
Identification and Characterisation of Emerging Viruses from Clinical and Environmental Samples

Andrea Marco Amati, PhD in Biochemistry and Molecular Biology (May 20)
Department for Chemistry & Biochemistry, Faculty of Science (Prof. Dr. Christoph von Ballmoos)
«Towards unidirectional reconstitution of membrane proteins into liposomes»

Simona Amodeo, PhD in Biochemistry and Molecular Biology (September 22)
Institute of Cell Biology, Faculty of Sciences (Prof. Dr. Torsten Ochsenreiter)
«One structure to link it all – the interface between the mitochondrial genome, and its replication and segregation machinery in *Trypanosoma brucei*»

Nanina Tamar Anderegg, PhD in Biomedical Sciences (December 18)
Institute of Social and Preventive Medicine, Faculty of Medicine (Prof. Matthias Egger)
«People living with HIV worldwide: from start of antiretroviral therapy to retention in care and death»

Maria Regula Arnold, PhD in Biomedical Sciences (April 27)
Department of Cardiovascular Surgery, Faculty of Medicine
(PD Dr. Sarah L. Longnus, Prof. Dr. Hendrik Tevaearai Stahel)
«Heart transplantation with donation after circulatory death: Energy metabolism in cardioprotection»

Fabian Balsiger, PhD in Biomedical Engineering (December 4)
ARTORG Center for Biomedical Engineering Research, Faculty of Medicine (Prof. Mauricio Reyes)
«Quantitative Magnetic Resonance Imaging to Diagnose and Monitor Neuromuscular Diseases»

Güliz Tuba Barut, PhD in Immunology (September 16)
Institute of Virology and Immunology, Vetsuisse Faculty (Prof. Dr. Arthur Summerfield)
«Immunostimulatory effects of toll-like receptor ligands on bovine peripheral blood dendritic cells and monocytes»

Jens Michael Becker, Doctor of Veterinary Medicine and Philosophy (DVM, PhD) (November 30)
Department of Clinical Veterinary Science, Vetsuisse-Faculty (Prof. Mireille Meylan)
«The novel concept for veal calf fattening ‘outdoor veal calf’ and its associations with antimicrobial use, mortality, daily weight gain and the evolution of antimicrobial resistance in the course of the fattening process»

Photo Right

Thesis Defense
Matteo Rossi Sebastiano PhD in Biomedical Sciences (March 31)



Johanna Karin Bernhard, Doctor of Veterinary Medicine and Philosophy (DVM, PhD) (August 20)
Clinic for Ruminants, Vetsuisse Faculty Bern (Prof. Dr. Adrian Steiner)
«Lameness, Behavior and Skin Lesions in Swiss Dairy Cows Housed in Tie Stalls»

Giuseppe Bombaci, PhD in Immunology (April 28)
Department for BioMedical Research (DBMR), Faculty of Medicine (Prof. Dr. Ramanjaneyulu Allam)
«Understanding the role of RNH-1 in Inflammation»

Nuria Bosch Guiteras, PhD in Biomedical Sciences (December 11)
Department of BioMedical Research (DBMR), Faculty of Medicine (Prof. Rory Johnson)
«Enhancing CRISPR deletion via pharmacological delay of DNA-PK »

Lisa Maria Bracher, PhD in Biochemistry and Molecular Biology (May 7)
Department of Chemistry and Biochemistry, Faculty of Science (Prof. Dr. Norbert Polacek)
«The role of human vtRNA1-1 in starvation-mediated apoptosis»

Oliver Stephan Caliaro, PhD in Biochemistry and Molecular Biology (November 6)
DCB, Faculty of Science, Bern (PD Dr Carlos Ros)
«Intracellular Trafficking and Uncoating of Human Parvovirus B19»

Daniela Casari, PhD in Biomedical Engineering (October 27)
EMPA, Faculty of Medicine (Prof. Philippe Zysset)
«Mms19: A regulator of mitosis and neural development in Drosophila melanogaster»

Rohan Chippalkatti, PhD in Cell Biology (February 18)
Institute of Cell Biology (Prof. Dr. Beat Suter)
«Mms19: A regulator of mitosis and neural devel

Anca-Liliana Cismaru, PhD in Biomedical Sciences (August 10)
Department of Clinical Chemistry, Faculty of Medicine (PD. Dr. Ursula Amstutz)
«Genetics of metamizole-induced agranulocytosis»

Michel Jacques Counotte, PhD in Biomedical Sciences (January 27)
Institute of Social and Preventive Medicine (Prof. Dr. Nicola Low)
«Zika virus: Causality, open science and risk of emerging infectious diseases»

Iva Cvitas, PhD in Immunology (January 24)
Department of Clinical Research and Veterinary Public Health, Vetsuisse Faculty Bern (Prof. Dr. Eliane Marti)
Investigating the role of keratinocytes in the development of equine insect bite hypersensitivity

Carmen Cornelia Maria de Jong, MD, PhD (Doctor of Medicine and Philosophy) (February 24)

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

«Childhood asthma: From referral to long-term outcomes»

Monica de Oliveira Caldeira, PhD in Biomedical Sciences (December 9, 2020)

Veterinary Physiology, Vetsuisse Faculty (Prof. Rupert Bruckmeier, Prof. Olga Wellnitz)

«Nonsteroidal anti-inflammatory drug effects on the immune system of dairy cows»

Annunziata Di Domenico, PhD in Biochemistry and Molecular Biology (April 29)

Institute of Pathology Faculty of Medicine (Prof. Dr. med. Aurel Perren, Dr. Ilaria Marinoni)

«Designing a pancreatic neuroendocrine tumour (PanNet) progression model based on epigenetics»

Benjamin Peter Eigl, PhD in Biomedical Engineering (November 11)

RTORG Center For Biomedical Engineering Research, Faculty of Medicine

(Prof. Stefan Weber, Prof. Matthias Peterhans)

«On the role of image guidance technologies in the treatment of pancreatic cancer»

Alexander Uwe Johann Ernst, PhD in Biomedical Sciences (June 22)

Institute of Anatomy, Faculty of Medicine (Prof. Nadia Mercader Huber)

«New insights into epicardium formation through in vivo imaging in the zebrafish»

Laura Facchin, PhD in Neuroscience (June 29)

University hospital (Inselspital), Faculty of Medicine (Prof. Antoine Adamantidis, Prof. Claudio Bassetti)

«Slow waves promote sleep-dependent plasticity and functional recovery after stroke»

Yanyun Gao, PhD in Cell Biology (September 3)

Department of BioMedical Research, Faculty of Medicine (Prof. Dr. Ralph Schmid, PD Dr. Thomas Marti)

«Targeting Mitochondrial Metabolism of Chemoresistant Non-Small Cell Lung Cancer Cells»

Carolina Garcia Poyatos, PhD in Biomedical Sciences (April 29)

Institute of Anatomy, Faculty of Medicine (Prof. Nadia Mercader Huber)

«Supramolecular organization of the mitochondrial electron transport chain in zebrafish: Physiological role of respiratory supercomplexes»

Pascal Gasser, PhD in Immunology (July 17)

University Hospital Bern, Dept. RIA, Faculty of Medicine (PD Dr. Alexander Eggel)

«Characterization of next-generation anti-IgE inhibitors to treat IgE-associated allergic disorders»

Tom Gawliczek, PhD in Biomedical Engineering (August 13)

ARTORG Centre Hearing Research, Faculty of Medicine (Prof. Dr. Martin Kompis)

«Influence of coupling and fitting parameters on the benefit with bone conduction hearing systems»

Manuela Gerber, DVM, PhD (Doctor of Veterinary Medicine and Philosophy) (December 7)

Department of Clinical Veterinary Science, Vetsuisse Faculty Bern (PD Dr. Michèle Bodmers)

«Reduction of antimicrobial use by evidence-based preventive measures and understanding its influencing factors in Swiss dairy farms»

