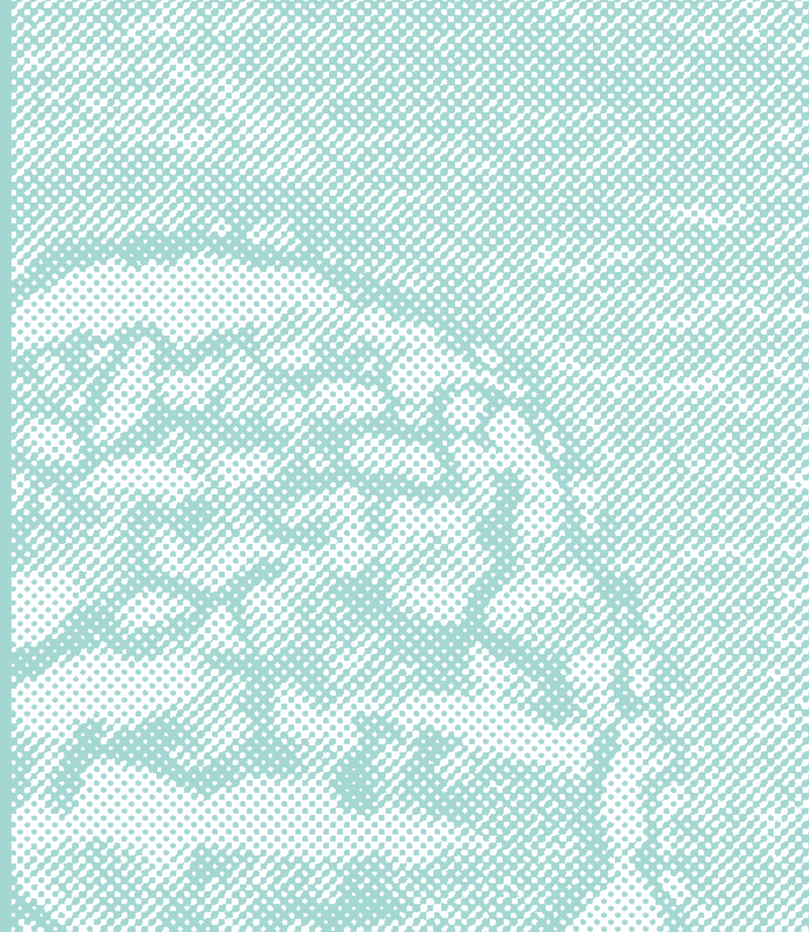
University of Basel

Department of Biomedicine

DBM Basel

Newsletter
February 2024

DBM
Basel
Department of
Biomedicine



Editorial

Dear All,

In January 2024 we received the visit of our Scientific Advisory Board and I am happy to report that the assessment of the DBM – from the standpoint of scientific, operational and cultural developments – was highly positive. There was one specific advance that has been judged as 'impressive' and that is related to the strategic planning and operative activities in the area of communication and outreach. You will hear more about that on April 25 at the Plenary Assembly… till then, I would like to propose a short reflection on the etymological roots of the word 'communication'. The latin expression, literally indicating the coming together ('com') of different municipalities ('munis'), evokes the definition and valorization of what we have in 'common'. In this sense, the activities coordinated around Tanja Rinaldi-Barkat (Ressort Communication & Outreach) and Xiomara Banholzer (DBM Communications Office), along with the intent to make the DBM visible to the outside, are meant to further develop our own internal identity. I take here the chance to share with you my personal interpretation for the dots of our new logo: in my view, they picture the collaborative interactions with local departments and institutions, the interdisciplinary connections among different research areas and scientific approaches … but ultimately also the development of 'communication' among each and every member of the DBM Basel.

In this spirit, I trust you will enjoy reading this Newsletter.

Ivan Martin
Director of the Department of Biomedicine

Interview of Petya Apostolova

by Martina Konantz

How was your start at the DBM?

It's been two months since I joined the DBM at the beginning of November, and I am happy to say that I've had a very positive, productive, and energetic start. It's a wonderful and special feeling to be establishing a new research lab: bringing the people together, developing the ideas for our research program, and connecting with the friendly and welcoming colleagues at the DBM, and the broader Basel community. For me, starting in a new place as a scientist has always been a period of inspiration and excitement about the new opportunities lying ahead. It's even more special to do this as a research group leader. Being a part of the DBM has been a great experience so far! Everyone has been incredibly welcoming and supportive and I want to use this opportunity to say a sincere „Thank you!" to all the people who have helped me get the ball rolling. Even before I joined the DBM officially, I had wonderful interactions with the scientists and administrative staff, which really helped me organize a smooth transition from my previous position in the US to Switzerland. On the first day of my appointment, I arrived at my office to find a welcoming note, a platter with chocolates, and a fully operational computer - the most exceptional „starting package" I could have imagined! I can definitely say that I have felt quite „at home" at the DBM from the very beginning.

I particularly appreciate how interdisciplinary the DBM is, and how easy it is to get in touch with research labs from a wide variety of fields. I have already been able to establish connections with several groups and learn about their scientific programs, which are very diverse, both in terms of the topics and in terms of the technologies people use. I think this is a great strength of the DBM. Of course, the proximity to the Faculty of Sciences, the ETH, and other potential academic and industrial partners is one of the central things that makes Basel a very vibrant research hub.

Did you manage to establish up your own lab already?

I am quite pleased with the progress we've made so far, but it would be an exaggeration to say that we are already fully established. These two months have mostly been dedicated to administrative work, introducing myself and my group to other investigators at the DBM, getting in contact with companies that can provide us with reagents, and crafting a specific plan of what we need to do in order to establish our central research tools. Now, after the Christmas holidays, we're planning to actually start the experimental work. I am very excited about this, but also realistic that it will take us some more time until we're fully up and running. What makes me very enthusiastic is that we have three specific projects in mind, which we want to kick-start in the next months, and I literally cannot wait to see the first results.

Can you provide us with a brief overview of your research, how it fits into the DBM, your vision for the next five to ten years, and the specific niche or specialization you aim to establish?

I am a physician-scientist and my research spans the areas of hematology, immunology, and cellular metabolism. This focus has evolved as a result of my combined clinical and scientific training. During my clinical training at the Medical Center-University of Freiburg, Germany, I studied the immune responses after an allogeneic stem cell transplantation. This procedure is a form of cancer immunotherapy, in which we transfer hematopoietic and immune cells from a healthy donor to a patient with a hematological disease - for instance, leukemia. Allogeneic stem cell transplantation is a unique situation from an immunological perspective because we have a patient who carries the immune system of another individual. This therapy holds both promises and challenges: a healthy immune system can help eliminate the patient's cancer and provide a cure, but, on the other side, it also recognizes the recipient's body as foreign and can mount an immunological attack. I have been fascinated by the fine balance necessary to manage this immune response. Allogeneic transplantation is currently the only curative therapy for high-risk leukemia, and I am particularly interested in understanding how we can boost the anti-leukemia immune responses. Then, during my postdoctoral scientific training at the Max-Planck Institute for Immunobiology and Epigenetics and at Johns Hopkins University, I became excited about cellular metabolism. Metabolism is the combination of all biochemical reactions that keep our cells alive and functional. It provides energy in the form of ATP but also signaling intermediates, molecules for cell division, the maintenance of redox balance, and much more. Metabolism is of essential importance to both immune cells and cancer cells. Now, in my independent research program, I aim to unite my expertise in these areas and work towards a better understanding of how metabolic processes govern leukemia biology and leukemia-immune cell interactions in the context of allogeneic transplantation. My research fits within the topic areas of Oncology and Immunology within the DBM, and I am pleased that I can interact and collaborate with groups from both areas. I am also particularly delighted to encounter here other research groups with an interest in metabolism and hope that together we can work towards establishing a cutting-edge technology platform to study metabolism at the DBM.

My vision for the next few years is to become an established part of the international community dedicated to developing more efficient (immuno-) therapy approaches for patients with leukemia and other blood cancers. Specifically, I am dedicated to exploring how metabolism can be harnessed in this context. Metabolic processes are important for every cell in the body,

Interview of Petya Apostolova

by Martina Konantz

and so it is challenging to identify pathways that can be targeted selectively in cancer cells in patients, without causing adverse effects in healthy tissues. Nevertheless, I believe that metabolism is an essential part of cell biology and holds therapeutic potential. Furthermore, I hope that with time we can extend our approaches to other forms of cancer immunotherapy, such as chimeric antigen receptor (CAR)T cells.

What role does our institute and its proximity to the hospital play for your scientific aims?

The DBM is a vibrant, very diverse research environment embedded in an impressive landscape of scientific and medical institutions. The proximity to the hospital is particularly important for me because it allows me to pursue my interests both in clinical work and in science. Wtithin the first weeks, I had the opportunity to join the rounds of all patients with hematological diseases, and I was impressed by the breadth and complexity of the cases. In the future, 20% of my time will be dedicated to patient care in the outpatient clinic for stem cell transplantation recipients. I believe that the bed-to-benchside-to-bed transition is critical for the advancement of medicine. Caring for patients allows me to maintain an overview of the medically important needs and questions, and to integrate our basic research program with studies of patient material. Furthermore, I am delighted about the opportunity to work together with both basic researchers and physicians. I hope that I will be able to attract medical students and physician-scientists to my group and establish clinical collaborations. One particular project that I am committed to is the systematic biobanking of blood and bone marrow samples from patients undergoing allogeneic stem cell transplantation. The Hematology clinic in Basel has the largest transplant program in Switzerland and is one of only three centers where this highly specialized procedure is performed. I believe that this offers us a unique opportunity to integrate both basic and translational elements in our research. Down the road, I hope that we can develop therapeutic strategies that we can test in patients at our hospital.

What is the vision for your lab here in general and what part of your work as a group leader do you enjoy/appreciate the most?

My decision to commit to academia is based on several reasons. Probably the most important one is that I love research! I am truly and (almost) every day fascinated by what I would call „the research circle“: thinking about an important scientific question - designing experiments to address it - performing these experiments - interpreting the results and developing the next experimental series. I am so often truly curious to see the result of a specific experiment! With my lab, I strive to conduct rigorous, innovative basic and translational research. I particularly love the fact that science is a „team sport“ and I enjoy working alongside colleagues and trainees. So, my vision for my laboratory is to be able to pass on my knowledge and my passion to other people and to build with them a team with which we work together towards advancing our field. This is probably also the part I enjoy the most - the opportunity to inspire and mold young minds, to help trainees advance in their professional development, and to work together with a group of creative, motivated individuals towards a common goal.

