

Newsletter

August 2017

GRK 2046

cSummary, Update and News

Hello dear people of GRK 2046 and welcome to the 4th edition of your most favorite newsletter! Our graduate school continues its successful course and keeps rising like a rocket. All systems nominal, the first stage of fresh PhDs will soon be decoupled as we ascend to the magical 3-year mark and hit space! But don't get too excited, as according to Confucius, the journey is the reward. As also evident from the events of the last six months: GRK 2046 students got numerous chances to travel throughout the world to hear and spread the word of science, this time in Brazil, Cuba, Portugal, the UK and USA.

The highlight of this term was the publication of 6 papers (5 published, 1 in review) under the research topic "Parasite Infections: From Experimental Models To Natural Systems" in *Frontiers in Cellular and Infection Microbiology*, which is a significant result ($p < 0.05$)!

As always, several renowned scientists were invited to the Berlin Parasitology Seminar and Role Model series, fruitful discussions were held at the Science-Ethics-Politics event and at the ZIBI Retreat and Summer School.

On a final note, don't forget the GRK 2046 retreat on 18th and 19th September at the Müggelsee.

So, that's it. Enjoy the newsletter and see you around!

*Costanza Tacoli & Martin Kraft
(doctoral researchers)*

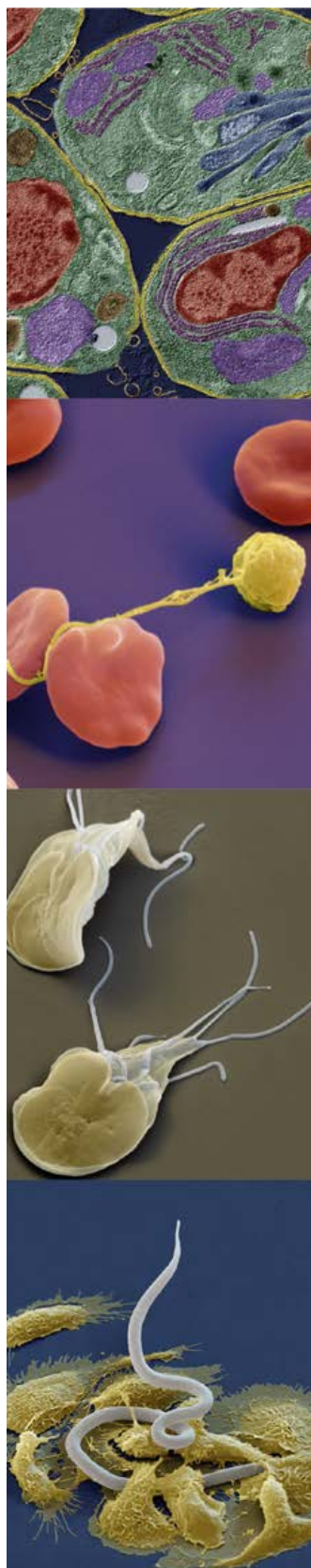
New face in the coordination office

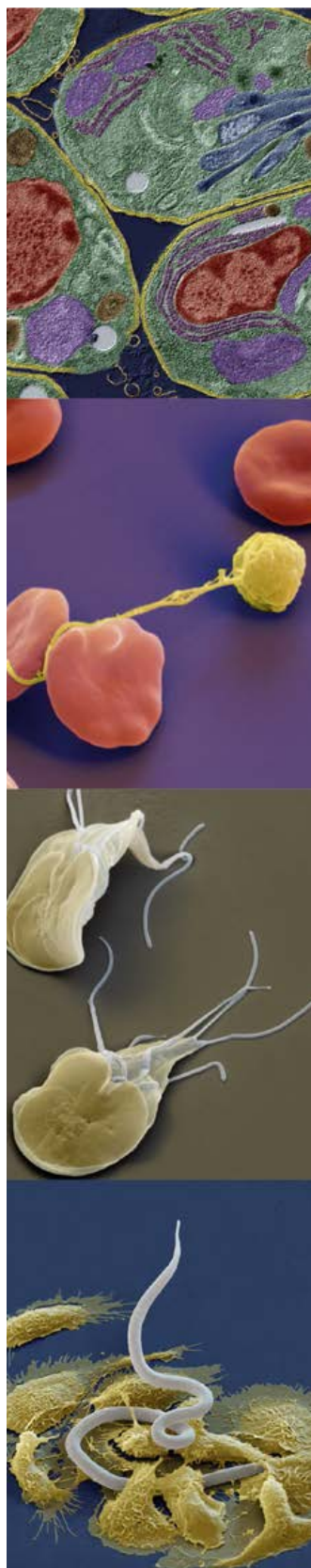
We are very happy that Michael Rundorf started working in the coordination office in May. For the next one year, you can direct all your nitty gritty questions regarding travel and speaker invitations to him. You will meet Michael in person at the retreat. Until then, you can reach him through phone (+49 30 838 51834) or email (immunologie@vetmed.fu-berlin.de)

Juliane Kofer



Image Credit: Institute of Immunology





Student Profile

Víctor Hugo Jarquín-Díaz

Studied Biomedicine and Molecular Biotechnology in Mexico City

PhD topic “Filling the gap between metabarcoding and genotyping – a case study in *Eimeria* spp., an intracellular parasite of house mice (*Mus musculus*)”

Humboldt-Universität zu Berlin and Leibniz Institute for Zoo and Wildlife Research, Berlin

Supervisor: Prof. Emanuel Heitlinger

Contact: jarquin-diaz@izw-berlin.de

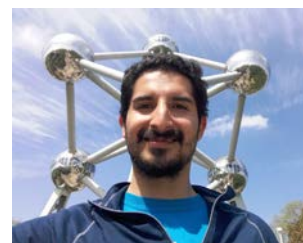


Image Credit: Víctor Hugo Jarquín-Díaz

Upcoming GRK 2046 Retreat 2017

The next annual GRK 2046 retreat will be held at Hotel Müggelsee Berlin, on 18th - 19th September 2017. This year the retreat will include an additional session for a talk from a guest speaker, Dr. Moritz Treeck. Moritz is from the Francis Crick Institute and his focus is on signaling in Apicomplexan parasites (*Plasmodium* and *Toxoplasma*). In addition to the science, we are sure to pick up some career tips from Moritz, too.

The retreat organizers are Nicole Affinass, Suzana Zakovic and Caroline Kiuru. Do not hesitate to contact the organizers in case you have any questions.

