

Djinovic & Jantsch Labs

Master's thesis in structural biology

Understanding the consequences of RNA-editing at the structural level

About the labs

The labs of Kristina Djinovic-Carugo and Michael Jantsch are teaming up to understand how RNA-editing induced recoding of the pre-mRNA encoding the actin crosslinking protein filamin A changes the structure of this protein. To achieve this, the protein structure of parts of the filamin A protein will be determined in their natural and "edited" state. The Djinovic Lab uses a combination of biochemical, biophysical and structural biology approaches, the Jantsch Lab biochemistry and mouse models to understand the impact of RNA-editing at the cellular and organismic level.

Background

Adenosine deaminases acting on RNA deaminate adenosines to inosines in structured regions of RNAs. The RNA-editing process occurs in millions of sites in the human transcriptome. As inosines are interpreted as guanosines during translation, this RNA-editing process can alter codons and therefore lead to the formation of proteins that are not encoded in the genome. A prominent adenosine to inosine deamination event is found in the mRNA encoding filamin A, an abundant actin crosslinking protein that links the cellular cortex and transmembrane proteins with the cytoskeleton. Changes in the editing pattern of the filamin A mRNA lead to the expression of altered filamin A which causes high blood pressure but also causes gastrointestinal inflammatory disorders. To understand the molecular consequences of the editing-induced amino acid exchange, the affected domain will be studied by structural and molecular biophysics means.

Thesis description

We are looking for a highly motivated and dedicated student to use a combination of structural and molecular biophysics approaches to investigate the molecular consequences of RNA-editing of filamin A. The successful candidate will have the opportunity to (i) express and purify native and "edited" variants and perform a comparative molecular biophysics analysis (ii) X-ray crystallography to determine their structures at high resolution (iii) use biochemical and biophysical methods to validate the mechanistic model.

MAX PERUTZ LABS

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Part of



Requirements

A background in biochemistry or molecular biology, studies of Molecular Biology, Biochemistry, Chemistry, Cell Biology or related fields.

Application Details

Interested students, please send

- A cover letter
- Your CV
- Contact details of two referees

To Michael Jantsch michael.jantsch@meduniwien.ac.at and Kristina Djinovic-Carugo Kristina.Djinovic@univie.ac.at

Duration of thesis

12 months, salary: 440 € per month. Beginning: immediately.

Further Information

<https://anatomieundzellbiologie.meduniwien.ac.at/abteilungen-wissenschaft-forschung/abteilung-fuer-zell-u-entwicklungsbiologie/epigenetics-and-rna-biology/group-jantsch/>
<https://www.maxperutzlabs.ac.at/research/research-groups/djinovic>

Relevant publications

DOI: 10.15252/emj.201694813

DOI: 10.1080/15476286.2018.1480252

About the Max Perutz Labs

The Max Perutz Labs are a research institute established by the University of Vienna and the Medical University of Vienna to provide an environment for excellent, internationally recognized research and education in the field of Molecular Biology. Dedicated to a mechanistic understanding of fundamental biomedical processes, scientists at the Max Perutz Labs aim to link breakthroughs in basic research to advances in human health. The Max Perutz Labs are located at the [Vienna BioCenter](#), one of Europe's hotspots for Life Sciences, and host around 50 research groups, involving more than 450 scientists and staff from 40 nations.

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