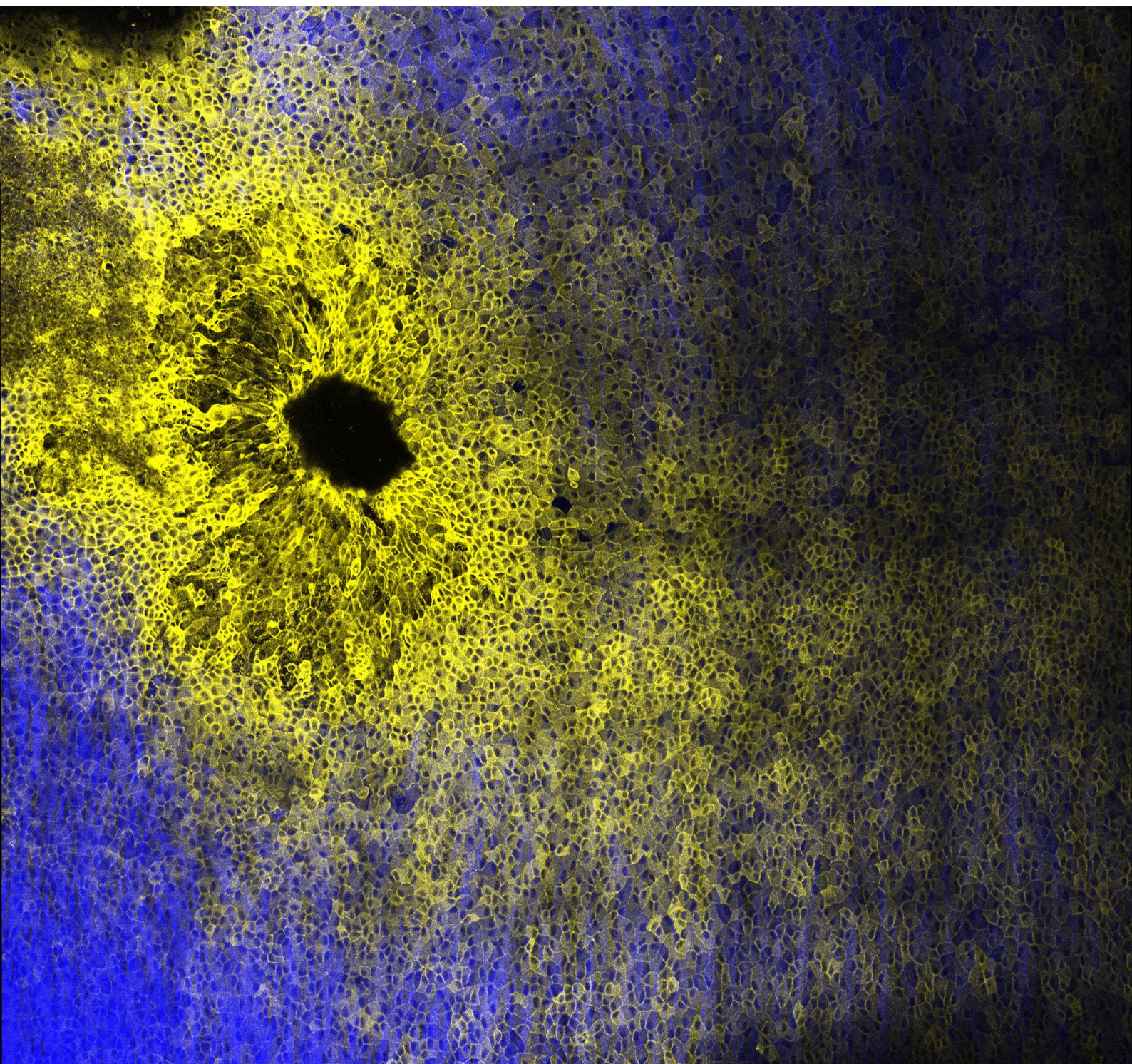


Annual Report 2021



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Foreword

Director's Report

Building bridges across scientific teams is a major goal in the new re-organization of the DBMR.

As recently reported in *Nature* (www.nature.com/articles/d41586-022-01204-1), Nobel laureates Jennifer Doudna and Emmanuelle Charpentier first met in 2011 at a conference where both gave talks about CRISPR–Cas9, a subject that at the time was understudied and drew little attention, and recognized that they were coming at the same story from different angles. They developed an incredible collaboration complementing each other's skill set – one an expert in biochemistry and the other in microbiology. This interaction was not only a huge scientific success but also resulted in a great friendship between the two.

Today, team science in the area of biomedical research is ever more important. The great complexity of technical tools and bioinformatics requires special expertise that go far beyond the general expertise of any one individual scientist. Clinical questions, while fundamentally the same, become more complex with novel targeted therapies, immune system modulation, and deeper understanding inter-individual variation.

We hope that supporting the concept of research programs will enable more team and collaborative science within the DBMR. We hope that as research labs interact together and formulate common interests, synergies will emerge from different scientific and clinical backgrounds. We also hope that proximity will allow members from different labs and programs to interact more freely. We are aware that physical proximity is not the only key factor, as seen with the Doudna-Charpentier example whose highly productive collaboration span several time zones, a common research goal is a major driving factor.

Many journals now expect that one paper goes from discovery all the way to some clinical end point, a highly ambitious goal, which takes years of work with many collaborators to achieve (or even to strive for this type of results). To be successful in completing these complex projects, good communication is paramount to team science. In the coming year, as we move away from further COVID-19 pandemic restrictions, we hope to see more and more interactions between researchers, clinicians and invited speakers. We are encouraging programs to invite experts from other institutions to develop and support bridges to the national and international research community. We envision a leading role for the DBMR in our community in dealing with the complexity of their team science efforts.

I am delighted to see that all of our core laboratories are now in close proximity. We are hopeful that this will improve the quality of research by enabling better communication with researchers and between the cores. Ultimately, our goal should be to achieve high quality, reproducible science that stands long after a publication. Another Nobel laureate, William Kaelin (2019), who made fundamental discoveries in the ability of cells to respond to oxygen availability through the HIF-1-alpha pathway, talks about building houses of stone and not castles of cards.

Team science at the DBMR and beyond is a theme that we would like to encourage and foster. Please let us know your thoughts on how we can help over the upcoming year.

Sincerely,
Prof. Mark A. Rubin, MD




The DBMR at Glance

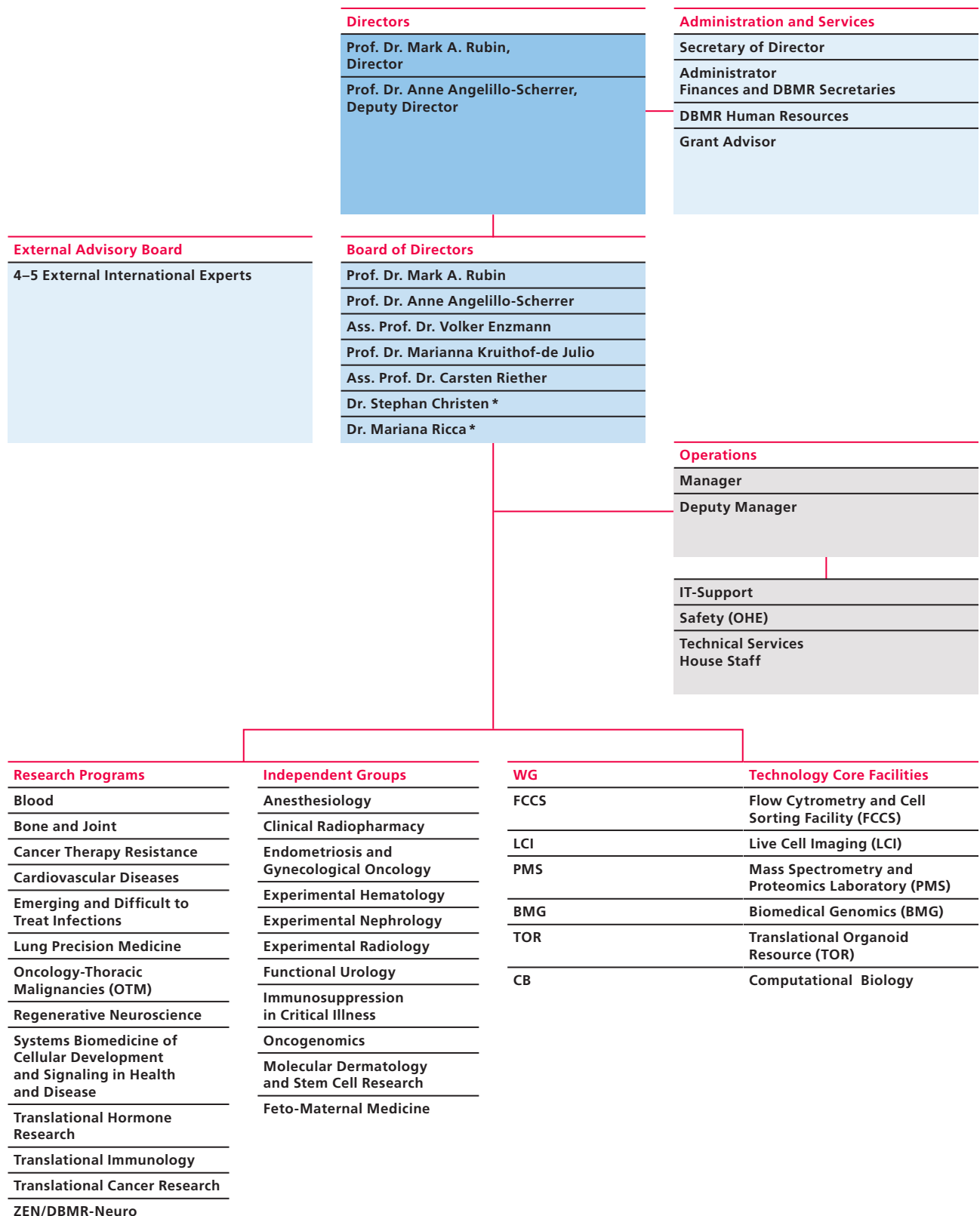
The Department for BioMedical Research (DBMR) of the Faculty of Medicine at the University of Bern was established in 1994 by the University of Bern and the Inselspital (Bern University Hospital). At the DBMR, there are 13 research programs with approximately 100 participating individual labs and several independent research laboratories, with research spanning all biomedical fields. To realize its mission to bridge the gap between bench and bedside, DBMR promotes an integrative perspective to clinical research with a strong emphasis on the development of translational approaches, use of omics and other cutting-edge technologies, operation of core facilities with state-of-the-art technology, and extensive interaction and collaboration between laboratory-based and patient-oriented clinical research.



Organization

The role of DBMR is to provide optimal infrastructure and scientific support to its affiliated members comprising labs from clinics of the Inselspital, Bern University Hospital and internal DBMR groups. DBMR also operates six core technology facilities. The research groups are supported by central services responsible for administration, facility management, and technical support, as well as providing informatic and bioinformatic services.

Organigram



* without voting right

Key People

Leadership



Prof. Dr. Mark A. Rubin *
Director



Prof. Dr. Anne Angelillo-Scherrer *
Deputy Director

Board of Directors



Ass. Prof. Dr. Volker Enzmann
Member, Board of Directors and
Contact Insel-Uni-Support



Prof. Dr. Marianna Kruithof-de Julio
Member, Board of Directors and
Gender Equality Representative



Ass. Prof. Dr. Carsten Riether
Member, Board of Directors



Dr. Mariana Ricca **
Grant Advisor



Dr. Stephan Christen **
Operations Manager

* Board of Directors
** non-voting members

Management

Dr. Stephan Christen
Operations Manager

Dr. Raschid Setoud
Deputy Operations Manager

Administration/Finances and DBMR Secretaries

Basak Ginsbourger
Administrator (until Dec.)

Marla Rittiner
Secretary

Beatrix Stalder
Secretary

Uyen Vo
Secretary (until July)

Trân Vu
Secretary (since Sep.)

