PhD position in „Prot-RAN: What drives the RAN translation" project

funded by NCN-Sonata 15

Institution: Adam Mickiewicz University in Poznań, Institute of Molecular Biology and Biotechnology, Gene Therapy Laboratory

Project description:
In Prot-RAN project, we will focus on the expansion of trinucleotide CGG repeats (CGG^{exp}) in the 5'UTR of *FMR1* gene, which causes common neurodegenerative disease, fragile X-associated tremor/ataxia syndrome (FXTAS). The pathogenesis of FXTAS remains unclear, and to date, various pathogenesis models have been proposed. One of the possible mechanism is the repeat associated non-AUG initiated (RAN) translation. This phenomenon is based on the observation that the expanded short tandem repeats can trigger the production of mutant proteins, without the canonical AUG initiation codon, which is usually used for protein translation. Resulting aberrant proteins accumulate in nuclear inclusions in the brain of FXTAS patients, leading to neuronal death.
Despite emerging reports about the possible mechanisms driving RAN translation, still little is known about this process. The main goal of the Prot-RAN project is to identify the proteins regulating RAN translation, which will help to understand the disease mechanisms and find potential drug targets for neurodegenerative diseases- FXTAS, HD and other short tandem repeat expansion disorders.
To achieve this goal, we will bridge cutting-edge proteomics with RNA biology techniques. Briefly, we will employ the CGG^{exp} RNA-targeting pull-down approaches combined with proteomic profiling, RNA mutagenesis, protein expression analysis and RNA/protein interaction studies. The role of identified proteins will be then verified in other expansion disorders, e.g. HD, giving insight into more global context of the RAN translation. As a result, the discovered factors driving RAN translation could be used as potential new targets for therapeutic strategies of microsatellite expansion disorders.

Profile of candidates/ requirements:
- Master degree in biology, biochemistry, genetics, computational biology or related life science field
- Excellent university records (grades, honors and prizes, subject and quality of their MSc thesis)
- Experience in human molecular genetics, molecular and cellular biology, cell culture.
- Experience in proteomics and/or mass spectrometry will be a plus.
- Enthusiasm for science, ability to work independently as well as collaboratively, strong organizational and communication skills,
- Good command of English

Key responsibilities:
The experiments proposed in the project will include searching for the role of protein candidates in the mechanism of RAN translation in various diseases associated with the expansion of trinucleotide repeats. To do so, we will use techniques such as gene cloning, gene silencing and overexpression, SDS-PAGE, western-blot, flow cytometry, mass spectrometry.

Application deadline: 31.07.2020

Please submit the application to:
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