

High resolution approaches in virology: from cell ultrastructure to OMICS

Meeting report of the 17th Workshop “Cell Biology of Viral Infections” of the German Society of Virology (GfV) in Schöntal, October 15th–17th 2018.

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Group photo with 2018 workshop participants in front of the main building of Kloster Schöntal.

Once again the GfV workshop “Cell Biology of Viral Infection” aimed at bringing together virologists and cell biologists with the intention to promote and encourage collaborations on cell biological aspects of virus infections. New cell biological tools and approaches are clearly needed to understand fundamental principles of virus infection and enable preclinical research. The research of the four keynote speakers of the 2018 meeting perfectly illustrates this concept.

As in 2017, Dr. Pierre-Yves Lozach (Heidelberg) and Prof. Dr. Gisa Gerold (Hannover) organized the annual workshop. The conference was held at Kloster Schöntal, Germany, for the fifth consecutive time; this year from October 15th to 17th 2018. All participants stayed directly at the conference site, which stimulated active discussions during lunch and dinner gatherings as well as during the social events such as the wine tasting in the cellar.

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The theme of this year was “High resolution approaches in virology: from cell ultrastructure to OMICS”. The program included four keynote lectures, a workshop on scientific editing, 22 oral presentations, and a poster session. The workshop resonance was again great with 45 participants, including among others 23 students, nine post-docs, and five young group leaders. The majority of the junior scientists were virologists from various German academic research institutes, but also French, Swiss, Swedish, Hungarian, Chilean, and Czech scientists came to the former Cistercian monastery. The four excellent keynote speakers from Switzerland, USA, France, and Germany as well as the enthusiastic participants significantly contributed to the success of the workshop. We were extremely satisfied that students actively participated in the lively discussions with their colleagues including the keynote speakers.

The workshop opened with the inspiring keynote lecture “The bunyavirus envelope glycoprotein and evolutionary relations with other membrane-fusogenic proteins” given by Prof. Félix Rey from the Pasteur Institute in Paris, France. Prof. Rey dedicated his career to studying the structure of viral envelope proteins. His work is an excellent illustration of how viruses can contribute to improve our understanding of complex cell biological processes. During his keynote, Prof. Rey highlighted the various class-II fusion proteins that viruses use to penetrate cells and drew parallels with host cell-encoded fusion proteins involved in developmental biology.

Prof. Gisou van der Goot from the École Polytechnique Fédérale de Lausanne, Switzerland gave the second enlightening keynote, entitled “Function and regulation of protein palmitoylation”. Prof. van der Goot investigates molecular mechanisms of palmitoylation and discussed the role of this reversible post-translational modification in the intracellular trafficking of bacterial toxins and host proteins.

The third exciting keynote, “Dynamic organelle remodeling as a herpesvirus replication strategy”, was given by Prof. Ileana Cristea from the University of Princeton, USA. Prof. Cristea started her lecture by introducing herpesviruses

with a special accent on the viral replication. She put a particular emphasis on exciting new OMICS approaches developed in her group. In particular she showed that mass spectrometry based profiling of posttranslational modifications can help understand how herpesviruses subvert the host cellular machinery and remodel organelles during infection.

Prof. Kai Grünewald from the Centre for Structural Systems Biology, Hamburg, Germany, gave the final keynote on “Structural cell biology of virus-host interactions”. He beautifully described latest cutting-edge electron microscopy approaches. Prof. Grünewald then explained how state-of-the-art imaging methods such as super resolution CLEM can improve our understanding of the virus life cycle at the molecular level, using herpesviruses as main example.

This year, for the second time a short interactive session on scientific editing was organized. Ms. Jasmin Bakker, an associate editor at the Journal of Molecular Biology (Elsevier publishing group), gave an entertaining and insightful talk on the editorial process and pitfalls during manuscript submission. This provided an excellent platform for students to interactively discuss questions regarding the submission of their scientific work to international peer-reviewed journals.

Among the many excellent student presentations, the prize committee had the hard task to select two prize winners. Dr. Melina Vallbracht from the group of Dr. Barbara Klupp and Prof. Dr. Thomas Mettenleiter at the Friedrich-Loeffler-Institut in Greifswald-Insel Riems was awarded the prize for the best oral presentation with the title “Structure based functional analysis of the Pseudorabies virus gB fusion loops”.

Due to the high numbers of registrations, the 2018 workshop featured a poster session in addition to the oral communications. The poster session was extremely well attended with many fruitful discussions in a friendly environment. Ms. Jana Koch from the lab of Dr. Pierre-Yves Lozach at the University of Heidelberg received the award for the best poster presentation for her work on the “Cell biology of Toscana virus entry”.

According to immediate feedback from participants ranging from students to keynote speakers, everybody praised the high quality of all presentations, the friendly and engaging discussions that lasted until the last glass of wine. In particular the students appreciated the feedback on their work and new insights into other topics in Cell Biology of Viral Infections.

The organizers would like to thank the German Society for Cell Biology (DGZ) and the Society for Virology (GfV) for their support. The workshop would also not have been possible without generous contributions from the Chica and Heinz Schaller (CHS) Foundation as well as the companies ReBlikon and the Journal of Molecular Biology.

We already look forward to the 18th annual workshop, which will be held again at the Kloster Schöntal, October 23rd–25th 2019, with the new exciting theme, “Cell biology of zoonotic viral infections: from reservoirs to humans”. More information and updates can be found on the workshop’s website (www.gfv-cellviro.de).