Research laboratories are a unique working environment. The majority of the people are young professionals, mostly at various stages of their academic training. They are complemented by more experienced scientists, who provide continuity within the group. Very often, after several years, people would leave, and a new group of people would come together to study new research questions. During my own training, I appreciated very much the creative intellectual energy that developed between people working in one lab at the same time. Discussions with my colleagues have been and continue to be essential for me. I aspire to create an environment in which constructive, detailed discussions between lab members push projects forward. My ultimate goal is to be able to attract lab members from different backgrounds and with different types of expertise so that we can continuously learn from each other and advance our scientific work in a multidisciplinary fashion.

Is there anything you dislike?

Probably like many other people, I have been dealing with a lot of paperwork in numerous areas. A significant portion of this paperwork, unsurprisingly, relates to my lab. However, I found the process of navigating the documentation required for my personal appointment and work contract to be even more challenging. Born and raised in Bulgaria, I received my medical degree and clinical training in Germany, and was a postdoc at two institutions in Germany and the United States. When I had to get my training and certificates acknowledged in Switzerland, I had to gather documents from three different countries and multiple institutions in three different languages. In some areas, it proves exceedingly difficult to obtain recognition of equivalent training. For instance, in the US, I was not allowed to be a practicing physician because I had only received German, but not US medical training. Another example is that in the US and UK, students can apply for a PhD position with only a B.Sc. degree, while this is not possible in Switzerland or Germany. Consequently, it is extremely challenging to attract US students for PhD studies in Basel, because they would be required to pursue an M.Sc. degree, which is not necessary in their home countries. I think that working

Interview of Petya Apostolova

by Martina Konantz

towards harmonizing such requirements is essential in order to support international mobility in science. I regard it an important part of my mission to speak about the hurdles of international scientists and, wherever possible, to take concrete steps towards facilitating international exchange.

Can you also tell us something about our team? Who are/will be the people that work for you?

I am starting a new research group here and so I am extremely grateful to the people who joined my team from the very beginning and to embark with me on the journey of creating something new together from scratch. Some of my team members are familiar faces from my previous research endeavors, and I am delighted that they have decided to join me again at the DBM. Others learned about my group through word-of-mouth recommendations, while others applied after my lab was officially listed on the DBM website. By the end of February 2024, the team will include a total of six people: two master's students, a PhD student, a postdoctoral scientist, a technician, and me. We come from four different countries and have various backgrounds with training in medicine, biology, and biotechnology. I think all of us are committed to building a creative, supportive, communicative, and fun environment in which we can do exciting research. I look forward to establishing our research program with everyone's input. Our lab is in room 202 at the DBM Hebelstrasse, so if anyone would like to get to know us, please feel free to stop by!

Last but not least? If we could grant you a scientific "wish", apart from enough resources to perform your research, what would that be? The sky is the limit…

I would ask for two wishes! The first is that I would like to be involved in multiple collaborative research projects, both within Basel and Switzerland, and internationally. My experience has taught me that when people with different experiences and expertise work together, they can create something really novel, which neither one could do by themselves. I believe that fostering greater exchange between clinicians and basic researchers, more open science between labs at different institutions, and sharing resources and data are crucial steps to advance our fields quickly. I am determined to establish such regular collaborations with my network at the DBM and beyond.

My second „wish" is technological. I hope that in the future, we will have even better, more precise tools to study metabolism, including those capable of spatial resolution and single-cell analysis. Currently, metabolomics lags behind other „omics" disciplines. Unlike RNA sequencing, for instance, there is no technology that allows to detect and confidently identify all metabolites within a cell, and even less so on the single-cell level. While our lab will not be directly involved in developing these technologies, I am confident that they will advance a lot in the coming years. I am eagerly anticipating the prospect of being able to look at an even deeper level in the biochemistry of tissues and cells!

Petya Apostolova was born in Sofia, Bulgaria. She studied medicine at the University of Freiburg, Germany. After finishing her doctorate and specialist training she conducted research at the Max Planck Institute of Immunology and Epigenetics in Freiburg before she moved to the US as a postdoctoral research fellow at the Johns Hopkins School of Medicine in Baltimore (USA). Last year, she joined the Department of Biomedicine as a research group leader. Her research is noted in the exploration of how hematological cancers can be cured using immunotherapies. Beyond her professional pursuits, she finds joy in her two cats, Crossfit, and being out in nature. We look forward to learning more about her research at the next "Explore the Lab" seminar.

DBM Personal Story
Anna Griadunova

In this newsletter, Anna Griadunova will share her inspiring story, recounting her journey from when she moved to Russia as a teenager. We will dig into her educational experiences, discuss her motivation to become a scientist, elaborate on the reasons behind her decision to join the DBM, and provide insights into where her journey continues.

Anna Griadunova grew up in Belarus and moved to Russia together with her parents when she was fifteen. There, she discovered a deep interest in chemistry and got an Associate's degree from Ulyanovsk College of Pharmacy in 2012. She then earned her Bachelor's, and then Master's degree in Pharmacy in 2017 from Sechenov University in Moscow. Afterwards, she chose the Moscow Institute for Physics and Technology for her doctoral studies and earned a PhD in Cell Biology, Cytology, and Histology in 2021.

What inspired her to become a scientist?

"I could name two very special people that greatly contributed to my resolve in becoming a scientist. My initial interest in science was nurtured by my chemistry teacher in college, Tatiana Naumova. She noticed my desire to understand the underlying mechanisms of chemical reactions and was the first to suggest that I should deepen my knowledge in chemistry and stick with science in the future.

And later, when I was a first-year student at Sechenov University, my Physiology Professor, Dr. Vladimir Volkov, also had a major impact on me. He built even a greater sense of curiosity in me and redirected my aspirations towards understanding how our body works on a cellular level. His every lecture was a masterpiece and truly an inspiration and encouraged my pursuit of science as a career choice."

Her PhD dissertation was focused on the production of chondrospheres, tissue spheroids fabricated from primary chondrocytes, and evaluation of their functional and morphological features. During her PhD, she obtained a President's Scholarship for studying abroad, one of the most prestigious funding awards in her home country. Since she was still a PhD student working on cartilage regeneration at the time and was eager to expand and deepen her knowledge, she was looking for an institution specializing both on cartilage and tissue engineering. Ivan Martin's lab at the DBM was the top tier in her list.

"I discussed a lot his outstanding research in cartilage engineering within our group in Moscow and was extremely excited when I got a chance to join his team."

Anna then joined the DBM in the beginning of the COVID-19 pandemic in February 2020, where she has been involved in a number of projects. Her latest project was focused on developing a novel gene delivery platform for CRISPR components in intervertebral disc repair. She was responsible for establishing new protocols for production of lipid-based nanoparticles loaded with CRISPR dCas9-SAM plasmids and introducing advanced methodologies for nanoparticles comprehensive characterization. Additionally, she worked on creating new collaborations to enhance the quality of nanoparticle research in the group, with the eventual goal of clinical translation.

What did she enjoy most at the DBM?

"My time here has been extremely valuable. I had the chance to collaborate with some of the most skilled and passionate experts from many different areas. The international spirit is definitely what makes working at the DBM so special. It is very inspiring to see people with diverse backgrounds and skill sets teaming up to push forward the progress towards bringing research to the next level and developing new therapies. I am also immensely grateful for all new connections and friendships I have developed here. I take with me a lot of great memories and lessons learned from each of them."

Her time at the DBM helped her to achieve her next goal in her young career, the chance to work at the Innovative Genomics Institute (IGI) at UC Berkeley in collaboration with Prof. Jennifer Doudna (Nobel Prize in Chemistry, 2020).

"UC Berkley is considered to be the best public university in the world and in general is ranked among the world's top universities. Getting an offer to join the team there felt like a dream coming true. I highly appreciate the opportunity of making a contribution to the success of the project and working alongside the most brilliant researchers in the field of molecular biology and genetics."

She also highlights that this would not have been possible without the support from the DBM. In particular, the seminar series organized in February 2023 with the help of Prof. Lukas Jeker who invited Fyodor Urnov, Professor of Molecular and Cell Biology at the UC Berkeley and Director of Technology & Translation at the IGI, as a speaker. It was his lecture that was absolutely mind-blowing for Anna and marked the beginning of intense discussions and a line of interviews on Zoom. However, this also comes with a challenge, since Anna is still waiting for her US visa.

"It's a waiting game with no fixed deadline."

DBM Personal Story
Anna Griadunova

Meanwhile, she is working as a freelancer, providing her services as a strategy consultant for companies aiming to translate groundbreaking science into transformative therapies. When asked about her future plans, Anna does not want to give a standard answer:

"I don't have a plan. Uncomfortable yet very valuable experience from the past four years has taught me that sometimes despite our best efforts to control our lives, unexpected events and circumstances can arise, leading to unpredictable outcomes. Right now I am learning to map out my career journey in a way that keeps it flexible. I believe being adaptable and open to change is an underrated superpower, as life is often beyond our control."

When asked about her three career tips for young scientists, she highlights the importance of visibility and openness.

"Most importantly, bring yourself out there. It might be hard in the beginning, especially for those of us who have grown accustomed to work in the shadow of the lab bench, but that alone will contribute to your personal and professional growth immensely. Surround yourself with people that bring the best qualities in you. Look for those that will encourage and support you, those who believe in your abilities. A lot has been said about the importance of networking and I cannot really emphasize it more than by saying that one meaningful connection can change your life.

Seek guidance from your mentors. I learned it from the colleagues I genuinely admire and also from personal experience that you need mentors and coaches to bring up that maximum efficiency from your career journey. Finding a mentor and building a meaningful, mutually advantageous relationship with them is a hard task on its own, but once you meet that special someone, make sure to use this opportunity. There are so many people out there that have been standing at the exact point where you are now and are open to share their perspective."

Anna also emphasizes that when building a successful career – and that's applicable not only to careers in science – one should prioritize activities that energize them. While passion, legacy, and purpose are all significant factors, the focus should be on energy. Her recommendation is to go for things that feel like a possibility, are exciting to do, are energizing and naturally expanding one's horizons. Though it might be uncomfortable in the beginning, the key consideration is how this pursuit makes one feel. Navigating one's path, particularly right after obtaining a PhD, can be challenging, and seeking the sense of expansion and energy will certainly help to make a meaningful choice.

One interesting fact about Anna that is not on her CV is that, as a result of her contribution to a project that took place at the International Space Station, her name is now carved inside the world's first bioprinter that was sent to the ISS in 2018. The bioprinter was handed over to the Space Museum in Moscow when she already moved to Switzerland and next time she visits she hopes to have a picture taken with her name on it that she could then share with us.