Dr. Mariana Ricca
Grant Advisor

Director's Secretariat
Cornita Rohda
Jasmine Stiefel

DBMR Human Resources
Rahel Tschudi (until Dec.)
Sigrid Zimmermann (since Dec.)
Marla Rittiner

Occupational Safety, Health Protection and Environmental Safety (OHE)
François Achermann

IT-Support
Michael Ackermann
Ilker Romann
Luca Sulmoni

Technical Services
Patrick Furer
Head Technical Services

Lucille Wotzkow Alvarez
Polymechanic (since Sep.)

Nivetha Ravindran
Polymechanics Trainee

Heads of Core Facilities

PD Dr. Fabian Blank
Live Cell Imaging (LCI)

Prof. Dr. Manfred Heller
Mass Spectrometry and Proteomics Laboratory (PMS)

Dr. Stefan Müller
Flow Cytometry and Cell Sorting /FCCS

Prof. Dr. Marianna Kruthof-de Julio
Translational Organoid Resource (TOR)

Prof. Dr. Ursula Amstutz
Biomedical Genomics (BMG)

Dr. Kiu Yan Charlotte Ng
Computational Biology

DBMR Research Programs / Independent Research Labs

Research Programs

Blood

Allam Lab
 Angelillo-Scherrer Lab
 Bacher Lab
 Bonadies Lab
 Daskalakis Lab
 Kremer Hovinga Lab
 Oppliger Leibundgut Lab
 Rao Tata Lab
 Rovó Lab
 Schaller Tschan Lab
 Schroeder Lab
 Zeerleder Lab

Bone & Joint

Gantenbein & Hofstetter Lab
 Saulacic Lab

Cancer Therapy Resistance (CTR)

Kruihof-de Julio Lab
 Rottenberg Lab
 Rubin Lab

Cardiovascular Diseases

Döring Lab
 Heller Lab
 Longnus Lab
 Mercader Lab
 Odening Lab
 Osterwalder Lab
 Rexhaj Lab
 Rieben Lab
 Zuppinger Lab

Emerging and Difficult-to-Treat Infections

Leib Lab
 Schefold Lab
 Cameron Lab
 Furrer Lab
 Que Lab

Lung Precision Medicine

Blank Lab
 Funke-Chambour Lab
 Gazdhar Lab
 Geiser Lab
 Kopp Lab
 Latzin Lab
 Maurer Lab

Oncology-Thoracic Malignancies

Marti Lab
 Peng Lab

Regenerative Neuroscience

Enzmann Lab
 Kleinlogel Lab
 Leib Lab
 Marbacher Lab
 Saxena Lab
 Schöberlein & Surbek Lab

Translational Hormone Research

Grössl Lab
 Bally Lab
 Flück Lab
 Vogt Lab
 Stettler Lab
 Escher Lab
 Pandey Lab
 Hediger Lab

Systems Biomedicine of Cellular Development and Signaling in Health and Disease

Al Nabhani Lab
 Bally Lab
 Balmer Lab
 Beldi Lab
 Berzigotti Lab
 Candinas Lab
 Ganai-Vonarburg Lab
 Keogh-Stroka Lab
 Macpherson Lab
 Misselwitz Lab
 Stettler Lab
 Wiest Lab
 Yilmaz Lab

Translational Immunology

Bachmann Lab
 Eggel Lab
 Schlapbach Lab
 Vogel Lab

Translational Cancer Research

Aebersold Lab
 Bernasconi Lab
 Häfliger Lab
 Medova Lab
 Novak Lab
 Ochsenbein Lab
 Pabst Lab
 Riether Lab
 Seipel Lab
 Zimmer Lab

ZEN/DBMR-Neuro

Adamantidis Lab
 Bassetti Lab

Baud Lab
 Chan Lab
 Guttierrez Herrera Lab
 Saxena Lab
 Schmidt Lab

Independent Research Labs

Anesthesiology

Stüber & Hedinger Lab

Clinical Radiopharmacy

Rominger Lab

Endometriosis & Gynecological Oncology

Müller & Andrieu Lab

Experimental Radiology

Tengg-Kobligk Lab

Experimental Hematology

Baerlocher Lab

Experimental Nephrology

Faller Lab
 Fuster Lab
 Huynh-Do Lab
 Mohaupt Lab
 Moor Lab
 Sidler Lab

Feto-Maternal Medicine

Surbek & Schoeberlein Lab

Functional Urology

Monastyrskaja Lab

Immunosuppression in Critical Illness

Schefold Lab

Molecular Dermatology & Stem Cell Research

Müller E. Lab

Oncogenomics

Ng Lab



BLOOD

Participating Labs

- **Allam Lab**
Inflammation and hematopoiesis
- **Angelillo-Scherrer Lab**
Hemostasis, thrombosis, inflammation, and hematopoiesis/myeloproliferative neoplasms
- **Bacher Lab**
Targeted diagnostics in hematological malignancies
- **Bonadies Lab**
Personalized treatment for patients with myeloid malignancies
- **Daskalakis Lab**
Mechanisms of epigenetic regulation
- **Kremer Hovinga Lab**
ADAMTS13, von Willebrand factor, and thrombotic thrombocytopenic purpura/thrombotic microangiopathy
- **Oppliger Leibundgut Lab**
Hematopoiesis & molecular genetics
- **Rao Tata Lab**
Stem cells, Leukemia, Aging and Metabolism (SLAM)
- **Rovó Lab**
Long-term survivorship after stem cell transplantation, bone marrow failures, and cytopenia
- **Schaller Tschan Lab**
Thrombotic autoimmune diseases
- **Schröder Lab** Experimental hemostasis
- **Zeerleder Lab** Innate immunity in hematological diseases

Program Contact

Prof. Dr. Anne Angelillo-Scherrer

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- www.dbmr.unibe.ch → [Research](#) → [Programs](#)

Selected Collaborators

American Society for Transplantation and Cellular Therapy – Survivorship Special Interest Group, EBMT Chronic Malignancies Working Party (CMWP)
 Swiss MDS Registry and Biobank
 Steering committee and Advisory Board of Hereditary TTP Registry (➤ www.ttpregistry.net)
 University Medical Center Amsterdam, Amsterdam (NL)
 University of Oklahoma Health Sciences Center, Norman, OK (US)

Hematology is a comprehensive specialty dedicated to epidemiology, diagnosis, prognosis, treatment, and research of all types of blood-related disorders. Hematology research activities include the investigation of blood production, blood function, and blood-related diseases. The mission of the BLOOD Research Program is to develop a competitive basic, translational, and clinical research program in all areas of hematology.

The BLOOD Research Program comprises projects aimed at investigating epidemiological and pathophysiological processes; diagnosis, prognosis, and therapeutic approaches for all blood-related disorders; and pathophysiological processes that contribute to inflammation, thrombosis, and hemato-oncological diseases.

Research Highlights 2021

Annual incidence and severity of acute episodes in hereditary thrombotic thrombocytopenic purpura; Tarasco G. et al., Blood (2020), 137:3563-75

First publication with prospective data from an international registry on the incidence and severity of acute TTP episodes in patients with hereditary (hTTP) or congenital TTP. The authors also documented the impact of prophylactic ADAMTS13 replacement therapy, ADAMTS13 genotype, and patient age on these outcomes. Notably, the annual incidence was highest in children and declined with age. This was surprising, as von Willebrand factor is a major contributor to cardiovascular and cerebrovascular events, and its influence increases with age.

LRR protein RNH1 dampens the inflammasome activation and is associated with adverse clinical outcomes in COVID-19 patients; Bombacci G. et al., Life Science Alliance, 2022.

The study described RNH1-mediated anti-inflammatory mechanisms, including the potential inhibition of NF-κB signaling through an unknown mechanism, and regulation of inflammasome activation by controlling caspase-1 protein levels via proteasome-mediated degradation.

NGS evaluation of a Bernese cohort of unexplained erythrocytosis patients; Jalowiec K.A. et al. Genes 2021 (presentation at the Congress of the American Society of Hematology 2021, which received the Abstract Achievement Award)

In 18% of the patients, 8 different heterozygous gene variants were found. The patients were diagnosed with congenital erythrocytosis. Two patients displayed two different gene variants. All variants were characterized as variants of unknown significance, as they have not been previously described in the literature. The remaining 82% of the patients did not harbor gene variants. The findings indicated the value of next-generation sequencing in determining the reasons for persistent and unexplained erythrocytosis. The identification of some unknown gene variants in this cohort of patients with erythrocytosis may help clarify the clinical picture.

Thrombophilia testing and impact on treatment decision, recurrence of venous and arterial thromboembolism, and pregnancy morbidity; Vrotniakaite Bajercene K. et al., presentation at the Congress of the American Society of Hematology 2021 (Abstract Achievement Award) and Swiss Society of Hematology (Hemostasis Prize 2021)

Data showing clinical usefulness of thrombophilia testing for treatment decisions are limited. This single-center, retrospective cohort study of 3686 eligible patients over a 10-year period revealed that only 6 % of workups provided further guidance to extend or initiate anticoagulation. Patients with high-risk thrombophilia had significantly more new venous thromboembolisms and pregnancy morbidities.

Outlook 2022 – selected ongoing projects

Swiss National Science Foundation (grant nos. 310030-192635, 320030-189090, 310030-185233; 314730_173127)
 NFP78 "COVID-19(4078P0_198255); R'EQUIP316030_183501)
 Landsteiner Foundation for Blood Transfusion Research (LSBR1719), Amsterdam, The Netherlands
 Product and Process Development Cellular Products Sanquin (PPOC) Program Sanquin (PPOC-17-44), Amsterdam (NL)
 Dutch Thrombosis Foundation (TSN 201604), Amsterdam, The Netherlands
 Health Services Research grant, Swiss Cancer Research (HSR-4085-11_2016)
 Swiss Cancer Grant (KFS-5158-08-2020, KFS-4896-08-2019) and SAKK Grant 33/18
 Bernese Cancer League, Jacques und Gloria Gossweiler Stiftung, Olga Mayenfish Stiftung- 3rd Call for Proposals for Personalized Health and Related Technologies PHRT project #2019-717
 IIR grant (H16-36165) from Baxalta US Inc., Novartis CINC 424BCH01R, CSL Behring AG, Alexion

Selected Publications

Tarasco, E., L. Butikofer, K. D. Friedman, J. N. George, I. Hrachovinova, P. N. Knobl, M. Matsumoto, et al. "Annual Incidence and Severity of Acute Episodes in Hereditary Thrombotic Thrombocytopenic Purpura." *Blood* 137, no. 25 (Jun 24 2021): 3563-75.
 Bombaci, G., M. A. Sarangdhar, N. Andina, A. Tardivel, E. C. Yu, G. M. Mackie, M. Pugh, et al. "Lrr-Protein Rnh1 Dampens the Inflammasome Activation and Is Associated with Covid-19 Severity." *Life Sci Alliance* 5, no. 6 (Jun 2022).
 Jalowiec, K. A., K. Vrotniakaite-Bajerciene, A. Capraru, T. Wojtovicova, R. Joncourt, A. Rovo, and N. A. Porret. "Ngs Evaluation of a Bernese Cohort of Unexplained Erythrocytosis Patients." *Genes (Basel)* 12, no. 12 (Dec 4 2021).
 Schar, D. T., M. Daskalakis, B. Mansouri, A. Rovo, and S. Zeerleder. "Thromboembolic Complications in Autoimmune Hemolytic Anemia: Retrospective Study." *Eur J Haematol* 108, no. 1 (Jan 2022): 45-51.

Graf, J. R., S. Forster, F. K. Bruehl, Y. Banz, M. Hallal, J. Brodard, V. U. Bacher, et al. "Diagnostic and Prognostic Implications of Caspase-1 and Pd-L1 Co-Expression Patterns in Myelodysplastic Syndromes." *Cancers (Basel)* 13, no. 22 (Nov 15 2021).

