

RTG 2408

SUMMER SCHOOL



AUGUST 19–22, 2024
MAGDEBURG



PREFACE

WHAT DO I NEED TO KNOW?

We're happy to meet for our 2nd RTG 2408 summer school. Over four days, our program consists of a debate workshop, practical courses, (guest) lectures and a session with an editor. This year's translational part will be organized by the Department of Gastroenterology, Hepatology and Infectious Diseases. In addition to the academic program, a cultural exchange and a social evening as well as a scavenger hunt will serve as fun and collaborative events.

A few important reminders:

- Please make sure that you sign the attendance list each day, as this is necessary for the event's invoice.
- We will be taking photos throughout the event, which may be used for RTG 2408's public relations activities.
- To reduce our environmental impact, we will not be providing a printed version of this booklet.

We look forward to an inspiring and memorable summer school with all of you!

Organizing committee

Niklas Heucke | Verena Keitel-Anselmino | Michael Naumann | Sandra Dittrich

19
AUG

Day 1

9:00	Workshop Debate training: Awareness for gender topics Julian Staudt	H5 seminar room
10:30	Coffee break	H5 seminar room
10:45	Continuation workshop	H5 seminar room
12:30	Lunch break	H5 seminar room
13:30	Continuation workshop	H5 seminar room
15:00	Coffee break	H5 seminar room
15:15	Continuation workshop end at 17:00	H5 seminar room

Day 2

10:00	Welcome Michael Naumann	H4 lecture hall
10:15	Studying gene expression: From bulk sequencing to cellular resolution – Part I Thomas Nickl-Jockschat	H4 lecture hall
11:00	Introduction to Light-Sheet Imaging Stephan Werk & Jan Dudeck	H4 lecture hall
12:00	Lunch break	H4 lecture hall
12:45	Practical courses – Part I	various
18:00	Bring your culture to the table Cultural evening	Apartment Verena Keitel- Anselmino

20
AUG

Day 3

8:30	Practical courses – Part II	various
12:30	Lunch break	H5 seminar room
13:15	Scavenger hunt Introduction	H5 seminar room
13:45	Scavenger hunt End approx. 17:00	on campus

21
AUG

Day 4

9:30	Multiscale microscopy for understanding local and systemic immunotherapy response in cancer Bettina Weigelin	DZNE seminar room
10:30	Coffee break	DZNE seminar room
10:45	Studying gene expression: From bulk sequencing to cellular resolution – Part II Thomas Nickl-Jockschat	DZNE seminar room
11:45	Lunch break	DZNE seminar room
12:30	Translational part Verena Keitel-Anselmino & Niklas Heucke	KGHI (H60a) Secretary's office
15:30	Editor session Thomas Berg	KGHI (H60a) Room 1510
18:00	Social evening	Türmchen Werder

22
AUG

DIVERSITY

DEBATE TRAINING WORKSHOP

Day 1 | Aug 19, 2024

I beg to differ!

Debate training for the awareness for gender related topics

Many people have little connection to the topic of gender equality in their everyday lives. As a result, they often consider the issues of the gender equality debate to be of little relevance. The willingness to deal with the topic of equality is therefore correspondingly low. The debate training to raise awareness of equality issues arouses the participants' interest: By addressing the issues in the argumentation training and in various debate topics, participants succeed in dealing with the topic of equality on an intuitively accessible level. The participants are thus sensitized to the topic of equality and re-evaluate its relevance for their everyday lives. In addition, the participants train their argumentative and rhetorical skills. The debate training thus promotes the culture of debate.

After a short introduction to the topic of equality, participants will learn how to

- find valid arguments and argue in a target-oriented way
- check arguments for relevance
- build arguments in a coherent and comprehensible way
- develop a persuasive strategy
- present arguments with confidence



JULIAN STAUDT

- Master Debate Trainer (DDG, IDEA)
- VDCH certified debate trainer
- B.A. Business Administration/Business Psychology
- Studies of Philosophy and Computer Science

[WEBSITE](#)

DIVERSITY

BRING YOUR CULTURE TO THE TABLE CULTURAL EVENING

Day 2 | Aug 20, 2024

With this delicious event we want to celebrate our diverse backgrounds and foster cultural exchange. This event encourages each participant to bring a starter, main dish, or dessert that represents their home culture or region.

While we enjoy these culinary delights, each participant will have the chance to give a brief 1-minute talk about their contribution. This talk can include nice-to-know facts, personal stories, or cultural significance related to the dish. It's a perfect occasion to celebrate our diversity, share cultural traditions, and enjoy a variety of flavors from around the world.

Please note: For coordination on who brings what, and any further questions, please reach out to Niklas Heucke.