Nina Germic, PhD in Immunology (March 17)

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

«ATG5 promotes eosinophil hematopoiesis but inhibits eosinophil effector functions – implications for cancer and bacterial infections»

Annik Imogen Gmel, PhD in Biomedical Sciences (January 23)

Institute of Genetics, Vetsuisse Faculty Bern (Prof. Dr. Tosso Leeb, Dr. Markus Neuditschko)

«Increasing the accuracy of genetic studies by improving the phenotyping process—A case study in the Franches-Montagnes horse breed»

Carole Salome Grädel, PhD in Biochemistry and Molecular Biology (December 11)
Institute for infectious diseases, Faculty of Medicine (Prof. Stephen Leib)
«Next Generation Sequencing and Molecular Epidemiology of Human Enteroviruses»

Simone Sandra Graf, PhD in Biochemistry and Molecular Biology (July 21)
Department of Chemistry and Biochemistry, Faculty of Science (Prof. Christoph von Ballmoos)
«Charging and Emptying the Battery of Lifes»

Thomas Gruber, PhD in Immunology (May 12)
Institute of Pathology, Faculty of Medicine (Prof. Dr. Mirjam Schenk)
«The roles of IL-32 and CB2R in tumor immunity»

Quentin Haas, PhD in Biomedical Sciences (March 6)
Institute of Pharmacology, Medical Faculty (Prof. Dr. Stephan von Gunten)
«The role of Siglec-7 and Siglec-9 on cytotoxic T cells»

Alexander Christoph Haindrich, PhD in Biochemistry and Molecular Biology (August 31)
Institute of Plant Sciences, Faculty of Science (Prof. Doris Rentsch)
«Amino Acid Transporters in *Trypanosoma brucei*»

Mahmoud Malek Hallal, PhD in Computational Biology (April 22)
Department for BioMedical Research, Faculty of Medicine (PD Dr. med. Nicolas Bonadies)
«Development and Validation of a Phosphoproteomics Analysis Pipeline for the Characterization of Targetable Kinases in Myeloid»

Seid Hamzic, PhD in Biomedical Sciences (July 28)
Institute of Clinical Chemistry, Faculty of Medicine (Prof. Carlo Largadièr)
«5-FU Toxicity: Hunting the missing heritability»

Daniela Christiane Hanke, PhD in Cell Biology (September 1)
Institute of Biochemistry and Molecular Medicine, Faculty of Medicine (Prof. Daniel Guido Fuster)
«The role of sodium/proton exchangers NHEs in bone homeostasis»

Kati Hänssgen, PhD in Biomedical Sciences (December 17)
Institute of Anatomy, Faculty of Medicine (Prof. Valentin Djonov)
«The vagal and phrenic contribution on the innervation of the antireflux barrier in humans and piglets»

Andreas Hemmerle, PhD in Biochemistry and Molecular Biology (March 6)
Department of Chemistry and Biochemistry, Faculty of Science (Prof. Dr. Achim Stocker)
«CRALBP and the Chemistry of Vision»

Melanie Hierweger, DVM, PhD (Doctor of Veterinary Medicine and Philosophy) (September 18)
Division of Experimental Clinical Research, DCR-VPH, Vetsuisse Faculty Bern (Prof. Dr. Torsten Seuberlich)
«Studies on the causative relationship between candidate virus infection and non-suppurative encephalitis in ruminants and initial investigations of the underlying pathomechanisms»

Magdalena Hinterbrandner, PhD in Immunology (February 28)
Department for BioMedical Research (PD Dr. Carsten Riether)
«Towards LSC eradication: Unravelling the interplay of leukemia stem cells with adaptive immune cells and the commensal microbiota»

Jule Anna Horlbog, DVM, PhD (Doctor of Veterinary Medicine and Philosophy) (December 2)
Institute for Food Safety and Hygiene, Vetsuisse Faculty Zurich (Prof. Roger Stephan, Prof. Claudia Guldemann)
«Resilience in food borne pathogens – facing the food and host environment»

Maïke Svenja Höfemann, PhD in Biomedical Engineering (March 26)

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

«Optimizing acquisition and quantitative evaluation in ¹H Magnetic Resonance Spectroscopy »

Elise Jeannerat, PhD in Biochemistry and Molecular Biology (May 11)

Swiss Institute Equine Medicine, Vetsuisse Faculty (Prof. Dr. Dominik Burger)

«Influence of major histocompatibility complex social signalling on reproductive efficiency in horses»

Joël Jovanovic, PhD in Biomedical Sciences (March 23)

Department of Ophthalmology, University hospital (Prof. Dr. Martin Zinkernagel, PD Dr. med. Andreas Ebnetter)

«Immunomodulation in experimental retinal vein occlusion in mice»

Alain Jungo, PhD in Biomedical Engineering (December 3)

ARTORG Center for Biomedical Engineering Research of Medicine (Prof. Mauricio Reyes)

«Applications and Insights of Uncertainty Estimates in Automated Brain Tumor Segmentation»

Nicole Kadzioch, PhD in Biochemistry and Molecular Biology (December 4)

Division of Experimental Clinical Research, DCR-VPH, Vetsuisse Faculty, Bern (PD Dr. Philippe Plattet)

«Understanding the molecular mechanism of morbillivirus cell exit»

Stephan Martin Kammer, PhD in Biochemistry and Molecular Biology (July 17)

Department of Chemistry and Biochemistry, Faculty of Science (Prof. Dr. Achim Stocker)

«Model inspired design of α -TTP nanoparticles»

Efstathios Katharopoulos, PhD in Biochemistry and Molecular Biology (November 6)

Dept. of Biomedical Research, Faculty of Medicine (Prof. Emma Flück)

«Understanding human gene variants involved in steroidogenic pathways»

Mirjam Kiener, PhD in Cell Biology (July 23)

Department for BioMedical Research (DBMR), Faculty of Medicine (Dr. Marianna Kruithof-de Julio, Dr. Roland Seiler)

«Precision Medicine In Genitourinary Cancers: The role of mir-221-5p in prostate cancer and personalized drug screens in bladder cancer patients
Charging and Emptying the Battery of Lifes»

Krempaska Kristina, PhD in Biomedical Sciences (December 16)

Department of BioMedical Research, Faculty of Medicine (Prof. Thomas Geiser)

«Anti-fibrotic strategies against Idiopathic Pulmonary Fibrosis»

Nicolas Langenegger, PhD in Biochemistry and Molecular Biology (April 2)

Nentwig Group, Institute of Ecology and Evolution, Faculty of Sciences

(Prof. Dr. Wolfgang Nentwig, Dr. Lucia Gerda Kuhn-Nentwig)

«SPIDER VENOM NEUROTOXINS, THEIR MATURING, AND DISTRIBUTION»

Bastien Paul André Le Gars Santoni, PhD in Biomedical Engineering (December 18)

Bioceramics and Biocompatibility, RMS Foundation, Bettlach, Switzerland, Faculty of Medicine

(Prof. Marc Böhner, Prof. Dr. Wilhelm Hofstetter)

«Ion-doped grain boundaries to control the dissolution as well as the osteoclastic and macrophage response of sintered calcium phosphate ceramics»

Pascal Leimer, PhD in Neuroscience (January 27)

Department of Physiology (Prof. Dr. Walter Senn)

«A computational model for continual learning and synaptic consolidation»

Deming Liang, MD, PhD (Doctor of Medicine and Philosophy (December 1)

ARTORG Center for Biomedical Engineering Research, Faculty of Medicine (PD Dr. Andreas Häberlin)

«Optical Coherence Tomography As a Non-Functional Approach to Assess Radiofrequency Ablation Lesions For the Treatment of Atrial Fibrillation»