Anna is always looking to expand her professional network and would be happy to connect on LinkedIn: https://www.linkedin.com/in/annagriadunova/

DM her to have a chat with her!

Chair of the Scientific Advisory Board
Ivo Touw

What inspired you to become a Scientist?

Trained as a biologist, my initial interest was in plant science, specifically in plant physiology. The paucity of PhD positions in the Netherlands in the early nineteen-eighties for basic science initially led me in the direction of finding a position as a teacher. I still have a strong affection for promoting education in science. However, a final internship at the Netherlands Cancer Institute focussing on tumor immunology made me change my mind. Those were exciting times, with the first monoclonal antibodies and flow cytometry just entering the scene of cancer research. Cancer-related research has inspired me ever since and has given me great opportunities to develop as an independent scientist.

What is your Area of Expertise?

My PhD training at the Daniel den Hoed Cancer Center in Rotterdam focused on the growth characteristics of acute lymphoblastic leukemia (ALL). Initially, this was a tedious affair because most the hematopoietic growth factors were still unknown, let alone molecularly cloned and purified. Our discovery of interleukin-7 receptors and IL-7 responses of ALL cells published in 1990 was a breakthrough in this field. From then on, I was intrigued by how hematopoietic growth factor receptors work and particularly how they manage to provide such diverse signals in normal and diseased hematopoietic stem cells. This became my major area of expertise, specifically in the context of disturbed neutrophil production in severe congenital neutropenia (SCN) and its predisposition to malignant transformation towards myelodysplasia (MDS) and acute myeloid leukemia (AML). Our key finding that mutations in the receptor for granulocyte colony-stimulating factor (G-CSF) are frequently acquired in SCN patients while undergoing life-long G-CSF therapy, published in the NEJM in 1995, formed the basis of my subsequent major research activities. Herein, we dissected how these mutations affect the signaling function of the G-CSF receptors and how this contributes to the development of MDS/AML. To this end, we generated mouse models and more recently patient-derived induced pluripotent cell (iPSC) lines, in which we revealed that signal-rewiring towards inflammatory pathways is an early hallmark of how G-CSF receptor mutants contribute to disturbed myelopoiesis.

When and why did you agree to join the Scientific Advisory Board of the DBM Basel?

I joined the SAB in 2013 or 2014, I don't remember exactly. I was approached by the DBM department head, Radek Skoda, with the request to replace Bob Löwenberg, who had decided to step down. I accepted his offer to join the SAB, based on Bob's advice and positive experience with the SAB and the status of the DBM in general. I was already acquainted with Radek's outstanding research program and impressed by his organizational skills, in part based on our shared activities within the European Hematology Association (EHA).

What changes and developments have you noticed at DBM Basel in recent years?

The most visible change has been the implementation of the new management structure, which became effective in 2022. Following the successful leadership directed by Radek Skoda, the new leadership headed by Ivan Martin faces important challenges, most notably those concerning the new DBM building and the organizational aspects linked to this.

What do you consider to be the strengths of the DBM Basel?

In my view, the major strength of the DBM is its multi-dimensional profile, allowing basic, translational and clinical scientists to go hand in hand in timely addressing original and important biomedical issues. While one might argue that excessive diversity also bears the risk of spreading the butter over too many sandwiches, maintaining a strong vision and strategy for recruiting professors and scientific staff, offering necessary support for project promotion, and fostering interactions between the basic scientific and (pre-)clinical disciplines will continue to present unique opportunities for an internationally competitive DBM. This approach ensures ample career possibilities for young talent and secures sustained competitive funding.

Chair of the Scientific Advisory Board
Ivo Touw

In your opinion, what is the most important role of an advisory board?

To provide constructive input on strategic matters concerning the near and longer-term future of the DBM and to advise the working group leaders and core facility management.

Can you tell us an interesting fact about yourself that people wouldn't know from your resume?

Not all that spectacular. Like many Dutch, I am an enthusiastic (tour)cyclist and ice-skater. Particularly, skating on natural ice is a sensational experience and a real tradition in Holland, which unfortunately becomes increasingly exotic, thanks to global warming. I also like to play music (guitar) and cook (italian). Last but not least, together with my wife Anja, I greatly enjoy spending time with my two grand-daughters, currently 2.5 and 1.5 years of age.

Scientific Advisory Board
Jim Norman

What inspired you to become a Scientist?

I have always been inspired by the manner in which all the scientific disciplines (biology, chemistry, physics, maths) are interconnected and built on one another with the goal of understanding the nature of the universe and, in particular, life. At school, I was fascinated and inspired by the research conducted in the 1940s-1960s by Sir Hans Krebs, Peter Mitchell, Sir Andrew Huxley et al, which elucidated how oxidative phosphorylation couples catabolism to ATP production via the generation of proton gradients and how this, in turn, generates force in muscles.

What is your Area of Expertise?

I am a biochemist and cell biologist and lead a group of between 9-12 researchers at the Cancer Research UK-Scotland Institute. We are interested in discovering how membrane trafficking (chiefly endo- and exo-cytosis/recycling) influ ences, and contributes to cell migration and invasion. This interest has led to the discovery of several membrane trafficking and metabolic processes that drive metastasis and metastatic niche priming. Moreover, we have developed transgenic mouse models to study this in a whole-body context. The next challenge for the group is to capitalise on these discoveries to inform the development of therapies and early detection tools for cancers.

When and why did you agree to join the Scientific Advisory Board of the DBM Basel?

I joined the DBM's SAB in January 2018 and I have enjoyed working alongside the the DBM's management team to assess and helping drive forward its cancer research. I agreed to join the DBM because I believe that the DBM's leading interdisciplinary research into diseases (including cancer) is exciting and important, and I am honoured to be able to contribute to guiding this venture and the DMB's leadership to realise its strategic aims.

What changes and developments have you noticed at DBM Basel in recent years?

One of the most important and positive developments that have occurred since 2018 is that the DMB's four research areas - Cancer, Immunology, Neurosciences and Tissue Development/Regeneration (stem) - are much more closely and effectively connected than they were in 2018. This is evidenced by the increasing number of intramural interdisciplinary collaborations and the recruitment of groups that have catalyzed this.

What do you consider to be the strengths of the DBM Basel?

The main strength of the DBM is the very close and effective connection between basic scientists and research-active clinicians.This allows research to be directed towards the development of therapeutic interventions, but whilst retaining a strong and rigourous scientific foundation.

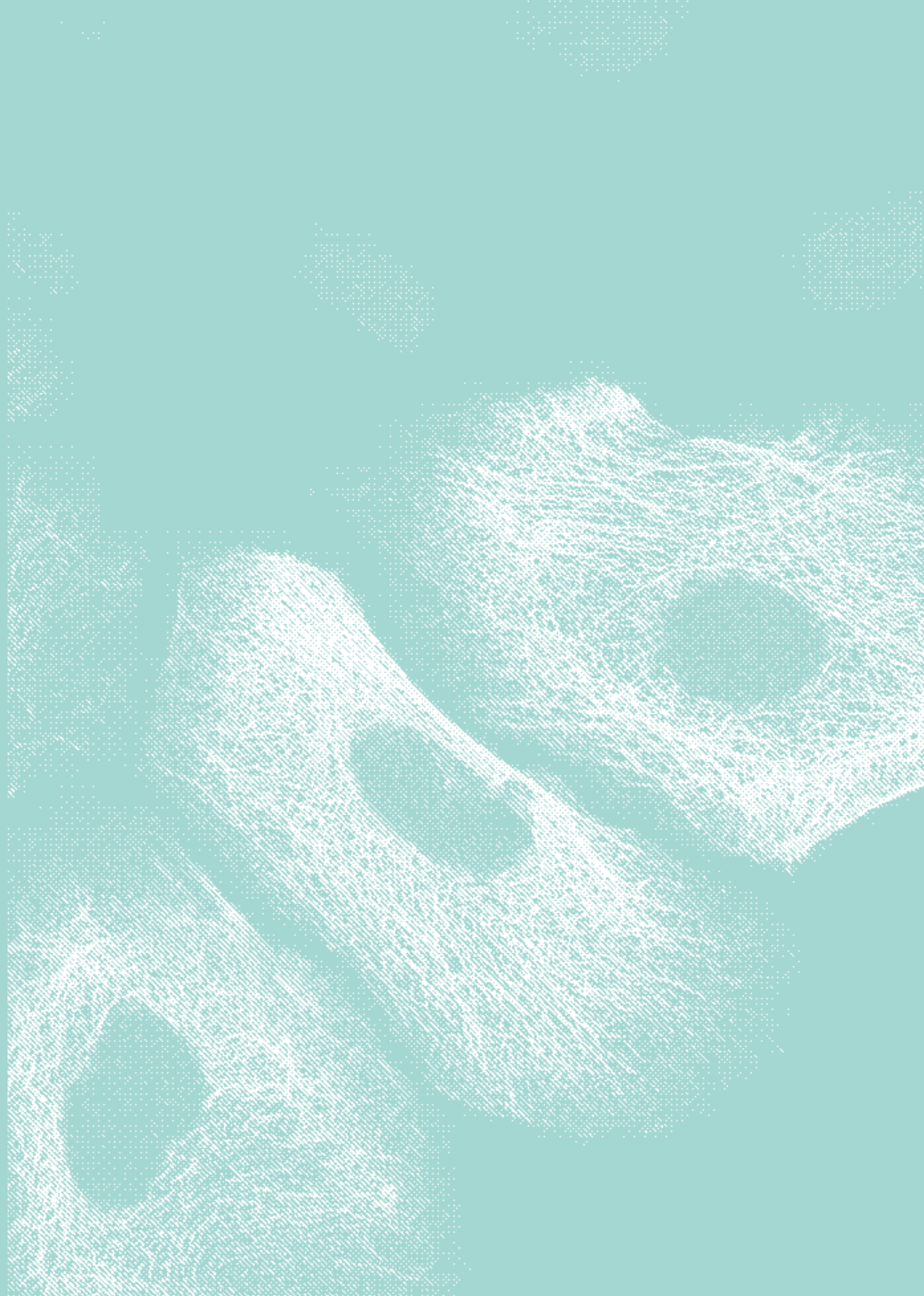
In your opinion, what is the most important role of an advisory board?

To assist the scientific leadership with making key strategic decisions. In particular, decisions which influence the recruitment and retention of research groups in a way that maintains a good balance of clinical/basic science.