GOOD TO KNOW

BEGIN 18:00

FOOD & DRINKS

food provided by RTG
members (see above)

soft drinks | beer | wine
(provided by RTG)

VENUE

Apartment Verena Keitel-
Anselmino

More information on how
to get there shortly before
the event

TEAM EVENT

SCAVENGER HUNT

Day 3 | Aug 21, 2024

Get ready for an exciting team event that will test your problem-solving and teamwork skills. Join a scavenger hunt across the medical campus, where three teams will compete to solve a series of tasks and puzzles.

The challenge isn't just about speed: side quests along the way are waiting to be solved, adding an extra layer of strategy to the competition. The team that excels at completing both the main mission and the side quests will be the ultimate winner.

Before the hunt begins, we will have an introduction session to explain the procedures, rules, and provide all necessary materials. Teams will start at staggered times. The winners will be announced during our social evening event the following day.

GOOD TO KNOW

- Everyone be on time. We will start after lunch.
- Each team needs at least one device with mobile internet (more are highly recommended).
- Each team needs a device to take photos and the capability to share them via a cloud service or email link.
- No bags are allowed during the hunt. All equipment is provided.

PRACTICAL COURSES

Day 2 & 3 | Aug 20/21, 2024

- On days 2 and 3 we will offer 2 different practical courses.
- The first course “Light Sheet Microscopy” will be organized by Jan Dudeck and Stephan Werk.
- For the “Sequencing” course you have requested we are unable to offer a hands-on part. Instead, we will have a two-part lecture on this topic by Thomas Nickl-Jockschat on days 2 and 4.
- A second practical course, which will take place in parallel to the Microscopy course, will be on “Mass Spectrometry” and will be organized by Thilo Kähne.
- You will be divided into two subgroups. One will have course A in the afternoon of day 2 and course B in the morning of day 3. The other group will do it the other way round.

Course	Topic	Place
A	Light-Sheet Microscopy	H65, Foyer* H65-063
B	Mass Spectrometry	H5, seminar room

* meeting point

COURSE A

LIGHT-SHEET MICROSCOPY

STEPHAN WERK & JAN DUDECK

Day 2 & 3 | Aug 20/21, 2024

Introduction to light-sheet Imaging

Light-sheet imaging is an emerging technique in microscopy, offering high-resolution, high-speed, and low-phototoxicity imaging. This talk will introduce the basics of imaging and the principles behind light-sheet microscopy, which uses a thin sheet of light for optical sectioning. We will compare its benefits with other microscope types, highlighting its reduced photodamage and fast volumetric imaging.

Key applications of light-sheet imaging will be discussed, demonstrating its use in fields such as developmental biology and neuroscience. A focus will be placed on the UltraMicroscope Blaze, exploring its working principle, beam path, hardware, and software components.

The platform's modularity and future-proof features, including high-throughput imaging, AI integration, VR, and robotics, will be highlighted. Attendees will gain a comprehensive understanding of light-sheet imaging, its applications, and future potential, preparing them to utilize this cutting-edge technology in their research.

STEPHAN WERK

- Studied Marine Sciences, Ecology and Medical Microbiology (University of Rostock)
- 2003-2005: EU-ESF Deep-sea project OASIS, University of Rostock
- 2009-2011: Research fellow, Technical Meteorology, niversity of Hamburg
- Since 2013: Sales Area Manager & Instrument Sales Specialist for advanced imaging equipment, LaVision BioTec (until 2020) and Miltenyi Biotec



COURSE A

LIGHT-SHEET MICROSCOPY

STEPHAN WERK & JAN DUDECK

Day 2 & 3 | Aug 20/21, 2024

Demo and hands-on training session of light-sheet microscopy at the UltraMicroscope Blaze

In this session, participants will learn about the principles of light-sheet imaging directly in front of the UltraMicroscope Blaze, the light-sheet microscope of the MPBIC imaging platform of the Medical Faculty, OVGU Magdeburg. The use of the microscope will be demonstrated using previously prepared and provided material and the advantages of the technology in comparison with other microscopy methods explained. Participants will not only familiarize themselves with the functional principle, but also with the corresponding hardware and software components and learn about their application. Various potential uses as well as future-proof technologies, which were explained in the lecture, will be discussed directly on the device. Participants will also have the opportunity to discuss the use of this technology, and the herewith associated possibilities of data analysis in the context of their own research projects. In addition, the students will get to know and discuss the procedure of tissue clearing and whole-mount staining. While the staining procedure is too time-consuming to be demonstrated, tissue clearing can be practiced on fixed organs/specimens that are provided or brought along.

If there are specific questions in context with your respective research project or if you wish to bring specific samples to be tested, please consult us in advance.

