

SFB 960-/BZR – Kolloquium

Dienstag 11. September 2018, 17.00 Uhr
H 53



Dr. Monika Gaik

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Uncovering molecular mechanisms of translation regulation with structural biology.

During my talk I will present the overview of the research conducted in Max Planck Research Group led by Sebastian Glatt in Krakow. First part introduces the highly conserved Elongator complex that specifically modifies uridines located in the wobble base position of eukaryotic tRNAs. The resulting 5-methoxycarbonylmethyl-uridine (mcm⁵U) modifications directly affect translation rates and folding dynamics of hundreds of proteins and thereby represent an important regulatory mechanism of gene expression. In addition, the regulatory circuits have strong clinical importance as mutations or variants of Elongator subunits are associated with neurodegenerative diseases, cancer and obesity. A single point mutation in one of the Elongator subunits causes Purkinje neuron degeneration and has been linked with ataxia-like phenotype in the mutant 'wobbly' mouse. This mutation destabilizes the complex and compromises its function in translation regulation, leading to protein misfolding and neuronal death. The aim of the second presented project is to unravel structural snapshots of regulators affecting translation of specific RNA transcripts during germline stem cells differentiation. By combining protein biochemistry with structural biology to study RNA-binding protein complexes, we would like to understand regulatory processes that determine cell fate and may significantly influence human health. We are using insect cells to produce individual proteins and reconstitute multisubunit complexes for structural analyses. We have recently obtained crystal structure of RNA-binding NHL domain of Brat homologue at 1.7 Å resolution and currently we are investigating its RNA recognition specificity.

Host: Dr. Sébastien Ferreira-Cerca (BCII) and PD Dr. Jan Medenbach (BCI)
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