RTG 2408
SUMMER SCHOOL

22 – 25 AUGUST 2023

MAGDEBURG

PREFACE

WHAT DO I NEED TO KNOW?

We're happy to meet for our 1st RTG 2408 summer school. Over four days our program consists of practical courses, diversity workshops, guest lectures, a whole day with a translational focus as well as a good scientific practice/research data management session.

Some helpful information:

- for the invoice of the event it's necessary to sign the attendance list every day
- we will take photos during the event that might be used for public relations activities of the RTG 2408
- there will be a group photo on day 3
- most events will take place in H22, exceptions: practical method sessions and evening events
- during the meet the speaker events you will have the opportunity to get to know the guest speakers of the day
- we won't provide this booklet as a printed version

We're looking forward having a great time together in Magdeburg.

Organizing committee

Dimitrios Mougiakakos | Dunja Bruder | Lorena Ferino | Michael Naumann | Sandra Dittrich

22 AUG

Day 1

9:00	**Welcome** Michael Naumann	H22-3
9:15	**Spectral flow cytometry** Andreas Jeron	H22-3
10:00	**Isolation of cholangiocytes and biliary organoids** Maria Reich	H22-3
10:45	**MELC (Multi-Epitope-Ligand-Cartography)** Lars Philipsen	H22-3
11:30	**Lunch break**	H22-2
12:30	**Practical method sessions** Optional course A, B or C	various
18:30	**Diversity in Magdeburg (World Café)**	Klostercafé

23 AUG

Day 2

9:30	**Unconscious Bias (workshop part I)** Iris Wangermann	H22-1
12:00	**Lunch break**	H22-2
13:00	**Unconscious Bias (workshop part II)** Iris Wangermann	H22-1
15:30	**Shaping virulence for acute and persistent infections** Petra Dersch (University of Münster)	H22-3
16:30	**Molecular checkpoints controlling onset and resolution of inflammation** Gerhard Krönke (Charité Berlin)	H22-3
18:30	**Social evening**	Basta

Day 3

10:30	**CAR T cell therapy in the clinical practice** Dimitrios Mougiakakos	H22-3
11:30	**How do I diagnose a leukemia?** Enrico Schalk	H22-3
12:00	**Lunch break**	H22-2
13:00	**Guided tour Clinic of Hematology** Dimitrios Mougiakakos	H39
14:00	**Effector functions of tumor-associated macrophages (TAMs)** Heiko Bruns (University Hospital Erlangen)	H22-3
15:00	**Key assays for immune based therapies** Martin Böttcher, Romy Böttcher-Loschinski, Naz Sürücü	H39
18:00	**Social evening**	Viehbörse

24 AUG

Day 4

9:00	**Good scientific practice & research data management** Barbara Witter	H22-3
11:30	**End**	

25 AUG

PRACTICAL COURSES

- on day 1 we will offer 3 different practical courses
- morning lectures will provide theoretical knowledge
- after lunch break demonstrations and practical sessions will take place in small groups
- each small group is restricted to max. 6 persons
- please give priority order for all courses during registration
- you will receive further instructions and/or material via email a few days before the courses start

Course	Topic	Place
A	Spectral flow cytometry	H44-312* H44-318/343/344
B	Isolation of cholangiocytes and biliary organoids	H65-323 H65-324
C	MELC (Multi-Epitope-Ligand-Cartography)	H26-244/209 H65

