MOI Project 9

Composition of the host-controlled endosymbiont division machinery in the trypanosomatid *Angomonas deanei*

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Background: In nature, eukaryotic organisms often host symbiotic intracellular bacteria. These endosymbionts can have a positive effect on the fitness of their host organisms. The molecular mechanisms underlying the interaction of host and endosymbiont in these permanent "intracellular infections" are largely unknown.

Own previous work: We use the endosymbiont-harbouring trypanosomatid *Angomonas deanei* as a model system to elucidate molecular mechanisms of host/symbiont interaction. Each *A. deanei* cell contains a single β-proteobacterial endosymbiont that divides at a specific time point in the host cell cycle, suggesting a tight cellular integration of the endosymbiont. In previous projects we established molecular genetic tools for *A. deanei* (MOI II) and identified a number of nucleus-encoded endosymbiont-targeted proteins, termed 'ETPs' (MOI III). Interestingly, three of these proteins, ETP2, ETP7, and ETP9 localize at the endosymbiont division site. Whereas for ETP2 similar proteins are missing in other organisms that could provide a hint on its function, ETP7 and ETP9 are annotated as 'peptidoglycan hydrolase' and 'dynamin-like protein', respectively. As both these functions also play a role in the division of mitochondria and/or chloroplasts, together protein localizations and functional annotations suggest a role in providing *A. deanei* with nuclear control over endosymbiont division. In an ongoing project we are characterizing the function of ETP9 in vivo (MOI IV).

Aim of the project: The MOI V project aims to identify proteinaceous interaction partners of the nucleus-encoded components of the endosymbiont division machinery to explore interactions between the bacterial components (inside) with nuclear-encoded components (outside) of the endosymbiont division machinery. Furthermore, this work has the potential to identify novel components of the endosymbiont division machinery. The subcellular localization of nucleus-encoded components of the endosymbiont division machinery will be characterized in a time resolved manner to understand their behavior over the cell cycle. Finally, we aim to purify recombinant ETP9 and characterize its structure and function in vitro to understand the mode of action of this fascinating protein in detail.