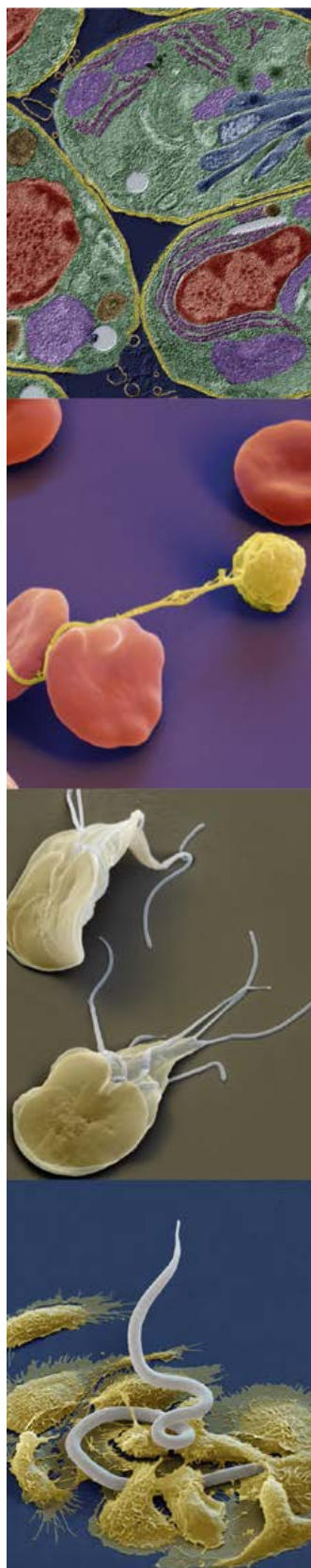
Caroline Kiuru

Edinburgh collaboration

In this second year of our training program, the GRK 2046 students and PIs aimed at building connections with other parasitology-focused research communities. With this purpose, we found a perfect match with the



Image Credit: Christina Bredtmann



Centre for Immunity, Infection and Evolution (CIIE) based at the University of Edinburgh (<http://ciie.bio.ed.ac.uk/>), considering our common area of research and approaches. From Berlin the organizing team composed of Anton Aebischer, Nicole Affinass and Francesca Torelli established contact with possible matching group leaders in Edinburgh with the help of the CIIE head Keith Matthews. At the same time we surveyed GRK 2046 students for project ideas and common interests. Eventually, in March we flew to Edinburgh for a one-day workshop between the interested partners. Four groups from Berlin, involving both students and PIs participated in the workshop. It was a really intense and successful day, where each student had to present an overview of their PhD subject with a specific focus on possible projects to start in collaboration with a present group. On the same manner, interested group leaders from Edinburgh presented their work. Possible working partners then sat in individual groups to evaluate the feasibility of the proposed projects and draw a suitable plan. At the end of the day all four GRK 2046 students had drafts of interesting projects that will be further developed! These projects represent a first step for possible fruitful partnerships and will contribute significantly to the PhD projects of the students. To relax after such a long day, we enjoyed a visit to the impressive genomic facility of Mark Blaxter led by Mark itself, and we all headed to dinner to continue the scientific discussion in an informal and pleasant atmosphere.

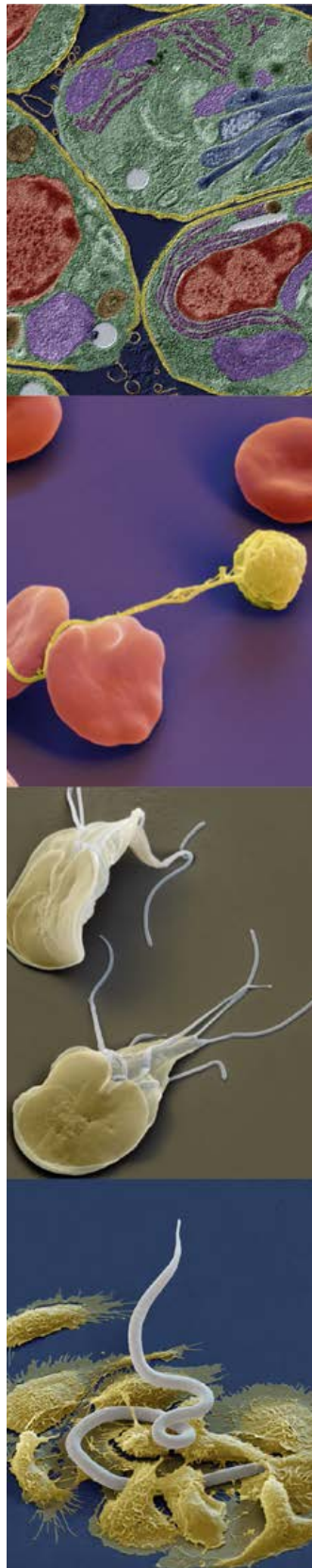
Francesca Torelli

One Health in the GRK 2046



Image Credit: Christina Bredtmann

The GRK 2046 student Christina Bredtmann was accepted as a student for an Integrated Training Program in Infectious Diseases, Food Safety and Public Policy (ITraP), funded by the Natural Sciences and Engineering Research Council of Canada. From January until June 2017 Christina took part in web-based



classes and multidisciplinary group work. Here, she was involved with the development of a human and wildlife risk assessment for Toxoplasmosis in the Arctic and a presentation on the global impact of African Swine Fever, both from a One Health perspective. Additionally, Christina was invited to take part at a One Health Summer School at the State University of São Paulo in Botucatu, Brazil, where some ITraP students met face to face for the first time after 6 months of web-learning and listened and worked on more One Health topics, such as Chagas disease caused by the parasite *Trypanosoma cruzi*.

Christina Bredtmann

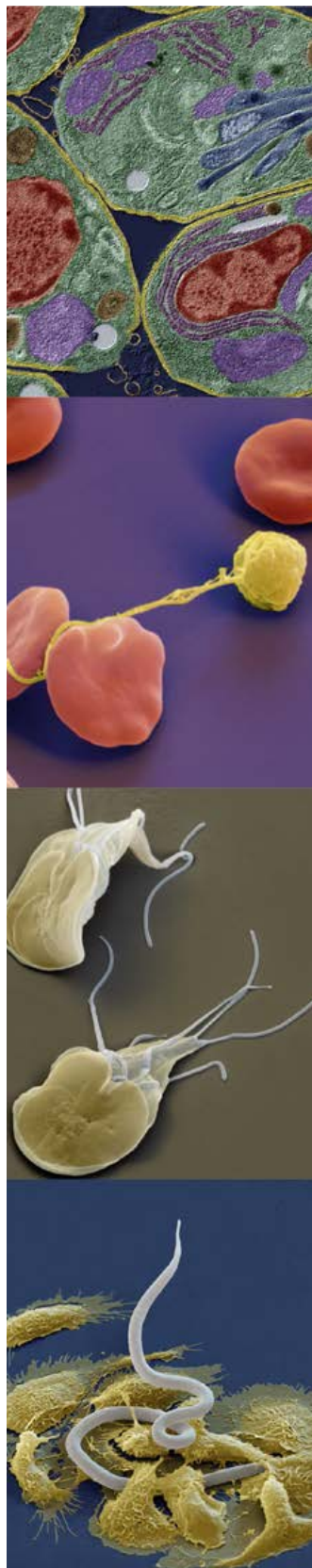
ZIBI Science-Ethics-Politics Day 2017

The annual Science-Ethics-Politics event exposes doctoral researchers to the ethical and political questions that are important for the development of modern scientists. This event is designed to promote discussion on topics of great public interest. This year's event took place on the 3rd February in Berlin and was entitled "Brave New World: Can we vs. Should we?". It included thought-provoking panel discussions concerning the ethical implications of genome editing in the era of CRISPR/Cas as well as science communication to a public which seems increasingly less concerned with facts and reality. Panel members discussing genome editing included Peter Dabrock, President of the German Ethics council; Stefan Mundlos, Director of the Max Planck Institute for Molecular Genetics; and Tony Nolan, Scientist and Gene Drive Expert. Science communication was considered in talks and a panel discussion including Michael J. Gorman, Chair of Life Sciences in Society at LMU; Bart Knols, scientist and science communicator; and Kathrin Zinkant, science journalist and editor at Süddeutsche Zeitung. Additionally, students engaged in a science communication workshop led by Annette Klinkert of City2Science.