*meeting point

COURSE A
SPECTRAL FLOW CYTOMETRY

Day 1 | 22 Aug 2023

Introduction into spectral flow cytometry

Flow cytometry is an indispensable analytical tool for cell biology and immunology to capture cellular responses and the complexity of immunological processes on a protein level and single cell basis. The increased commercial availability of a variety of fluorochrome-labeled antibodies for specific detection of proteins in the context of flow cytometric measurements has enormously increased the experimental possibilities in recent years. However, new technical developments such as "spectral flow cytometry" have also significantly contributed to this. Contrary to conventional flow cytometers, spectral flow cytometers do not record only one or a few narrow spectral detection ranges for each fluorochrome, but instead always record the entire spectral bandwidth for each fluorochrome in reference to the respective laser excitation wavelength. This allows a more efficient and flexible fluorochrome selection in the panel design process, a better fluorochrome detection as well as the possibility to extract cellular autofluorescence from flow cytometric data. However, spectral-based parallel flow cytometric detection of a variety of cellular protein markers using fluorochrome-labeled antibodies also introduces new problems and challenges in experimental design and data analysis. This course provides a practical introduction to the spectral detection technique in flow cytometry and gives insights into the advantages but also the new challenges of this measurement technique.

Trainer: Andreas Jeron (IMMB, UMMD)

COURSE B

ISOLATION OF CHOLANGIOCYTES AND BILIARY ORGANOIDS

Day 1 | 22 Aug 2023

Isolation of bile duct units from mouse liver and the subsequent outgrowth of cholangiocytes and the formation of cholangiocyte organoid structures

Cholangiocytes are a heterogeneous population of epithelial cells that line a three-dimensional network of bile ducts known as the biliary tree. Their major physiologic function lies in the modification of the canalicular (i.e., primary) bile, which is produced by hepatocytes. Bile modification occurs through coordinated transport of various ions, solutes and water across the cholangiocyte apical and basolateral plasma membranes [1]. A first protocol for the isolation of bile duct units from rat liver was established by Roberts et al. in 1993 [2]. Modification of this method is used for isolation of mouse cholangiocytes [3-5]. Cholangiocyte organoids have emerged as a powerful tool for modeling biliary disease and investigating cholangiocyte biology [6]. Organoids are 3D structures that self-organize from isolated cells, and they can recapitulate the complexity and heterogeneity of the native tissue in vitro. The protocol demonstrated during the workshop uses the microdissection of lobular and interlobular bile ducts, which are subsequently embedded into rat tail collagen, resulting in the outgrowth of a monolayer of biliary epithelial cells, which then can be passaged several times [5] or used for the formation of cholangiocyte organoid structures [7]. Cholangiocyte organoids can be generated from primary cholangiocytes or immortalized cholangiocyte cell lines and can be used to study cholangiocyte differentiation, proliferation, migration, and signaling. They can also be used to model specific biliary diseases, such as cholangiocarcinoma, primary sclerosing cholangitis, and cystic fibrosis-associated liver disease, and to test potential therapeutics. Therefore, the isolation of bile duct units and the formation of cholangiocyte organoids from mouse liver have the potential to significantly advance our understanding of cholangiocyte biology and biliary disease.

Trainer: Maria Reich (KGHI, UMMD)

COURSE C

MELC (MULTI-EPITOPE-LIGAND-CARTOGRAPHY)

Day 1 | 22 Aug 2023

MELC (Multi-Epitope-Ligand-Cartography) a multiplex imaging technique that works with most of the directly labeled antibodies on the market: How to design, run and analyze experiments

MELC is an automated sequential multiplex microscopy technique which uses directly labelled antibodies to detect specific epitopes on fixated cells or tissue samples. The automated process requires a microscope (usually an inverted wide-field fluorescence microscope) and a detection system (scientific CMOS camera), which both are coupled to a pipetting system with a cooled antibody storage. The process starts with the incubation of the first antibodies. After a washing step the fluorescent signals were detected. The following bleaching step is erasing the fluorescent signal of the dyes. With this 'empty' sample the next cycle of incubation, washing, detection and bleaching starts with new antibodies. This cyclic process will proceed for all antibodies of interest. The detection process results in a series of images containing the epitope expressions for all used markers (antibodies) [1,2].
During the workshop we will setup a MELC experiment with about 30 markers, prepare a shock frozen tissue sample and start the MELC robots. The starting process defines the fields of interest of the tissue sample, which we will select according to the fluorescence signal of a pre-staining which is part of the sample preparation protocol. Because the measuring process took about 2 days, we will inspect and analyze images series of already finished experiments of a project in which the analysis of the spatial distribution of T cells and virus infected hepatocytes shows different interaction pattern after different immunization strategies [3]. The combination of expression analysis of multiple markers and its spatial distribution shows the strength of multiplex bio-imaging technique.