Link to publication list

➤ www.hzl.insel.ch/de/lehre-und-forschung/publikationen

Bone & Joint

The skeletal system is subject to traumatic conditions, including fractures and large bone defects, and pathologies due to degeneration, such as osteoporosis, osteoarthritis, and intervertebral disc degeneration. The demand for improved and efficient treatments is increasing as the proportion of the elderly in societal populations increases, with many desiring to stay physically active. However, surgical procedures for the repair of large bone defects or degenerated spinal discs need to be improved. The regeneration of skeletal tissues is the focus of the Bone & Joint Research Program. To this end, strategies based on cells, materials, and growth factors are being used *ex vivo* (2D/3D cell cultures and bioreactors) and *in vivo*. Pioneering orthopedic surgery, which has been a longstanding tradition in Bern, requires interaction between surgeons and scientists. The Bone & Joint Research Program will continue and extend this tradition and provide clinicians with tools to improve the treatment of patients.

Participating Labs

- **Gantenbein & Hofstetter Lab**
Orthopedic Research
- **Saulacic Lab**
Cranio-Maxillofacial Surgery

Program Contact

Prof. Dr. Benjamin Gantenbein

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Selected Collaborators

- Albers C** Department of Orthopaedics & Traumatology, Bern University Hospital (CH)
- Bohner M** Robert Mathys Foundation, Bettlach, Switzerland
- Ferrari S. L.** Division of Bone Diseases, Department of Internal Medicine Specialties, Faculty of Medicine, Geneva University Hospital (CH)
- Krebs P** Institute of Pathology, University of Bern
- Le Maitre C** Biomolecular Sciences Research Centre, Sheffield Hallam University (UK)
- Noailly J** Department of Information and Communication Technologies, University Pompeu Fabra (ES)
- Schär M** Department of Orthopaedics & Traumatology, Bern University Hospital (CH)
- Tryfonidou M** Department of Clinical Sciences of Companion Animals, Faculty of Veterinary Medicine, Utrecht University (NL)

Research Highlights 2021 / Outlook 2022

As of 2021, there are four competitively funded research projects actively concerning intervertebral disc regeneration and improved spinal fusion, long bone repair, osteoimmunology (interaction of immune system and skeleton). Two of these research projects were funded by the EU Horizon 2020 framework, one by the Swiss National Science Foundation, and one by the Center of Applied Science and Molecular Medicine (CABMM).

The first highlight is the iSpine research project on progenitor cells. iSpine is an international consortium led by Prof. Marianna Tryfonidou, a leading veterinarian from the University Medical Center Utrecht & University Utrecht. The consortium includes both universities and companies and received 16 million euros from EU funding (➤ <https://cordis.europa.eu/project/id/825925>). The consortium was established in January 2019 to begin researching a new advanced therapy for the treatment of LBP caused by disc deterioration. The aim of this project is to investigate and develop a new advanced biological therapy using induced pluripotent stem cells (iPSCs) (➤ <https://ipspine.eu>). iPSCs are created by reprogramming fully mature cells, such as cells from the blood or skin, into spine-specific cells. Over the next five years, the goal of the iSpine partners is to demonstrate the success of iPSCs as a therapeutic strategy. By the end of the project, the therapy should be ready for the first clinical trial. Within this highly cross-disciplinary consortium, our group was able to isolate primary cells from human trauma intervertebral discs (IVDs) with written consent from patients. These cells were then delivered to the consortium partners at INSERM in Montpellier and Nantes, France. These partners were able to produce novel iPSC cell lines that can be used in future cell therapies to cure degenerated IVDs.

A second highlight is the investigation of engineered silk scaffolds for IVD repair. A new project funded by the Swiss National Science has been initiated that targets regeneration of the IVD by using “cross-linked growth factors and engineered” silk fibers and knitting techniques developed by Dr. Michael Wöltje at the Dresden University of Technology, Institute of Textile Machinery and High Performance Material Technology, Dresden, Germany.

A third key highlight is a project that began in Nov 2020. The project involves artificial intelligence, statistical shape and finite element modelling, and organ culture models for IVD regeneration. The €4M-funded Disc4All project aims to tackle this issue through collaborative expertise of clinicians, computational physicists and biologists, geneticists, computer scientists, cell and molecular biologists, microbiologists, bioinformaticians, and industrial partners (➤ <https://cordis.europa.eu/project/id/955735>). The project provides interdisciplinary training in data curation and integration, experimental and theoretical/computational modelling, computer algorithm development, tool generation, and model and simulation platforms to transparently integrate primary data

for enhanced clinical interpretations through models and simulations. The consortium is led by biomedical engineer Prof. Jérôme Noailly, Universitat Pompeu Fabra, Barcelona, Spain (<https://www.upf.edu/web/disc4all>). The Disc4All early-stage researchers will provide a new generation of internationally mobile professionals with unique skill sets for the development of thriving careers in translational research applied to multifactorial disorders.

Finally, the fourth highlight is the development of a coccygeal rat non-fusion model for IVDs. In collaboration with the RMS foundation (Bettlach, SO), porous ceramic implants are currently being tested in an *in vivo* rat animal model for spinal fusion. This project was awarded in Dec 2021 with the Best Poster Award at the German Spine Society Conference.

Another topic of interest in orthopedics is the healing of osteoporotic bone treated with bisphosphonates (BP), a class of drugs that inhibit osteoclastic bone resorption. In the past year, a mouse model of ovariectomized (OVX) and β -tricalcium phosphate (BTCP)-filled femoral critical-size defects was used to investigate whether treatment with BP affects defect healing and impairs biomaterial turnover. After harvesting all the tissue samples and preparing the RNA, the outcomes were assessed by histomorphometry and second-generation sequencing. The research was performed by PhD student Franziska Strunz and was supported by a grant from the Alfred & Anneliese Sutter-Stöttner Foundation.

Regeneration of extended bone deficiencies is one of the most challenging goals in the field of Cranio-Maxillofacial Surgery. A standardized critical-size bone defect calvarial model was used to assess the rate of bone formation and resorption of the biphasic calcium phosphates (BCP) and collagen-based bone substitute materials. Lowering the level of biomimetic hydroxyapatite coating induced higher rate of bone formation concomitant with the higher degradation rate of BCP. Cross-linking of the collagen-based matrices (CM) induced significantly greater total tissue volume in the middle area of the defects compared to non-cross-linked CM, concomitant with a thicker connective tissues regeneration. Mineralization of CM further contributed to the new bone formation and a shift from M1 to M2 macrophages.

Another key research focus in bone research is to identify the regulatory mechanism of supraosteal bone formation induced by mechanical manipulation of periosteum. Reciprocal interactions between the bone and the periosteum are most important for *de novo* bone formation. Research project supported by SNF aimed to assess the mechanobiological principles governing hard tissue formation. Results indicated that an alternated activation and relaxation of periosteum (periosteal pumping) enhanced modelling and remodeling of the calvarial bone. Gadolinium (Gd) is a component of contrast agents and is frequently used in clinical practice. Despite its common application, it is not clear whether the incorporation of Gd into tissues causes negative long-term effects. In this study, the effects of ionized Gd and complexed Gd on the development

and activation of bone cell lineages were investigated. This work was also performed by Franziska Strunz in collaboration with Dr. Rainer Egli (Clinic of Diagnostic and Interventional Radiology) and supported by a grant from Inselspital.

In collaboration with Dr. Philippe Krebs (Institute of Pathology, University of Bern), the effects of a deficiency in inositol-polyphosphate-5-phosphatase (SHIP1) on osteoclast development and activity were assessed. SHIP1-deficient Styx mice are characterized by a low bone mass phenotype. The cellular basis for this phenotype was analyzed *in vitro* and *in vivo*.

Selected Publications

- Gantenbein, B., S. Tang, J. Guerrero, N. Higuera-Castro, A. I. Salazar-Puerta, A. S. Croft, A. Gazdhar, and D. Purmesur. "Non-Viral Gene Delivery Methods for Bone and Joints." *Front Bioeng Biotechnol* 8 (2020): 598466.
- Croft, A. S., Y. Roth, K. A. C. Oswald, S. Corluka, P. Bermudez-Lekerika, and B. Gantenbein. "In Situ Cell Signalling of the Hippo-Yap/Taz Pathway in Reaction to Complex Dynamic Loading in an Intervertebral Disc Organ Culture." *Int J Mol Sci* 22, no. 24 (Dec 20 2021).
- Zhang, X., J. Guerrero, A. S. Croft, C. E. Albers, S. Hackel, and B. Gantenbein. "Spheroid-Like Cultures for Expanding Angiopoietin Receptor-1 (Aka. Tie2) Positive Cells from the Human Intervertebral Disc." *Int J Mol Sci* 21, no. 24 (Dec 10 2020).
- Saulacic, N., F. Munoz, E. Kobayashi, V. Chappuis, A. Gonzales-Cantalapiedra, and W. Hofstetter. "Effects of Local Application of Alendronate on Early Healing of Extraction Socket in Dogs." *Clin Oral Investig* 24, no. 4 (Apr 2020): 1579-89.
- Schnyder, D., G. Albano, P. Kucharczyk, S. Dolder, M. Siegrist, M. Anderegg, G. Pathare, et al. "Deletion of the Sodium/Hydrogen Exchanger 6 Causes Low Bone Volume in Adult Mice." *Bone* 153 (Dec 2021): 116178



X-ray of a fixed bone fracture in a large bone defect model in black six mice 12-week post-operation.

Cancer Therapy Resistance

We studied therapy resistance using matched patient samples before and after treatment, state-of-the-art *in vivo*, *ex vivo*, and *in vitro* models, and functional screens to identify new vulnerabilities in resistant tumors. We hope to elucidate the basic mechanisms of therapy resistance by combining the power of next-generation sequencing with functional genomic screens. This is an additional validation of patient-derived samples, organoids, three-dimensional cultures, and realistic animal models that provide a unique opportunity. The added value created by the CTR cluster comes from an interdisciplinary team with extensive experience in basic, translational, and clinical research. We aimed to identify novel genomic alterations associated with treatment resistance and new therapeutic targets to restore treatment sensitivity. CTR principal investigators have established collaborations with other leading scientists abroad (e.g., SU2C-PCF Prostate, SPORE, SNF Sinergia, KWF, ITN, FWF, The Netherlands Cancer Institute). CTR is active internationally, and we are convinced that it will provide more visibility for the University of Bern and Switzerland in the field of precision oncology.

Participating Labs

- **Kruithof-de Julio Lab**
Urology Research Laboratory
- **Rubin Lab**
Precision Oncology
- **Rottenberg Lab**
Therapy Escape of Cancer

Program Contact

Prof. Dr. Marianna Kruithof-de Julio

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Selected Collaborators

- Demichelis F** University of Trento (IT)
- Emerling B** Sanford Burnham Prebys Medical Discovery Institute (USA) ➤
- Jonkers J** The Netherlands Cancer Institute, Amsterdam (NL)
- Lunardi A** University of Trento (IT)
- Piscuoglio S** University of Basel (CH)

Research Highlights 2021 / Outlook 2022

Research highlights in the Kruithof-de Julio laboratory include the following:

1. Generated patient-derived xenografts (PDX) and patient-derived organoids (PDO) from biopsies of prostate and bladder cancer (Karkampouna et al. 2021).
2. In collaboration with NEXUS and ETH, a new medium composition was developed that allows culture of PDO matrix-free and medium throughput on the PDOs.
3. Developed and implemented a clinically relevant culture system for studying tumor tissues *ex vivo* (patent pending).
4. We have previously shown that the effects of drug treatment in this system are consistent with those observed in organoids (*in vitro*) and PDXs (*in vivo*) (Karkampouna et al. 2021). Presently, we customized a microvasculature-on-chip device to mimic the bone microenvironment.
5. Generated and fully characterized a unique PDX *BRCA2* mutant (Karkampouna et al. 2021).
6. A medium throughput screen with NEXUS was used to identify 16 compounds that are in current use in PDO (Karkampouna et al. 2021; LaManna 2021 FrOnc).
7. Demonstrated that the CRIPTO cell surface protein drives bone metastatic progression and plays a novel role in fibrosis (Karkampouna et al. 2021).

New support has been received for several research projects (SNSF Sinergia, Swiss Cancer League, Bernese Cancer League, PHRT and Innosuisse).

