

INTERNSHIP AT LANGEVIN INSTITUTE 2024  
ICFP MASTER

LABEL FREE DETECTION OF VIRUS-CELL INTERACTION:  
IMAGING OF VIRAL FACTORIES

The goal of this research project is reveal the presence of virus replication sites within infected cells. Indeed monitoring infected cell behavior is of major importance in medical/pharma research as well as in understanding the cycling organic carbon in the ocean.

We will use phages and marine virus that are not harmful to human.

The cells involved here would be bacteria (E.coli) and diatoms (algae primary producer of organic carbon).

In order to tackle these biological/pharma problems we will use a label free physical technique. This tomographic optical microscopy approach recently developed at Institute Langevin is able to detect virus particles and changes in cell metabolism.

During the internship the student will be trained to use the technique of Full Field Optical Transmission Tomography as well as introduce to a few virological methods.

(a) Boccara, M., Fedala Y., Vénien-Bryan C., Bailly-Bechet M., Bowler C., Boccara A.C., Full field interferometry for counting and differentiating aquatic biotic nanoparticles: from laboratory to Tara Oceans. Biomed Opt Express Vol. 7, 3736-3746, (2016).

(b) Houda Bey, Florent Charton, Helena Cruz de Carvalho, Shun Liu, Richard G. Dorrell, Chris Bowler, Claude Boccara & Martine Boccara (2022): Dynamic Cell Imaging: application to the diatom *Phaeodactylum tricornutum* under environmental stresses, European Journal of Phycology

CONTACTS

Martine BOCCARA : [boccara.martine@gmail.com](mailto:boccara.martine@gmail.com)

Ignacio IZEDDIN : [ignacio.izeddin@espci.fr](mailto:ignacio.izeddin@espci.fr)

Claude BOCCARA : [claud.boccara@espci.fr](mailto:claud.boccara@espci.fr)