



Post-doctoral position on the roles and interplay between RNA-based defense systems in the interactions of *Clostridioides difficile* with phages

A two-year post-doctoral position funded by collaborative project grant of the ANR (The French National Research Agency), is available from **March 2025** in the laboratory “Regulatory RNAs in Clostridia” headed by Olga Soutourina, Professor at Paris-Saclay University, at the **Institute for Integrative Biology of the Cell in Paris region, France**.

The post-doctoral fellow will participate in the exciting collaborative project combining functional genomics, molecular biology, bacterial genetics and bioinformatics **to address the role of RNA-based defense systems in the emergence of highly adapted bacterial pathogens such as *Clostridioides difficile***. *C. difficile* is the major cause of nosocomial infections associated with antibiotic therapy. Despite recent efforts, many aspects of *C. difficile* pathogenesis associated with adaptation strategies remain poorly understood. During the infection *C. difficile* survives in phage-rich gut communities by relying on defense systems like CRISPR (clustered regularly interspaced short palindromic repeats)-Cas (CRISPR-associated). RNAs have emerged as key components of Toxin-Antitoxin (TA) and abortive infection (Abi) systems that contribute to prophage maintenance, prevention of phage infection, and stress response. This project is built upon our recent data on CRISPR-Cas, TA and Abi-like systems in *C. difficile* frequently associated with prophages. Our goal is to decipher the original interplay between these systems and their contribution to *C. difficile* adaptation and interactions with phages. We will use an integrative strategy to identify the roles of RNA-based defense systems with associated protein machineries in *C. difficile*, contributing to its fitness inside the host, and to cover evolutionary aspects of these mechanisms. These data will shed new light on the coordination of bacterial defense and regulatory strategies and genome evolution, pertinent for the development of phage and genome editing, epidemiological monitoring and new therapeutic strategies.

The successful candidate will have a recent PhD in microbiology or molecular biology with solid background knowledge in bacterial genetics, phage biology and regulatory RNAs. We are seeking for highly motivated candidates with a strong interest in the field of RNA biology, phage-bacteria and host-pathogen interactions. The previous experience in the manipulation of bacterial genomes, phages and bacterial defense mechanisms, RNA-based regulations, RNA-protein interactions and/or physiology of anaerobic bacteria will be useful for this project. Skills in high-throughput sequencing methods and analysis of data would also be recommended. Good communication skills in English are required.

Interested candidates should contact Pr. Olga Soutourina at olga.soutourina@i2bc.paris-saclay.fr and send a Curriculum Vitae, including past research experiences and publication records, as well as a letter detailing their motivation and interest in our project. Applicants should also provide the names and contact details for two or three references and recommendation letters.