Precision oncology applies precision medicine approaches to understand the mechanisms of prostate cancer (Pca) progression and therapy resistance. Related highlights in the Rubin laboratory include the following:

1. Validation of findings from multi-omic datasets that characterize changes in cell metabolism using P15P4K-depleted systems and continued characterization of the first prostate cell type-specific mouse models to target expression *in vivo* (PMID: 33984270).
2. Determination of the role of reduced METTL3 expression and resistance to androgen-targeted therapy (PMID: 34088870).
3. Development of *in vitro* models to elucidate the biological processes underlying metastases, including organoid models of the brain and liver.
4. Demonstration that the minor spliceosome is a strong therapeutic target for lethal PCa (manuscript under review).
5. Clarification of the underlying mechanisms of how the SWI/SNF complex regulates lineage plasticity and therapy resistance to identify novel therapeutic strategies for neuroendocrine Pca.
6. Continued development of new therapeutic strategies that exploit vulnerabilities in the TC-NER pathway of Pca patients.

7. Defined tumor heterogeneity and its molecular landscape from matched samples of primary and brain metastatic PCa (PMID: 35504881).

New support has been received for several research projects (Fond'Action, Engelhorn Foundation, Swiss Government, ISREC, Berger-Janser Foundation, Hermann Foundation, and Fondation Nuovo-Soldati).

In the Rottenberg lab, we have continued our efforts to understand the mechanisms of anti-CTR using genetically engineered mouse models for BRCA1/2-mutated breast cancer, as well as genome-wide functional CRISPR/Cas9 screens. Highlights in 2021 include the following:

1. Validated that MDC1 counteracts restrained replication fork restart, and that its loss causes poly (ADP-ribose) polymerase (PARP) inhibitor resistance in BRCA1/2-deficient tumors (manuscript in revision).
2. Demonstration that the loss of nuclear DNA ligase III reverts PARP inhibitor resistance in BRCA1/53BP1-deficient cells by exposing ssDNA gaps (PMID: 34555355).
3. Investigated the essentialome of p53 and BRCA1 in p53-deficient human cells exposed to ionizing radiation (IR).
4. Identified genes that promote IR resistance when depleted for further validation.
5. Confirmed that the loss of the volume-regulated anion channel components, LRRC8A and LRRC8D, limits platinum drug uptake and efficacy.
6. Identified a posttranslational modification that is essential for LRRC8A/D-mediated platinum drug uptake was identified.
7. Demonstrated that the cellular receptor of a canine distemper virus strain might be useful for oncolytic immunotherapy.

In 2021, this research was supported by the EU (ERC-AdG 883877, ERC-CoG-681572), SNSF (310030_179360, 31BL30_189698, MD-PhD 02/21), Swiss Cancer League (KLS-4282-08-2017), Wilhelm Sander Foundation (no. 2019.069.1), and Foundation for Clinical-Experimental Cancer Research.

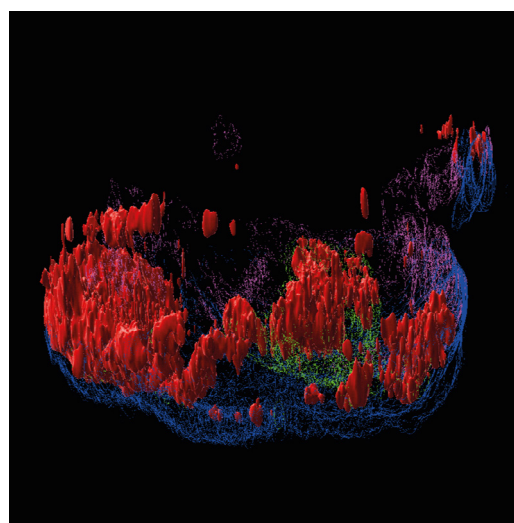
Selected Publications

- Cotter, K. A., J. Gallon, N. Uebersax, P. Rubin, K. D. Meyer, S. Piscuoglio, S. R. Jaffrey, and M. A. Rubin. "Mapping of M(6)a and Its Regulatory Targets in Prostate Cancer Reveals a Mettl3-Low Induction of Therapy Resistance." *Mol Cancer Res* 19, no. 8 (Aug 2021): 1398-411.
- Ravi, A., L. Palamiuc, R. M. Loughran, J. Triscott, G. K. Arora, A. Kumar, V. Tieu, et al. "Pi5p4ks Drive Metabolic Homeostasis through Peroxisome-Mitochondria Interplay." *Dev Cell* 56, no. 11 (Jun 7 2021): 1661-76 e10.
- Karkampouna, S., D. van der Helm, M. Scarpa, B. van Hoek, H. W. Verspaget, M. J. Goumans, M. J. Coenraad, B. P. T. Kruihof, and M. Kruihof-de Julio. "Oncofetal Protein

- Cripto Is Involved in Wound Healing and Fibrogenesis in the Regenerating Liver and Is Associated with the Initial Stages of Cardiac Fibrosis." *Cells* 10, no. 12 (Nov 26 2021).
- Karkampouna, S., F. La Manna, A. Benjak, M. Kiener, M. De Menna, E. Zoni, J. Grosjean, et al. "Patient-Derived Xenografts and Organoids Model Therapy Response in Prostate Cancer." *Nat Commun* 12, no. 1 (Feb 18 2021): 1117.
- Rottenberg, S., C. Disler, and P. Perego. "The Rediscovery of Platinum-Based Cancer Therapy." *Nat Rev Cancer* 21, no. 1 (Jan 2021): 37-50.

Link to publication list

- www.ncbi.nlm.nih.gov/myncbi/1tchmU-55LZ5H8/bibliography/public/
- www.ncbi.nlm.nih.gov/myncbi/mark.rubin.1/bibliography/public/
- www.ncbi.nlm.nih.gov/myncbi/sven.rottenberg.1/bibliography/public/



Tumour cells (red) colonise the brain milieu and expand among the cortical plate (green) and neurons (magenta) of the mini-brain after co-culture. 5x magnification, scale bar = 200µm.

Cardiovascular Diseases

Participating Labs

- **Döring Lab – Yvonne Döring (Y.D.)**
Atherosclerosis, vascular inflammation, and lower extremity arterial disease
- **Heller Lab – Manfred Heller (M.H.)**
Mass spectrometry-based methods to characterize circulating extracellular vesicles and system-wide protein regulation
- **Longnus Lab – Sarah Longnus (S.L.)**
Cardiac metabolism and signalling, and heart transplantation
- **Mercader Lab – Nadia Mercader (N.M.)**
Heart development and regeneration
- **Odening Lab – Katja Odening (K.O.)**
Cardiac electrophysiology and arrhythmogenic mechanisms in inherited rhythm disorders
- **Osterwalder Lab – Marco Osterwalder (M.O.)**
Gene regulatory mechanisms underlying cardiac development, disease, and reprogramming
- **Rexhaj Lab – Emrush Rexhaj (E.R.)**
Fetal programming of metabolic and cardiovascular function/dysfunction later in life
- **Rieben Lab – Robert Rieben (R.R.)**
Ischemia/reperfusion injury, xenotransplantation, vascularized composite allotransplantation
- **Zuppinger Lab – Christian Zuppinger (C.Z.)**
Mechanisms of adverse effects of cancer therapies on the cardiovascular system (Cardio-Oncology)

Program Contact

Prof. Dr. Yvonne Döring

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Selected Collaborators

- Enriquez JA** Cardiovascular Regeneration Program of The National Centre for Cardiovascular Research, Madrid, (ES)
- Torres M** Cardiovascular Regeneration Program of The National Centre for Cardiovascular Research CNIC, Madrid, (ES)
- Marsano A** Basel University, Biomedicine/Cardiac Surgery, Basel (CH)
- Weber C** IPEK, LMU Munich, Munich (DE)
- Söhnlein O** Institute of Experimental Pathology at the WWU, Münster (DE)
- Eckhard Wolf** Gene Center and Department of Biochemistry, LMU, Munich (DE)

Tight spatiotemporal control of cardiac gene expression and a functional cardiovascular system is essential for embryonic development and during the entire lifespan, ensuring blood supply throughout the body. In healthy adults, blood vessels remain in a quiescent state with nonproliferating, antithrombotic, anti-inflammatory, and nonangiogenic endothelial and smooth muscle cell phenotypes. Cardiomyocytes ensure proper electrical and contractile function in the heart. Focusing on human cardiovascular diseases (CVDs), the DBMR CVD research program covers all aspects of cardiac development and vascular and injury responses. We analyze molecular, epigenetic, and physiologic mechanisms underlying heart formation, regeneration, and injury responses after tissue damage (inflammation, ischemia/reperfusion injury, cancer treatment). We aim to dissect cardiac gene regulatory networks and fibrotic repair mechanisms, and to investigate the long-term consequences of injury (e.g., arrhythmias and heart failure). Furthermore, we examine vascular biology (e.g., role of glycocalyx), chronic inflammation (e.g., atherosclerosis), and immune mechanisms (e.g., complement or neutrophil extracellular traps) affecting vascular health and disease.

Research Highlights 2021

In 2021, we moved into our new laboratory and office spaces in Murtenstrasse 24. This spatial consolidation of CVD program groups fosters joint meetings, get-togethers, and group discussions. All members greatly appreciate the new lab space and proximity to the core facilities. Beginning in November 2021, a monthly CVD program meeting has focused on exchanging information with the DBMR management team and presentation of the latest scientific findings and our own data. This platform provides younger scientists the opportunity to present their data in a protective and supportive setting to the larger group.

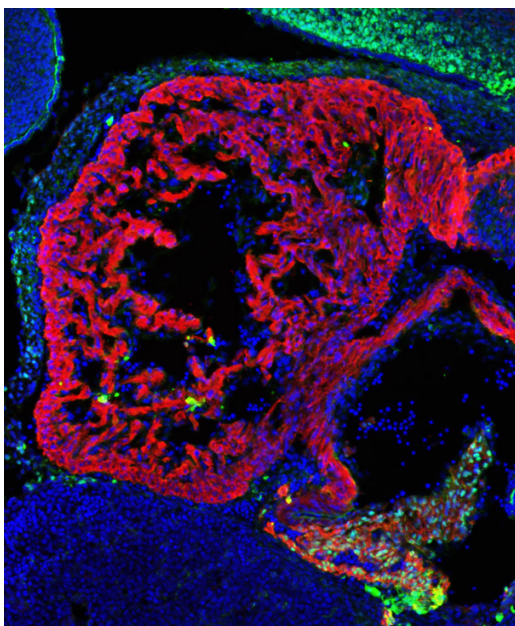
In 2021, successful scientific collaborations involving the CVD program resulted in several joint efforts to raise third-party funding:

1. We were successful in obtaining funding from the SNSF NRP78 (4078P0_198297) to study the effects of SARS-CoV-2 on the cardiovascular system (Program PIs: Y.D., N.M., R.R.; Associated: S.L., K.O.; External PI: B.Engelhardt).
2. In a joint application involving CVD-PIs M. O. (main applicant), C. Z. (co-applicant), Iros Barozzi (external PI, co-applicant), N. M. (project partner), K. O. (collaborator/implementation partner), and Y. D. (collaborator), we applied for a NRP79 (407940_206520) “Advancing 3R – Animals, Research and Society” grant, termed HeartX. We also have focused on establishing a novel type of cardiac organoids, which we intend to leverage as a mouse replacement model recapitulating in vivo cardiac chamber formation. The outcome decision is scheduled for May 18, 2022.
3. We were awarded an SNSF project grant (310030_205073) to investigate energy metabolism as a basis for

sex differences in cardiac tolerance to ischemia and reperfusion (Program PI: S.L., Program Partner: M.H.).

4. Since March 2021, a state-of-the-art cardiac catheterization lab for large animals has become available. This lab is essential for translational projects in CVD research. An example is the ongoing Innosuisse project 2155005728 from R.R. together with HAYA Therapeutics, Lausanne.
5. Y.D. and K.O., together with cooperation partners from the CVD cluster, also applied for a grant in the framework of the newly launched fields of competence of the medical faculty of Bern. The grant, titled "Cardiovascular rare disease – to establish personalized diagnostic and therapeutic approaches", did not receive initial funding within the scope of the Competence Fields initiative. Nonetheless, it will continue to be pursued thematically in the Medizinbereich Herz/Gefäss.