JAN DUDECK

- Studied Material Science (University of Leipzig)
- 2004-2005: Forschungszentrum Karlsruhe
- 2005-2009: Bundesanstalt für Materialprüfung Berlin, MPI for Colloids & Interfaces Potsdam and Max Bergman Center of Biomaterials Dresden
- 2010-2016: Research fellow and Imaging specialist for Intravital Microscopy, TU Dresden
- 2016-2020: Research fellow and Imaging specialist for Intravital Microscopy, OVGU
- Since 2020: MPBIC Imaging platform, OVGU



COURSE B

MASS SPECTROMETRY

THILO KÄHNE

Day 2 & 3 | Aug 20/21, 2024

Mass spectrometry

Mass spectrometry (MS) is an advanced analytical tool that plays a crucial role in biomedical research by enabling the precise identification, quantification, and structural analysis of a wide range of biological molecules. This technique operates by ionizing molecules in a sample, separating these ions based on their mass-to-charge ratio (m/z), and detecting them, allowing for the detailed analysis of complex biological mixtures.

Key applications in biomedical research

1. *Proteomics*: MS is extensively used for proteomic studies, where it identifies and quantifies proteins in biological samples. It helps in characterizing post-translational modifications, protein-protein interactions, and protein expression levels. This is vital for understanding cellular processes, disease mechanisms, and for discovering new biomarkers.
2. *Metabolomics*: In metabolomics, MS profiles small molecules and metabolites within cells, tissues, or biological fluids. This is important for studying metabolic pathways, understanding disease states, and identifying potential therapeutic targets.
3. *Lipidomics*: MS is also essential in lipidomics, where it analyzes the lipid composition of cells and tissues. Lipids play key roles in cell structure and signaling, and their dysregulation is linked to many diseases, including cardiovascular diseases and cancer.
4. *Drug Development and Pharmacokinetics*: MS aids in drug development by analyzing the metabolism of drugs in the body. It helps in understanding how drugs are absorbed, distributed, metabolized, and excreted (ADME), and in identifying potential metabolites that could be toxic.
5. *Clinical Diagnostics*: MS is increasingly used in clinical diagnostics for the detection of biomarkers in blood, urine, and other body fluids. It provides high sensitivity and specificity, making it useful for early disease detection and monitoring therapeutic responses.

COURSE B

MASS SPECTROMETRY

THILO KÄHNE

Day 2 & 3 | Aug 20/21, 2024

Impact on biomedical research

Mass spectrometry (MS) has transformed biomedical research, deepening our understanding of biological processes and disease mechanisms. Its ability to provide detailed molecular information has led to the discovery of novel biomarkers for conditions like cancer, diabetes, and neurodegenerative disorders. Advances in MS technology are enhancing the precision of analyses, pushing the field toward personalized medicine that tailors treatments to individual molecular profiles. In short, MS is an essential tool in biomedical research, offering critical insights into the molecular composition of biological systems, crucial for advancing diagnostics, therapeutics, and our understanding of health and disease.

Workshop goals

- Brief explanation of the very basics of mass spectrometry
- Overview of different techniques and their advances (demonstrated on the basis of own examples)
- Hands-on training on MALDI-TOF/TOF instrument (preparation of samples and data acquisition on MS instrument, calculations and database search)

- Studied Biochemistry (MLU Halle)
- 1995: PhD at OVGU, Magdeburg
- 1996: Centenary Institute of Cancer Medicine and Cell Biology, University of Sidney, Australia
- 1996-2001: PI, CRC 387
- 2001-2003: Head, Core facility "Proteomics and Mass Spectrometry, OVGU, Magdeburg
- 2004: Habilitation, OVGU, Magdeburg
- 2007-2018: PI, CRC 779
- Since 2017: Research Associate, Institute of Experimental Internal Medicine, OVGU, Magdeburg



LECTURE

THOMAS NICKL-JOCKSCHAT
(OVGU MAGDEBURG)

Day 2 & 4 | Aug 20/22, 2024

Studying gene expression: From bulk sequencing to cellular resolution

Gene expression is a major biological force, allowing the organism to adopt to different environmental and intrinsic challenges. Traditionally, changes in gene expression have been studied by bulk sequencing approaches that rely upon homogenized tissues and pool over different cell types. The latter is a challenge especially in tissue types consisting of diverse and highly specialized cell types as, e.g., the brain. Novel approaches recently introduced to the field yield the great advantage that they allow inference on gene expression in distinct cell types, with some of them also providing a high spatial resolution.

In two lectures, I will provide an overview over these novel approaches, in detail, single cell/nuclei RNAseq and spatial transcriptomics methods. In a first lecture, I will introduce these methods and provide some examples for their application. In my second lecture, I will speak about how to plan experiments and how to analyze results.

Unfortunately, as we are still building up our new spatial transcriptomics core center, a practical part cannot be offered this time. We apologize for any inconvenience!

