



Master thesis: Cellular metabolism in inflammation and cancer



Who are we?

The Cellular Metabolism Lab (headed by Prof. Thekla Cordes) is located at the Braunschweig Integrated Centre of Systems biology (BRICS). Our research focuses on how metabolism is reprogrammed in various stress situations and how it influences cell function and disease outcome. Methodologically, we combine mass spectrometry, tracing, and molecular biology approaches for in-depth metabolic pathway study in mammalian cell models to identify and exploit metabolic vulnerabilities in inflammatory diseases, including infections, cancer, and brain disorders.

Project background

Metabolic reprogramming is a hallmark of the innate immune response and cancer development, and the dynamic control of metabolites serves to facilitate the execution of inflammatory responses and cancer survival. For example, the dynamic control of mitochondrial metabolites influences inflammation and infection, while non-essential amino acids have emerged as critical regulators of tumor progression. Mitochondrial metabolism is tightly linked to amino acid availability influencing cell responses. Since metabolism plays a critical role in cell function, we will investigate how metabolism is reprogrammed during inflammatory diseases to better understand disease mechanisms.

Thesis content

We have multiple openings for master theses and looking for highly motivated students interested in cellular metabolism during infections.

Topics may include:

- 1) Identifying metabolic consequences in human macrophages upon infection of *L. pneumophila*
- 2) Establish co-culture models to investigate the impact of macrophages on cancer progression
- 3) Elucidate the impact of amino acids on macrophage metabolism during immune responses

The successful candidate will work with primary and immortalized cells as well as co-culture systems to explore these exciting topics. Further, the candidates might be involved in other projects within the lab to expand their knowledge of cellular metabolism.

Methodology: cell culture, mass spectrometry, tracing approaches, respirometry, gene expression, cell culture models, engineering cell models, high-dimensional data analysis, cytokine expression

Interested?

Please contact us if you are interested in cellular metabolism and would like to join our team.

We have multiple openings and we are happy to discuss various projects in the field of inflammatory diseases.

Contact:

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