Can you tell us an interesting fact about yourself that people wouldn't know from your resume?

I am a classical organist and (try to) give recitals on a reasonably regular basis.

DBM
Basel
Department of
Biomedicine



Research Group at a Glance
Core Facility at a Glance
Publications

Research Group at a Glance
Translational Hepatology (Bernsmeier Lab)

A quick Overview of our Research

Liver cirrhosis is a systemic inflammatory disease marked by high morbidity and mortality, affecting 1% of the global population. The management of cirrhosis and its complications is challenging. While cirrhosis may be reversible in the early stages by treating the underlying liver disease, in the advanced stage liver transplantation remains the only definitive treatment, available only to a minority of patients. A notable concern in cirrhosis is the high incidence of infectious complications, which critically influence the patients' prognosis being the main cause of acute decompensation, progression to "acute-on-chronic" liver failure, and increased mortality rates. Underlying the significant infection risk in cirrhotic patients is a phenomenon known as systemic "immuneparesis", defined by attenuated immune responses to microbial challenge. Gaining insights into the complex mechanisms of immuneparesis is crucial for developing prognostic tools and pioneering novel immunotherapies aimed at bolstering immune responses and diminishing the recurrence of infections, the need for liver transplants, and mortality.
Our research group is at the forefront of exploring the pathophysiology of immuneparesis, particularly focusing on how immuneparesis evolves and affects the differentiation and function of circulating monocytes and also macrophages in various tissues in cirrhotic patients ex vivo. Through several studies over recent years, we have uncovered the emergence of distinct monocytic states that exhibit immune-suppressive and immune-regulatory features in patients with cirrhosis at different stages. These pathological states progressively accumulate in the systemic circulation as liver cirrhosis advances, leading to weakened responses to microbial challenge.

Highlights, Breakthroughs and current Projects

1. TAM receptors, TYRO-3, AXL, MERTK, are expressed on monocytes and macrophages, serving as receptor tyrosine kinases and important negative regulators of innate immune responses to pathogens. Over the previous years, we have deciphered their role in immuneparesis in cirrhosis. We identified MERTK-expressing monocytes/macrophages in diverse compartments in liver failure patients, where they suppressed immune responses to bacterial challenge. While AXL-expressing monocytes with immuneregulatory functions emerged in cirrhosis stages preceding liver failure. Of note, AXL- expressing macrophages appear to physiologically reside in tissues with barrier function such as the: the skin, lung, joints – and, as we revealed, the liver and gut. However, they only accumulate in the circulation and lymph nodes in cirrhosis, as a pathological condition. Moreover, in cirrhosis these AXL-expressing cells were reduced in the liver and gut, where they may play physiological roles in immune homeostasis. The process is related to the paracrine effects of activated hepatic stellate cells. The work highlights the compartment-specific dynamics of innate immunity in cirrhosis from early to advanced stages, and underscores the regulatory role of TAM receptors in this context.

2. We also described the emergence of immunesuppressive monocytic myeloid-derived suppressor cells, M-MDSC, in the blood and the liver of patients with cirrhosis. M-MDSC occurred with disease progression, representing 10% of circulating monocytic cells in the compensated, 23% in the decompensated, and 55% in the liver failure stage. Functionally M-MDSC suppressed significant mechanisms of the innate immune defence against infection, and their abundance and persistence were associated with infection and survival. In vitro, M-MDSC evolved in response to circulating plasma components, including bacterial products and cytokines. Proof-of-principle data revealed a role for TLR3 agonism in reversing M-MDSC and enhancing immune function in advanced cirrhosis.

3. Currently, we have transcriptionally dissected the systematics of monocyte states circulating in patients with compensated and decompensated cirrhosis, hereby revisiting the reduction of non-classical monocytes and the accumulation of M-MDSC with disease severity, but also identifying distinct changes within in the classical monocyte subset. One of these targets may represent CD52 expression on monocytes, related to an activated monocyte state with enhanced innate immune function, associated with improved survival.

4. We are currently also investigating the short- and long-term dynamics of monocyte and macrophage differentiation and function along the disease evolution ex vivo in patients with cirrhosis. These investigations aim to identify mechanisms that influence the dynamic modulation of monocyte and macrophage function in patients with cirrhosis.

Our Vision for the Future

Our vision is to uncover a detailed understanding of the immunopathophysiologic mechanisms underlying the development of immuneparesis throughout the evolution of liver cirrhosis.
This understanding may, on the one hand, enable us to identify the time when immuneparesis occurs, in other words when the patient with liver cirrhosis is at risk to die from infection. On the other hand, it may also translate to the identification of specific immunetherapeutic targets and the development of immunemodulatory strategies for those at risk. If immunemodulation could enhance antimicrobial responses in patients with advanced cirrhosis, preventing infection and associated mortality, this could bridge to liver regeneration, organ preservation and substantially improve the prognosis of liver cirrhosis.

Research Group at a Glance
Translational Hepatology (Bernsmeier Lab)

Team Spirit – Introduction of us

We are a frank and communicative group of individuals with a deep passion for scientific inquiry into the fields of immunology and liver disease. Our members range from expert hepatologists to the dynamic energy of PhD candidates, medical students and master's students. Each member, regardless of their career stage, is valued for their unique contributions and expertise. Our strength lies in the deep connections we've cultivated, not only with the facilities and research groups within the DBM but also with the dedicated medical staff at the clinical Gastroenterology and Hepatology unit. This synergy allows our scientific explorations to seamlessly progress within an evergrowing cohort of generous patients with cirrhosis, while also being challenged by unsolved clinical questions. We nurture our collaborative spirit through a weekly scientific meeting, ensuring that everyone's voice is heard and that our research directions benefit from collective insight. These sessions are a cornerstone of our group, providing a platform for mentorship, discussion, and shared learning. Outside the lab, our interactions are just as important – whether during a coffee break or at group gatherings, these moments fortify our team's bond. Beyond our institutional walls, we pride ourselves in fostering numerous research friendships, both domestically and internationally.

If you're inspired by the prospect of collaboration and eager to contribute to the cutting-edge field of liver cirrhosis research, please do not hesitate to reach out to us!

We are

Christine Bernsmeier	Research Group Leader
Robert Brenig	Postdoc
Sofia Schaeffer-Roth	Postdoc
Andrijana Bogdanovic	Postdoc
Anne Geng	PhD Candidate
Emilio Flint	PhD Candidate
Paul Jorzik	PhD Candidate
Martin Schaub	MD Candidate
Deborah Augsburger	Medical Master Student

From left to right: Andrijana Bogdanovic, Emilio Flint, Christine Bernsmeier, Anne Geng, Sofia Schaeffer-Roth, Robert Brenig, Oltin Pop (collaborator, Institute of Immunobiology, Medical research Centre St. Gallen)

Research Group at a Glance
Systems Pharmacology and Biology of Metabolism (Zampieri Lab)

A quick Overview of our Research

The mission of the group is to understand fundamental mechanisms allowing short- and long-term metabolic adaptation to genetic and environmental perturbations. This understanding will enable us to ultimately find new and unconventional therapeutic strategies, from antibacterial to anticancer drugs. To this end, we develop new ways of combining state-of-the-art technologies in metabolomics with mathematical modeling. An innovative contribution of our experimental and theoretical work is establishing a new perspective and methodology to search for novel drug mechanisms of action and ways to bypass drug resistance. Therefore, we develop novel quantitative experimental-computational approaches to shed light on the interplay between cellular metabolism and drug treatment.

Highlights and Breakthroughs

Here are some of the questions that drive and inspire the research in our lab:

1. How does metabolism mediate rapid and long-term adaptation to continuous environmental changes as well as genetic or chemical perturbations?
2. Which are the underlying evolutionary forces that influence the operational dynamics of metabolic reactions in organisms such as pathogenic bacteria or cancer cells?
3. How can we systematically interfere with metabolic regulation?
4. Can we develop computational models capable of predicting cellular responses to drugs that have not yet been tested, or anticipate the functional consequences of a genetic mutation?

To address these questions, we:

1. ***Develop new strategies to explore the chemical-genetic space.*** We established a innovative multiplexed, unbiased framework that, by linking genetic to drug-induced changes in nearly a thousand metabolites, allows for high-throughput annotation of gene functions and drug modes of action. The approach consists first in generating a reference map of metabolic changes from genetic interference (e.g. gene knockdown). Next, a new computational strategy (iSim) to compare genetic with small molecule-induced metabolic changes allows making de novo predictions of compound modes of action. With this approach, we showed that the unbiased characterization of compounds, that themselves are not growth inhibitory but exhibit diverse modes of action, can expand antibacterial strategies beyond direct inhibition of core essential functions and guide the systematic predictions of small molecules epistatic interactions.

2. ***Develop novel frameworks for quantitative metabolomics.*** Our research led to innovative high-throughput metabolomics frameworks and computational tools opening new opportunities in systems pharmacology and chemical genetics. By combining high-throughput metabolomics with automated time-lapse microscopy, we developed a unique platform to quantitatively investigate metabolic regulation virtually in any cell type. By systematically studying rewiring of metabolism upon genetic and chemical perturbations and by connecting metabolic to phenotypic changes, we can model the flow of signaling information and shed mechanistic insights on metabolic dependencies across largely diverse cancer types. We generated the first genome-wide map of associations between transcriptional regulators and metabolites in cancer cells and demonstrated the potential of this map to predict transcriptional regulator drivers of metabolic dysregulation in tumor biopsies. By developing an innovative methodology to resolve metabolic differences at subpopulation levels without the need for physical separation, we unraveled a new role of fatty acid □-oxidation in preventing the buildup of toxic intermediates during cellular transitioning to quiescence.

3. ***Develop computational tools for studying metabolic regulation and adaptation to perturbations.*** To efficiently search for vulnerabilities that could be exploited for therapeutic applications, we developed innovative computational approaches able to integrate metabolomics data with genome scale models of metabolism and regulation. These methods paved the way to unravel the potential role of metabolism in mediating the short- and long-term adaptive response to antimicrobials. Combining metabolomics with mathematical models of bacterial metabolism led to unraveling the genetic basis for metabolic diversity across clinical strains of the Mycobacterium tuberculosis and predicting mutations that associate with strain-specific metabolic vulnerabilities and inherent baseline susceptibility to antibiotics. Moreover, by developing new quantitative approaches to measure metabolic activity of single bacterial colonies, we demonstrated the existence of different Pareto-optimal metabolic strategies within a clonal bacterial population of Escherichia coli and unravel new evolutionary principles and mechanisms governing how phenotypic variability originates from stochasticity in gene expression.

