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Master thesis subject:

Biophysical characterization of a new peribunyavirus using dynamic light scattering and cryo electron microscopy.

Cryo electron microscopy became number one method for structural determination of virus particles in the last decade. High resolution structures solved by so called 'Single Particle Recognition' require very pure and stabilized samples to prevent damage of the virus particle during cryo fixation. We are developing purification strategies for enveloped and unenveloped animal viruses. The interaction of viruses with different buffer systems and in combination with various grid preparation techniques is our target of investigation.

Project Description:

Your task will be the production of virus containing cell culture supernatants followed by virus purification and concentration, that is in principal established in our lab. The virus is a not characterized enveloped peribunyavirus isolated from fish.

The development of a simple buffer screening workflow and the analysis of samples with dynamic light scattering will be the main aim of the project. Successful candidates can be tested in cryo fixation and observed in cryo transmission electron microscope.

The results will have an impact in the understanding of using different viral structural elements during infection of varying vertebrate hosts. The structural adaptation of a virus to new ecosystems could lead to an amplified change in their thermodynamic stability.

Methods:

- Virus cell culture (eukaryotic cells)
- Ultracentrifugation
- Dialysis
- Buffer Screening in 96 well format
- Dynamic light scattering (Spectro Light 610)
- Grid preparation (GloQube Plus)
- [Cryo fixation (Vitrobot Mark IV)]
- [Cryo electron microscopy (Talos F200i(c))]

The research will be carried out under biosafety level 2 conditions (BSL2) in the Lab of Electron Microscopy being located in the Institute of Infectology in the Friedrich-Loeffler Institute.

If you are highly motivated in getting experiences in the in vitro handling of viruses during your master thesis and for further information, feel free to contact:

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Mit freundlichen Grüßen



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