Shengchen Liu, MD, PhD (Doctor of Medicine and Philosophy (July 3)
Institute of Clinical Chemistry, Faculty of Medicine (Prof. Stephan Jakob)
«Effects of sepsis and its routine treatments on splanchnic blood flow regulation and metabolism»

Ya Lu, PhD in Biomedical Engineering (December 15)
ARTORG Center, Faculty of Medicine (Prof. Stavroula Mougiakakou)
«Dietary Assessment based on Computer Vision and Machine Learning »

Alberto Mantegazza, PhD in Biomedical Engineering (August 21)
ARTORG Center for Biomedical Engineering Research, Faculty of Medicine (Prof. Dr. Dominik Obrist)
«Experimental investigations of red blood cell partitioning in artificial microvascular networks»

Alessandro Marazza, PhD in Biochemistry and Molecular Biology (March 12)
Department of Chemistry and Biochemistry, Faculty of Science (Dr. Maurizio Molinari)
«Lysosomal quality control of secretory proteins in mammalian cells»

Natalia Méndez Carmosa, PhD in Biomedical Sciences (April 30)
Department of Cardiovascular Surgery, Inselspital and University of Bern, Faculty of Medicine
(PD. Dr. Sarah Longnus and Prof. Dr. med. Hendrik Tevaearai Stahel)
«Endothelial function in cardiac grafts obtained with donation after circulatory death»

Nicolas Melin, PhD in Biomedical Sciences (September 15)
Department of BioMedical Research, Faculty of Medicine (Prof. Dr. Deborah Keogh-Stroka)
«What makes the liver go RILD? Radiation Induced Liver Disease; Model, Mechanism & Countermeasure»

Gaia Alessandra Moore-Jones, DVM, PhD (Doctor of Veterinary Medicine and Philosophy) (May 28)
Centre for Fish and Wildlife Health, Vetsuisse Faculty (Prof. Marie-Pierre Ryser-Degiorgis)
«Epidemiological study of footrot in free-ranging Alpine ibex in Switzerland»

Merve Mutlu, PhD in Biochemistry and Molecular Biology (November 13)
Institute of Animal Pathology, Vetsuisse Faculty Bern (Prof. Sven Rottenberg)
«Functional genetic profiling to identify genes that influence radiotherapy response»

Lukas Till Oesch, PhD in Neuroscience (July 1)
IZentrum für experimentelle Neurologie (ZEN), Faculty of Medicine (Prof. Antoine Adamantidis)
«Optical imaging of hypothalamic circuits across sleep states and feeding behaviors»

Jaime Osuna Luque, PhD in Biochemistry and Molecular Biology (May 13)
Institute of cell biology, Faculty of Science (Prof. Dr. Peter Meister)
«Analysis of the transcriptional basis of natural transdifferentiation initiation in Y cell using *Caenorhabditis elegans* as a model organism»

Marzieh Ovesy, PhD in Biomedical Engineering (August 11)
ARTORG Center for Biomedical Engineering Research, Faculty of Medicine (Prof. Philippe Zysset)
«Primary stability evaluation of uncemented bone-implant interface using finite element modeling during implantation and subsequent loading»

Ranya Özçelik, DVM, PhD (Doctor of Veterinary Medicine and Philosophy) (October 30)
AVeterinary Public Health Institute, Vetsuisse Faculty Bern (Prof. Salome Dürr)
«Voluntary veterinary-based and community-based surveillance and their application in human and animal health surveillance in Switzerland and Chad»

Iwan Paolucci, PhD in Biomedical Engineering (August 24)
ARTORG Center for Biomedical Engineering Research, Faculty of Medicine (Prof. Stefan Weber)
«3D Ultrasound-based stereotactic image-guidance in hepatobiliary surgery»

Deborah Barbara Angela Sarah Piffaretti, PhD in Biomedical Sciences (January 15)

Laboratory for Biomedical Neurosciences (Prof. Dr. Michael Reinert)

«Manipulating protoporphyrin IX accumulation to improve glioblastoma visualization for surgical treatment and photodynamic therapy»

Taisia Polidori, PhD in Biochemistry and Molecular Biology (December 7)

Department of BioMedical Research (DBMR), Faculty of Medicine (Prof. Rory Johnson)

«CRISPR-Cas9-based screens for long noncoding RNAs discovery in lung cancer»

Valerie Pucken, DVM, PhD (Doctor of Veterinary Medicine and Philosophy) (June 23)

Clinic for Ruminants, Vetsuisse Faculty Bern (Supervisor: Prof. Gertraud Schüpbach)

«Reduction of antimicrobials in dairy cattle - Considering relevant aspects»

Anna Sophie Ramsauer, DVM, PhD (Doctor of Veterinary Medicine and Philosophy) (January 31)

Institute of Virology, Vetsuisse Faculty Zurich (Dr. Kurt Tobler)

«Transcriptional and histological analysis of Equine Papillomavirus Type 2 associated lesions in vivo and in vitro»

Dominic Ritler, PhD in Biochemistry and Molecular Biology (June 16)

Institute of Parasitology, Vetsuisse Faculty (Prof. Dr. Britta Lundström-Stadelmann, Prof. Dr. Andrew Hemphill)

«New ways to target the deadly parasite Echinococcus multilocularis»

Matteo Rossi Sebastiano, PhD in Biomedical Sciences (March 31)

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

«Targeting lipid metabolism in pancreatic ductal adenocarcinoma»

Reto Rufener, PhD in Biochemistry and Molecular Biology (April 1)

Institute of Parasitology, Vetsuisse Faculty Bern

(Prof. Dr. Andrew Hemphill, Prof. Dr. Britta Lundström Stadelmann)

«NEW DRUGS AGAINST ECHINOCOCCUS MULTILOCULARIS TARGETING THE ENERGY METABOLISM»

Maria Saliakoura, PhD in Biomedical Sciences (December 8)

Institute of Pharmacology, Faculty of Medicine (Prof. Georgia Konstantidou)

«Regulation of lipid metabolism in lung adenocarcinomas»

Andr s Sanz-Morej n, PhD in Biomedical Sciences (June 25)

Institute of Anatomy, Faculty of Medicine (Prof. Nadia Mercader Huber)

«Role of macrophages and epigenetic inheritance during cardiac regeneration in the zebrafish»

Fay Joanne Sauer, DVM, PhD (Doctor of Veterinary Medicine and Philosophy) (March 2)

Swiss Institute of Equine Medicine ISME, Vetsuisse Faculty Bern (Prof. Dr. Vinzenz Gerber)

«Assessment of chronic stress in horses and development of a „stress test“ (adrenal cortisol response to ACTH) for stress-induced health problems»

Christina Schindera, MD, PhD (Doctor of Medicine and Philosophy) (November 18)

Institute of Social and Preventive Medicine, Faculty of Medicine (Prof. Claudia K hni)

«Cardiovascular and pulmonary disease after childhood cancer: Prevalence, risk factors, and early detection»

Florian Schmaranzer, MD, PhD (Doctor of Medicine and Philosophy) (August 3)

Department for Orthopaedics, Inselspital Bern, Faculty of Medicine (Prof. Dr. med. Moritz Tannast)

«Hip MRI to study cartilage biochemistry and three-dimensional morphology in femoroacetabular impingement»

Daniel Schneider, PhD in Biomedical Engineering (October 29)

Image-guided Therapy Group, ARTORG Center, Faculty of Medicine (Prof. Stephan Weber)

«Freehand stereotactic image-guidance tailored to lateral skull base surgery - A means for accurate orientEARing»

Shikha Shikha, PhD in Biochemistry and Molecular Biology (March 16)

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

«tRNA processing and import in the mitochondrion of *Trypanosoma brucei*»

Mirko Stauffer, PhD in Biochemistry and Molecular Biology (April 30)

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

«Functional and structural studies on bacterial and archaeal membrane proteins»

Bisera Stepanovska, PhD in Biomedical Sciences (April 28)

Institute of Pharmacology, Faculty of Medicine (Prof. Dr. Andrea Huwiler)

«Sphingosine 1-phosphate signaling in in vitro and in vivo models of inflammation»

Martina Stilinovic, PhD in Biomedical Sciences (November 21)

Department of Biomedical Research, Faculty of Medicine, Bern (Prof. Ramanjaneyulu Allam)

«Understanding the role of Ribonuclease Inhibitor (RNH1) in erythropoiesis and translation»

Ana Stojiljković, DVM, PhD (Doctor of Veterinary Medicine and Philosophy) (January 28)

Division of Veterinary Anatomy, Vetsuisse Faculty Bern (Prof. Dr. Michael H. Stoffel, Dr. Jasmin Balmer)

«Modelling dog pain in the dish—What about the cat?»

