

Project 9.5 RNA targeting and degradation in human pathogen, *Acinetobacter baumannii*

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Laboratory: Laboratory of Single-Molecule Biophysics

www: <https://shorturl.at/IUuS>

Background:

Antibiotic resistance in bacteria, including *Acinetobacter baumannii*, represents a significant global healthcare challenge. Understanding the molecular mechanisms underlying bacterial RNA metabolism is essential for developing innovative therapeutic strategies. This project aims to investigate the protein interactions and regulatory dynamics of RNase E, a critical enzyme in RNA processing and degradation in *A. baumannii*. Furthermore, the project will explore the role of the RNA chaperone protein Hfq, particularly its unusual glycine-rich C-terminal tail, in mediating sRNA-mRNA interactions.

Aim:

The aim of this project is to investigate the molecular mechanisms of RNA metabolism in *Acinetobacter baumannii*, with a specific focus on RNase E and Hfq. This involves identifying the components of the RNA degradosome using co-immunoprecipitation and mass spectrometry. Once these proteins are identified, their functional roles in RNA processing and degradation will be examined using biophysical and biochemical methods. Additionally, the project aims to characterize the *A. baumannii* Hfq protein's role in facilitating sRNA-mRNA annealing through single-molecule TIRF microscopy. By analyzing the impact of Hfq on RNA stability and degradation, this study seeks to reveal novel regulatory pathways and identify promising targets for the development of antibacterial therapies.

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 in recombinant protein purification and microscopy is a plus,
- proficiency in spoken and written English,
- strong interpersonal skills, initiative, and good organizational abilities,
- willingness to learn and take on new challenges, ability to work independently, and analytical thinking skills.

Number of positions available: 1

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