

MASTER THESIS IN STRUCTURAL BIOLOGY

DJINOVIC & JANTSCH LABS

Understanding the consequences of RNA-editing at the structural level

The Djinovic Lab uses a combination of biochemical, biophysical and structural biology approaches, the Jantsch Lab uses biochemistry and mouse models to understand the impact of RNA-editing at the cellular and organismic level

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.

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.

Requirements: 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/embj.201694813

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