Current Projects

All projects within our laboratory are designed to incorporate a mix of metabolomics, wet lab experiments and computation.

Here are a few examples from various lab members:

Research Group at a Glance
Systems Pharmacology and Biology of Metabolism (Zampieri Lab)

Dr. Laurentz Schuhknecht
Drug mode of action annotation by multidimensional profiling

Understanding a small molecule's mode of action is essential to guide compound selection, optimization and clinical development. However, general and scalable approaches for target and mode of action deconvolution are lagging behind. To close this gap, we are leveraging our high-throughput non-targeted metabolomics approach to perform metabolic fingerprinting on large and diverse compound libraries and unravel mechanistic insights on new drug modes of action.

Sebastian Bors
Deciphering transcription factor driven metabolic rewiring in cancer

Metabolic rewiring in cancer is a major driver of uncontrolled proliferation, metastatic potential, immune evasion and treatment resistance. However, despite its recognized importance, the transcriptional mechanisms that mediate this oncogenic metabolic transformation remain largely unknown. We aim to fill this gap by combining high-throughput metabolomics with CRISPR technologies to map the individual regulatory role of transcription factors in metabolism, pinpointing the metabolic mechanisms that drive cancer, and identifying transcription factors that are responsible for metabolic rewiring in patient tumors.

Alexandra Evelyne Huber
Investigating the interplay between transcriptional regulation and metabolism in bacteria facing harsh environments

Bacteria survive and thrive in diverse and dynamic environments, for example pathogens that colonize different host niches. We aim to explore mechanisms that help bacteria to physiologically adapt to harsh environments. Specifically, we investigate the interplay between transcriptional regulation and metabolism in Escherichia coli and the role of controlling transcription factor levels during environmental shifts. The project aspires to bridge the gap for translational application to understand which transcription factors are crucial for pathogens during within-host physiological adaptation and which metabolic changes accompany such transitions.

Dr. Sebastian Sosa-Carrillo
A pipeline to exploit bacterial metabolism for drug repurposing as new antibacterial agents

The process of antibiotics discovery is dominated by classical in vitro susceptibility assays. However, during infection, bacteria face specific metabolic constraints that largely differ from those imposed during in vitro conditions. Such disparity can lead to overlook drugs targeting non-essential processes in vitro, but with potential antimicrobial activity in vivo. To cope with this limitation and to propose new antibiotics that are effective under in vivo metabolic constraints, we first we characterize the dynamic metabolic response of bacteria exposed to a variety of small molecule drugs across different culture conditions mimicking the environment at the infection site. Then, we link the observed metabolic and growth phenotypes to rationally identify drugs whose mode of action have potential antimicrobial activity under specific (in vivo) conditions.

Dimitrios Balasopoulos
Investigating the role of central metabolism in antibiotic tolerance

The understanding of the mechanisms mediating antibiotic tolerance is of great significance in order to tackle major clinical issues like the relapses of chronic disease and the evolution of antibiotic resistance. Mounting evidence has implicated the connection of antibiotic tolerance with the pathogen´s respiro-/fermentative metabolism. In collaboration with the Jenal lab from the Biozentrum and other members of the NCCR Antiresist, we aim to unravel the association of respiro-/fermentative metabolism with antibiotic tolerance by combining high-throughput metabolomics with single cell analysis.

Dr. Michela Pauletti
Structural kinetic modeling of metabolic networks

Advances in metabolomics enable dynamic tracking of metabolite changes during treatment at an unprecedented time resolution (i.e. seconds). To leverage the potentials of metabolomics technologies developed in the lab, we develop mathematical models (e.g. Structural Kinetic Modeling) that by integrating drug-induced dynamic metabolic effects and large-scale metabolic networks are able to predict drug mode of action.

Our Vision for the Future

Fast high-resolution mass spectrometric approaches allowing mass-accurate and rapid analyses of small molecules within the cell's metabolome are now paving the way towards true high-throughput metabolomics. These advancements open new opportunities in systems biology, diagnostics and drug discovery. However, in spite of significant advancements to rapidly generate high-resolution spectral profiles, efficient experimental sampling workflows for acquiring large-scale metabolome of complex clinical samples and computational methods capable of extracting functional information from such comprehensive studies are lagging behind. The bottleneck has shifted from analytical data acquisition to requirement for innovative experimental design and novel solutions for integrating multiple molecular profiling and phenomics data. Our envisioned future entails enhancing the design of novel quantitative workflows for large-scale metabolome profiling of complex in vitro and in vivo systems, like organoids, clinical pathogenic strains or patient-derived samples. This expansion promises groundbreaking insights into a better understanding of fundamental biochemical processes underlying mechanisms of disease. Furthermore, we aim to develop a versatile computational and experimental framework applicable across various biological systems and conditions. The integration of experimental and computational tools enables us to shed mechanistic

Research Group at a Glance
Systems Pharmacology and Biology of Metabolism (Zampieri Lab)

insights into the complexities of metabolic adaptation to genetic, chemical or environmental perturbations and to generate hypotheses from complex in vivo systems that can be experimentally tested in vitro. The DBM is the perfect place to translate our fundamental research into clinical research programs and ultimately into new health care solutions. We look forward to strengthening our collaborations with clinical partners within the department, as we strive to unite expertise across disciplines. These collaborations will accelerate scientific progress and unlock the full potential of metabolomics in reshaping the landscape of biomedical research.

Team Spirit – Introduction of us

Our research revolves around three core scientific pillars: metabolomics, regulation and computational analysis. Our interdisciplinary research requires a broad set of different skills. Thus, our group comprises individuals with diverse academic backgrounds, including biologists, engineers, chemists, and bioinformaticians, working hand in hand. This multidisciplinary environment offers varied perspectives on ongoing projects and fosters innovative solutions and research in a collaborative and stimulating scientific environment. The success of our group is rooted in active exchange and discussion within and outside the group. This extends beyond science to our fixed-time coffee and lunch breaks where everyone is joining and our international team likes to share everything from cuisine to opinions. While our team is very supportive, it encourages independence in pursuing our own projects as well as your scientific and leadership maturation. We strongly believe in the practical implications of our work, and as such, we are always actively seeking collaborations to explore the translational value of our research endeavors. We are always happy to discuss exciting science!

From left to right: Dimitrios, Terezia, Sebastian Beiter, Katerina, Sebastian Bors and Alexandra

We are

Mattia Zampieri	Research Group Leader
Dimitrios Balasopoulos	PhD Candidate
Sebastian Beiter	Student
Sebastian Bors	PhD Candidate
Terezia Dorcakova	PhD Candidate
Tobias Fuhrer	Senior Scientist
Alexandra Evelyne Huber	PhD Candidate
Eleni Panoussis	Research Associate
Michela Pauletti	Postdoc
Laurentz Schuhknecht	Postdoc
Sebastián Sosa Carrillo	Postdoc
Katerina Sulkova	Student
Medea Wyss	Student

From left to right: Tobias, Mattia, Alexandra, Laurentz, Eleni, Sebastian Bors, Michela, Sebastian Beiter, Dimitrios, Sebastian Sosa Carrillo

Core Facility at a Glance
DBM Bioinformatics Core Facility

A Quick Overview of Our Facility:

The Bioinformatics Core Facility serves as a centralised hub of computational biology and statistical expertise at the DBM, helping researchers with the analysis, visualisation, management, and interpretation of large-scale biological data.

How does a typical collaboration take place?

First, every project supported by the facility starts with a discussion with you, during which we design the experiment – before any data is generated! Initially, this may involve some brainstorming sessions, so don't hesitate to join us early on. As things become more concrete, we identify the most suitable technology, optimal replicate structure and draft the experimental plan together to best answer your research questions. We collaborate closely with both internal and joint DBM facilities to be able to provide up-to-date information on available technologies and facilitate data exchange.

On the data generation side, our main partners currently include: i) the Genomics Facility Basel, which provides extensive expertise in high-throughput sequencing
technologies, including RNA-seq (bulk or single-cell), ChIP-seq, ATAC-seq, Whole Genome and Exome sequencing, and Metagenomics; ii) the Proteomics Facility at the Biozentrum, offering quantitative measurements of protein abundance (full proteome) as well
as post-translational modifications (phosphorylation) using mass spectrometry. For computation, we use the high-performance computing cluster (HPC) maintained by the Center for Scientific Computing (sciCORE) at the University of Basel. Our facility maintains close collaboration with other bioinformatics units in the Basel area, such as the Center for Data Analytics at Unibas and the computational biology facility at the FMI. Finally, since January 2017, we have been part of the Swiss Institute of Bioinformatics, enabling regular interactions with the Swiss bioinformatics community.

Once the datasets are generated, we perform initial data analysis, including quality control and preliminary analysis. Over the past years, we have developed standardised pre-processing workflows to provide answers to the question "Did the experiment work?" as quickly as possible.

Based on the follow-up discussions we will have with you, we will continue the analysis over several rounds to explore the data in great depth. Here, we typically need to come up with custom tailored solutions to meet the specific requirements of individual research projects because every project is different!

When you decide that your paper should be written, we assist and support you to push the project to its final stage. We provide contributions to manuscripts and take care of data deposition in public repositories. This process can be time-consuming, as we s metimes realise at this point that some analyses need to be entirely rerun (for example if tools have evolved over the past years, or if published datasets need to be incorporated).

What is special about the DBM bioinformatics facility: support for embedded bioinformaticians

The resources in our facility are limited, and although we would like to assist everyone, we can handle only a few projects at a time. Therefore, over the past years, we have promoted a model involving "embedded bioinformaticians" within individual research groups. Embedded bioinformaticians provide bioinformatics support tailored to the needs of their team. To do so, they should cultivate a unique blend of skills: a good computational expertise but also in-depth biological knowledge of the systems studied in the team (we can assist you in the hiring process to find the best-matching candidates!). Our facility maintains a close connection with the various embedded bioinformaticians from DBM teams. We train them to use our pre-processing workflows, enabling them to benefit from efficient, standardised and reproducible analyses; we provide regular feedback on the analyses they conduct and help them in interpreting the results, In some cases, we even collaborate on the joint development of analytic approaches.

We regularly organise bioinformatics seminars, where we exchange ideas and discuss bioinformatics-related topics in an informal seting. Please let us know if you are interested in joining us! For those looking to enhance their "dry lab" skills, we offer two full semester training courses:

1. Introduction to R: This course focuses on hands-on learning of the fundamental aspects of data exploration, visualisation, and basic statistics: https://ivanek.github.io/introductionToR/

2. Advanced course - Analysis of Genomics Data in R and Bioconductor: This course provides an overview of high-throughput sequencing data processing, differential gene expression analysis, DNA binding analysis, working with sequence and annotation packages, and visualisation of genomic data: https://ivanek.github.io/analysisOfGenomicsDataWithR/

Core Facility at a Glance
DBM Bioinformatics Core Facility

What is "hot" at the moment?