Image Credit: Nguyen Anh Duc

Ankur Midha



Annual ZIBI Retreat

16th - 17th March in Nauen, Germany



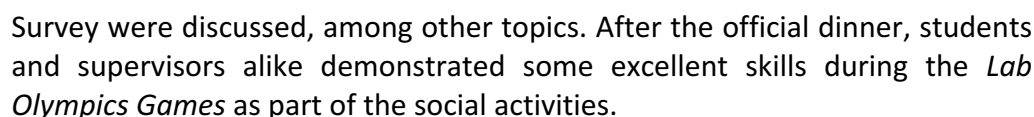
Image Credit: ZIBI Graduate School

The annual ZIBI Graduate School Retreat this year took place on the 16th - 17th of March at the Landgut Stober Hotel, overlooking the picturesque Groß Behnitzer See in Nauen. The meeting welcomed over 80 ZIBI Graduate School PhD students and 22 group leaders and supervisors from across Berlin.

Over the course of the two-day retreat, GRK 2046 students presented some excellent work in ten-minute oral presentation slots and during the afternoon poster sessions, demonstrating their current scientific progress to fellow students, senior colleagues and PIs. The evening on the first day saw the holding of a strategic student-steering group meeting where practical matters, ZIBI Graduate School requirements and the student Happiness



Image Credit: Christina Bredtmann



The second day of the retreat continued with more superb student talks and poster presentations. Shortly before lunch, PhD students were also able to take part in the Alumni session, where a number of ZIBI Graduate School Alumni guests had the opportunity to talk about their career choices and experiences in their chosen fields of work.

In summary, the 2017 ZIBI Retreat presented a great opportunity for PhD students and their supervisors to get together and present some excellent work in a wide range of infection biology topics, alongside a number of entertaining social events, key strategic and career-oriented sessions. We are already looking forward to the ZIBI Retreat 2018!

Ivet Yordanova

ZIBI Summer Symposium 2017

26th – 27th June in Berlin, Germany

The annual ZIBI Summer Symposium is committed to enabling interested people a deeper understanding of certain aspects of infectious diseases. For this year's theme, entitled „Ecology of Infectious Diseases“, 17 speakers were invited. Over the course of two days, attendees were given insight into the ecology and evolution of parasitic, bacterial, fungal and viral infections as well as the methodology which involves both field work and advanced -omics technologies.

To be welcomed from a student's point of view was not only the opportunity to meet internationally renowned researchers, but also to chair sessions.

Esra Yilmaz

In cooperation with:










ZIBI

Center of
Infectious
Diseases
and
Immunology

ECOLOGY OF INFECTIOUS DISEASES

Explore the ecology and evolution of infectious diseases and the responses of the hosts.



Talks by

Marabeth Eiden, Bethesda
Rebecca Hahn, Pennsylvania
Janet Trevisan, Nottingham
Jan Felix Dreier, Bonn
Sébastien Caillaud-Speranza, Berlin
Pablo Marín, Girona
Rainer G. Ulrich, Guelphville – José Riera
Jacques Goffard, Tromsø
Elke Gernandt, Berlin

Deputy Krüger, Berlin
Steve Rafti, Berlin
Hana Pierre-Rayer, Bonn
Makdenika Mierres, Washington
Tina Heinrich, Pils
James Wasmuth, Calgary
Thomas Das Otto, Cambridge
John Parkinson, Toronto







June 26 – June 27, 2017, Berlin/Germany
www.zibi-summeryposium.de

Venue:
 Ballroom Humboldt/ Graduate School Building
 Humboldt-Universität zu Berlin,
 Luisenstr. 56, 10117 Berlin

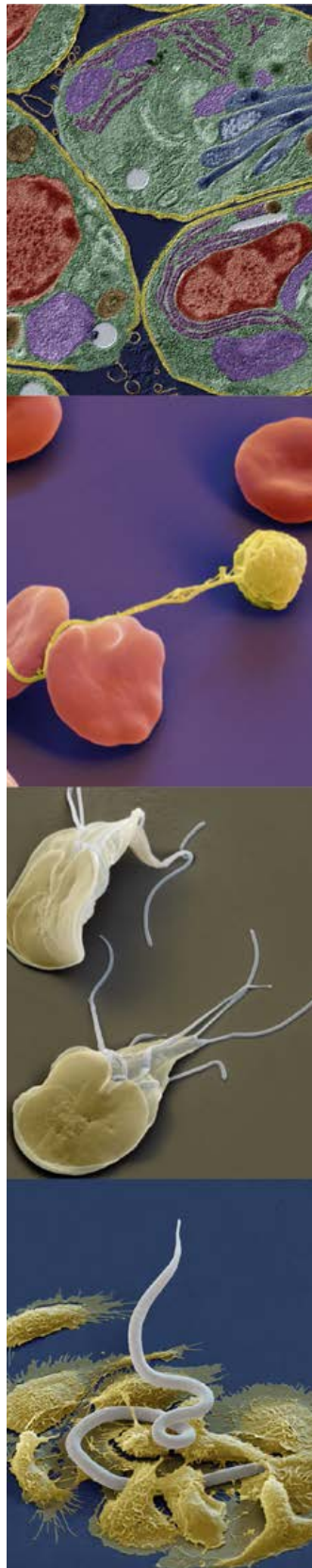


Image Credit: ZIBI Berlin

Berlin Parasitology Seminar Series

14th February - Andre Buret (University of Calgary, Canada)

Prof. Buret's talk "How *Giardia*-induced microbiota dysbiosis may disrupt intestinal homeostasis" gave insights into *Giardia duodenalis*' capabilities to lyse the intestinal mucus layer, as well as bacterial biofilms, which may clear the way for pathogenic microbes to the host's epithelium. Generally, it seems that *Giardia* does not harm the host directly, but that the parasite rather



changes the microbiome, which can induce gastrointestinal complaints. Prof. Buret also expressed his concerns about the proliferation of fecal transplantations, climaxing in do-it-yourself fecal transplant kits – I still can't imagine what exactly the large funnel is used for...

Afterwards we had a nice informal discussion with pretzels and beer and adapted our microbiota to potatoes with a dinner in the "Kartoffelkeller".

Martin Kraft

12th June - William Harnett (University of Strathclyde, UK)

Prof. William Harnett presented his work in a talk entitled "Is a dose of worms good for you? The therapeutic potential of the parasitic worm-derived anti-inflammatory immunomodulator, ES-62". He guided us through the many trials and tribulations of attempting to bring a potent immunomodulator to market as a novel therapeutic while presenting a wealth of data. The seminar was followed by a lively and involved discussion.

