

Functional characterization of extracellular vesicles in the archaeal order Sulfolobales



General description

Extracellular vesicles (EVs) are small membrane-bound structures, which are released by cells into their surrounding environment. Due to encapsulated intracellular compounds, EVs contribute to cell-cell communication, horizontal gene transfer and nutrient cycling. Although the release of EVs is common across all three domains of life, only little is known about the machinery behind archaeal vesiculation and its function.

Project background

Saccharolobus solfataricus is a member of the archaeal order Sulfolobales. Adapted to hot and acidic environments like volcanoes and hot springs, *S. solfataricus* needs thermoacidophilic conditions for survival. Recent studies suggest that archaeal EVs play a significant role in the environmental adaptation and physiology. However, the biogenesis and mode of action of these vesicles have been poorly investigated so far. This thesis is supposed to characterize the function of EVs in *S. solfataricus*. The research will focus on studying the impact of EVs on archaeal metabolism by exposing *S. solfataricus* to secreted vesicles.

Thesis content

The primary goal of this study is to establish methods for EV isolation and EV treatment of *S. solfataricus*. In addition possible metabolic changes due to vesicle exposure will be investigated.

Methodology

- Microbiological methods, cultivating archaea under thermoacidophilic conditions
- Extracellular vesicle isolation
- Metabolite extraction
- Metabolomics with untargeted GC-MS

Interested?

Please get in touch with us if you are interested and send your preferred starting date.

- Master thesis
- English or German

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