Single-cell RNA-seq is the dominant data type at the moment, increasingly complemented by additional information layers. For instance, the quantification of cell surface proteins (CITEseq) allows us to "sort" single cells into compartments in silico. B-cell or T-cell receptor sequences can be obtained for single cells, allowing us to identify their clonotypes and reconstitute the lineages.

We are now seeing the advent of spatial transcriptomics, faciltating the localisation of expression patterns in cells from tissue sections. Multi-omics is also on the rise, enabling the study of chromatin accessibility in addition to transcriptomics data. These technologies and the tools to analyse them are evolving rapidly and we are here to assist you in your grant application process!

Another hot topic at the University of Basel is related to data management. We actively participate in the data stewardship program of the University of Basel, contributing to the establishment of the Data Access Committee (DAC) for the Medical Faculty. Sequencing data collected on human samples are sensitive and for publication they need to be shared only via repositories with "restricted-access". The DAC is here to help you during the data deposition process, especially from a legal point of view. Once the data is officially released, they manage the approval of requests for data access from external researchers. Reach out to us if you are dealing with sensitive human data.

We are

Robert Ivánek	Head of Bioinformatics Core Facility
Anastasiya Börsch	Bioinformatician
Dominik Burri	Bioinformatician
Athimed El Taher	Bioinformatician
Florian Geier	Bioinformatician
Julien Roux	Bioinformatician

From bottom to top: Julien Roux, Anastasiya Börsch, Robert Ivánek, Florian Geier and Athimed El Taher

Publications

All publications we have received from the period between September and December 2023. The publications are listed by date.

Regulator of G-protein signaling 1 critically supports CD8+TRM cell-mediated intestinal immunity

von Werdt D, Gungor B, Barreto de Albuquerque J, Gruber T, Zysset D, Kwong Chung CKC, Corrêa-Ferreira A, Berchtold R, Page N, Schenk M, Kehrl JH, Merkler D, Imhof BA, Stein JV, Abe J, Turchinovich G, Finke D, Hayday AC, Corazza N, Mueller C

Front Immunol. 2023 Apr 20:14:1085895.
doi: 10.3389/fimmu.2023.1085895. eCollection 2023.

Urine CXCL10 to Assess BK Polyomavirus Replication After Kidney Transplantation

Haller J, Diebold M, Leuzinger K, Wehmeier C, Handschin J, Amico P, Hirt-Minkowski P, Steiger J, Dickenmann M, Hirsch HH, Schaub S

Transplantation. 2023 Dec 1;107(12):2568-2574.
doi: 10.1097/TP.0000000000004712. Epub 2023 Jul 6.

Characterization of engraftment dynamics in myelofibrosis after allogeneic hematopoietic cell transplantation including novel conditioning schemes

Jungius S, Adam FC, Grosheintz K, Medinger M, Buser A, Passweg JR, Halter JP, Meyer SC

Front Oncol. 2023 Aug 10:13:1205387.
doi: 10.3389/fonc.2023.1205387. eCollection 2023.

Exogenous humanin and MOTS-c function as protective agents against gentamicin-induced hair cell damage

Waldmann D, Lu Y, Cortada M, Bodmer D, Huaman SL

Biochem Biophys Res Commun. 2023 Oct 20:678:115-121.
doi: 10.1016/j.bbrc.2023.08.033. Epub 2023 Aug 17.

mTORC2 regulates auditory hair cell structure and function

Cortada M, Levano S, Hall MN 2, Bodmer D

iScience. 2023 Aug 19;26(9):107687.
doi: 10.1016/j.isci.2023.107687. eCollection 2023 Sep 15.

Human blood-labyrinth barrier on a chip: a unique in vitro tool for investigation of BLB properties

Sekulic M, Abdollahi N, Graf L, Deigendesch N, Puche R, Bodmerab D, Petkovic V

RSC Adv. 2023 Aug 25;13(36):25508-25517.
doi: 10.1039/d3ra04704k. eCollection 2023 Aug 21.

An Animal Model for Chronic Meningeal Inflammation and Inflammatory Demyelination of the Cerebral Cortex

Enz LS, Winkler A, Wrzos C, Dasen B, Nessler S, Stadelmann C, Schaeren-Wiemers N

Int J Mol Sci. 2023 Sep 9;24(18):13893. doi: 10.3390/ijms241813893.

Neurofunctional underpinnings of individual differences in visual episodic memory performance

Geissmann L, Coynel D, Papassotiropoulos A, de Quervain DJF

Nat Commun. 2023 Sep 14;14(1):5694.
doi: 10.1038/s41467-023-41380-w.

A method for polyclonal antigen-specific T cell-targeted genome editing (TarGET) for adoptive cell transfer applications

Palianina D, Di Roberto RB, Castellanos-Rueda R, Schlatter F, Reddy ST, Khanna N

Mol Ther Methods Clin Dev. 2023 Jun 19:30:147-160.
doi: 10.1016/j.omtm.2023.06.007. eCollection 2023 Sep 14.

Human blood-labyrinth barrier model to study the effects of cytokines and inflammation

Sekulic M, Puche R, Bodmer D, Petkovic V

Front Mol Neurosci. 2023 Sep 21:16:1243370.
doi: 10.3389/fnmol.2023.1243370. eCollection 2023.

Publications

Epitope-engineered human hematopoietic stem cells are shielded from CD123-targeted immunotherapy

Marone R, Landmann E, Devaux A, Lepore R, Seyres D, Zuin J, Burgold T, Engdahl C, Capoferri G, Dell'Aglio A, Larrue C, Simonetta F, Rositzka J, Rhiel M, Andrieux G, Gallagher DN, Schröder MS, Wiederkehr A, Sinopoli A, Sacramento VD, Haydn A, Garcia-Prat L, Divsalar C, Camus A, Xu L, Bordoli L, Schwede T, Porteus M, Tamburini J, Corn JE, Cathomen T, Cornu TI, Urlinger S, Jeker LT

J Exp Med. 2023 Dec 4;220(12):e20231235.
doi: 10.1084/jem.20231235. Epub 2023 Sep 29.

CSF1R inhibition with PLX5622 affects multiple immune cell compartments and induces tissue-specific metabolic effects in lean mice

Bosch AJT, Keller L, Steiger L, Rohm TV, Wiedemann SJ, Low AJY, Stawiski M, Rachid L, Roux J, Konrad D, Wueest S, Tugues S, Greter M, Böni-Schnetzler M, Meier DT & Cavelti-Weder C

Diabetologia. 2023 Dec;66(12):2292-2306.
doi: 10.1007/s00125-023-06007-1. Epub 2023 Oct 4.

Amplicon size and non-encapsidated DNA fragments define plasma cytomegalovirus DNA loads by automated nucleic acid testing platforms: A marker of viral cytopathology?

Leuzinger K, Hirsch HH

J Med Virol. 2023 Oct;95(10):e29139. doi: 10.1002/jmv.29139.

Patient-derived organoids identify tailored therapeutic options and determinants of plasticity in sarcomatoid urothelial bladder cancer

Garioni M, Tschan VJ, Blukacz L, Nuciforo S, Parmentier R, Roma L, Coto-Llerena M, Pueschel H, Piscuoglio S, Vlajnic T, Stenner F, Seifert HH, Rentsch CA, Bubendorf L, Le Magnen C.

NPJ Precis Oncol. 2023 Nov 2;7(1):112.
doi: 10.1038/s41698-023-00466-w.

Functional characterization of RYR1 variants identified in malignant hyperthermia susceptible individuals

Nodaa Y, Miyoshib H, Benuccia S, Gonzalezc A, Bandschappc O, Girardc T, Trevesa S, Zorzato F

Neuromuscul Disord. 2023 Dec;33(12):951-963.
doi: 10.1016/j.nmd.2023.10.019. Epub 2023 Nov 3.

Harnessing human adipose-derived stromal cell chondrogenesis in vitro for enhanced endochondral ossification

Chaaban M, Moya A, García-García A, Paillaud R, Schaller R, Klein T, Power L, Buczak K, Schmidt A, Kappos E, Ismail T, Schaefer DJ, Martin I, Scherberich A.

Biomaterials. 2023 Dec;303:122387. doi: 10.1016/j.biomaterials.2023.122387. Epub 2023 Nov 6. PMID: 37977007.

The Flt3-inhibitor quizartinib augments apoptosis and promotes maladaptive remodeling after myocardial infarction in mice

Belik DM, Bernasconi R, Xu L, Verde GD, Lorenz V, Grüterich V, Balzarolo M, Mochizuki M, Pfister O, Kuster GM

Apoptosis (2023). doi.org/10.1007/s10495-023-01911-8

Effects of calibrated blue–yellow changes in light on the human circadian clock

Blume Ch, Cajochen Ch, Schöllhorn I, Slawik H C, Spitschan M

Nat Hum Behav. 2023 Dec 22.
doi: 10.1038/s41562-023-01791-7. Online ahead of print.

Sequential maturation of stimulus-specific adaptation in the mouse lemniscal auditory system

Valerio P, Rechenmann J, Joshi S, De Franceschi G, Barkat Rinaldi T

Sci Adv. 2024 Jan 5;10(1):eadi7624.
doi: 10.1126/sciadv.adi7624. Epub 2024 Jan 3.

