Title: Therapeutic and endogenous mRNAs metabolism

Supervisor: Professor Andrzej Dziembowski
Institute: International Institute of Molecular and Cell Biology in Warsaw
Laboratory: Laboratory of RNA Biology – ERA Chairs Group
www: https://shorturl.at/lyzS5

Project description:
mRNA vaccines have proven to be a game-changer in the fight against COVID-19 pandemic, paving the way for mRNA-based therapies to become more widely used in medicine. However, there are still significant knowledge gaps in our understanding of mRNA metabolism at the organismal level, which limits the optimization and refinement of these therapies. Broadly speaking, we plan to investigate ways to increase the stability of mRNA, allowing for their deeper integration into therapeutic medicine.

The stability of mRNA molecules is affected by the length of the Poly(A) tail, which has, in turn, an effect on how well therapeutics work. The data gathered by our team revealed that the variability in the way poly(A) tails are processed in different cells is much larger than previously thought. The newly funded Europen Research Council *Vive*RNA project will use experimental and computational approaches to enhance the accuracy of the Direct RNA Sequencing method used to determine the properties of mRNAs. With the help of transgenic mouse models, primary cell culture, and synthetic biology approaches, the project will facilitate the design of next-generation mRNA therapeutics.

Aim:
The exact nature of the project will depend on the skills, predispositions, and interests of the selected PhD student. It may focus on:

- analysis of mRNA stability *in vivo* with the help of transgenic mouse models
- mastering of the DRS methodology in either the experimental part or bioinformatic analysis.
- analysis of principles of mRNA stability control and design of more efficient mRNA based therapeutics

Requirements:

- Master's degree in biology, biochemistry or related field
- Highly talented individuals who are passionate about research and are full of scientific curiosity
- Experience in either: molecular biology/transcriptomics, animal models, bioinformatic analysis of transcriptomic data, will be a clear benefit
- Written and spoken fluency in English
- Willingness to learn and take new challenges, ability to work independently, analytical thinking
- Good interpersonal skills and a collaborative attitude.

Number of positions available: 2

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The application system will be activated from July 29, 2023 to August 11, 2023