

Title: Investigating the mechanisms of viral translation initiation (NCN/SONATA BIS).

Supervisor: Stefan Bresson, PhD

Institute: International Institute of Molecular and Cell Biology in Warsaw

Laboratory: Laboratory of RNA Viruses

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

Project description:

Upon infection, viruses hijack the cell's protein synthesis machinery and use it to assemble new viral proteins. One common strategy involves the use of an internal ribosome entry site (IRES), an RNA element which directly recruits host ribosomes to the viral RNA, bypassing conventional cap-dependent initiation. In order to function effectively, IRESs require the assistance of various cellular RNA-binding proteins. These accessory factors, termed ITAFs (IRES *trans-acting* factors), help the IRES fold into its final, active conformation. Our overarching goal is to identify novel cellular ITAFs which activate viral translation. In the future, these proteins could be targeted to treat viral disease.

Aim:

In this project, we aim to characterize factors involved in IRES-dependent translation of picornaviruses, a diverse family of RNA viruses which includes numerous human pathogens. This work will involve: (1) high-throughput screening for cellular proteins which bind the viral IRES element, and (2) functional characterization of the identified proteins (viral infection and translation assays, CLIP-seq, etc.). In this project, you will learn: mammalian cell culture and viral infection, CRISPR/Cas9 gene editing, high-throughput proteomics and sequencing, and data analysis.

Requirements:

- MSc degree in biology, biochemistry, or related field
- Solid knowledge in at least one of the following disciplines: molecular biology, biochemistry, or microbiology
- Basic hands-on experience in molecular biology
- Written and spoken fluency in English
- Willingness to learn and take on new challenges, ability to work independently, analytical thinking
- Good interpersonal skills and a collaborative attitude.

Number of positions available: 1

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