Trainer: Lars Philipsen (MPBIC unit, UMMD)

DIVERSITY

DIVERSITY IN MAGDEBURG

WORLD CAFÉ

Day 1 | 22 Aug 2023

On the first evening we will meet in the Klostercafé of the Kloster Unser Lieben Frauen ("Monastry of Our Lady"), Magdeburg's oldest surviving building. In historical atmosphere we will have the chance to discuss a highly topical subject: diversity. Within a World Café you will have the chance to exchange views and swap ideas on different dimensions of diversity and how you perceive them in Magdeburg. We're looking forward to inspiring conversations and new insights.

World café is a method/technique to create a welcoming environment to share perspectives and connect people and ideas on a common topic. Different aspects of one idea/key question are discussed in small groups. During different discussion rounds everyone gets a chance to speak. On each table one participant serves as a host and remains at their table until the end while the others change tables each round. All participants write down their ideas, thoughts etc. directly on the table. At the end all hosts are invited to share and discuss a few insights with the whole group.

GOOD TO KNOW

BEGIN 18:30

FOOD & DRINKS
various finger food
soft drinks | beer | wine

VENUE
Klostercafé, Kloster
Unser Lieben Frauen
Regierungsstr. 4-6
39104 Magdeburg

WEBSITE

DIVERSITY

UNCONSCIOUS BIAS
WORKSHOP

Day 2 | 23 Aug 2023

Unconscious Bias: or how our brain tricks us

We live in an increasingly complex world. Every day, we are bombarded with countless pieces of information. To remain agile, our brain tries to filter out and interpret the most important information. We unconsciously use categories, stereotypes and memories to “make the world manageable”. These thinking habits are extremely efficient. Nevertheless, they lead to unconscious biases that can have numerous negative consequences.
The impact of these Unconscious Biases, when working with other people: we under- or overestimate the competence of students, co-workers and teammates. We prefer people who are similar to us. Talents are overlooked, people who are not necessarily best suited for the position are promoted. Bias Consciousness, will strengthen your decision-making and leadership skills.

In this interactive workshop, you will …

- Learn, how Unconscious Bias arises: neuroscientific and psychological background.
- Understand how biases influence our decisions.
- Why we all have prejudices and how our brain tricks us: reflection of blind-spots without shaming.
- Have fun and meet peers.

SAVE THE DATE

28 NOV 2023
follow-up workshop online
via Zoom

TRAINER

IRIS WANGERMANN
Trainer, consultant and
speaker for intercultural
& diversity competence

WEBSITE

GUEST LECTURE

PETRA DERSCH
(UNIVERSITY OF MÜNSTER)

Day 2 | 23 Aug 2023

Shaping virulence for acute and persistent infections

Yersinia pseudotuberculosis evolved numerous strategies to survive in mammalian hosts. A hallmark is the ability to rapidly adjust the lifestyle upon host entry to prevent attacks by the host immune systems. One important strategy is that *Y. pseudotuberculosis* uses a type III secretion system to apply toxic effector proteins into professional phagocytes to prevent phagocytosis. Some isolates also produce the cytotoxic necrotizing factor (CNFY), which enhances Yop translocation, contributes significantly to the induction of acute inflammatory responses, and results in extensive tissue destruction. The presence of these virulence factors is tightly controlled, and the control network and the implication of the individual contributing factors in the control of the type III secretion system including the Yop effectors (Ysc-T3SS/Yops) and the CNFY toxin will be presented. Moreover, CNFY mediated immune-cell manipulation will be illustrated to demonstrate how one virulence factor is sufficient to control switch from an acute into a persistent infection. In summary, our findings highlight a novel level of complexity in which the concerted action of transcriptional regulators and non-coding RNAs adjusts the control of *Yersinia* fitness and virulence to the requirements of their virulent lifestyle.