Shubha Bevkal Suramanyaswamy, PhD in Biochemistry and Molecular Biology (August 21)

Institute of Cell Biology, Faculty of Science (Prof. Isabel Roditi)

«Investigation of Alba-domain proteins in *Trypanosoma brucei*»

Federico Storni, DVM, PhD (Doctor of Veterinary Medicine and Philosophy) (December 3)

Immunology, Faculty of Medicine (Prof. Martin Bachmann)

«Development of a new strategy for peanut allergy»

Qingnan Sun, PhD in Biomedical Engineering (June 25)

ARTORG Center for Biomedical Engineering Research, Faculty of Medicine (Prof. Stavroula Mougiakakou)

«AI-Based Personalised Blood Glucose Regulation»

Miguel Tavares Pereira, DVM, PhD (Doctor of Veterinary Medicine and Philosophy) (March 17)

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

«Role of prostaglandins in early CL formation in the dog: effects on vascularization, immunoactive factors and global transcriptomic changes»

Lester Thoo Sin Lang, PhD in Immunology (October 9)

Institute of Pathology, Faculty of Medicine (PD Dr Phillippe Krebs)

«Alternative splicing modulates intestinal homeostasis and pathology»

Florian Traversi, PhD of Science in Biochemistry and Molecular Biology (January 27)

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

«Investigation on the mutated pathways involved in thyroid cancer: Focus on MAPK, NOTCH, and LAT1»

Lucia Unger, DVM, PhD (Doctor of Veterinary Medicine and Philosophy) (April 3)

Swiss Institute of Equine Medicine ISME, Vetsuisse Faculty Bern (Prof. Dr. Vinzenz Gerber)

«Circulating miRNAs – next-generation biomarkers for equine sarcoid disease?»

Kristin Uth, PhD in Biomedical Sciences (August 27)

Institute of Pathology, Faculty of Medicine (Prof. Inti Zlobec, Prof. Mario Tschan)

«The Role of CDX2 in Colorectal Cancer»

Diego von Werdt, PhD in Immunology (January 17)

Institute of Pathology (Prof. Dr. Christoph Müller, PD Dr. Nadia Corazza)

«Regulator of G protein signaling 1 (Rgs1) regulates the differentiation and function of intestinal tissue resident memory CD8 T cells »

Sebastian Wangler, MD,PhD (Doctor of Medicine and Philosophy) (December 16)

AO Research Institute, Faculty of Medicine (Dr. Mauro Alini)

«Stem cell homing towards degenerative intervertebral discs: characterization of the migrating subpopulation and its regenerative potential»

Duo Xu, MD,PhD (Doctor of Medicine and Philosophy) (June 10)

Department for Biomedical Research, Faculty of Medicine (Prof. Dr. Ralph Alexander Schmidt, PD Dr. Ren-Wang Peng)

«New Strategies to Target Malignant Pleural Mesothelioma»

Haitang Yang, MD,PhD (Doctor of Medicine and Philosophy) (July 1)

Department for BioMedical Research (DBMR), Faculty of Medicine (Prof. Ralph Alexander Schmid, PD Dr. Ren-Wang Peng)

«Targeting the Mitogen-Activated Protein Kinase Signaling Cascade in KRAS-mutant Lung Cancer and Malignant Pleural Mesothelioma»

Siqing Yu, MD,PhD (Doctor of Medicine and Philosophy) (September 2)

INSELSPITAL, University hospital Bern, Department of Ophthalmology, Faculty of Medicine (PD Dr. Andreas Ebnetter)

«New Perspectives on the Prediction of Retinal Disease Course and Treatment Outcomes Using Optical Coherence Tomography»

Pauline Gil Véronique Zamprogno, PhD in Biomedical Engineering (April 6)

ARTORG Center, Faculty of Medicine (Prof. Dr. Olivier Thierry Guenat)

«Development of second generation of air-blood barrier on chip»

Christian Zanchin, MD,PhD (Doctor of Medicine and Philosophy) (November 20)

Department of Cardiology, Faculty of Medicine, Bern (Prof. Lorenz Räber)

«Coronary Atherosclerosis In vivo characterization by intravascular imaging modalities and its treatment with lipid-lowering therapy and new-generation drug-eluting stents»

Jonas Zaugg, PhD in Biochemistry and Molecular Biology (November 17)

Institute of Biochemistry and Molecular Medicine, Faculty of Medicine (Prof. Dr. Christiane Albrecht)

«SLC transporter-mediated transfer of iron and amino acids across the placenta»

Soheila Zeinali, PhD in Biomedical Engineering (June 2)

ARTOG Center for Biomedical Engineering Research, Faculty of Medicine (Prof. Dr. Olivier T. Guenat)

«Functional in vitro Human Microvasculature»

Guodong Zeng, PhD in Biomedical Engineering (June 12)

ARTOG Center for Biomedical Engineering Research, Faculty of Medicine (Prof. Dr. Juergen Burger, Prof. Dr. Guoyan Zheng)

«Effective and Efficient Deep Learning for 3D Image Segmentation of Musculoskeletal Structures»

Yang Zhang, MD,PhD (Doctor of Medicine and Philosophy) (October 28)

Department of BioMedical Research, Faculty of Medicine (Prof. Ralph A. Schmid, PD Dr. Ren-Wang Peng)

«Development of a synergistic combination therapy for non-small cell lung cancer (NSCLC)»

Hadi Zolfaghari, PhD in Biomedical Engineering (March 5)

ARTORG Center, Faculty of Medicine (Prof. Dr. Dominik Obrist)

«Impinging leading edge vortex instability in the bileaflet mechanical heart valves: direct numerical simulation, stability analysis, and adjoint-based control»

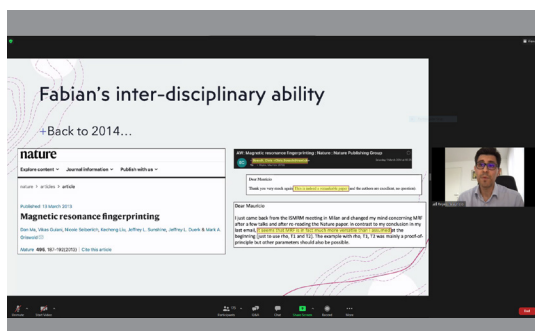


Photo above left

Prof. Dr. Mauricio Reyes

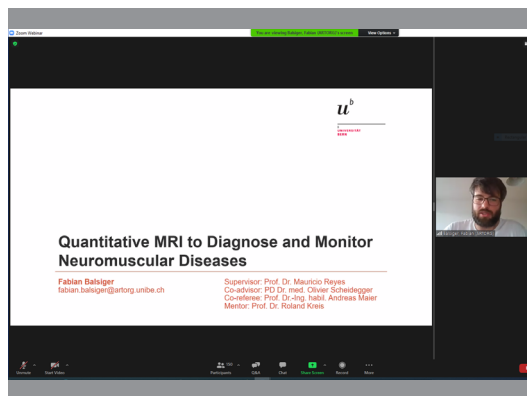


Photo above right

Fabian Balsiger

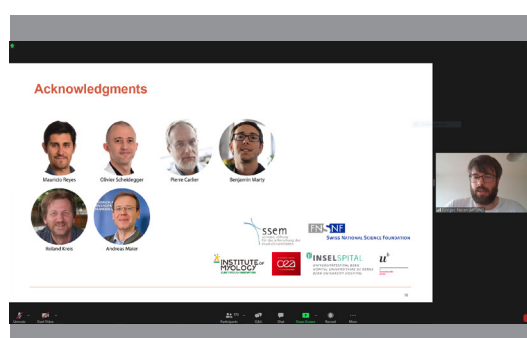


Photo below right

Acknowledgments to Mauricio Reyes, Olivier Scheidegger, Pierre Carlier, Benjamin Marty, Roland Kreis, Andreas Maier and Fabian Balsiger

