Deutsche Gesellschaft für Parasitologie

Fraunhofer IME

18th Drug Design & Development Seminar (DDDS)

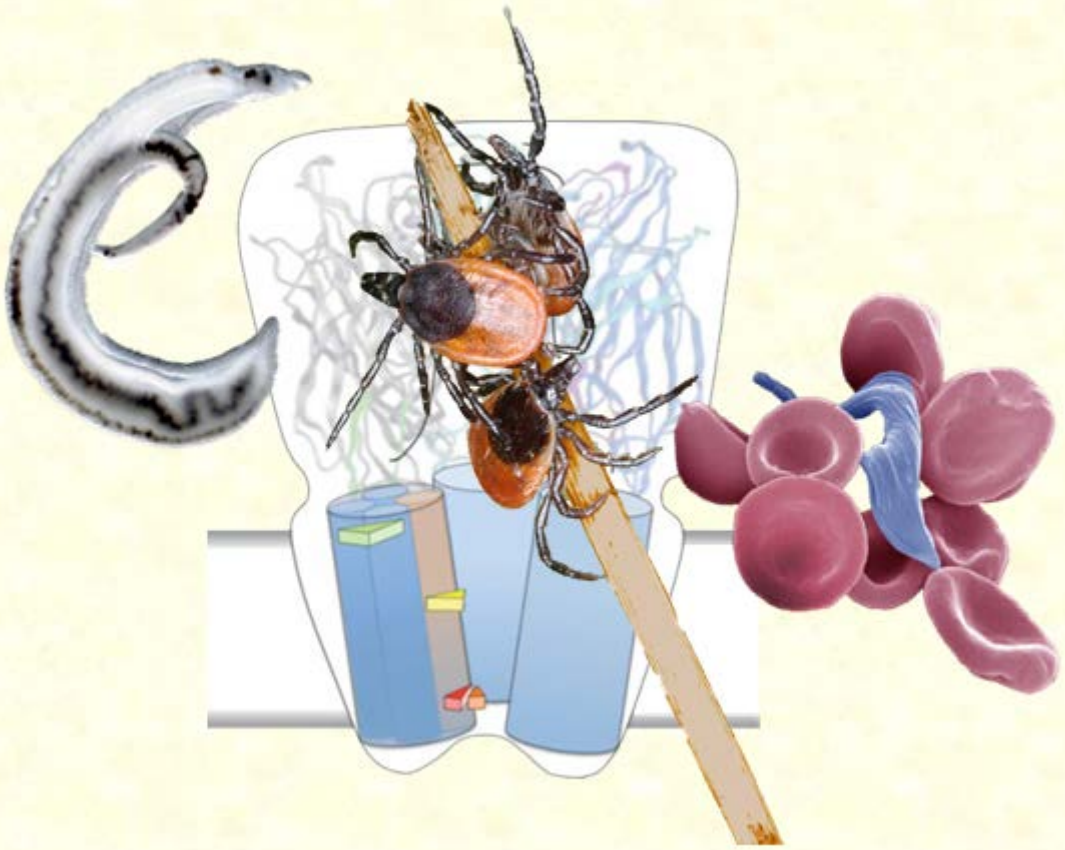
of the German Society for Parasitology (DGP)

March 30th – 31st, 2017

Forschungszentrum Borstel
Leibniz-Zentrum für Medizin und Biowissenschaften

Parkallee 1-40
23845 Borstel, Germany

Conference Report



We would like to thank the sponsors of the 18th Drug Design & Development Seminar of the German Society for Parasitology for their support:

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Scope of the meeting

The Drug Design & Development Seminar (DDDS) of the German Society for Parasitology (DGP) facilitates the exchange of scientific information about antiparasitic chemotherapy between universities, industry, and other research organizations. Independent of a DGP membership, the DDDS is open for scientists and professionals from all over the world, interested in the field of antiparasitic research. Meetings are held on a yearly basis – integrated in the biannual DGP main meetings and every other year as an independent intermediate meeting – in different venues. Among the most important focus areas of the DDDS are identification and validation of drug targets, identification of modulators of drug action, synthesis and optimization of lead compounds to develop marketable drugs and strategies to improve delivery of active compounds to infected hosts. This opportunity also brings together complementary approaches from the fields of human and veterinary parasitology aims to stimulate One-Health approaches to combat parasitic diseases.

Organization, venue and support

The 18th DDDS was organized by Fraunhofer IME-SP, Hamburg and took place at the Research Center Borstel - Leibniz-Center for Medicine and Biosciences in northern Germany on March 30th and 31st, 2017. Conference chairs and scientific committee members were Sheraz Gul (Fraunhofer IME-SP), Helmut Haas (helminGuard), Sandra Noack and the DDDS coordinator Paul M. Selzer (both Boehringer Ingelheim Animal Health GmbH).