- 1998 – 2002: group leader, Free University Berlin
- 2003 – 2005: junior research group leader, Robert Koch-Institute, Berlin
- 2005 – 2008: associate professor for Microbiology, TU Braunschweig
- 2008 – 2019: professor of Molecular Infection Biology, TU Braunschweig
- 2008 – 2019: head of department 'Molecular Infection Biology', HZI, Braunschweig
- since 2019: director, Institute for Infectiology, University of Münster

GUEST LECTURE

GERHARD KRÖNKE
(CHARITÉ BERLIN)

Day 2 | 23 Aug 2023

Molecular checkpoints controlling onset and resolution of inflammation

Immune-mediated inflammatory diseases (IMIDs) are prevalent disorders that represent a major burden for patients and society. The reasons for a failure in immune tolerance and/or onset of inflammation in affected individuals remain incompletely understood and we still lack curative therapeutic options for most IMID patients. During the last years, we have sought to unravel molecular pathways underlying the molecular pathogenesis of IMIDs such as rheumatoid arthritis (RA) and systemic lupus erythematosus (SLE) and aimed to understand mechanisms that promote onset and/or impair resolution of inflammation in affected patients. Obtained insights might not only help to understand basic molecular aspects of innate and adaptive immunity during health and disease, but will additionally aid the development of novel diagnostic and therapeutic approaches in the near future.

- studied medicine in Vienna and was a Postdoc at University of Virginia, Charlottesville
- 2006 – 2012: clinical training (internal medicine and rheumatology) at University of Erlangen
- 2016 – 2023: professor, Translational Immunology, University of Erlangen
- since 2023: director, Department of Rheumatology and Clinical Immunology, Charité Berlin
- research focus: molecular mechanisms regulating the onset and resolution of inflammation, autoimmunity and immune tolerance

SOCIAL EVENING

MEET THE SPEAKER &
INFORMAL DISCUSSION

BEGIN 18:30

VENUE
Basta. Halberstädter Str. 51-53, 39112 Magdeburg

FOOD & DRINKS
antipasti | pizza
soft drinks | beer | wine

WEBSITE

TRANSLATIONAL DAY

CANCER IMMUNE THERAPY

Day 3 | 24 Aug 2023

Cancer immunotherapy is a groundbreaking approach in the field of oncology that harnesses the power of the body's immune system to fight against cancer. Unlike traditional cancer treatments like chemotherapy and radiation therapy, which directly target and destroy cancer cells, immunotherapy aims to enhance and activate the body's natural defense mechanisms to recognize and eliminate cancerous cells.

The immune system is a complex network of cells, tissues, and organs that work together to protect the body from foreign invaders, such as bacteria, viruses, and abnormal cells, including cancer cells. However, cancer cells often develop ways to evade detection and attack by the immune system. Immunotherapy seeks to overcome these evasive tactics and strengthen the immune response against cancer.

There are several types of cancer immunotherapy, each designed to target specific aspects of the immune system or cancer cells. Some common approaches include immune checkpoint inhibitors, which block proteins that inhibit immune cell activity, allowing them to better recognize and destroy cancer cells. Another approach is adoptive cell therapy, where immune cells, such as T cells, are extracted from the patient, modified or enhanced in the laboratory, and then reintroduced into the patient to enhance their cancer-fighting abilities.

Cancer immunotherapy has shown remarkable success in treating various types of cancer, including melanoma, lung cancer, and certain types of leukemia. It offers the potential for long-lasting responses, fewer side effects compared to traditional treatments, and the possibility of personalized therapy tailored to each patient's immune profile. Ongoing research and advancements in the field continue to expand our understanding of cancer immunotherapy, paving the way for more effective and targeted treatments in the fight against cancer.