GCB AWARD FOR BEST THESIS 2020

FABIAN BALSIGER

ARTORG Center for Biomedical Engineering Research

Awarded at the January 28, 2021 GCB Symposium via Zoom

ABSTRACT

Quantitative Magnetic Resonance Imaging to Diagnose and Monitor Neuromuscular Diseases

Neuromuscular diseases (NMDs) impose a high burden on patients and society in terms of disease severity and economic costs. To diagnose and monitor NMDs, magnetic resonance imaging (MRI) gained popularity in recent years due to the limitations of gold standard electrophysiology. MRI enables a qualitative investigation of the anatomy and tissue composition of peripheral nerves and skeletal muscles involved in NMDs. However, qualitative MRI hampers objective, comparative, and reliable diagnosis and monitoring of NMDs as it relies on subjective evaluation by radiologists. Therefore, methods for quantitative MRI of NMDs are of utmost importance. This thesis investigates and proposes methods for quantitative MRI of NMDs based on medical image computing using machine learning. In the first part, the segmentation of peripheral nerves from MR neurography (MRN) is investigated. The proposed methods automatically segment the peripheral nerves in MRN images and achieve performances on par to the variability of manual segmentation by radiologists in significantly decreased time. Machine learning-based segmentation of peripheral nerves enables cross-sectional area and signal intensity analyses of peripheral nerves, which might serve as biomarkers for lesion burden. In the second part, the reconstruction of MR fingerprinting (MRF) is investigated. The proposed methods estimate MR parameters with high accuracy and robustness, and significantly reduce the reconstruction time compared to the usually employed pattern matching. Machine learning-based reconstruction of MRF enables accurate and fast multiparametric mapping of diseased skeletal muscle, which extracts biomarkers for disease severity and disease activity. The results of this thesis demonstrate that machine learning provides and improves methods for quantitative MRI of NMDs. Biomarkers of neurogenic and myopathic NMDs can be obtained in a clinically feasible time with sufficient accuracy and robustness. By using machine learning-derived quantitative MR measures, diagnosis and monitoring of NMDs might be effectively improved.

2020 NATIONAL MD-PHD GRANTS

The National MD-PhD Program, which is supported by the Swiss National Science Foundation (SNSF), the Swiss Academy of Medical Sciences (SAMS), 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.

In 2020 Swiss Academy of Medical Sciences (SAMS) granted fellowship to the following recipients:

Mey Boukenna

Supervisor: Prof. Dr. Hugues Abriel

Institute of Biochemistry and Molecular Medicine (IBMM)

Sandro Christensen

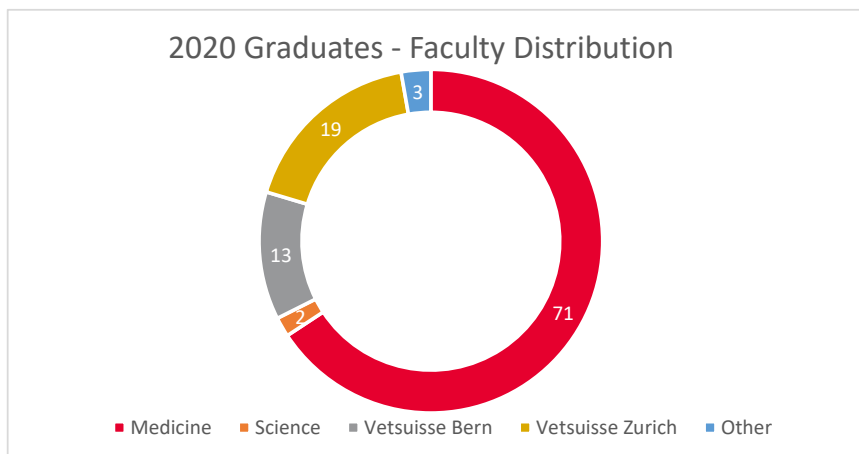
Supervisor: Prof. Dr. Stephanie Ganal-Vornarburg