Ankur Midha

13th June - Judith Appleton (Cornell University, USA)

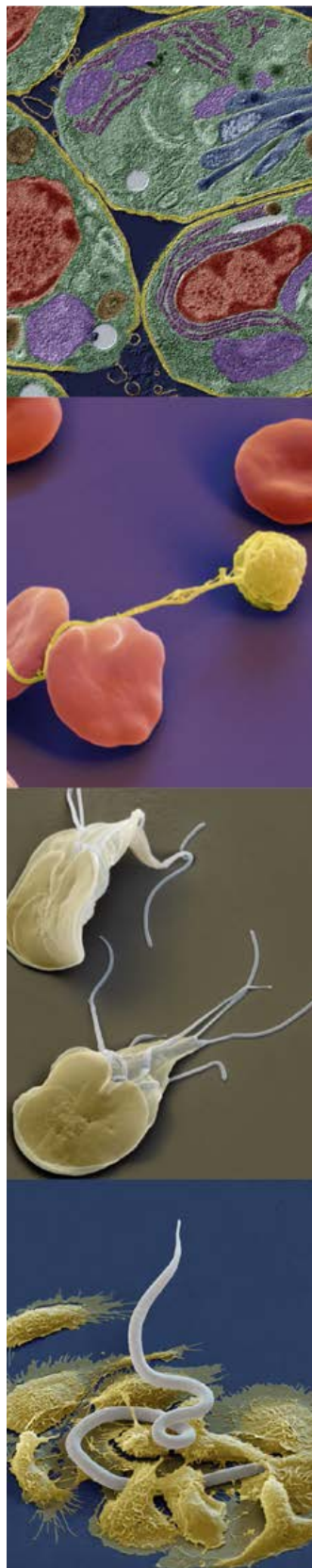
Dr. Judith Appleton is a Vice Provost at Cornell University in New York. During her time as an active scientist her research focused on the mechanism of immunity to infection by parasitic nematodes. She gave a very interesting talk about the diverse functions of eosinophils during primary and secondary infections with *Trichinella spiralis*. In particular, Dr. Appleton and colleagues could show that against expectations eosinophils are protecting the larvae of *T. spiralis* in a primary infection by preventing the host from producing nitric oxide, which would otherwise kill off the parasite. In a secondary infection, on the other hand, eosinophils are important for the protection of the host and the expulsion of the parasite.

Nicole Affinass

Role Model Seminar Series

17th January - Andrea Graham (Princeton University, USA)

Why do hosts vary so much in their immune defense to parasite infections? To discuss this topic, Professor Andrea Graham joined us in January and presented her work on parasite-host interactions. As a 'hybrid' researcher, she gave us insights into the recent field of ecoimmunology, applying immunology methods to evolutionary ecology questions in order to understand the drivers of immune variation to parasite infections. Not only did we have the opportunity to discuss Andrea's scientific work, but also her career path and experiences over breakfast in a casual and open environment.



Susana Ferreira

18th April - Dominique Soldati-Favre (Université de Genève, Switzerland)

Prof. Dominique Soldati-Favre from the Université de Genève presented her work on unexpected implications of *Toxoplasma* myosins in cell-cell communication. In particular, her talk highlighted how myosin-dependent cell-cell communication controls synchronicity of division in acute and chronic stages of the parasite. In addition to presenting novel findings, she also shared her thoughts on various ongoing projects at the Department for Molecular Parasitology, Humboldt-Universität zu Berlin, and Robert Koch Institute, Berlin. Further on, she discussed her career and personal experiences in science during a career briefing session with members of the GRK 2046.

Laura Radtke

27th June - Makedonka Mitreva (Washington University, USA)

Shortly after her interesting talk at the ZIBI Symposium Professor Mitreva, a Professor of Medicine and Genetics from Washington University, joined the ZIBI Summer School students and GRK 2046 PhD students for a very interesting Q&A session. In a casual atmosphere, the students felt motivated to ask many questions regarding her personal life and professional career, covering a broad range of topics from job applications to the difficulties of moving countries within an academic career. Professor Mitreva answered all questions wholeheartedly and reflected very positively on her career choice in academia, thus setting an inspiring example for a successful and fulfilling career in science.

Alexander Gerhard

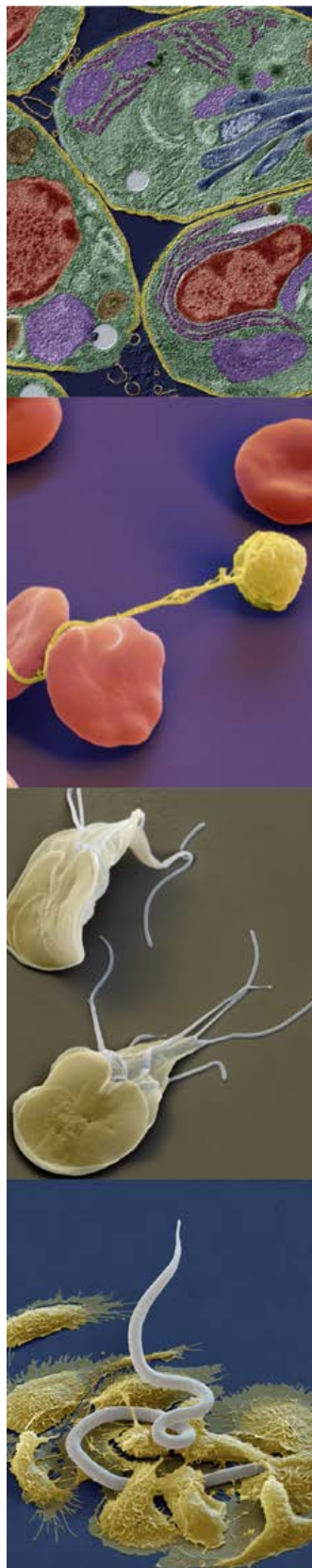
To Do List

As requested by some students, we provide little “To Do” lists. This way you can check whether or not you are on the right track.

Have you already:

1st year:

- ... sent your project proposal (that was approved by your supervisor)?
- ... put together your thesis advisory committee (TAC)?
- ... scheduled your first TAC meeting?
- ... put together your supervision agreement?
- ... taken a Good Scientific Practice course?
- ... handed in your certificates of attendances to keep your transcript up to date?
- ... thought about if you want to be responsible for the next newsletter?



2nd year:

- ... attended an introductory course introducing biostatistical analysis and experimental design?
- ... attended an introductory course on bioinformatics?
- ... taken a Good Scientific Practice course?
- ... attended a time and self-management workshop?
- ... written your biannual progress report?
- ... scheduled your next TAC meeting?
- ... handed in your certificates of attendances to keep your transcript up to date?
- ... thought about if you want to be responsible for the next newsletter?

3rd year:

- ... written your biannual progress report?
- ... scheduled your next TAC meeting?
- ... handed in your certificates of attendances to keep your transcript up to date?
- ... assessed your overall progress and what's missing for your next career step?
- ... discussed the timeline for wrapping up with your supervisor (and TAC members)?
- ... thought about if you want to be responsible for the next newsletter?

Juliane Kofer

Admin

Corporate Identity

When you are attending a conference, please keep in mind corporate identity. We don't enforce a corporate design, as you first have to make sure to follow the corporate rules of your institute. If there is none, we are happy to provide a template. Always acknowledge funding (us and/or where applicable other funding sources) and scientific/technical support. If you haven't saved a high-resolution file of the GRK logo yet, we are happy to provide it once again. Lastly, if you want a GRK button, please contact Juliane.