TRANSLATIONAL DAY

CANCER IMMUNE THERAPY

Day 3 | 24 Aug 2023

To provide you with a practical understanding of this topic, we have prepared the following program for you:

- Guided tour of the Hematology and Oncology Clinic, including the diagnostic laboratory, to gain insight into the daily routines of the doctors utilizing cancer immunotherapy.
- Lecture by Dimitrios Mougiakakos on the application of CAR T-cell therapy in the clinical setting.
- Guest lecture by Heiko Bruns on the role of macrophages in immunotherapy.
- Overview of laboratory techniques relevant to the development and evaluation of immunotherapies.

We are looking forward to your participation.

SOCIAL EVENING

MEET THE SPEAKER &
INFORMAL DISCUSSION

BEGIN 18:00

FOOD & DRINKS
mixed buffet
soft drinks | beer | wine

VENUE
Viehbörse
Zum Handelshof 3
39108 Magdeburg

WEBSITE

GUEST LECTURE

HEIKO BRUNS
(UNIVERSITY HOSPITAL ERLANGEN)

Day 3 | 24 Aug 2023

Effector functions of tumor-associated macrophages (TAMs)

Macrophages are the most abundant immune cells in the microenvironment of hematologic and solid tumors. However, the macrophage infiltrate is often considered an unfavorable prognostic factor. Tumor-associated macrophages (TAMs) promote tumor cell growth, neoangiogenesis, and metastasis. In addition, TAMs also impair the efficacy of different immunotherapeutic approaches. These observations are surprising in light of recent evidence that macrophages can recognize and phagocytose tumor cells. Moreover, macrophages are important effector cells for the therapeutic effect of monoclonal antibodies, which belong to standard of care for malignancies such as Non-Hodgkin lymphoma (NHL). This raises the question of whether TAMs differ from other macrophage phenotypes in their tumoricidal effector functions and, if so, why these mechanisms can no longer be adequately executed by TAMs. In recent years, we have analyzed the interplay between TAMs and lymphoma cells in more detail and have been able to show that lymphoma cells instruct TAMs to establish a protumoral milieu. The work led to the hypothesis that reactivation of the tumoricidal effector mechanisms of TAMs is promising as a novel therapeutic option in tumor therapy and can be used for most tumor entities. A critical prerequisite for this is a precise understanding of the molecular interactions between TAMs and tumor cells.

- studied Biology at the University Erlangen-Nürnberg and got his Diploma in 2006
- 2010: PhD (Dr. rer. nat.), University Hospital Ulm, doctoral thesis: Inhibition of abl tyrosine kinase supports antimicrobial activity in human alveolar macrophages
- 2010 – 2012: BayImmunNet founded PostDoc
- since 2012: Junior Research Group Leader “RG Macrophages”, Unviersity Hospital Erlangen
- 2019: Venia legendi, University Erlangen-Nürnberg

GSP & RDM
WITHIN RTG 2408

Day 4 | 25 Aug 2023

Good Scientific Practice & Research Data Management

It's time to talk about Good Scientific Practice (GSP) and Research Data Management (RDM) within our RTG 2408. Both GSP and RDM are currently considered as an essential component of research by all funding organizations. Therefore we want to not only gain insight into current developments but also discuss what we achieved so far and what we can further implement and improve in the future. Barbara Witter from our OVGU Graduate Academy will join this session. The program will start with a short introduction to the Research Integrity Code of Conduct. We will further discuss the chances of an Electronic Lab Notebook for Institutional Research Data Management and also analyze methods and results sections in selected research articles.

Expert: Barbara Witter (OVGU Graduate Academy)

REFERENCES & PHOTO CREDITS

Course B: Isolation of cholangiocytes and biliary organoids

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Course C: MELC (Multi-Epitope-Ligand-Cartography)

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Photos

Entrance University Hospital (title page): press photos UMMD: https://www.med.uni-magdeburg.de/Kommunikation+_+Presse/Presse/Pressebilder.html

Cathedral Magdeburg (title page): Ulrich Arendt, www.bilddatenbank.ovgu.de

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