S.L. and K.O. are coordinators and Y.D., N.M., M.O., and R.R. are board members of the CV Research Cluster Bern. This cluster promotes research collaborations among fundamental and clinical researchers, raises visibility and awareness of CVD research in Bern, enriches the training environment of junior researchers, and provides a framework for multi-team and/or interdisciplinary projects. Cluster activities include regular seminar series with internal and external speakers, student research events, and annual networking meetings.



Marco Osterwalder group. Cross-section of the mouse embryonic heart (red) at gestation day 11.5. The SHOX2 transcription factor (green) is essential for cardiac pacemaker differentiation in the sinus venosus.

Outlook 2022

A research article by N.M. and M.O. has been very recently published in the scientific journal "Development" (DOI: 10.1242/dev.200375). C.Z. published a paper titled "Supplementing soy-based diet with creatine in rats: implications for cardiac cell signaling and response to doxorubicin" in *Nutrients*. Y.D., N.M., R.R., and colleagues had a review article titled "COVID-19 and the vasculature: current aspects and long-term consequences" accepted for publication in *Frontiers of Cell and Developmental Biology*.

The following CVD Program researchers received funding: Individual funding to Y.D. (SNSF project grant 310030_197655), N.M. (ERC Consolidator grant 819717 and SNSF Project ForcelnRegeneration 310030L_182575), K.O. (SNSF project grant 310030_197595, NIH joint-grant 2R01HL131461-05, and EJP-RD grant 31ER30_194836), M.O. (SNSF Eccellenza Professorial Fellowship PCEFP3_186993), E.R. (SNF project grant 320030_185023/1), and R.R. (SNSF Sinergia CRSII5_198577, SNSF project grant 310030_182264, US DoD project W81XWH1910714).

Finally, we are proud that the PI N.M. was nominated as an individual member of the Swiss Academy of Medical Sciences in 2021.

Selected Publications

- Thakur, M., B. Evans, M. Schindewolf, I. Baumgartner, and Y. Doring. "Neutrophil Extracellular Traps Affecting Cardiovascular Health in Infectious and Inflammatory Diseases." *Cells* 10, no. 7 (Jul 4 2021).
- Bonetti, N. R., T. A. Meister, R. Soria, A. Akhmedov, L. Liberale, S. Ministrini, A. Dogar, et al. "In Vitro Fertilization Exacerbates Stroke Size and Neurological Disability in Wildtype Mice." *Int J Cardiol* 343 (Nov 15 2021): 92-101.
- Marques, I. J., A. Sanz-Morejon, and N. Mercader. "Ventricular Cryoinjury as a Model to Study Heart Regeneration in Zebrafish." *Methods Mol Biol* 2158 (2021): 51-62.
- Mendez-Carmona, N., R. K. Wyss, M. Arnold, A. Segiser, N. Kalbermatter, A. Joachimbauer, T. P. Carrel, and S. L. Longnus. "Effects of Graft Preservation Conditions on Coronary Endothelium and Cardiac Functional Recovery in a Rat Model of Donation after Circulatory Death." *J Heart Lung Transplant* 40, no. 11 (Nov 2021): 1396-407.
- Tokarska-Schlattner, M., L. Kay, P. Perret, R. Isola, S. Attia, F. Lamarche, C. Tellier, et al. "Role of Cardiac AMP-Activated Protein Kinase in a Non-Pathological Setting: Evidence from Cardiomyocyte-Specific, Inducible AMP-Activated Protein Kinase Alpha1alpha2-Knockout Mice." *Front Cell Dev Biol* 9 (2021): 731015.
- Olariu, R., C. Tsai, M. Abd El Hafez, A. Milusev, Y. Banz, I. Lese, J. I. Leckenby, et al. "Presence of Donor Lymph Nodes within Vascularized Composite Allotransplantation Ameliorates VEGF-C-Mediated Lymphangiogenesis and Delays the Onset of Acute Rejection." *Transplantation* 105, no. 8 (Aug 1 2021): 1747-59.



Anesthesiology

Stueber & Hedinger Lab

Research in macro-physiology-embracing dimensions such as respiration and hemodynamics has shaped research in anesthesia over decades. Looking ahead, further discoveries and deepened understanding of molecular biology offer tremendous opportunities to advance perioperative care. With anesthesiology and surgery evolving interdependently and given the nature of anesthesiology as a collaborative aspect of perioperative medicine, we aim to understand the molecular risks and responses of anesthetized patients to surgical interventions. Our goal is to define the best practices for personalized perioperative patient care.

Our group focuses on the anesthesia-induced neurotoxicity and the genetic predisposition for perioperative morbidity and mortality. Our special interests include inflammation/immunology, cardiovascular system, pharmacokinetics and pharmacodynamics of general anesthetics, pharmacogenetics, and pain medicine. With basic science as our foundation and translational medicine as our vision, our goal is to contribute significantly to precision medicine in anesthesiology and perioperative care both nationally and internationally.

In our lab, we apply a broad spectrum of state-of-the-art molecular and cell biology methods, including *in vitro*, *ex vivo*, and *in vivo* models, linking basic science with clinical phenotypes to enhance recovery after surgery through personalized medicine.

Research Highlights 2021 / Outlook 2022

1. Flow cytometry-based RNA interference high-throughput screening RNAi HTS in human melanoma cells for either up- or down-regulation of microRNAs (miRNAs) of surface human leucocyte antigen HLA-DR expression has been conducted. *In silico* approaches have been applied to functional miRNA-mRNA interaction prediction. The potential underlying gene regulation by different miRNAs has been proposed. The manuscript summarizing this study is currently under revision. Individual miRNA candidates will be further tested in monocytic and primary cell lines. Our results will promote the study of miRNA-mediated HLA-DR regulation under both physiological and pathological conditions and may pave the way for potential clinical applications.
2. We established behavior-based HTS assays for testing established and widely used anesthetic and sedative compounds in a novel zebrafish *in vivo* model. The goal is to identify drug-specific neurotoxicity endpoints and discover new anesthetic adjuvants and target-specific neuroprotective agents that can enhance anesthetic safety and management.
3. Human THP-1 cells were used to investigate regulatory mechanisms of the nociceptin system. The expression of nociceptin, nociceptin opioid receptor, and Toll-like receptors (TLRs) in response to different stimulations was analyzed. The study outcomes were presented at the SGAR Congress 2021. The manuscript on the

interactions between nociceptin and the TLR system has been accepted for publication. Further studies on the mechanisms underlying nociception/TLR regulation will be conducted.

Selected Publications

- Ropelato S, Menozzi M, Huang MY. Hyper reoriented walking in minimal space. *Virtual Reality* (2021). <https://doi.org/10.1007/s10055-021-00608-0>
- Spinetti, T., C. Hirzel, M. Fux, L. N. Walti, P. Schober, F. Stueber, M. M. Luedi, and J. C. Schefold. "Reduced Monocytic Human Leukocyte Antigen-Dr Expression Indicates Immunosuppression in Critically Ill Covid-19 Patients." *Anesth Analg* 131, no. 4 (Oct 2020): 993-99.
- Lin, T. F., M. Mohammadi, A. M. Fathalla, D. Pul, D. Luthi, F. Romano, D. Straumann, et al. "Negative Optokinetic Afternystagmus in Larval Zebrafish Demonstrates Set-Point Adaptation." *Sci Rep* 9, no. 1 (Dec 13 2019): 19039.
- Zhang, L., F. Stueber, C. Lippuner, M. Schiff, and U. M. Stamer. "Erk and P38 Contribute to the Regulation of Nociceptin and the Nociceptin Receptor in Human Peripheral Blood Leukocytes." *Mol Pain* 15 (Jan-Dec 2019): 1744806919828921.
- Stamer, U. M., M. Schmutz, T. Wen, V. Banz, C. Lippuner, L. Zhang, M. Steffens, and F. Stueber. "A Serotonin Transporter Polymorphism Is Associated with Postoperative Nausea and Vomiting: An Observational Study in Two Different Patient Cohorts." *Eur J Anaesthesiol* 36, no. 8 (Aug 2019): 566-74.
- Zhang, L., U. M. Stamer, M. Y. Huang, and F. Stueber. "Interactions between the Nociceptin and Toll-Like Receptor Systems." *Cells* 11, no. 7 (Mar 23 2022).

Program Contact

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Selected Collaborators

- Leib S & Grandgirard D** Institute for Infectious Diseases, University of Bern, Switzerland
- Mercader Huber N** Institute of Anatomy, University of Bern, Switzerland
- Menozzi M** Department of Health Sciences and Technology D-HEST, ETH Zurich, Switzerland
- Cullen K** Department of Biomedical Engineering, Johns Hopkins University, USA
- Chacron M** Department of Physiology, McGill University, Canada

Technology Core Facilities



Proteomics and Mass Spectrometry Core Facility (PMS)



Achievements 2021

The demand for proteomics services continues to be very high. This has slowed the delivery of results due to the saturation of work capacity by the researchers and instrument capacities. We were able to quantify several hundred proteins from only 10–20,000 sorted small cells, in collaboration with Prof. S. Saxena (DBMR). The facility is now accompanied by a working group consisting of members from all three life sciences faculties. The laboratory was moved to the 4th floor of the new research building at Murtenstrasse 24. A business plan for PMS CF was written, which included ideas on how the university could deal with core facilities. We take this opportunity to thank all our customers for their trust in our services.

Performance report 2021

We processed 1830 samples submitted by laboratories from the Faculty of Medicine (50.2%), Faculty of Science (27.4%), Vetsuisse Faculty (21.9%), and external institutions (0.5%). This produced 3679 LC-MS/MS runs for the generation of publishable data. This number was supplemented by 209 runs for development, 896 standards, and 4981 blanks for quality assurance. The 3-week lab shutdown due to the move and the use of the new timsTOF™ instrument decreased the average up-time from 43 weeks at a 69% time occupancy rate to 42 weeks at 64% on the three orbitraps.

Finances 2021

Our financial situation remains sound, mainly due to substantial support from the NCCR RNA & Disease and DBMR.

Outlook 2022

Our CF business plan will be discussed with the new vice-rector for research. Our oldest instrument will be replaced using investment funds from the university rectorate. We intend to equip the laboratory with a liquid-handling robot for reproducible sample preparation if funding is available.

Selected Publications

- Hill, V., H. Akarsu, R. S. Barbarroja, V. L. Cippa, P. Kuhnert, M. Heller, L. Falquet, et al. "Minimalistic Mycoplasmas Harbor Different Functional Toxin-Antitoxin Systems." *PLoS Genet* 17, no. 10 (Oct 2021): e1009365.
- Anghel, N., J. Muller, M. Serricchio, J. Jelk, P. Butikofer, G. Boubaker, D. Imhof, et al. "Cellular and Molecular Targets of Nucleotide-Tagged Trithiolato-Bridged Arene Ruthenium Complexes in the Protozoan Parasites *Toxoplasma Gondii* and *Trypanosoma Brucei*." *Int J Mol Sci* 22, no. 19 (Oct 5 2021).
- Schniering, J., M. Maciukiewicz, H. S. Gabrys, M. Brunner, C. Bluthgen, C. Meier, S. Braga-Lagache, et al. "Computed Tomography-Based Radiomics Decodes Prognostic and Molecular Differences in Interstitial Lung Disease Related to Systemic Sclerosis." *Eur Respir J* (Oct 14 2021).
- Hallal, M., S. Braga-Lagache, J. Jankovic, C. Simillion, R. Bruggmann, A. C. Uldry, R. Allam, M. Heller, and N. Bonadies. "Inference of Kinase-Signaling Networks in Human Myeloid Cell Line Models by Phosphoproteomics Using Kinase Activity Enrichment Analysis (Kaea)." *BMC Cancer* 21, no. 1 (Jul 8 2021): 789.
- Contu, L., G. Balistreri, M. Domanski, A. C. Uldry, and O. Muhlemann. "Characterisation of the Semliki Forest Virus-Host Cell Interactome Reveals the Viral Capsid Protein as an Inhibitor of Nonsense-Mediated Mrna Decay." *PLoS Pathog* 17, no. 5 (May 2021): e1009603.

