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ORAL ABSTRACT PRESENTATIONS
SESSION TITLE: STRUCTURE OF VIRUSES AND CHAPERONINS

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## Abstract OR-9: Cryo-Electron Microscopy Studies of Flaviviruses

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**Background:** Flaviviruses cause human disease such as dengue fever, West Nile fever, and Zika fever with high degree of severity. There are almost no licensed vaccines and treatment except symptomatic for these diseases. Our group studies the virus structure and interactions with ligands such as receptors and antibodies in order to understand the virus' life cycle with the aim to find possible preventive or curative drugs.

**Methods:** For structural biology work, we employ mostly cryo-EM such as single particle analysis and cryo-electron tomography to study complexes of the virus with antibody fragments.

**Results:** We obtained subnanometer and near-atomic resolution cryo-EM structures for immature and mature forms of dengue virus serotype 1, dengue virus serotype 4, and zika virus. We described a possible maturation pathway based on the higher resolution structures. We also described a temperature-dependent structural change that occurs in some strains of the flaviviruses, important for vaccine development. In addition, we described a cryo-EM structure of a complex of a dengue virus and antibody fragment that demonstrates that in some cases cryo-EM is superior to X-ray crystallography as providing a fuller picture of the virus and antibody interaction.

**Conclusion:** Modern cryo-EM allows us a better and more detailed look at the viruses, their life cycle and help the development of a better vaccines and therapeutics.

**Key Words:** Dengue virus • Zika virus • Flavivirus • Cryo-EM

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