Clinic of Visceral Surgery and Medicine, Gastroenterology

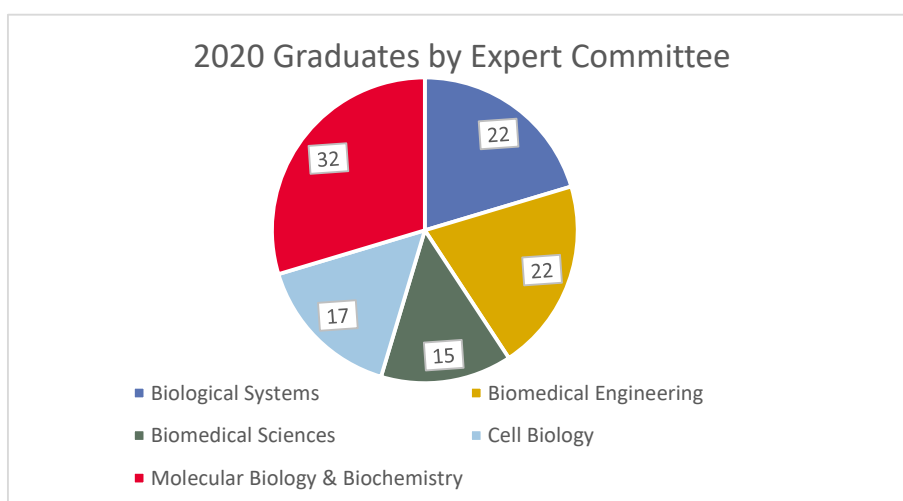
FACTS & FIGURES 2020



Graduates Faculty Distribution



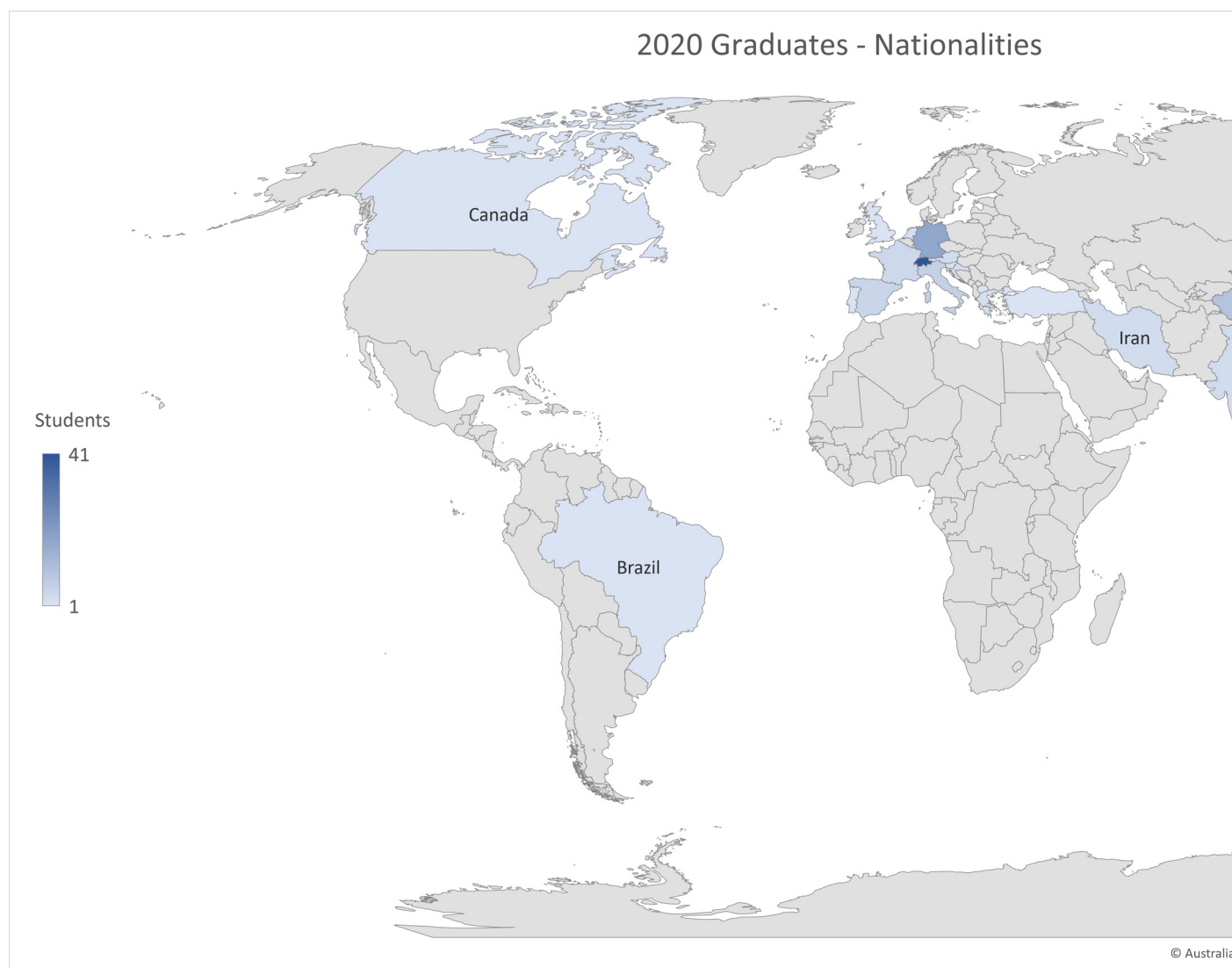
Graduates by Expert Committee



Degree Titles by Faculty

2020 Degree Titles	Faculty of Medicine	Faculty of Science	Vetsuisse Faculty BE	Vetsuisse Faculty ZH	Affiliated Institutions*	Total
MD, PhD	11				1	12
DVM, PhD			12	3		15
PhD in Biomedical Engineering	16				1	17
PhD in Biomedical Sciences	22		2			24
PhD in Immunology	7		1			8
PhD in Neuroscience	4					4
PhD of Science in Biochemistry and Molecular Biology	7	12	4			23
PhD of Science in Cell Biology	3	1				4
PhD in Computational Biology	1					1
Total	71 (65.7%)	13 (12.0%)	19 (17.6%)	3 (2.8%)	2 (1.9%)	108 (100%)

*AO Foundation, Davos (1) and Robert Mathys Foundation, Bettlach (1)



FIVE YEAR FIGURES (2016 - 2020)

FUNDING SOURCES

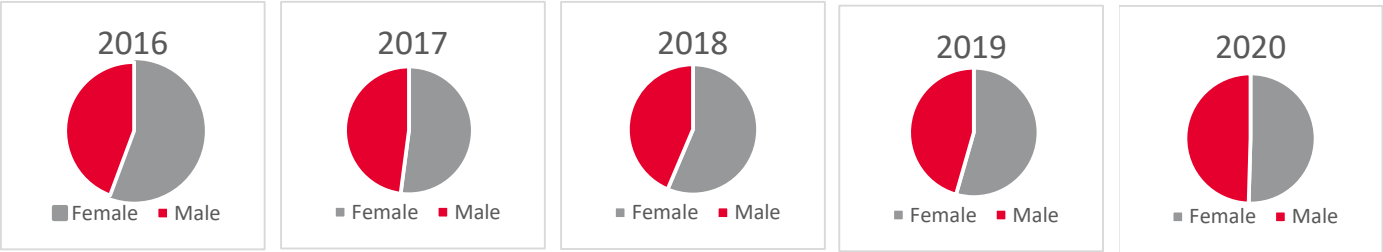
GCB PhD Students received funding from over 150 sources 2016 - 2020

The University of Bern, Inselspital, SNF, NCCR, the Swiss government, IRB and many more institutes supported the GCB students' research projects.

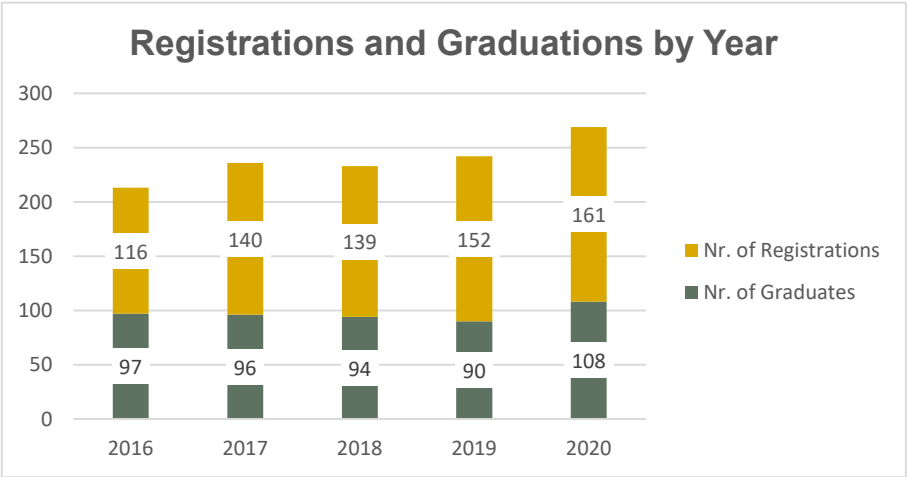
The GCB funded over 324,000 CHF direct financial support to its students between 2016 – 2020. The areas of support included: contributions to internships & summer schools, GCB Academic Symposia, congress contributions to doctoral students, travel grants and course contributions, etc.

FIVE YEAR (2016 - 2020)

