Title: mRNA-modifying enzymes in mammalian hormonal systems: from cell models and transgenic mice to human genetics

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Project description:

How do cells rapidly boost protein production when the body needs it most? Our research has uncovered a key role for cytoplasmic mRNA polyadenylation in immunity (Bilska et al. Nat Commun; Liudkovska et al. Sci Adv), bone formation (Gewartowska et al. Cell Rep), and vaccine responses (Krawczyk et al. Nature). We are now investigating how this mechanism contributes to human phenotypic variation and whole-body homeostasis regulated by inter-organs communication.
The project combines transcriptomics, nanopore sequencing, human genotype–phenotype analyses, and functional studies in cellular and mouse models. Researchers will also have access to advanced bioinformatics pipelines (Guminska et al. Nat Comm), state-of-the-art imaging technologies, and newly established mass spectrometry and electron microscopy facilities (IN-MOL-CELL).

Aim:

The PhD project offers the opportunity to pursue one or more of the following directions:

- **Human genetics**: linking genetic variation with human phenotypes using large biobanks.
- **Nanopore sequencing**: exploring mRNA polyadenylation using long-read sequencing.
- **Functional studies**: in stem cells and transgenic mice with proteomics and phenotyping platform.
- **Tissue biology**: investigating differentiation in cleared organs with light-sheet microscope.

The final project will be tailored to the candidate's strengths, interests, and career goals.

Requirements:

You are a motivated MSc graduate in life sciences or computational biology who enjoys asking biological questions and solving them through research. We particularly value:

- Master's degree in biology, biotechnology, biochemistry or computational biology
- Interest in molecular and cellular mechanisms of gene regulation.
- Experience in experimental or computational biological research.
- Curiosity, creativity, and a willingness to learn new methods.
- Strong analytical and communication skills.
- The ability to work both independently and as part of a collaborative team.
- Good command of English.

Number of positions available: 2

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