

**Master 2 internship project
Year 2026-2027**

Laboratory/Institute: IBS
Team: Virus Replication Machines (VRM) group

Director: W. Weissenhorn
Head of the team: Darren Hart

Name and status of the scientist in charge of the project:

HDR: yes ☒ no ☐

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Program of the Master's degree in Biology:

- ☐ Microbiology, Infectious Diseases and Immunology ☒ Biochemistry & Structure
☐ Physiology, Epigenetics, Differentiation, Cancer ☐ Neurosciences and Neurobiology

Title of the project: Tools for mapping virus-host associations at metagenomic scale

Objectives :

We are combining protein engineering, structural biology and biochemistry to develop new enzyme tools to link together infecting viruses with their host cells. In this way, we can identify which viruses are infecting which cells in clinical and environmental samples.

Abstract :

Metagenomic sequencing identifies both viruses and microbial cells in environmental and patient samples. However, it remains unclear which viruses infect which hosts among the long species lists.

This EU-funded project is part of a new large European consortium developing biotechnological tools to answer this question, with applications from medicine to ecology. Our work focuses on atomic-scale analysis of virus-protein interactions and on developing tools to link viruses to their hosts using NGS-based metagenomic protocols. We will analyse oceanic samples in collaboration with international consortium partners.

Future applications include phage therapy to address antibiotic resistance and microbiome analysis to improve gut health.

Methods :

Molecular biology, protein biochemistry, mass spectrometry, biophysical characterisation, electron microscopy.

Requested domains of expertise :

DNA handling, SDS-PAGE, protein purification, computer skills, good English level