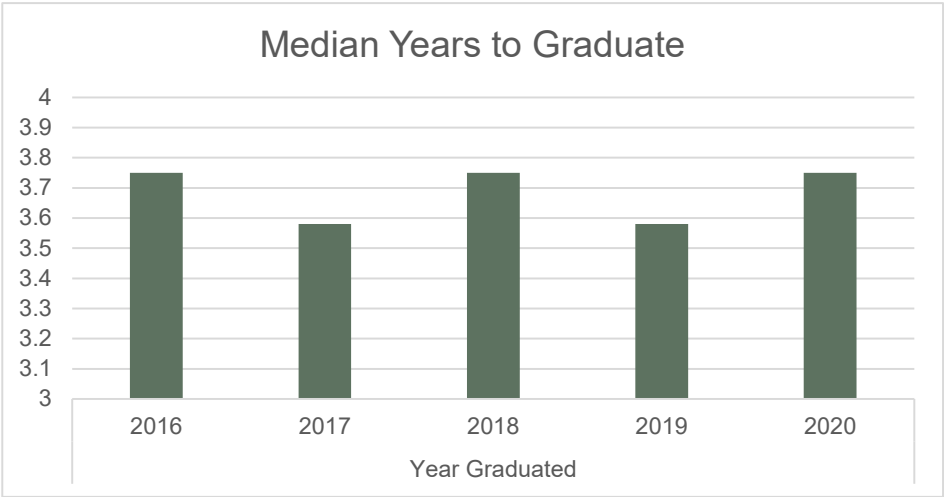
Student Gender



Registrations and Graduations



Median Years to Graduate



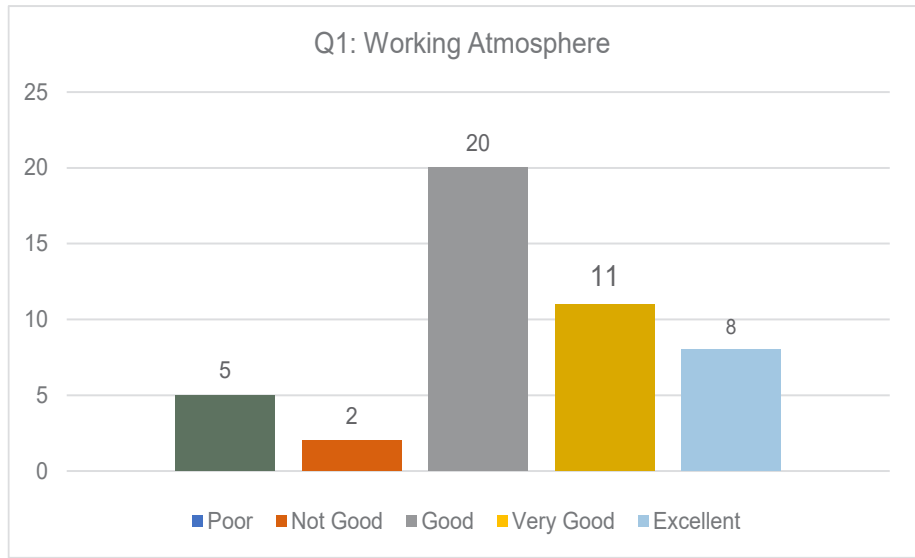
COVID-19 PANDEMIC GCB LEADERSHIP SURVEY RESULTS

In December 2020, GCB Administration distributed to all 534 registered students a survey requesting anonymous feedback on the impact the pandemic had on their research and studies. The survey included five open-ended questions regarding supervisor and team relationships, GCB support, communication, general well-being, and research delays,

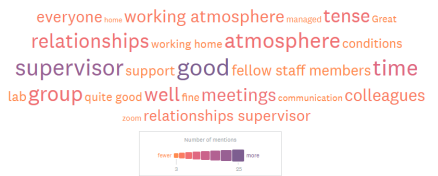
etc. 68 students responded – all survey participants answered all questions. Survey Monkey was the tool used for the survey. The qualitative analysis was done using mixed (deductive/inductive) thematic coding. Where answers did not lend themselves neatly into a category, these answers were highlighted. GCB Administration and the PhD Committee

are actively working toward addressing the key issues brought to light in the survey and continue to actively solicit student input and feedback, particularly during the ongoing pandemic. Below are highlights from the survey.

Q1 What have the working atmosphere, working conditions and your relationships with your supervisors and fellow staff members been like?



In addition to the charted ratings, the following labels were used to describe individual situations and conditions. The more frequent the response, the larger the word.



“

“Supporting, pleasant, a joy to work in”

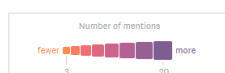
“My supervisors where always helpful and tried to manage the situation as good as possible. The working atmosphere was strange, and in the phase where there was limited contact not so easy, especially for less experienced people. Because the availability of other people to ask some quick question was not given. Other than that, the working atmosphere was quite good in our group.”

“It has been good, but a bit different with COVID”

Q2 How has and is the pandemic affecting your work schedule, your goals?

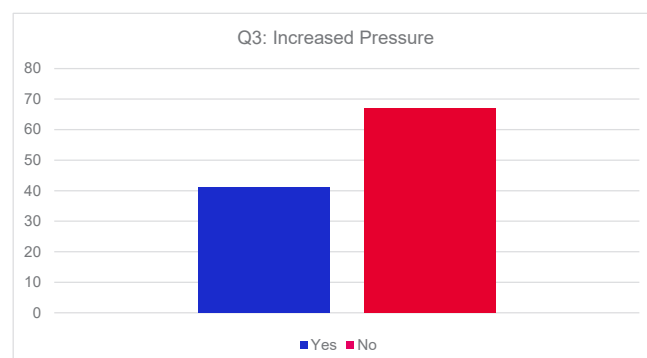
Thirty-five (51%) student responses identified delays and lost time due to lack of access to research labs. Generally, the estimates were 3-6 months delays. Mentions of cancelled fieldwork were acute – in one case, the student was frustrated after working two years to prepare for collaborative research only to have it cancelled due to the pandemic. Some students used the time that would have been lab time for data analysis and writing. Others highlighted the tendency to work more due to home office and/or reduced public transportation options.

pandemic postponed home office affected plan good project well
goals Working home delayed harder time slowed
experiments lost schedule still lab least lockdown feel



Q3 Do you feel that you are under increased pressure to do your research?

Most of the students admitted stress. However, it was noteworthy many realized they found the PhD program demanding irrespective of the pandemic. Additionally, others indicated the stress comes indirectly from personal lives and self-created pressure. As one student wrote, “not increased pressure, different pressure”.



“

“It has put me back by about 6 months, however I managed to do a lot of literature review and genome analysis during the lockdown, this is a plus”.

“... schedule was not affected too much because ...no access to the lab I had time to analyse a lot of data and write my first own article. I have a bit of delay on the planned schedule, but I feel that this would have been the same even without Pandemia.”

“It makes things different for sure, but work continues.”

“tough and stressful but managed all deadlines”

“I was more independent...The only drawback was... without a specific train to take home, I tended to overwork in the evening.”

“The pandemic was really good for me. It helps a lot, it is good to be able to work part-time in home office. If there was no pandemic I might have quit my PhD this year.”

“

“I feel that my scientific output will be much more detrimental for the continuation of my career, as networking opportunities as limited to a minimum.”

“Definitely because I'm in the last year of my PhD.”

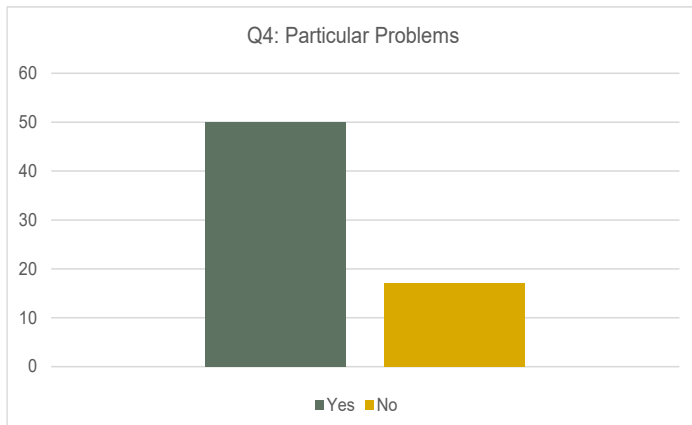
“Yes, I have been working 6-7 days a week since September!”

“Not anymore”

“No. PhD students are under continuous pressure and I feel that we have lost the ability to feel any added pressure.”

Q4 Are there any particular problems that you wish to communicate to us? (strictly confidential)

The majority of the 67 respondents (50, 75%) answered this question with a simple “no”. The remaining respondents (17, 25%) reiterated they have a high level of stress from a variety of sources (not limited to the pandemic, but in some cases exacerbated by it). There were a couple specific issues related to interpersonal relationships and management styles.



“

“I wish more surgical masks were available so we can wear a new mask every day.”

“The support offers for students and proofs on the university homepage (https://www.unibe.ch/coronavirus/informationen_zur_selbstorganisation_und_hilfsangebote/index_ger.html) are great. Also that there it is mentioned that it is normal that it takes time to get used to this unusual situation and that bosses should not put extra pressure. It helped me a lot.”

“A possible extension of time of a few months including grant payments would ease the pressure.”