Publications

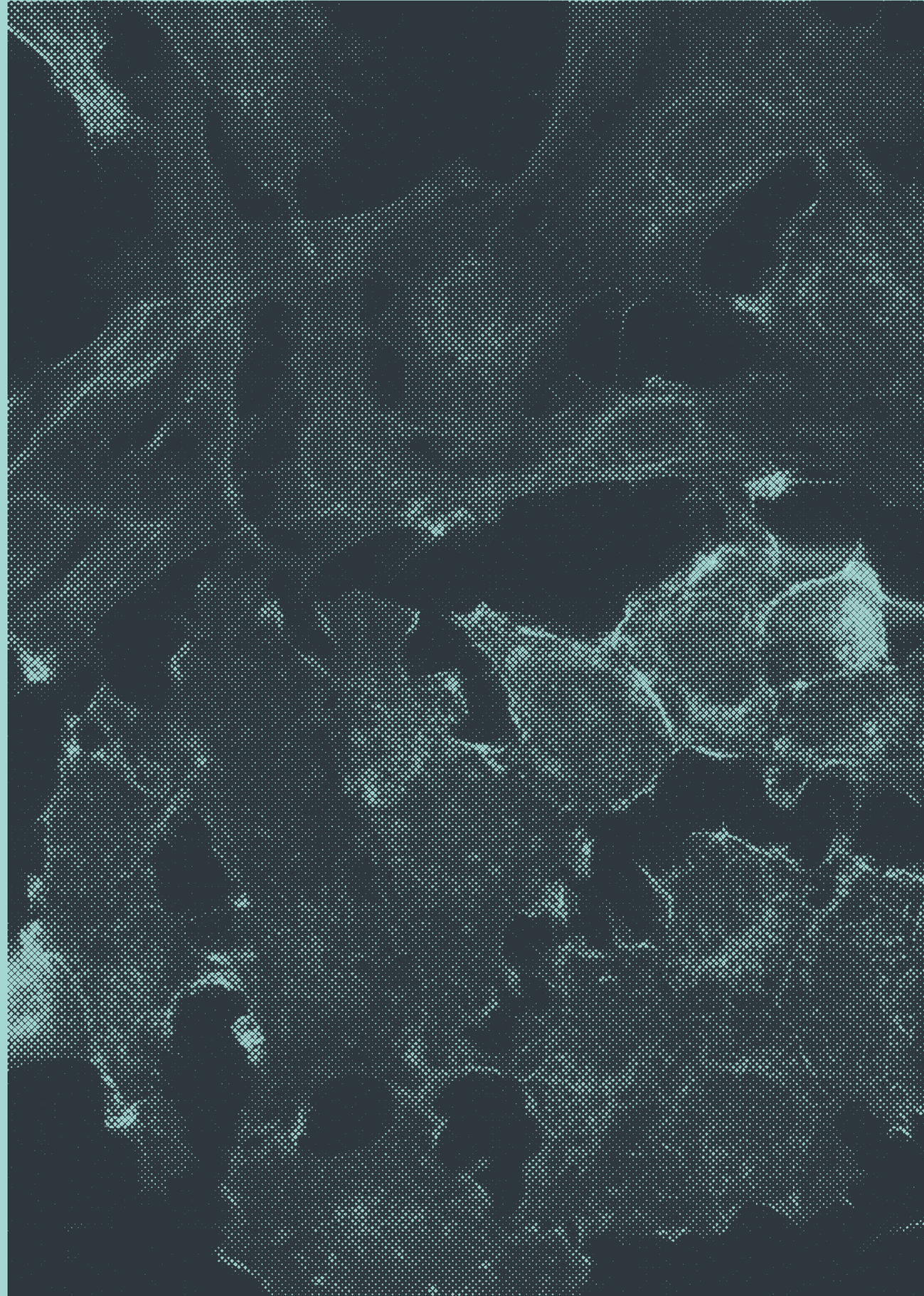
Development of resistance to type II JAK2 inhibitors in MPN depends on AXL kinase and is targetable

Codilupi T, Szibinki J, Arunasalam S, Jungius S, Dunbar AC, Stivala S, Brkic S, Albrecht C, Vokalova L, Yang JL, Buczak K, Ghosh N, Passweg JR, Rovo A, Angelillo-Scherrer A, Pankov D, Dirnhofer S, Levine RL, Koche R, Meyer SC

Clin Cancer Res. 2024 Feb 1;30(3):586-599.
doi: 10.1158/1078-0432.CCR-23-0163.

DBM
Basel
Department of
Biomedicine

Congratulations
Events



The DBM Congratulates

Awards since September 2023

We extend our heartfelt congratulations to the following DBM members for their remarkable awards and achievements since September 2023.

Darya Palianina for the best basic research paper, Swiss Society of Infectious Diseases (SSI).

Sara Dylgjeri on winning the Research Advancement Prize, Swiss Society of Gastroenterology.

Romuald Parmentier on winning the poster award in the Basic Science session at the Swiss Society of Urology (SGU) annual meeting.

Martin Heidinger for receiving a Hologic Award from the Swiss Society for Senology.

Cansu Sahinbay for earning a certificate in Intercultural Competence and **Ramona Felix** to the successful completion of the HR Administrator.

Congratulations to **Zora Baumann** for receiving the Patient Advocate Award, **Madhuri Manivannan** for receiving the Nancy Hynes Award and **Maria Rafaeva** for receiving the Gerhard Christofori Award at the BBC annual meeting in November 2023.

Jan Niess for receiving the Falk Innovation Award in November 2023.

Furthermore, for receiving a project grant, SNSF. “Investigating the impact of GPR35-mediated cytokine release by macrophages and dendritic cells on epithelial integrity in eosinophilic esophagitis.“

Christoph Schultheiss for best abstract in experimental hematology and oncology at this year‘s Swiss Oncology and Hematology Congress (SOHC) in Basel.

Christoph Hess on winning the 2023 Cloëtta Prize.

Sara Meyer on receiving an Ellermann Award in Hematology, awarded by the Swiss Society of Hematology.

Aimée Zuniga on her appointment as Titular Professor of Experimental Medicine and **Christoph T. Berger** on his appointment as Titular Professor of Internal Medicine.

Tobias Derfuss for accumulating an ERA-E-RARE grant from the SNSF in the frame of an EU project. ”Characterization and optimisation of myasthenia gravis care”.

Furthermore, a Sinergia grant from the SNSF “The Role of B Cells and EBV Infection in Multiple Sclerosis” together with Burkhard Becher and Chrstian Münz from the Institute of Experimental Immunology in Zürich.

The DBM Congratulates

PHD Defenses since September 2023

21.09.2023	Medical-Biological Research	**Ronja Wieboldt** Interaction of sialylated glycans with Siglec receptors on suppressive myeloid cells
22.09.2023	Microbiology	**Yuepeng Zhang** Location, dynamics and expression of functional proteins in the HIV viral reservoir
26.09.2023	Cell Biology	**Raphaëlle Servant** Patient-derived organoids to investigate drug response and treatment resistance mechanisms in prostate cancer
25.10.2023	Neurobiology	**Chloé Benoit** Deep brain imaging of cellular mechanisms of sensory processing and learning
06.11.2023	Medical-Biological Research	**Philippe G. Dehio** Mechanistic interrogation of amoeboid T cell migration reveals a novel role for the VPS34-PIKfyve pathway in the regulation of cell speed
20.11.2023	Molecular Biology	**Sabrina Blumer** Deciphering the role of fibrosis-specific alveolar basal cells in Idiopathic pulmonary fibrosis
24.11.2023	Medical-Biological Research	**Elena Bonaiti** A human in vitro vaccination model (‘organ-on-a-chip’) to study influenza vaccines
27.11.2023	Neurobiology	**Hiap Chon How** A Personalised Medicine Approach for the Study of Dopaminergic Neuron Degeneration in Parkinson’s Disease
20.12.2023	Neurobiology	**Ekaterina Verdiyan** Environmental enrichment promotes sparse coding in hippocampus via increased dendritic inhibition

Research Day 2024

The DBM Research Day 2024 took place on January 18th and marked another important chapter in the history of DBM Basel. The selected DBM Research Groups: Daniel Pinschewer, Clémentine Le Magnen, Arnaud Scherberich, Mike Recher, Aimée Zuniga, Carolin King, Tobias Derfuss, Jens Kuhle, Christoph T. Berger, and Alfred Zippelius presented an update on their research and outlined their future plans. The event was characterized by engaging presentations and lively scientific discussions.











Grättimaa
Deko Lab Challenge

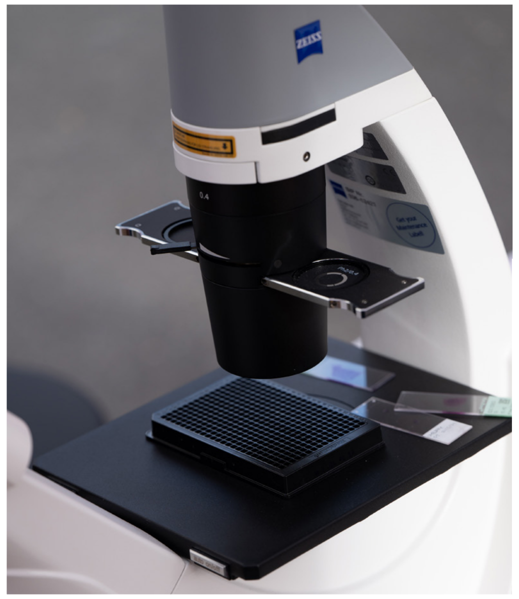
To celebrate St. Nicholas Day and the pre-Christmas season, some great DBM members dressed up and handed out Grättimänner at all DBM locations on December 6. What a wonderful pre-Christmas surprise!

The „DBM Green Lab Team“ came up with a special idea for the Christmas season: for the first time, a reusable Christmas tree was set up, and instead of hanging individually wrapped „Schöggeli“ on the tree, the labs were asked to create their own tree decorations using plastic packaging. The most creative and the winner of this challenge was Lab 318 (Experimental Neuroimmunology). Congratulations to all!

DBM Basel

Walk of Hope

The Walk of Hope, held on October 28, was an awareness and fundraising event where clinicians, breast care nurses, researchers and patient advocates provided a first-hand look at breast cancer research and treatment, as well as early detection through regular self-exams and screenings. Mohamed Bentires-Alj's Lab partnered with the breast cancer awareness initiative DearMamma, the Swiss Cancer League and the Basel Cancer League to set up interactive booths at central locations in Basel.



