Title: RNA biology at the phage-bacteria interface.

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Institute: International Institute of Molecular and Cell Biology in Warsaw
Laboratory: Laboratory of Single-Molecule Biophysics
www: https://shorturl.at/lUIuS

Project description:

Acinetobacter baumannii is a major public health threat, known for its multidrug resistance and ability to thrive in hospital settings. With limited treatment options and high mortality rates, it has been identified by the WHO as a critical priority for new antibiotic development. One promising area of research involves bacteriophages—viruses that infect bacteria—and the molecular strategies they use to take over bacterial cells. A key aspect of this study is the role of RNA-binding proteins (RBPs), both from the bacterial side—such as the RNA chaperone Hfq—and from phages, including a Ro60 homolog that may guide host RNA to degradation pathways. By investigating how these RBPs function during infection, we aim to uncover new mechanisms that could be harnessed to combat resistant bacterial strains.

Aim:

The goal of the project is to elucidate the molecular mechanisms by which RBPs mediate phage-host interactions in *Acinetobacter baumannii*, with a focus on the bacterial RBP Hfq and a phage-encoded Ro60 homolog. To achieve this, we will employ a combination of transcriptomic, biochemical, and biophysical approaches. We will identify RNA and protein interaction partners of both Hfq and Ro60 under normal and phage-infected conditions. Additionally, in vitro assays will be conducted to dissect the RNA-binding specificity, dynamics, and functional roles of these proteins. Together, these methods will provide a comprehensive view of RBP-mediated regulation during phage infection.

Requirements:

- Master's degree in biology, biochemistry, or related fields.
- Solid knowledge of fundamental molecular biology and biochemistry.
- Hands-on laboratory experience and familiarity with basic molecular biology techniques.
- Previous experience working with phages and/or RNA or protein biochemistry is an advantage.
- Proficiency in spoken and written English.
- Strong interpersonal skills, initiative, and good organizational abilities.
- Willingness to learn and take on new challenges, strong analytical thinking skills, and the ability to work independently.

Number of positions available: 2

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