“No but thank you for the offer. Your concern is appreciated and please keep asking. Also please stay safe and healthy yourself!”

“Less networking is happening”

Q5 Do you feel a need for further support from the GCB? If so, what support do you need?

The analysis of the responses to this question showed many of the “no” response to also include qualifying comments, e.g., “no, not right now, but when it comes time for my defense...”. Likewise, the “yes” responses included these qualifiers, e.g., “(yes) the support is sufficient”. Therefore, to avoid misconstruing the data, the questions were reviewed as discretely, rather than being categorized as simply “yes” or “no”. In general, the respondents were positive about the support. The suggestions that were put forth cover more networking, course opportunities and psychological support (in general for doctoral students, as well as during extraordinary times).

“

“regular surveys/ questionnaires like this would be useful also if there is no pandemic”

“No, but I appreciate this initiative.”

“Even t(h)ough, I talk to my boss and other mentors about my career from time to time, it would be nice, if there would be some support regarding the planning of the next steps, also for non-academic careers.”

“We have a great academic support from GCB. Thank you!”

“I feel like GCB is not very proactive in circulating information and stating the support they might provide, but I know that for every problem GCB is there to support me.”

“I definitely foresee that a lot of PhD students might require an extension in order to complete their thesis projects.”

“I think it would certainly help some students if the GCB could accommodate students a bit in the case of delays, missing achievements, missed lectures, or perhaps move back deadlines that would otherwise not be moved.

“...It would be nice if the professors knew about the result of this little survey, maybe?”

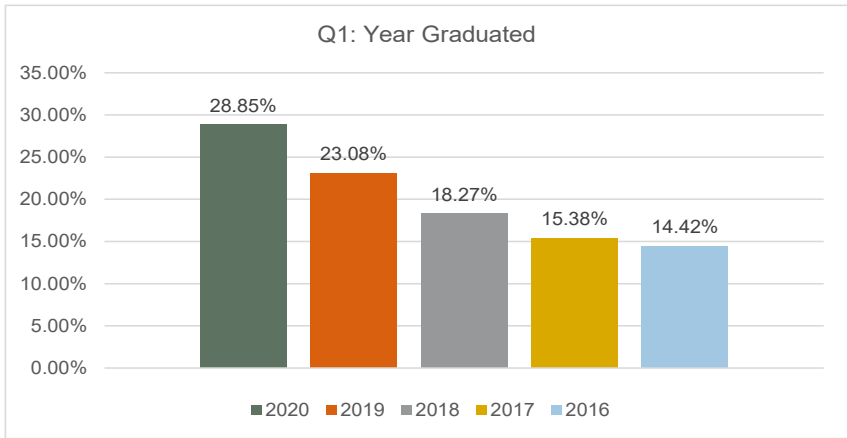
“Everything is perfect :)”

“Advertise more important seminars/talks happening in Bern. Facilitate the networking in Bern between the different research groups of similar fields more together.”

POST-DOC EMPLOYMENT SURVEY

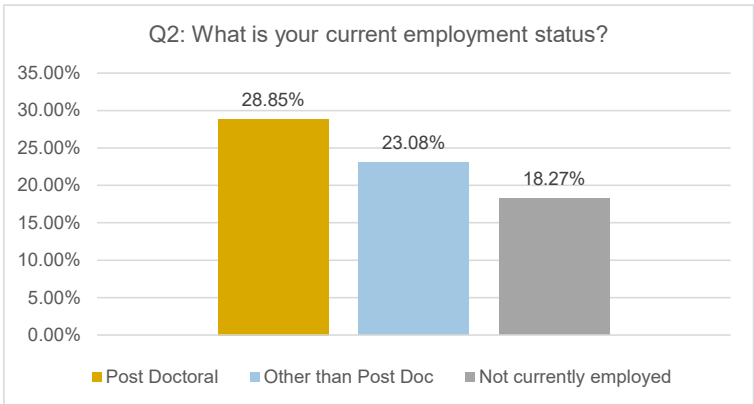
GCB Administration sent (February 2021) a six-question survey to the 2016-2020 GCB graduates inquiring about their post-doctoral employment status. The survey was sent to 486 GCB Post-Doctorates. 43% (208) responses were received. Survey Monkey was used for the survey tool and data visualization.

Question 1 – Which year did you graduate from the GCB?



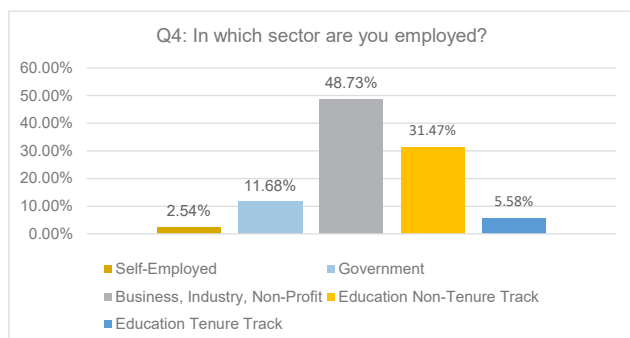
Answer Choices	Responses	
	%	#
2020	28.85%	60
2019	23.08%	48
2018	18.27%	38
2017	15.38%	32
2016	14.42%	30
Total	100.00%	208

Question 2 – What is your current employment status?



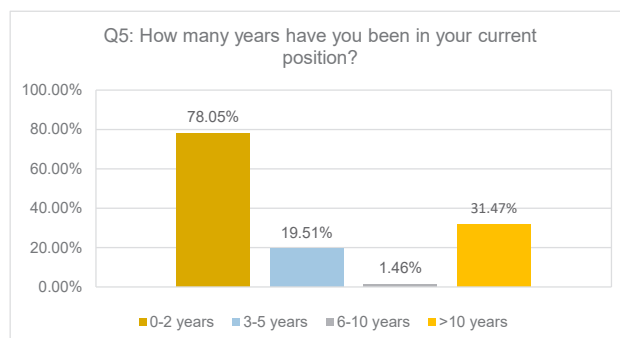
Answer Choices	Responses	
	%	#
Post Doctoral	35.58%	74
Other than Post Doctoral	61.54%	128
Not currently employed	2.88%	6
Total	100.00%	208

Q4 - Employment Sector – In which sector are you employed?



Answer Choices	Responses	
	%	#
Self-Employed	2.54%	5
Government	11.68%	23
Business, Industry, Non-Profit	48.73%	96
Education Non-Tenure Track	31.47%	62
Education Tenure Track	5.58%	11
Total	100.00%	197

Question 5 – How many years have you been in your current position?



Answer Choices	Responses	
	%	#
0-2 years	78.05%	160
3-5 years	19.51%	40
6-10 years	1.46%	3
>10 years	31.47%	2
Total	130.49%	205

Question 6 – Awards & Achievements – Would you like to share any?

year Best PhD thesis NA since research 2019 SNF Grant
 None one Cancer options Fellowship award
 Early postdoc mobility 2020 academia

The GCB would like to thank all its partners and collaborators. Particularly, we thank:

Prof. Dr. Britta Engelhardt and the team at the Theodor Kocher Institute (TKI) for the continued close cooperation and support. Special thanks go to Ursula Zingg for selflessly sharing her hard-won experience and knowledge of the university, for being a “go-to” person and for her positive, energetic approach to each administrative challenge. The calm steady support provided by Marianne Schori has been a tremendous benefit to the GCB Administration and for that we are genuinely thankful.

Rafaele Battaglia and the Institute of Social and Preventive Medicine (ISPM) IT Support team for their unflappable support throughout staff and equipment changes, as well as with the increased challenges supporting employees working from Home Office. Despite the at times unstable internet connections, 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.

Prof. Dr. Tobias Nef and Dr. Stephan Gerber from ARTORG Center for Biomedical Engineering Research for agreeing to take on and take over the planning of the virtual GCB Symposium 2021 in the final weeks of 2020. 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.

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