Title: RNA-Protein Interactions in Human Health and Disease (NCN/DIOSUCRI).

Supervisor: Professor Gracjan Michlewski
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Laboratory: Laboratory of RNA-Protein Interactions - Dioscuri Centre
www: https://shorturl.at/FUgZx

Project description:

In recent years, we have witnessed the most significant pandemic of modern times, driven by the RNA virus SARS-CoV-2 and resulting in the global crisis of COVID-19 disease. At the same time, mRNA vaccines have saved millions of lives and marked the beginning of a new era in RNA-based medicine. Yet every RNA molecule, whether endogenous, viral, or a therapeutic mRNA synthesised via *in vitro* transcription (IVT), does not act alone. It constantly interacts with RNA-binding proteins (RBPs), which govern its function, stability, and immunogenicity. Despite the central role of these interactions, our knowledge of RNA-protein dynamics across different RNA contexts remains limited. A deeper understanding is essential to grasp their biological impact and unlock their therapeutic possibilities.

Aims of the project:

This project aims to uncover previously unrecognised mechanisms by which RNA-binding proteins interact with RNA molecules, particularly in the context of immune sensing and RNA degradation. We will investigate how specific RNA-binding proteins influence the recognition and processing of foreign RNA, such as that originating from RNA viruses or RNA-based therapeutics. In addition, we will focus on identifying key RNA features, regulatory factors, and cellular pathways that govern innate immune responses. The long-term goal is to support the development of more effective and safer RNA-based treatments alongside improved antiviral therapies.

Requirements:

1. MSc degree in biology, biochemistry or related field
2. Solid knowledge of the principles of cell and molecular biology, virology or biochemistry
3. Hands-on experience in laboratory work and is familiar with basic cell and molecular biology techniques
4. Prior experience in virus handling and analysis, cell culture, mass spectrometry or bioinformatics will be an advantage
5. Proficiency in written and spoken English
6. Excellent interpersonal skills, initiative and ability to work independently and in a high-performance team

Number of positions available: 1

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