The DDDS was generously sponsored by the DGP, Boehringer Ingelheim Animal Health GmbH, the Jung-Stiftung für Wissenschaft & Forschung, Hamburg, Merck KGaA, Darmstadt, and Wiley-VCH. The meeting attracted over 50 participants from around the globe who presented 29 scientific talks, including five keynote talks by invited expert speakers, and 8 posters.

Scientific program

The opening keynote lecture by Loïc Le Hir de Fallois (Boehringer Ingelheim Animal Health, Duluth, US) gave an overview on antiparasitic drug discovery and research in animal health, followed by some insights on the development of Afoxolaner isoxazoline as an example. Jan Perner from Czech Academy of Sciences, České Budějovice, CZ, presented data on the relevance of host protein hydrolysis, heme and iron metabolism system for the fertility of ticks. Sandra Schorderet-Weber, Neuchâtel, CH, highlighted parameters to be considered for an ideal drug profile for ectoparasiticides to prevent

Cover legend: From left to right:
Schistosoma mansoni – courtesy of Conor Caffrey, Skaggs School of Pharmacy and Pharmaceutical Sciences, UCSD, San Diego, USA; *Ixodes ricinus* - courtesy of Jan Erhart and Petr Kopáček, Institute of Parasitology, BC CAS, Prague, Czech Republic; *Trypanosoma brucei* among red blood cells – courtesy of Michael Duszenko, Interfaculty Institute of Biochemistry, University of Tuebingen, Germany; In the back: schematic representation of the CysLGCC sectional view - courtesy of Tina Weber, Merck Darmstadt & Paul M. Selzer, Boehringer Ingelheim Animal Health GmbH, Ingelheim, Germany

transmission of vector-borne diseases. Koen Dechering, TropIQ Health Sciences, NL, shared an impressive methodology for barcoding live mosquitos, which is used for high throughput discovery of compounds that interrupt transmission of malaria. Manu De Rycker from the Drug Discovery Unit Dundee, UK, illustrated the benefits of an academic-industry partnership in the discovery and lead optimisation of new drugs for neglected diseases, as outlined here by a promising new antileishmanial compound series.

The keynote presentation by Collette Britton, University of Glasgow, UK on parasitic helminth small RNAs showed new options to interfere with development and immune modulation in parasitic nematodes. The results of her work showed the potential of miRNAs and the pathways they regulate as novel drug targets for parasite control. Helmut Haas, helminGuard, Borstel, DE, demonstrated the capabilities of his *in vitro* culture system for *Schistosoma mansoni* in different life cycles (schistosomula, juveniles and adults), which can be used for compound screening.

Georg von Samson-Himmelstjerna, Freie Universität Berlin, DE, gave a keynote lecture on mechanisms of benzimidazole resistance in helminthes. It could be shown that different mechanisms are responsible for resistance, which complicates the identification of selection factors contributing to the evolution of specific resistance mechanisms. Heinz Sager from Elanco Animal Health, Basel, CH, pointed to the relevance for resistance monitoring tools for *Rhipicephalus (Boophilus) microplus* in the search for new compounds. The talk of Oliver Koch, Dortmund University, DE, showed a good example for application of *in silico* molecular design within the drug discovery process for *Mycobacterium tuberculosis* thioredoxin reductase inhibitors.

Jeremy Mottram from the University of York, UK, presented the development of an inducible gene knock-out system in *Leishmania mexicana*. This system was used to identify new potential targets in cell signalling and proteolysis for trypanosomatid drug discovery. Asaad Khalid, Jazan University, SA, pointed out the potential of natural bioactive compounds for drug discovery, making use of a myriad of structurally diverse compounds optimised during million years of evolution.

The final keynote lecture was given by Fiona Tomley, University of London, UK on coccidiosis in poultry, combining market data, epidemiology and knowledge on development of natural resistance. Genetics, multi-omics, reverse genetics and bio-imaging were used to address the challenges for disease control in today's global industry.

Conclusions

The 18th DDDS was an excellent scientific forum for disseminating antiparasitic research activities for the knowledge exchange between scientists working in the human and veterinary area. The meeting offered numerous opportunities to establish and intensify contacts between researchers within the field including academics from different countries as well as people affiliated with academic and industrial organizations. The exchange of expertise is an important prerequisite for joining intellectual forces to combat parasitic diseases. Moreover, the meeting inspired new collaborations between different scientific groups, and many new contacts were built which is a major driving force in innovating science on antiparasitic drugs and neglected tropical diseases.

Participants of the meeting in front of the Manor House of the Research Center Borstel - Leibniz-Center for Medicine and Biosciences.

- The 19th DDDS will be an integrated part of the 28th Meeting of the German Society for Parasitology, 21–24 March 2018, Berlin, Germany http://www.parasitology-meeting.de/
- The 20th DDDS anniversary meeting is planned to take part at the University of Gießen, Germany from 27–29 March 2019.