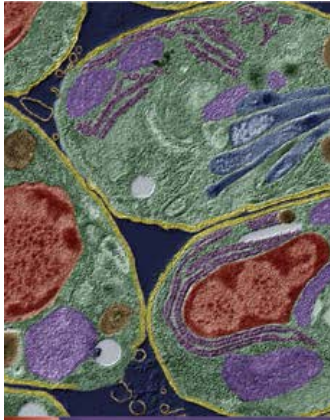
Juliane Kofer

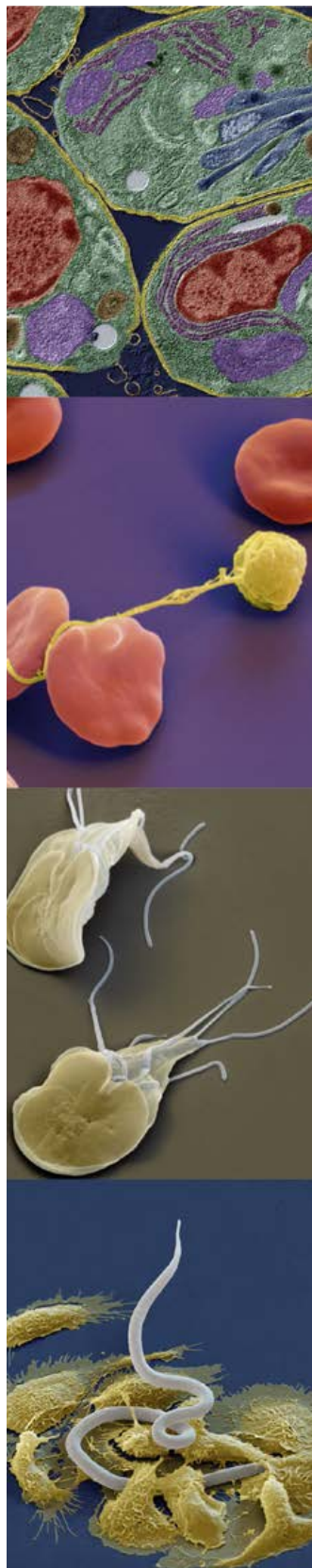
Students member area – GRK 2046

You can find all the nitty gritty details related to your life in the research training group in our students member area (requires a password). This includes cheat sheets on travel and how to host a guest speaker. Don't know where to find it? Search no more: <http://www.zibi-berlin.de/PM-students-intern/grk2046/index.html>

Don't know the secret password? Ask your fellows or Juliane.

Juliane Kofer





Publications

Review on our training program

We have published an article about training programs in parasitology and why they are so important (Kofer J, Hofer H, Hartmann S. (2017) Trends Parasitol 33(6):423-425). Fancy reading it? Hop on over to: <http://dx.doi.org/10.1016/j.pt.2017.03.008>

Juliane Kofer

Frontiers Research Topic "Parasite Infections: From Experimental Models to Natural Systems"

Ten publications by our doctoral researchers!

Our GRK 2046's research theme has been published in a special issue of "Frontiers in Cellular and Infection Microbiology". Congratulations to our contributing researchers!

The whole Research Topic Parasite Infections is available here: <http://journal.frontiersin.org/researchtopic/5289/parasite-infections-from-experimental-models-to-natural-systems>

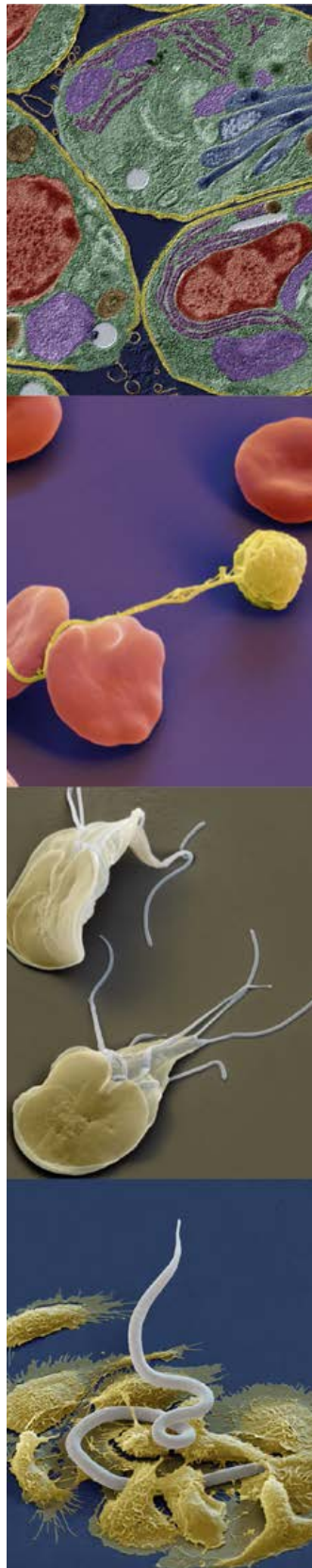
Contributing doctoral researchers: Ankur, Jonnel, Norus, Oriana, Susana, Suzana, Tina, Totta and Vivian

Juliane Kofer

Translational Rodent Models for Research on Parasitic Protozoa - A Review of Confounders and Possibilities

Totta Ehret, Francesca Torelli, Christian Klotz, Amy B. Pedersen and Frank Seeber

Rodents, in particular *Mus musculus*, have a long and invaluable history as models for human diseases in biomedical research, although their translational value has been challenged in a number of cases. We provide some examples in which rodents have been suboptimal as models for human biology and discuss confounders which influence experiments and may explain some of the misleading results. Infections of rodents with protozoan parasites are no exception in requiring close consideration upon model choice. We focus on the significant differences between inbred, outbred and wild animals, and the importance of factors such as microbiota, which are gaining attention as crucial variables in infection experiments. Frequently, mouse or rat models are chosen for convenience, e.g., availability in the institution rather than on an unbiased



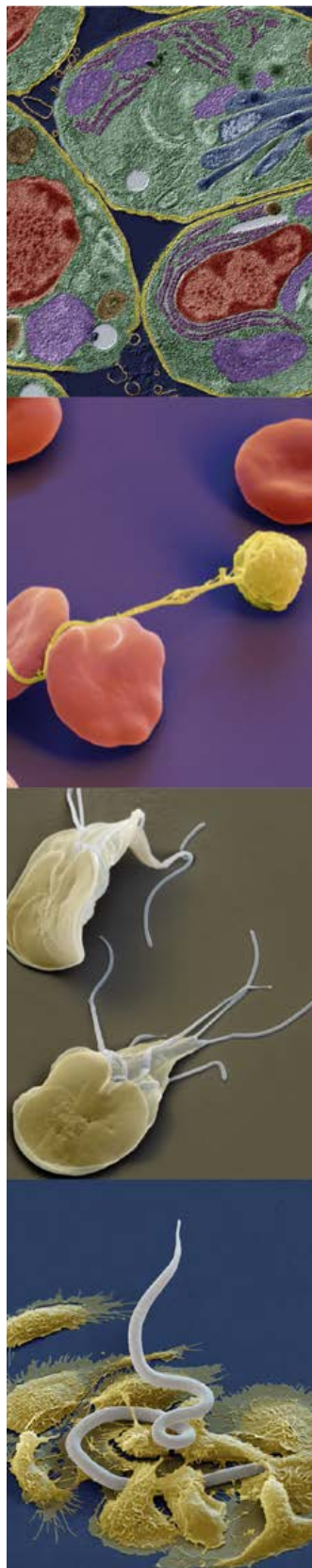
evaluation of whether they provide the answer to a given question. Apart from a general discussion on translational success or failure, we provide examples where infections with single-cell parasites in a chosen lab rodent gave contradictory or misleading results, and when possible discuss the reason for this. We present emerging alternatives to traditional rodent models, such as humanized mice and organoid primary cell cultures. So-called recombinant inbred strains such as the Collaborative Cross collection are also a potential solution for certain challenges. In addition, we emphasize the advantages of using wild rodents for certain immunological, ecological, and/or behavioral questions. The experimental challenges (e.g., availability of species-specific reagents) that come with the use of such non-model systems are also discussed. Our intention is to foster critical judgment of both traditional and newly available translational rodent models for research on parasitic protozoa that can complement the existing mouse and rat models.