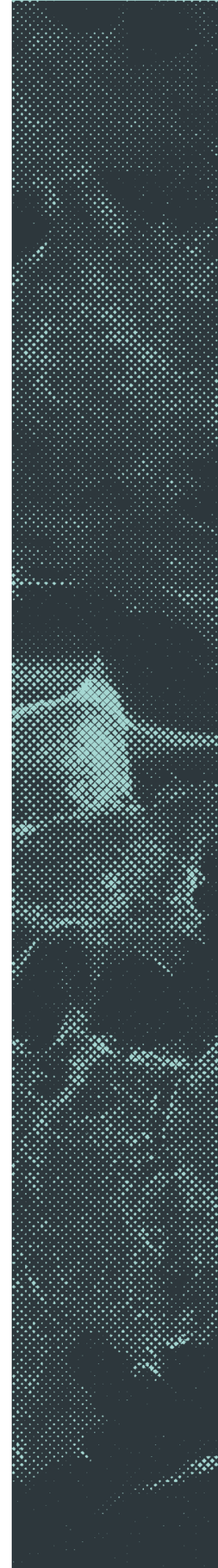
Upcoming Events

Career panel discussion - International Day of Women and Girls in Science 09.02.2024

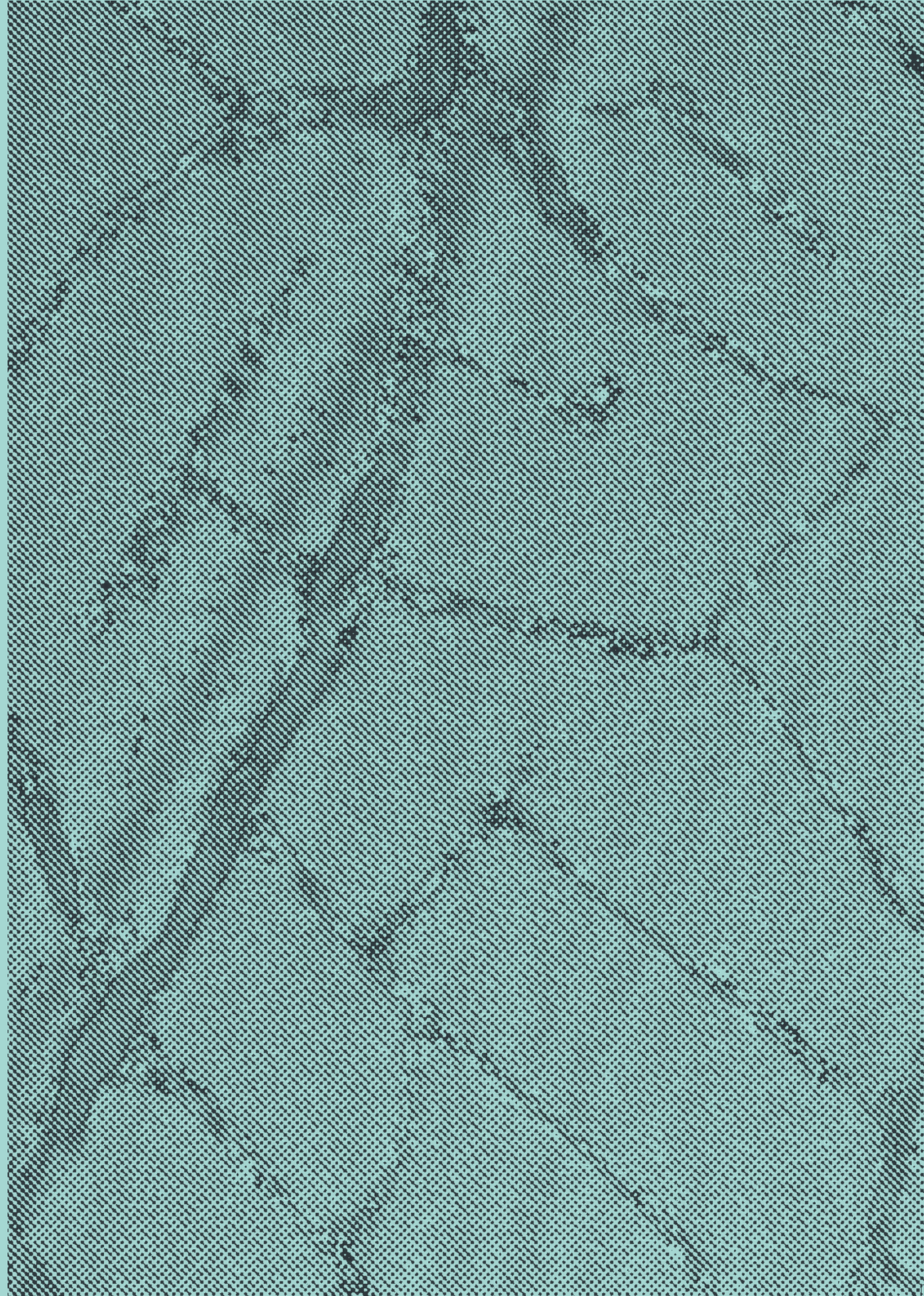
Explore the Lab 24.04.2024

DBM Plenary Assembly 25.04.2024

DBM Summer Symposium 22.08.2024



DBM
Basel
Department of
Biomedicine



New Colleagues

New Colleagues From September to December

We are delighted to have you among us. We would like to express our warmest welcome and good wishes!

Ahmadiangollajeh Mehri	Ocular Pharmacology and Physiology
Alikhanbeigi Anna	Developmental Neurobiology and Regeneration
Anezo Loic	Brain and Sound
Bentz Dorothee	Cognitive Neuroscience
Bezencon Olivier	Hepatology
Blum Yannick	Tumor Heterogeneity Metastasis and Resistance
Boog Olivier	Translational Neuroimmunology
Borer Géraldine	Cartilage Engineering
Borlandelli Valentina	Cancer- and Immunobiology
Born Natalie	Human Genomics
Broeglin Aline	Molecular Neuroscience
Burri Dominik	Core Facility Bioinformatics
Butaye Anais	Brain Ischemia and Regeneration
Cano-Muniz Santiago	Pulmonary infection biology
Chang Hong	Clinical Neuroimmunology
Chatelain Nina	Inner Ear Research
Cuan Chesa Djanelle	Zentrale Dienste Hebelstrasse
Denessen Ellen	Cardiac Surgery and Engineering
Dorcakova Terezia	Systems Pharmacology
Du Marc	Tissue Engineering
Eglin Hugo	Developmental Genetics
Eller Ruth Stefanie	Ovarian Cancer Research
Filain Cloelle	Cancer Immunology
Fleisch Silvan	Brain Tumor Immunotherapy and Biology
Forde Aaron James	Infection Immunology
Gardette Lena	Immunobiology
Ghasemi Neda	Cognitive Neuroscience
Giannaki Marina	Neurobiology
Goerg Alina-Maria	Ovarian Cancer Research
Gremelspacher Tatjana	Blood Cancer Biology and Immunotherapy
Guagnini Benedetta	Tissue Engineering
Guillet Carole	Allergy and Immunity
Gülan Alp Can	Cardiac Surgery and Engineering
Gysin Vera	Experimental Neuroimmunology
Halm Sebastian	Musculoskeletal Research
Hänggi Nico	Embryology and Stem Cell Biology
Haring Eileen	Blood Cancer Biology and Immunotherapy
Hodel Andreas	Childhood Leukemia
Immer-Dammann Sandra	Zentrale Dienste Mattenstrasse
Iseli Galya Clara	Cognitive Neuroscience
Jin Wen	Neuromuscular Research
Juric Doria	Tissue Engineering
Kerschbamer Emanuela	Infection Immunology
Kohler Natalie Joelle	Zentrale Dienste Hebelstrasse
Korah Alina	Inner Ear Research
Kriwanek Sophia	Hepatology
Küçüktaş Fulya Mina	Childhood Leukemia
Kudrnovsky Jan	Zentrale Dienste Pestalozzistrasse
Lattion Aurélie	Cognitive Neuroscience
Ljubijankic Almin	Infection Immunology
Lopes Rafael	Cancer Immunotherapy
Maes Elisa	Embryology and Stem Cell Biology
Mampel Falco Irene	Cognitive Neuroscience
Meier Marek	Skin Biology
Meyer Francois-Xavier	Cancer- and Immunobiology
Migga Alexandra	Brain Ischemia and Regeneration
Mock Andrea	Tumor Heterogeneity Metastasis and Resistance
Mu Xiya	Cardiac Surgery and Engineering
Mulliri Kleni	Cancer- and Immunobiology
Munoz-Blazquez Aida	Experimental Neuroimmunology
Mürle Josias	Liver Immunology
Neubert Pia	Diabetes Research
Orhan Bahar	Cancer Immunology
Oseledchyk Anton	Cancer Immunology
Paillaud Robert	Bone Regeneration
Pezzoli Margherita	Immunobiology
Pillai Ira	Cancer Immunology
Pinchetti Enea	Childhood Leukemia
Pinto da Mota Guerra	Zentrale Dienste Petersplatz
Poletti Fabio	Tissue Engineering
Pouzet Florian	Cartilage Engineering
Rahal Nader	Molecular Neuroscience
Rivera Petit Travis	Cancer Immunology
Rodic Andrijana	Brain Tumor Immunotherapy and Biology
Sabatino Valerio	Clinical Neuroimmunology
Sakiri Elif	Cellular Neurophysiology

New Colleagues from September to December

We are delighted to have you among us. We would like to express our warmest welcome and good wishes!

Salem Anna	Clinical Immunology
Schaefer Jasmin	Cancer Immunology
Schaeuble Karin	GMP Core Facility
Schatowitz Hendrik	Cancer- and Immunobiology
Schönbächler Emanuel	Diabetes Research
Sifoniou Kleopatra	Regenerative Angiogenesis
Singh Neha	Cartilage Engineering
Sovdagarova Ksenia	Translational Immuno-Oncology
Stücheli Simon	Systems Pharmacology
Sulkova Katerina	Experimental Neuroimmunology
Swinnen Stijn	Developmental Neurobiology and Regeneration
Thiele Benjamin	Translational Immuno-Oncology
Valenta Jan	Psychopharmacology Research
Vescovi Alessandra	Regenerative Angiogenesis
Voicu Victor	Cancer- and Immunobiology
Wang Menghan	Childhood Leukemia
Wyssen Shayenne	Cartilage Engineering
Zürcher Lisa	Hepatology

Thank you!

The DBM newsletter team would like to thank all the contributors for their work. We hope you enjoyed reading the newsletter.

Please feel free to submit your ideas and input for our next issue.

communications-dbm@unibas.ch

Find us on Social Media:

Linkedin:
Department of Biomedicine

X:
@DepBiomedicine

Mastodon:
@Department_Biomedicine@mstdn.science

Instagram:
@phd_dbm

Publishing Information Imprint

Publisher:
Department of Biomedicine
University of Basel
Hebelstrasse 20
4031 Basel
Switzerland

Concept: Xiomara Banholzer

Editorial:
Martina Konantz, Xiomara Banholzer

Layout: Chesa Cuan, Natalie Kohler
Photography: Chesa Cuan, Natalie Kohler, Mathias Mangold
Design: Chesa Cuan, Natalie Kohler

Contact:
Department of Biomedicine
Hebelstrasse 20
4031 Basel
Switzerland

Email: communications-dbm@unibas.ch

University of Basel

Department of Biomedicine

DBM Basel

Newsletter
February 2024