

SFB 960-/BZR – Kolloquium

Donnerstag 26. November 2020, 14.00 Uhr

Zoom: Meeting ID: 811 8577 0756, Passcode: 527532



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From Endocytosis to mRNA distribution How a novel protein complex connects the endosomal system to mRNA transport

mRNA localization plays a central role in neurons, where thousands of different transcripts are localized to specific subcellular regions or compartments within the large network of dendrites and axons. While the localization of a small number of transcripts has been characterized in detail, the mechanism by which the majority of mRNAs reaches their destination in the neuron remains elusive. However, incorrect mRNA positioning and hence dysfunctional local translation is detrimental to neurons and connected to neurodegenerative diseases. In the past years, we characterized a novel Rab5 effector complex, the p5-complex, which interacts with the GTPase Rab5 on early endosomes. Furthermore, we discovered that the p5-complex associates with the translation machinery and a specific subset of mRNAs through direct mRNA interaction, forming a novel link between the endocytic pathway and mRNAs or the translation machinery. Coupling mRNAs to a major transport system of the cell, the p5-complex seems to be destined for a role in mRNA localization. Based on these findings about the p5-complex, my future research will address the fundamental question of how mRNA is localized in specific subcellular locations in neurons. This research question comprises several key steps, including the recognition of specific mRNAs by the transport system, the delivery of the mRNA to its target location and the packing of the mRNA during transport.

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