<https://doi.org/10.3389/fcimb.2017.00238>

***Toxoplasma* Co-infection Prevents Th2 Differentiation and Leads to a Helminth-Specific Th1 Response**

Norus Ahmed, Timothy French, Sebastian Rausch, Anja Kühl, Katrin Hemminger, Ildiko R. Dunay, Svenja Steinfelder and Susanne Hartmann

Gastrointestinal nematodes are widespread and co-infections with other parasites and pathogens are frequently encountered in both humans and animals. To understand the immunological effects of protozoan infections on the anti-helminth immune response, we studied co-infection with the enteric nematode *Heligmosomoides polygyrus* in mice previously infected with *Toxoplasma gondii*. The protective Th2 immune responses against nematodes are dependent on IL-4, IL-5, IL-13, IgE and IgG1 antibodies. On the other hand, *T. gondii* infection elicits a strong and protective Th1 immune response associated with IFN- γ , IL-12 and IgG2a antibodies. Here we detected that co-infected animals showed significantly higher worm fecundity however worm burden remained unchanged. The Th2 response to *H. polygyrus* in co-infected animals showed a suppression of IL-4, IL-5, IL-13, GATA-3 expressing T cells as well as a lack of eosinophilia. However, the Th1 response to *T. gondii* was not diminished and parasitemia remained unaffected by helminth infection. Furthermore, co-infected animals showed reduced expression of the Th2 effector molecule RELM- β in intestinal tissue. Interestingly, *H. polygyrus* specific restimulation of splenocytes revealed *H. polygyrus*-reactive CD4⁺ T cells to produce IFN- γ in co-infected animals. This was not observed in animals infected with the nematode alone. In conclusion, a previous *T. gondii* infection



limits a helminth-specific Th2 immune response, while promoting a shift toward a Th1-type immune response.

<https://doi.org/10.3389/fcimb.2017.00341>

Reciprocal Interactions between Nematodes and Their Microbial Environments

Ankur Midha, Josephine Schlosser and Susanne Hartmann

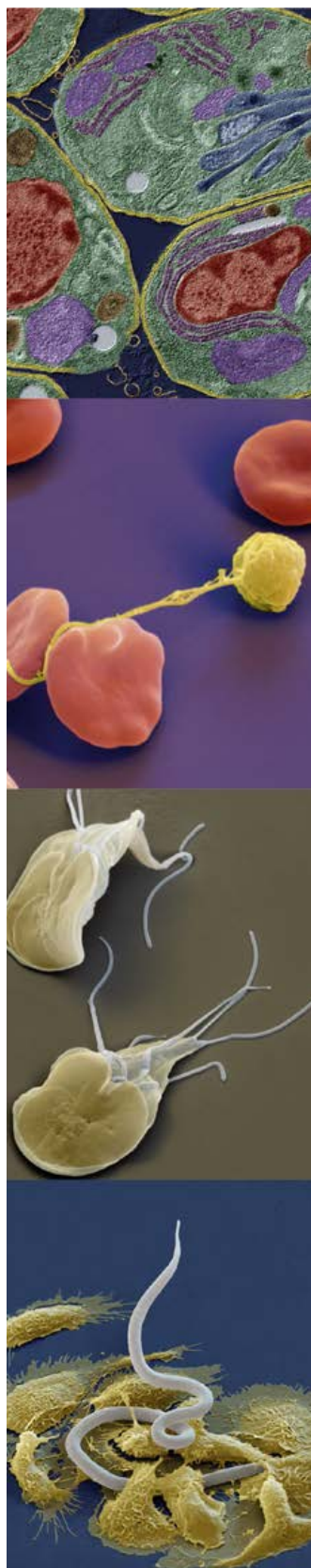
Parasitic nematode infections are widespread in nature, affecting humans as well as wild, companion, and livestock animals. Most parasitic nematodes inhabit the intestines of their hosts living in close contact with the intestinal microbiota. Many species also have tissue migratory life stages in the absence of severe systemic inflammation of the host. Despite the close coexistence of helminths with numerous microbes, little is known concerning these interactions. While the environmental niche is considerably different, the free-living nematode *Caenorhabditis elegans* (*C. elegans*) is also found amongst a diverse microbiota, albeit on decaying organic matter. As a very well characterized model organism that has been intensively studied for several decades, *C. elegans* interactions with bacteria are much more deeply understood than those of their parasitic counterparts. The enormous breadth of understanding achieved by the *C. elegans* research community continues to inform many aspects of nematode parasitology. Here, we summarize what is known regarding parasitic nematode-bacterial interactions while comparing and contrasting this with information from work in *C. elegans*. This review highlights findings concerning responses to bacterial stimuli, antimicrobial peptides, and the reciprocal influences between nematodes and their environmental bacteria. Furthermore, the microbiota of nematodes as well as alterations in the intestinal microbiota of mammalian hosts by helminth infections are discussed.

<https://doi.org/10.3389/fcimb.2017.00144>

The Intestinal Eukaryotic and Bacterial Biome of Spotted Hyenas: The Impact of Social Status and Age on Diversity and Composition

Emanuel Heitlinger, Susana C. M. Ferreira, Dagmar Thierer, Heribert Hofer and Marion L. East

In mammals, two factors likely to affect the diversity and composition of intestinal bacteria (bacterial microbiome) and eukaryotes (eukaryome) are social status and age. In species in which social status determines access to resources, socially dominant animals maintain better immune processes and health status than subordinates. As high species diversity is an index of



ecosystem health, the intestinal biome of healthier, socially dominant animals should be more diverse than those of subordinates. Gradual colonization of the juvenile intestine after birth predicts lower intestinal biome diversity in juveniles than adults. We tested these predictions on the effect of: (1) age (juvenile/adult) and (2) social status (low/high) on bacterial microbiome and eukaryome diversity and composition in the spotted hyena (*Crocuta crocuta*), a highly social, female-dominated carnivore in which social status determines access to resources. In line with our predictions, our results revealed a significantly less diverse microbiome in juveniles than adults and a significantly higher diversity of eukaryotes in high-ranking than low-ranking animals. We propose that free-ranging wildlife can provide an intriguing model system to assess the adaptive value of intestinal biome diversity for both bacteria and eukaryotes.