- Studied Medicine (University of Regensburg)
- 2005–2010: Residency (Psychiatry and Psychotherapy), University Hospital RWTH Aachen
- 2010–2017: Attendant, Clinic of Psychiatry, Psychotherapy & Psychosomatics, University Hospital RWTH Aachen
- 2017-2024: Attendant and associate professor, Department of Psychiatry, Carver College of Medicine, University of Iowa, USA
- since 2024: Director and professor, Clinic of Psychiatry & Psychotherapy, UMMD



GUEST LECTURE

BETTINA WEIGELIN
(UNIVERSITY OF TÜBINGEN)

Day 4 | Aug 22, 2024

Multiscale microscopy for understanding local and systemic immunotherapy response in cancer

Understanding immune responses against cancer requires monitoring immune cell function at multiple biological levels, from cellular interactions within tissues to systemic activation and trafficking. Multiscale imaging thereby provides spatio-temporal resolution and thus plays an important role in understanding immune cell function. Intravital microscopy (IVM) has facilitated real-time observation of immune cell effector function within tumors. Higher harmonic generation (HHG), a label-free multiphoton imaging technique, further provides tissue context and reveals guidance structures that influence immune cell migration and modulate T cell efficacy in the tumor microenvironment. Ex vivo, tissue clearing and light-sheet microscopy (LSM) have emerged as powerful tools to comprehensively analyze the efficacy of immune targeting of metastatic tumor cells in intact organs. In addition, multiplexed immunofluorescence labeling facilitates co-registration of immune cell infiltration and tumor cell viability in relation to anatomical organ niches. The talk will highlight the role of microscopic imaging in understanding immune cell behavior in cancer and for understanding the crosstalk between local immunity in tissues and systemic response.

- Studied Biology (University of Würzburg)
- 2015: PhD in Medical Sciences, Radboud University Medical Center, Nijmegen, The Netherlands
- 2015-2016: Post-Doctoral researcher, Radboud University Medical Center, Nijmegen
- 2016-2019: Research Instructor, MD Anderson Cancer Center, Houston, USA
- 2019-2021: Group leader, Multiscale Immunoimaging, University Hospital Tübingen
- Since 05/2021: Professor, Preclinical imaging of the immune system, University of Tübingen



TRANSLATIONAL PART

Day 4 | Aug 22, 2024

Hands-on: Major diagnostic and interventional tools in gastroenterology and hepatology

For the translational part of our summer school, we take you to our clinic's machine room: the ultrasound and endoscopy unit. It is of major importance since almost all patients admitted to our department pass through this unit for basic tests such as abdominal ultrasound, oesophagogastroduodenoscopy or colonoscopy, or more complex procedures such as endoscopic retrograde cholangiopancreatography or endosonography.

It is all Greek to you? No problem, in this session we will explain all the tests to you in detail. But more importantly, you will be doing them yourself. So be prepared to see your liver for the first time, say hello to your gall bladder or examine a stomach from the inside (not yours, for sure).

Please note: All participants will meet at the secretary's office (Daniela Deuschländer) in H60a, ground floor. You will be divided into two groups.

SOCIAL EVENING DAY 4

MEET THE GUESTS &
INFORMAL DISCUSSION

BEGIN 18:00

FOOD & DRINKS
mixed buffet
soft drinks | beer | wine

VENUE
Türmchen Werder
Zollstraße 1
39114 Magdeburg

[WEBSITE](#)

EDITOR SESSION

THOMAS BERG
(UNIVERSITY OF LEIPZIG)

Day 4 | Aug 22, 2024

Navigating the path to effective publication and reviewing: Insights from journal editors

In this session, experienced editor Thomas Berg will guide participants through the scientific manuscript review process, offering key insights and essential tips for writing and publishing research successfully.

Topics to be addressed:

- How to best write and publish your research
- How to select the right target journal
- How to meet editorial expectations
- How to write high-quality reviews

Thomas Berg served as Vice Secretary (2019-2021) and Secretary General (2021-2023) of the European Associations for the Study of the Liver (EASL). He was a Board member of the EASL International Liver Foundation (EILF, 2019-2013) Co-Editor of the *Journal of Hepatology* (2014-2019). He has published over 440 articles in peer-reviewed journals, more than 100 reviews and textbook contributions (>43,000 citations), and has h-index of 94 (Scopus).

Preparation: Participants are required to prepare for this session. Materials and further instructions will be sent via email in advance.

- studied Medicine
- Head of the Division of Hepatology, and Deputy Director of the Department of Medicine II, at the Leipzig University Medical Center
- Chair of the University Liver Tumor Center Leipzig
- Vice-Chair of the University Liver Transplant Center Leipzig



PHOTO CREDITS

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

Photos J. Staudt, S. Werk, J. Dudeck, T. Kähne, T. Nickl-Jockschat, B. Weigelin, T. Berg: provided by themselves

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<http://grk2408.ovgu.de>

grk2408@med.ovgu.de

Funded by

DFG

Deutsche
Forschungsgemeinschaft

German Research Foundation