Head of PMS Facility

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Core Facility Members

Anne-Christine Uldry

PhD, Computational Scientist

Sophie Braga-Lagache

MSc, Senior Assistant

Natasha Buchs

Laboratory Assistant

Live Cell Imaging Core Facility (LCI)



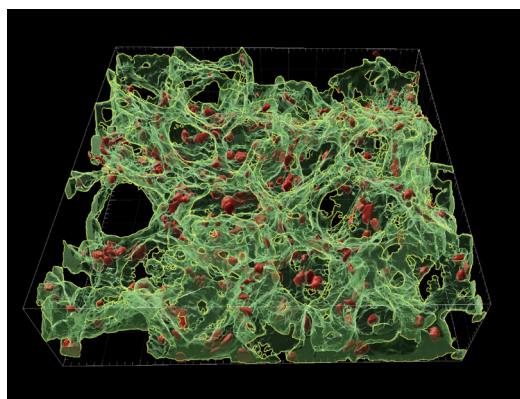
Achievements 2021

The DBMR LCI Core Facility successfully moved its major equipment to the new DBMR Research Building at Murtenstrasse 24 and started operations on the 4th floor. In addition to the existing equipment, a new single-point Zeiss LSM980 confocal microscope equipped with an Airyscan 2 unit and near-infrared detection (total cost approximately CHF 600'000) was installed and began operation. The core facility has also started to manage and take care of histology equipment that includes a new cryostat, microtome, and 3D Histech Slide Scanner in the new histology lab, which are accessible to all users.

Since its launch in 2012, the LCI Core Facility has been supported by the MIC, an interfaculty platform that coordinates, prioritizes, and supports funding applications in high-end microscopy, as well as organizing access to microscopy equipment for all University of Bern members.

Performance report 2021

The total number of booked hours for using LCI microscopes in 2021 was 4752, an increase from 4073 hours in 2020. These figures do not include systems that have to be booked on a daily basis, such as the InCuCyte S3 system. In 2021, LCI staff spent 117 hours on introductory training on LCI microscopes (91 hours in 2020). Working hours spent collaborating with other research groups from the DBMR increased to 257 in 2021 from 61 hours in 2020. The hours spent on technical assistance remained constant (182 hours in 2021, 185.5 in 2020). Every year, the facility contributes to advanced microscopy lectures and practical modules organized with the MIC. More than 20 students were trained in practical modules with the involvement of LCI in 2021.



Finances 2021

Owing to the recovery of research activities in the course of the pandemic in 2021, revenue is recovering to pre-pandemic levels and even increasing slightly. As in previous years, most expenses consisted of costs for repairs and maintenance contracts. The MIC kindly supported LCI with CHF 3,000 for general maintenance and repair.

Outlook 2022

The LCI is closely collaborating with its working group to extend and improve services for the DBMR. A great focus will be on equipping the new histology laboratory at Murtenstrasse 24 and providing extended support for users dealing with sample processing.

Selected Publications

- Fahmi, A., M. Brugger, T. Demoulins, B. Zumkehr, B. I. Oliveira Esteves, L. Bracher, C. Wotzkow, et al. "Sars-Cov-2 Can Infect and Propagate in Human Placenta Explants." *Cell Rep Med* 2, no. 12 (Dec 21 2021): 100456.
- Wang, L., H. Yang, P. Dorn, S. Berezowska, F. Blank, C. Wotzkow, T. M. Marti, et al. "Peritumoral Cd90+Cd73+ Cells Possess Immunosuppressive Features in Human Non-Small Cell Lung Cancer." *EBioMedicine* 73 (Nov 2021) 103664.

Head of LCI Facility

PD. Dr. phil. nat. Fabian Blank

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Core Facility Members

Carlos Wotzkow

Lab Technician

Selina Steiner

Lab Technician

Flow Cytometry and Cell Sorting Core Facility (FCCS)



Achievements 2021

We successfully completed our last round of the fluorescence-activated cell sorting (FACS) course after interruptions caused by the COVID-19 lockdown and subsequent related restrictions.

An FCCS CF working group was established. Under the direction of the selected PI, the working group aims to support the FCCS CF in terms of strategic development and implementation.

Two members of our team left the FCCS CF. Lab technician Isabelle Gsponer, who took the chance for a new challenge at Lonza, and Claudio Vallan, who had a long-standing, half-day per week appointment as a course administrator. They were replaced by Lorenzo Raeli, who has many years of experience in flow cytometry, cell sorting, and teaching.

Finally, we were able to purchase a new cytometer to replace one of the old instruments. The Cytek Aurora instrument adds innovative value to the FCCS CF with its novel technology of full spectrum analysis.

Moving to the new labs at Murtenstrasse 24 on October 20th and 21st occurred without notable problems, and all services were available one day later.

Performance report 2021

Self-operated measurements increased by 10.9% compared to 2020, and were, thus, half-way to the pre-pandemic level. Cell sorting services increased by 31.8% compared to 2020, reaching a level between the peak year 2018 and 2019.

Self-operated measurements were performed to 60.9% by researchers from Inselspital clinics and to 37.9% from unibe institutes. Measurements by external parties made up 1.2%. 75.6% of cell sorts were performed for Inselspital clinics and 22.6% for unibe institutes, while 1.8% were performed for external parties. 61.2% of measurements and 75.3% of cell sorts were performed by or for DBMR groups.

More than 50 students, postdocs, and lab techs successfully registered for the new round of our FACS course and attended the kick-off seminar and training offered by FlowJo analysis software company.

Finances 2021

Income: CHF 253,000.–

Expenses: CHF 203,000.–

Outlook 2022

The current round of our 5-day FACS course with more than 50 participants will be completed. This course is worth two European Credit Transfer System Points for members of the Graduate School of Cellular and Biomedical Sciences, and the list of future participants for the next round planned for late fall in 2022 is already growing.

Interested users will receive training for the self-operated usage of the new Cytek Aurora full spectrum flow cytometer.

The FCCS CF coordinates and supports a full SNF R'Equip application to purchase a NanoFCM NanoAnalyzer, planned to replace the NanoSight NS300.

Selected Publications

Lipp, J. J., L. Wang, H. Yang, F. Yao, N. Harrer, S. Muller, S. Berezowska, et al. "Functional and Molecular Characterization of Pd1(+) Tumor-Infiltrating Lymphocytes from Lung Cancer Patients." *Oncoimmunology* 11, no. 1 (2022), 2019466.

Head of LCI Facility

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Core facilities → Flow Cytometry and Cell Sorting

Core Facility Members

Dr. Fiona Augsburger PhD, Technical Assistant (since Oct.)

Isabelle Gsponer Lab Technician (until June)

Bernadette Nyfeler Lab Technician

Dr. Thomas Schaffer PhD, Senior Assistant

Dr. Lorenzo Raeli PhD, Scientific Assistant (since Oct.)

Dr. Claudio Vallan Scientific and Educational Support (until July)



Johanna Dürmüller-Bol DBMR Research Award



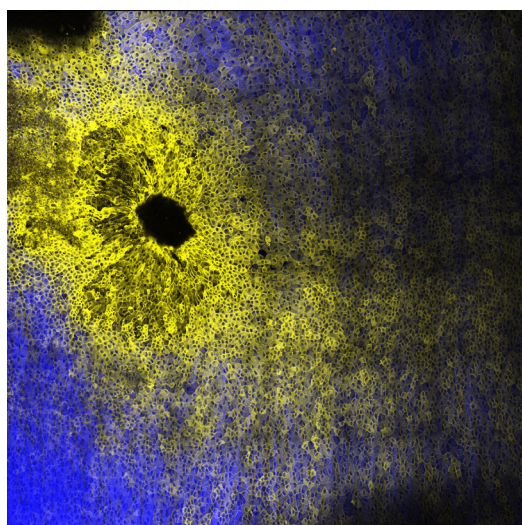
Dr. med Dr. sc. nat. Joel Zindel Systems biomedicine of cellular development and signaling in health and disease

Abdominal surgeries can save lives as they allow surgeons to remove malignant tumors or fight abdominal infections. However, these surgeries can also lead to fibrotic complications called peritoneal adhesions. Adhesions are internal scars that result in significant suffering and high health costs; they have no cure at present.

Collagen deposition by fibroblasts is a critical step in adhesion formation. Our published data (Zindel et. al. Nature Communications 2021) indicate that fibroblasts are recruited from distant mesothelium. However, the mechanism of cell migration remains largely unknown.

In 2022, we aim to introduce a new multi-photon intravital microscopy (IVM) model to Bern. This model will allow us to image the abdominal cavity in real time with subcellular resolution (Zindel et al. Science 2021). We will leverage this model with our fluorescent reporter system that fate-maps mesothelial cells. Mesothelial cells and mesothelium-derived fibroblasts can be tracked over time to describe when and how they migrate in response to injury. We will also investigate the potential molecular mechanisms underlying mesothelial cell migration using single-cell RNA-Seq.

These studies will allow us to identify mechanisms that could be targeted in future studies to inhibit mesothelial cell migration in injury repair and to investigate the effect on adhesion formation.



Mesothelial cells (yellow) grow over focal peritoneal injury (black circle) where they heal the lesion by depositing collagen (blue)

Biosketch

Dr. med Dr. sc. nat. Joel Zindel

MD at the University of Bern (2011). Residents in general surgery and visceral and transplantation surgery, General Surgery Tiefenausspital (Prof. Dr. Daniel Inderbitzin), Visceral Surgery and Medicine, Inselspital (Prof. Dr. Daniel Candinas) 2012–2017. FMH Certification in Surgery, 2018. Clinical Research Fellowship Visceral Surgery and Medicine (Supervisors: Prof. Dr. Daniel Candinas, Prof. Dr. Deborah Keogh-Stroka, Co-Advisor: Prof. Dr. Andrew J. Macpherson) 2017–2018. Research Fellowship in Calgary, Canada (Supervisor: Prof. Dr. Paul Kubes) 2018–2020. PhD in Immunology 2021. Since 2022, Staff Surgeon and Junior Group Leader Visceral Surgery and Medicine, Inselspital Bern, University of Bern.

Selected Publications

- Zindel, J., J. Mittner, J. Bayer, S. L. April-Monn, A. Kohler, Y. Nusse, M. Dosch, et al. "Intraperitoneal Microbial Contamination Drives Post-Surgical Peritoneal Adhesions by Mesothelial Egfr-Signaling." *Nat Commun* 12, no. 1 (Dec 16 2021): 7316.
- Zwicky, S. N., Stroka, D., and Zindel, J. "Sterile injury repair and adhesion formation at the serosal surfaces *Front Immunol* 12 (2021) 684967.
- Zindel, J., M. Peiseler, M. Hossain, C. Deppermann, W. Y. Lee, B. Haenni, B. Zuber, et al. "Primordial Gata6 Macrophages Function as Extravascular Platelets in Sterile Injury." *Science* 371, no. 6533 (Mar 5 2021).
- Deppermann, C., R. M. Kratofil, M. Peiseler, B. A. David, J. Zindel, Fves Castanheira, F. van der Wal, et al. "Macrophage Galactose Lectin Is Critical for Kupffer Cells to Clear Aged Platelets." *J Exp Med* 217, no. 4 (Apr 6 2020).
- Zindel, J., and P. Kubes. "Damps, Pamps, and Lamps in Immunity and Sterile Inflammation." *Annu Rev Pathol* 15 (Jan 24 2020): 493-518.

Contact

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- ➔ www.dbmr.unibe.ch → Research → Research Programs
- ➔ www.dbmr.unibe.ch → Research → Research Programs → Keogh-Stroka Lab

Selected Collaborators

- Macpherson AJ** University of Bern (CH)
- Kubes P** University of Calgary (CA)
- Kopf M** ETH Zürich (CH)
- Castagner Bastien** McGill University (CA)
- Deppermann C** Johannes Gutenberg University Mainz (GE)

Key Events

Johanna Dürmüller-Bol DBMR Research Prize 2021

21 candidates submitted applications for the 2021 Johanna Dürmüller-Bol DBMR Research Prize, funded by Johanna Dürmüller-Bol Foundation. The winner of the Johanna Dürmüller-Bol DBMR Research Award 2021 was Dr. med. Dr. sc. n. Joel Zindel, Systems Biomedicine of Cellular Development and Signaling in Health and Disease, Keogh-Stroka Lab Department for BioMedical Research, for his project on "Defining macrophage-dependent mesothelial cell recruitment in peritoneal injury repair and adhesion formation."