<https://doi.org/10.3389/fcimb.2017.00262>

Nematode Species Identification—Current Status, Challenges and Future Perspectives for Cyathostomins

Christina M. Bredtmann, Jürgen Krücken, Jayaseelan Murugaiyan, Tetiana Kuzmina and Georg von Samson-Himmelstjerna

In horses, co-infection with the nematodes cyathostomins is rather a rule than an exception with typically 5 to 15 species (out of more than 40 described) per individual host. A reliable morphological species differentiation is currently limited to adults and requires highly specialized expertise, while precise morphological identification of eggs and early stage larvae is impossible. The situation is further complicated by a questionable validity of some cyathostomins while others might actually represent cryptic species complexes. Several molecular methods using different target sequences were established to overcome these limitations. For adult worms, PCR followed by sequencing of mitochondrial genes or external or internal ribosomal RNA spacers is suitable to genetically confirm morphological identifications. The most commonly used method to differentiate eggs or larvae is the reverse-line-blot hybridization assay. However, both methods suffer from the fact that target sequences are not available for many species or even that GenBank® entries are unreliable regarding the cyathostomin species. For the first time proteomic tools that are already used for identification of metazoans, including insects and few nematode species, are evaluated for their suitability to diagnose cyathostomins. Future research should focus on the comparative analysis of morphological, molecular and proteomic data from the same cyathostomin specimen to optimize tools for species-specific identification.

<https://doi.org/10.3389/fcimb.2017.00283>



Student Conferences

21st Annual Woods Hole Immunoparasitology Meeting

2nd - 5th April in Woods Hole, USA

The long-standing conference affectionately known as WHIP took place over a few fresh days in Cape Cod, Massachusetts, USA. Session talks focused on innate and adaptive immune cells, mucosal immunity, neuroimmunology, and vaccination strategies in the context of parasite infection. The atmosphere was very relaxed and shared mealtimes provided ample time for students to mingle with group leaders and professors. Poster sessions coincided with the social evening after dinner, allowing scientific discussion to flow easily in a relaxed, conducive atmosphere. I found this conference to be one of the most engaging places I have experienced for discussing my research project, and I highly recommend all parasitologists to also attend this conference should the opportunity arise.



Image Credit: Jonnel Jaurigue

Jonnel Jaurigue

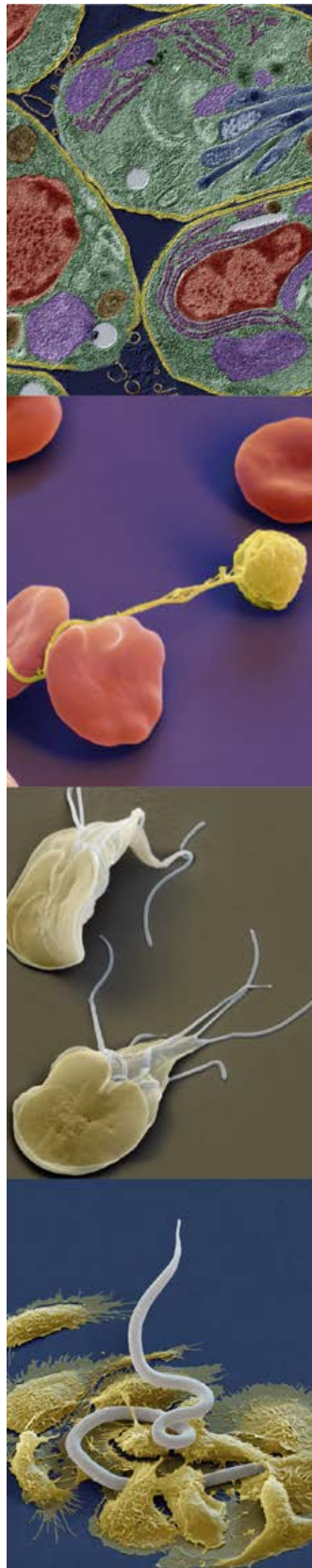
6th International Giardia & Cryptosporidium Conference

26th - 28th April in Havana, Cuba

The IGCC 2017 was held in the beautiful city of Havana, Cuba - the island of pirates, revolutionaries and guerilleros. At the Havana International Conference Center, a place which served Cuba's one and only legal party, the



Image Credit: Martin Kraft



Communist Party of Cuba, well throughout the past, we discussed recent findings on food and water transmission, zoonotic aspects, clinical health impact, host-parasite interaction and treatment methods of giardiasis and cryptosporidiosis beneath the gazes of Che Guevara and Fidel Castro from their omnipresent portraitures.

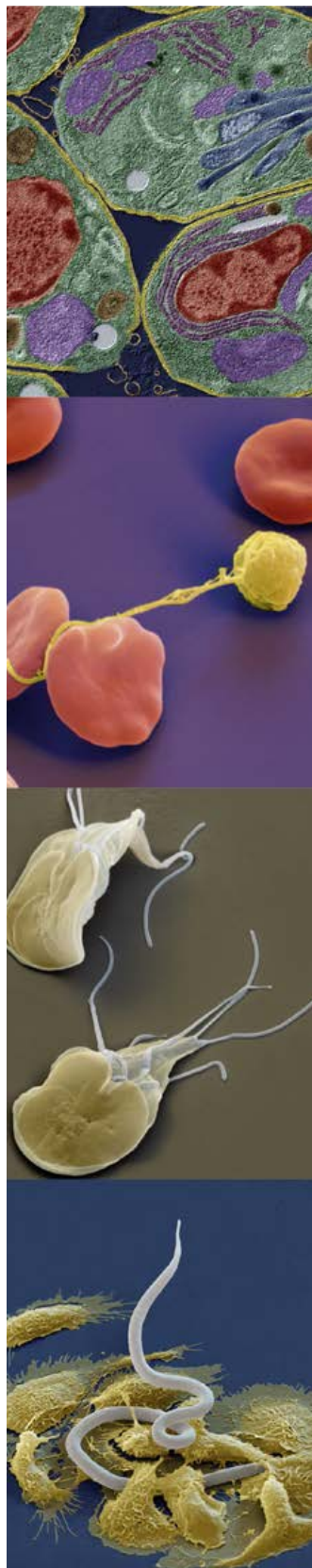
Despite a stronger focus on *Cryptosporidium* than *Giardia* this year, I was happy to meet more people working with the same parasite as I (Martin Kraft) do. I got the chance to show and discuss my results, receive feedback and explore Havana - also via bike, crazy taxi or nightly bar tours – together with those cool people. I witnessed a Cuban wedding, a funeral at sea and an animal (chicken) sacrifice for some kind of Voodoo. I also took the chance to join the Labor Day celebrations, which was way happier, relaxed and healthier than spending May 1st in Berlin. Viva Raúl! So I gained a lot of experience in both my field of science and the history and culture of Cuba from this wonderful trip. Thank you very much, GRK 2046.



Image Credit: Martin Kraft

As a final note, one valuable advice from the conference: Don't buy packaged sandwiches at large coffee shop franchises - unless you want to research them. They offer a remarkable degree of *Cryptosporidium*-contamination!

Martin Kraft



Workshop: Introduction to evolutionary biology for infection biologists

15th - 16th May in Berlin, Germany

Like last year, a workshop with the aim of introducing basic concepts of evolutionary biology to PhD students, interested in applying evolutionary thinking to their research areas took place at the Leibniz Institute for Zoo and Wildlife Research. For two inspiring days, we learned about evolutionary principles applied to health and disease, ecology, immunology and genetics. This workshop would not have been possible without the support of all the experienced and skilled scientists that not only gave great insightful presentations, but participated in the discussions of other speakers and all the interested and motivated attendees from different research areas and scientific backgrounds. The workshop was organized by Professor Heribert Hofer, Alice Balard and Susana Ferreira. If you missed this opportunity and think that applying evolutionary concepts to your research area will take you to another level, get involved and join the organization of next year's workshop!



