

HALRIC Research Internship Programme

Internship Proposal

Project Title: Uncovering the processive mechanism of bacteriophage Endosilidase NF with time-resolved crystallography.

Name of Institution/Country: Universitätsklinikum Hamburg-Eppendorf (UKE), Germany

Name of internship provider: Dr Robert Bosman (PostDoc), Dr Eike C Schulz (Group Leader)

Contact details: r.bosman@uke.de

Proposed timeframe: 3-6 months

Application deadline: June 6th 2025, start date to be negotiated

Administrative contact person at the organisation: Kerstin Hambrock, k.hambrock@uke.de

Scientific research questions

Investigating the dynamics and subunit coordination of the bacteriophage endosilidase EndoNF during binding and cleavage of N-acetyl-neuraminic acid during phage infection.

Experimental approach

We will utilise combination of high-resolution sub-zero cryo-soaking to trap the Enzyme-substrate complex, as yet unobserved. This will be complemented with time-resolved T-jump experiments and rapid-mixing experiments utilising micro-crystals via the cryo-trapping device, spitrobot. Micro-crystals may also be optimised toward Micro-ED measurements at the CSSB.

Tasks of the intern

- Protein purification and expression (protocol established).
- Growing large crystals (protocol established).
- Cryo-soaking experiments (with supervisor).
- Screening large crystal conditions for sub-zero soaking experiments. (with supervisor)
- Screening for micro-crystallisation conditions.
- Data collection at P14/P13 beamlines EMBL.
- Room temperature collections on HARBOR home-source.

General information about the work group, the university and the region

AG Schulz is a new research group at the UKE focusing on applying time-resolved structural biology methods to unravel the molecular mechanism of disease. We apply several methods in dynamic crystallography to understand and exploit protein dynamics for clinical applications. We are part of the Biochemie and Signaltransduktion institute at the UKE and sit at the HARBOR institute on the Bahrenfeld campus in Hamburg, with regular access to beamtime at the EMBL beamlines.

Eligibility and qualification of the applicant.

We are seeking an MSc or BSc with a Biosciences or Chemistry background, with interests in structural biology, with a focus on crystallography. The ideal candidate should enjoy interdisciplinary work, be self-motivated, and keen to work independently in the lab.