DBMR Research Conferences 2021

In 2021, we were pleased to host the following speakers:

01 Feb.: Dr. Paul Krimpenfort

Division of Molecular Genetics, Netherlands Cancer Institute, Amsterdam (NL)
Animal Model Generation Facility at The Netherlands Cancer Institute

01 Mar.: Prof. Dr. Wilhelm E. Jahnen-Dechent

Helmholtz-Institute for Biomedical Engineering, RWTH Aachen University (DE)
Mud in the blood: The role of fetuin, a protein-mineral complex, in mineral metabolism

12 Apr.: Prof. Dr. Oliver Söhnlein

Ludwig-Maximilians-University (LMU) Munich (DE)
Neutrophils in chronic inflammation – from physiology to therapeutic intervention

03 May: Prof. Robert Bristow

University of Manchester (UK)
The effect of hypoxia on the genomic architecture of human tumours

07 June: Prof. Dr. Larry J. Suva

Veterinary Physiology and Pharmacology, Texas A&M University, Galveston (USA)
Large animals in biomedical research: CRISPR, bisphosphonates and beyond

06 Sep.: Prof. Michal Schwartz

Department of Neurobiology, Weizmann Institute of Science, Rehovot (ISR)
A novel approach to defeat Alzheimer's disease: Empowering the immune system to mobilize monocyte-derived macrophages

04 Oct.: Prof. Dr. Anna Greka

Center for Kidney Disease and Novel Experimental Therapeutics, Harvard Institutes of Medicine, Brigham and Women's Hospital, Boston MA (USA)
The arc of discovery: From genes to mechanisms to therapies for kidney diseases and beyond

06 Dec.: Prof. Dr. Anna Köttgen

Institute of Genetic Epidemiology, Albert Ludwig University of Freiburg, Freiburg (DE)
Understanding kidney function through population-based genetic studies



The winner and the jury committee of the Johanna Dürmüller-Bol DBMR Research Award 2021:
Dr. med Dr. sc. nat. Joel Zindel
Prof. Dr. Mark A. Rubin
Prof. Dr. Anne Angelillo-Scherrer
Prof. Dr. Marianna Kruithof-de Julio
Ass. Prof. Dr. Volker Enzmann
Ass. Prof. Dr. Carsten Riether (not in picture)

Personnel Update

Academic Degrees

Full Professor

Prof. Dr. Britta Maurer
Lung Precision Medicine

Full Professor (Extraordinus)

Prof. Dr. Benoît Schaller
Bone & Joint

Assistant Professor

Prof. Dr. Ziad Al Nabhani
Systems biomedicine of cellular development and signaling in health and disease

Associate Professor

Prof. Dr. Ursula Amstutz
BMG, Biomedical Genomics

Prof. Dr. Alexander Eggel
Translational Immunology

Prof. Dr. Marianna Kruihof-de Julio Cancer Therapy Resistance

Prof. Dr. Ren-Wang Peng
Oncology-Thoracic Malignancies

Prof. Dr. Carsten Riether
Translational Cancer Research

Prof. Dr. Nikola Saulacic
Bone & Joint

Prof. Dr. Christoph Schlapbach Translational Immunology

Prof. Dr. Monique Vogel
Translational Immunology

Lecturer

PD Dr. Carolina Gutierrez Herrera
ZEN/DBMR-Neuro

PD Dr. Ramin Radpour
Translational Cancer Research

PhD (Supervisor in parentheses)

Ivan Bozic
(Prof. Dr. Antoine Roger Adamantidis)
Coordination of sleep oscillations amongst cortical, thalamic and hippocampal structures – Relevance to sleep structure and function

Maud Bagnoud
(Prof. Dr. Andrew Hao-Kuang Chan)
Mechanisms to improve glucocorticosteroid efficacy in multiple sclerosis

Emmanuele Giuseppe Bulla
(Prof. Pascal Escher)
Molecular mechanisms of photoreceptor differentiation

Martina Calió
(Prof. Benjamin Gantenbein)
Intervertebral disc disease and osteoarthritis: approaching the research needs using RNA sequencing and mechanical unloading

Kathrin Chiffi
(Prof. Dr. René Müri)
Cognitive processes in healthy and stroke subjects, methodological considerations and the relation to sleep

Noëlle Dommann
(Prof. Dr. Deborah Stroka)
Unraveling proliferation by mapping origins of replication and the function of Ajuba

Silvan Rolf Heeb
(Prof. Dr. Johanna Anna Kremer Hovinga) Novel insights into the immune response in immune-mediated and hereditary Thrombotic Thrombocytopenic Purpura

Lijuan Ma
(Prof. Christoph Müller)
The Role of EMT in the Alteration of Hormone Response in Endometriotic Lesions and its Contribution to the Recurrence of Endometriosis

Pascal Näf
(Prof. Adrian Ochsenbein)
The role of IL-33/ST2 signaling in hematopoiesis and myeloid leukemia

Carlos Pulido Quetglas
(Prof. Rory Johnson)
Accurate candidate selection for improved CRISPR library designs of long noncoding RNAs

Yannick Raphael Suter
(Prof. Dr. Mauricio Reyes)
Multiforme

Anna Silvia Wenning
(Prof. Andrew MacPherson, Dr. Mercedes Gomez de Agüero)
The maternal microbiota drives embryonic epidermal development and configures neonatal skin barriers

Xingshuo Zhang
(Prof. Benjamin Gantenbein)
Tissue-specific progenitor cells of the intervertebral disc – rare cells with big potential for the cure of low back pain?

Joel Zindel
(Prof. Daniel Candinas and Prof. Deborah Keogh-Stroka)
Peritoneal macrophage aggregation and EGFR-dependent mesothelial to mesenchymal transition: novel therapeutic avenues for peritoneal adhesions

MD, PhD (Supervisor in parentheses)

Sophie Manon Cottagnoud
(Dr. Marianne Jörgen-Messerli and Prof. Dr. Andreina Schoeberlein)
Isolation of Wharton's Jelly-derived small extracellular vesicles and analysis of their microRNA cargo

Haibin Deng
(Prof. Ralph Schmid)
Lactate dehydrogenase B (LDHB) and its involvement in mitochondrial metabolism in lung cancer

Judith Gili-Kovács
(Prof. Dr. Andrew Chan and Dr. med. Myriam Sandra Briner)
An algorithm using clinical data to predict the optimal individual glucocorticoid dosage to treat multiple sclerosis relapses

Mirjam Nussbaumer
(PD Dr. Loretta Müller)
Diagnosis of primary ciliary dyskinesia: discrepancy according to different algorithms

Katharina AC Oswald
(PD Dr. Christoph Albers)
Neisseria meningitidis-induced discitis at L5-S1 mimics lumbar disc herniation, accepted for publication in The Lancet Infectious Diseases

Maximilian Pistor
(Prof. Dr. Andrew Chan and PD Dr. Med. Robert Hoepner)
Immunotherapies and COVID-19 mortality: A multidisciplinary open data analysis based on FDA's Adverse Event Reporting System

Irina Schlegel
(Prof. Dr. Martin S. Zinkernagel and Dr. Denise C. Zysset-Burri)
Identification of the ocular microbiome and its role on dry eye disease

Alexander Joseph Schmitz
(Prof. Dr. Smita Saxena)
Emerging Perspectives on Dipeptide Repeat Proteins in C9ORF72 ALS/FTD

Staff changes
New Staff**Dr. med. Dilara Akhoundova Sanoyan**

Early Postdoc (80 %)
Rubin Lab (since Apr.)

Fiona Estelle Augsburg

Lab Technician (80 %)
FCCS (since Oct.)

Gabriela Maria Bäerlocher

Scientific Assistant (5 %)
Baerlocher Lab (since May)

Carole Gygax

Lab Technician (20 %)
Rieben Lab (since Aug.)

Monika Haubitz

Scientific Assistant (100 %)
Baerlocher Lab (since May)

Ingrid Helsen

Lab Technician (100 %)
Baerlocher Lab (since Apr.)

Dr. Melle Holwerda

Early Postdoc (100 %)
Rieben Lab (since Mar.)

Corinne Nicole Hug

Lab Technician (100 %)
DBMR Services (since Oct.)

Kirsten Ina Irmiler

Lab Technician (25 %)
Rieben Lab (since June)

Dr. Alina Naveed

Early Postdoc (100 %)
Rubin Lab (since Mar.)

Saskia Perret-Gentil-dit-Maillard

Scientific Assistant (20 %)
Hofstetter Lab (since Oct.)

Lorenzo Raeli

Scientific Assistant (100 %)
FCCS (since Oct.)

Vincent Lucien Paul Rapp

PhD Student (75 %)
Osterwalder Lab (since Dec.)

Neda Salimi Afjani

PhD Student (70 %)
Rieben Lab (since Jan.)

Thi Bao Trân Vu

Secretary (60 %)
Administration (since Sep.)

Junhua Wang

Scientific Assistant (50 %)
Rieben Lab (since Feb.)

Lucille Wotzkow Alvarez

Polymechanic (100 %)
DBMR Services (since Sep.)

Sigrid Zimmermann

Human resources assistant (90 %)
Administration (since Dec.)

Resignations**Basak Ginsbourger**

Administrator (80 %)
Administration (until Dec.)

Claudia Güttinger

Lab Technician (100 %)
DBMR Services (until June)

Matthias Reist

Lab Technician (20 %)
Rubin Lab (CTR)

Mark Siegrist

Lab Technician (50 %)
Hofstetter Lab (until Mar.)

Rahel Tschudi

Human resources assistant (90 %)
Administration (until Dec.)

Claudio Vallan

Scientific Assistant (10 %)
FCCS (until July)

Song Xue

PhD Student (75 %)
Clinical Radiopharmacy (until Mar.)

Short employment**Ahmed Fahiem Abdelsalam**

Hilfsassistent (50 %)
Rieben Lab (Mar. – Mar.)

Anaïs Elodie Yerly

Hilfsassistentin (50 %)
Rieben Lab (Mar. – Mar.)

Retirements**Silvia Dolder**

Lab Technician (90 %)
Hofstetter Lab (until June)

We mourn**Yvonne Roschi**

House Staff Manager (80 %)
DBMR Services (until Mar.)

Awards/Grants

Prof. Dr. Ziad Al Nabhani

Systems Biomedicine of Cellular Development and Signaling in Health and Disease
Helmut Horten Foundation's Grant for "How child intestinal microbiota influence lifelong immunity."

Prof. Dr. Ziad Al Nabhani

Systems Biomedicine of Cellular Development and Signaling in Health and Disease
Swiss Immunology Early Career Award 2021 by the Swiss Society for Allergology and Immunology and Sanofi Genzyme Switzerland
Pasteur Institute Young Scientist Award 2021 by the Pasteur Institute, Paris, France

Dr. Anke Augspach

Cancer Therapy Resistance
Fond'action contre le cancer Young Investigator Grant 2021 for "Towards understanding the role of the minor spliceosome in advanced cancer"

Dr. Maxime Baud, Timothée Priox (UniGE)

ZEN/DBMR-Neuro
Schweizerische Epilepsie Liga-Alfred-Hauptmann-Preis 2021 for publication: "Forecasting seizure risk in adults with focal epilepsy: a development and validation study"

Dr. Maxime Baud

ZEN/DBMR-Neuro
SNSF Eccellenza Professorial Fellowship for "Dynamical Control of Seizures"

Dr. Daniel Brigger,
Prof. Dr. Alexander Eggel

Translational Immunology
Vontobel Award for Research on Age(ing) 2021, Center for Gerontology of the University of Zurich (endowed by the Vontobel Foundation), Project: "Eosinophils regulate adipose tissue inflammation and sustain physical and immunological fitness in old age."