Image Credit: Susana Ferreira

Susana Ferreira

Toxo-14: The *Toxoplasma gondii* research community biennial meeting 2017

31st June - 4th May in Tomar, Portugal

Every other year the *Toxoplasma* community meets to discuss recent findings and developments regarding their parasite. This year the conference took place in Tomar, Portugal, where Francesca Torelli, Norus Ahmed and I (Laura Radtke) went. After a little bit of traveling we arrived in Tomar, a small city by the river about 100 km north of Lisbon. Jonathan Howard, Director of the Instituto Gulbenkian de Ciência, Oeiras, Portugal, organized the conference together with his group and gave us the following nice description of Tomar: "The old medieval town is full of charm and interesting architecture, churches, houses, museums, and one of the only two surviving medieval synagogues in Portugal. In addition to this, Tomar has something genuinely astonishing, an architectural assemblage of religious buildings, ancient fortifications of world-class quality and interest, a UNESCO Heritage Site set on the hill behind the city."

We gathered in a beautiful hotel in front of the hill to discuss our research for four days. We listened to many talks and met world-famous researchers in the *Toxoplasma* community, as well as early stage researchers. Many fruitful discussions occurred during talks and poster sessions. New connections were

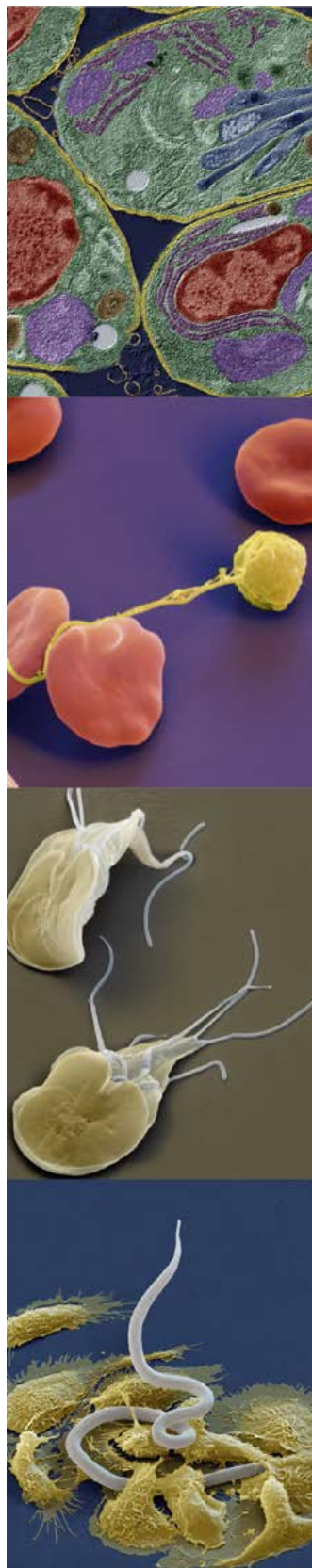


Image Credit: Toxo-14 meeting 2017

made during dinner and students got the chance to meet professors in a more casual environment.

Presentations and posters span several topics from news in ToxoDB over *Toxoplasma* infections in sea otters to innate sensing of *T. gondii* (and much more). But Toxo-14 sure was a success for all of us. We got great input and made important connections.

The non-scientific highlight was the gala dinner on the last evening. We all went to a castle on the hill, which Jonathan described. We had a Hogwarts-like dinner where they served a four-course meal for about 250 people in a beautiful and historical ceremonial hall – “genuinely astonishing”.

Laura Radtke

Tagung der Deutschen Veterinärmedizinische Gesellschaft - Fachgruppe “Parasitologie und parasitäre Krankheiten“

12th - 14th June in Hannover, Germany

The annual veterinary conference on parasitology and parasitic diseases of the German Veterinarian Society (DVG) hosted speakers from many different veterinary faculties in Germany and Austria who focus on a broad selection of different veterinary parasites. The speakers addressed a diverse range of challenges and problems in the parasitological veterinary field through clinical, epidemiological, pharmaceutical, as well as functional and molecular

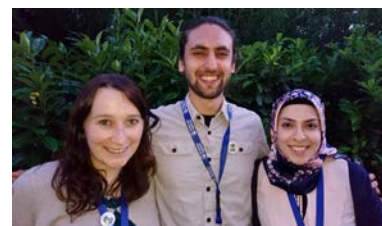
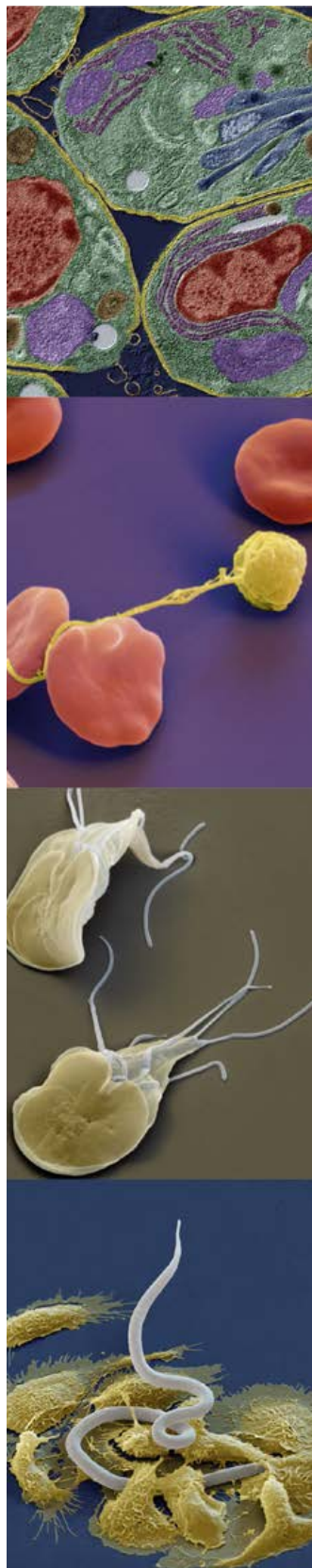


Image Credit: Christina Bredtmann



studies. The two keynote speaker from the UK and Denmark raised questions and proposed new perspectives, most notably and memorably for me, on the implication of organic farming on parasite control. From GRK 2046, Esra Yilmaz and Christina Bredtmann held excellent talks, which sparked the interest of the scientific community and led to lively discussions beyond the official speaker sessions. In addition to academic researchers, representatives from the pharmaceutical industry presented their latest results on new anti-parasitic treatments and policy makers joined the discussions at the social events.

This conference was a great opportunity to meet leading veterinary parasitologist and exchange knowledge, experience and opinions with different stakeholders of the field. To support networking and general communication, the conference offered long breaks in between sessions and two social evenings with outstanding food.

All in all, this conference represented the diverse range of research conducted in the field of parasitology and highlighted the clinical relevance of parasitic diseases in veterinary medicine.

Alexander Gerhard