

**SBCP MASTER
INTERNSHIP 2025-2026**

TITLE	Ultra-long Phages as Colloidal Analog of Molecular Polymers
COMPETENCES / INTERESTS	Soft Matter Physics, Physical-chemistry, Interface with biology, Optical microscopy for direct visualization of the phenomena
SUBJECT	<p>Bacteriophages are nanostructured viruses that infect bacteria, and are widely used as model systems, with applications ranging from nanoscience (as functionalizable scaffolds), and soft matter (as model system for colloidal liquid crystals) to medicine (as potential antibiotic alternatives). Recently, ultra-long filamentous bacteriophages have been developed, up to seven times larger than standard wild-type strains, making it possible to observe them as single particles directly using optical microscopy.</p> <p>This Master's internship aims to exploit these ultra-long flexible viruses as analogues of molecular polymers, in order to study their dynamics and self-assembly in solution. The functionalization of these phages with fluorescent dyes will enable direct visualization of their interactions under optical microscopy. By mimicking molecular polymers at a larger length scale, these systems will provide new insights into the physical phenomena governing the behavior of macromolecules and polymers.</p> <p>This interdisciplinary internship, carried out within an international team, offers the opportunity to work at the interface of chemistry, physics, and biology, and calls for curiosity and interest across these scientific fields.</p> <p>Reference : Elucidating chirality transfer in liquid crystals of viruses E. Grelet, M. Tortora, Nature Materials 23, 1276 (2024).</p>
TECHNIQUES USED	Physical-chemistry, formulation for sample preparation, optical microscopy (fluorescence, brightfield), transmission electron microscopy
HOST LABORATORY	Centre de Recherche Paul-Pascal (UMR 5031) CNRS & Université de Bordeaux
TEAM	(Bio 2.0
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