Dr. Daniel Brigger
Prof. Dr. Alexander Eggel

Dr. Mario Noti
Translational Immunology
Vontobel-Preis für Alter(n)sforschung 2021 for the publication "Eosinophils Regulate Adipose Tissue Inflammation and Sustain Physical and Immunological Fitness in Old Age", published on Nature Metabolism, 6, 2020.

Dr. Pauline Challande

Regenerative Neuroscience
Manegold-Brauer G, Ardabili S, Hösli I, Schönberger H, Amyliidi-Mohr S, Kohl J, Hodel M, Surbek D, Raio L, Mosimann B. IPSISS—Implementing preeclampsia screening in a Switzerland Pilot study. Annual Congress Gynécologie Suisse-Swiss Society for Gynecology and Obstetrics, June 24-26, Interlaken, Switzerland. 1st Prize Free Communication.

Dr. Noëlle A. Dommann

Systems Biomedicine of Cellular Development and Signaling in Health and Disease
Benoît Pochon Prize 2021: "Unraveling proliferation by mapping origins of replication and the function of Ajuba"

Dr. Therina du Toit

Experimental Nephrology
H2020 MSCA IF for "Tracing novel androgen pathways: deciphering the role of 16 α -hydroxylation in human fetal biology."

Prof. Dr. Alexander Eggel

Translational Immunology
Theodor-Kocher-Preis (2021), University of Bern, Project: "From Innovation to Application: Putting Immunology Research into Use."

Manuel Egler

Cardiovascular Diseases
The Swiss National Science Foundation awarded the MD-PhD Grant for "Cardiac graft preservation and evaluation in transplantation with donation after circulatory death."

Prof. Dr. Benjamin Gantenbein

Bone & Joint
Best Poster award: Verbesserung der spinalen Fusion mittels BMP2 und L51P in einem spinalen Fusionsmodell der Ratte in vivo K. A. C. Oswald, S. F. Bigdon, A. S. Croft, P. Bermudez-Lekerika, B. Gantenbein, C. E. Albers (Bern/Schweiz) presented at the 16. Jahrestagung der Deutschen Wirbelsäulengesellschaft, Münster, 9.–11. Dezember 2021

Liana Hayrapetyan

Translational Cancer Research
Best Poster Award of the 2nd AACR-KCA Joint Conference on Precision Medicine in Solid Tumors, held on November 12, 2021.

Liana Hayrapetyan

Translational Cancer Research
Best Academic Presentation Award, Scientific Association of Swiss Radiation Oncology (SASRO), 25th Annual SASRO Meeting (Rorschach, Switzerland). Project title: "HPV and p53 status determine irradiation-related responses to a selective DNA-PK inhibitor in head and neck squamous cell carcinoma models"

Liana Hayrapetyan

Translational Cancer Research
Best Poster Award, 2nd AACR-KCA Joint Conference on Precision Medicine in Solid Tumors (Seoul, Korea and virtual). Title of the project: "HPV and p53 status determine irradiation-related responses to a selective DNA-PK inhibitor in head and neck squamous cell carcinoma models"

Prof. Dr. Marianna Kruihof-de Julio

Cancer Therapy Resistance
InnoSuisse Grant for "AlvireX: A game-changing translational drug screening platform to revolutionize drug development against respiratory viral infections"

Prof. Dr. Marianna Kruihof-de Julio

Cancer Therapy Resistance
SNF Sinergia Grant for "PROMETEX: Metabolically-instructed personalized therapy selection for prostate cancer."

Dr. Niran Maharjan,
Prof. Dr. Smita Saxena

ZEN/DBMR-Neuro
FSRMM annual meeting 1st poster prize for "Seeding and spreading of dipeptide repeat proteins in C9ORF72 linked ALS"

Harpreet Kaur Mandhair

Translational Cancer Research
Short oral and poster presentation, 11th Swiss Apoptosis and Autophagy Meeting (SA2M) 2021 (Bern, Switzerland), awarded by the French Autophagy Society CFATG. Title of the project: "ULK complex blockade elicits NF- κ B activation in GCB-DLBCL whilst augmenting cytotoxicity of Ibrutinib"

Prof. Dr. Britta Maurer

Lung Precision Medicine
Paul Klee Research Award, Boehringer Ingelheim, "HRCT-based radiomics for drug response reduction in progressive fibrosis interstitial lung disease"

Prof. Dr. Eliane Jasmin Müller

Molecular Dermatology & Stem Cell Research
SNF Sinergia Grant for "Unravel Principles Of Self-Organization In Injured Tissue"

PD Dr. Loretta Müller

Lung Precision Medicine
SAG Award (2021) for the publication "Diesel exposure increases susceptibility of primary human nasal epithelial cells to rhinovirus infection"

Dr. Charlotte Ng

Oncogenomics
Bern Center for Precision Medicine Young Investigators Projects: "Towards translating hepatocellular carcinoma cellular interactions into biomarkers"

Dr. Anda-Petronela Radan

Regenerative Neuroscience
Fluri M, Schlatter B, Raio L, et al.. Gestational diabetes is associated with SARS-CoV-2 infection during pregnancy. Annual Congress Gynécologie Suisse-Swiss Society for Gynecology and Obstetrics, June 24–26, Interlaken, Switzerland. 2nd Prize Poster.

Patricia Verena Renz

Regenerative Neuroscience
Deciphering astrocyte polarization in acute perinatal white matter injury and its contribution to disease outcomes. European Neuroscience Conference by Doctoral Students (ENCODS), June 4–6, 2021. Online. Short presentation.

Patricia Verena Renz*Regenerative Neuroscience*

Tscherrig V, Haesler V, Liddelow S, Schoeberlein A, Surbek D, Brosius Lutz A. Understanding the role of inflammatory reactive astrocytes in acute perinatal white matter injury. Stem Cell Community Day, Nov 3, 2021, Cologne, Germany. Short presentation

Ass. Prof. Dr. Carsten Riether*Translational Cancer Research*

Pfizer Research Prize (Oncology)

Prof. Dr. Mark A. Rubin*Cancer Therapy Resistance*

Werner und Hedy Berger-Janser Foundation: "Molecular characterization, in vitro modelling and therapeutic targeting of prostate cancer liver metastases"

Prof. Dr. Mark A. Rubin*Cancer Therapy Resistance*

Fondation ISREC Translational Project: "Advanced in vitro models of prostate cancer metastases: unravelling and overcoming ARSI resistance"

Dr. Markus Schmidt*ZEN/DBMR-Neuro*

SNSF Project Funding for "Hypothalamic regulations of REM sleep"

Dr. Gerd Tinkhauser*ZEN/DBMR-Neuro*

SNSF Ambizione Grant for "Adaptive neuromodulation in movement disorders – a precision medicine approach"

Ioanna Tsioti*Regenerative Neuroscience*

XIXth International Symposium on Retinal Degenerations (RD2021) and the BrightFocus Macular Fast TrackSM awarded a virtual travel fellowship for the project: "Systemic lipopolysaccharide exposure triggers Tlr4-dependent inflammatory responses in the mouse retina in vivo."

Dr. Nicoletta Sorvillo*Blood*

Prof. Dr. Uyen Huynh-Do

Experimental Nephrology

CSL Research Acceleration Initiative Funding.

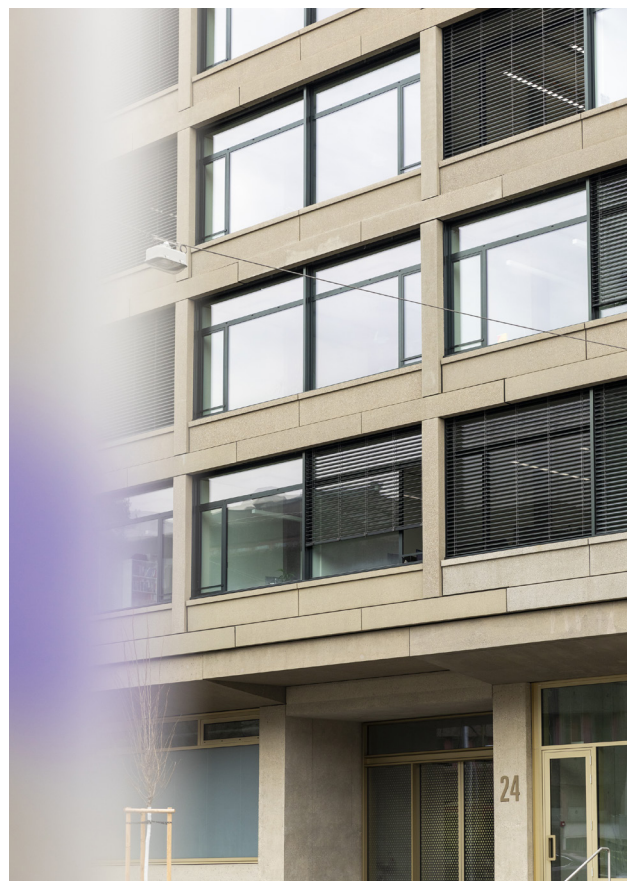
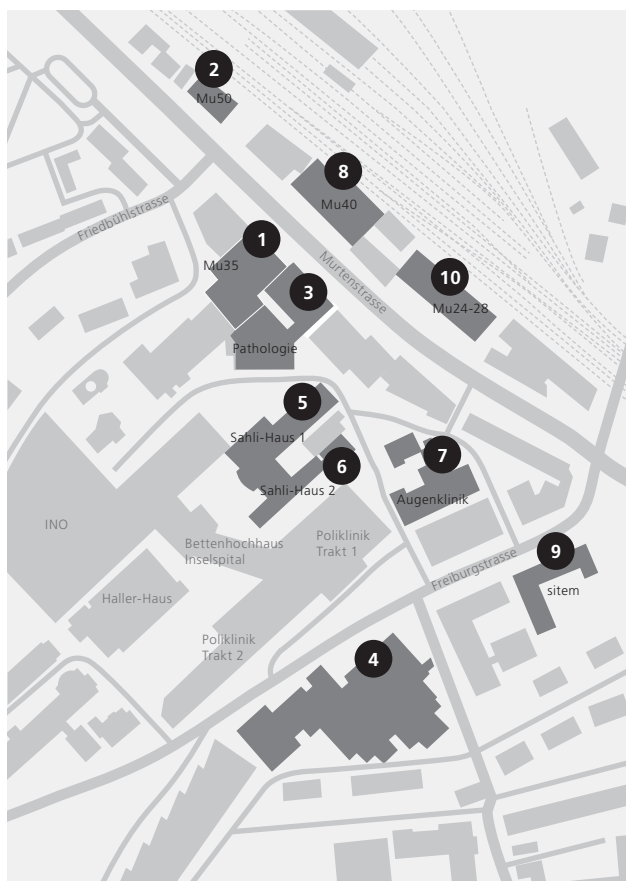
Dr. Bahtiyar Yilmaz*Systems Biomedicine of Cellular Development and Signaling in Health and Disease*

Bern Center for Precision Medicine Young Investigators Projects: "Targeting D-lactate producing gut microbial strains in pediatric IBD patients"

Dr. Jakob Zimmermann*Systems Biomedicine of Cellular Development and Signaling in Health and Disease*

Bern Center for Precision Medicine Young Investigators Projects: Transcriptional recording sentinel cells as living diagnostics of the human gastrointestinal tract"

DBMR Locations



- | | |
|---|---|
| 1 Murtenstrasse 35 | 6 Sahli-Haus 2
Freiburgstrasse 14 |
| 2 Murtenstrasse 50 | 7 Augenklinik
(Ophthalmology – Eye Clinic)
Freiburgstrasse 8 |
| 3 Pathologie
(Institute of Pathology) | 8 Murtenstrasse 40 |
| 4 Kinderklinik
(Children's University
Hospital Bern)
Freiburgstrasse 15 | 9 sitem
Freiburgstrasse 3 |
| 5 Sahli-Haus 1
Freiburgstrasse 14a | 10 Murtenstrasse 24–28 |

Imprint

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Cover

Dr. med Dr. sc. nat. Joel Zindel, Systems Biomedicine of
Cellular Development and Signaling in Health and Disease

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