

Master Thesis WS22/23

We are currently searching for two master applicants for following projects:

Project 1

Optimization of amino acid quantification and lipid extraction from human adipocytes

Short project description: Amino acids (AA) are essential as building blocks for proteins but are also important for metabolism as well as for cellular signaling. Due to the broad range of variations between each individual, the establishment of a representative reference population is essential for the diagnosis of inborn metabolic diseases. Our goal is to set up a customized reference library for AA analysis in dried blood spots. The second part comprises the optimization of lipid extraction of isolated adipocytes from human subcutaneous adipose tissue. Due to its highly lipid rich nature, lipid extraction is often very tedious and different lipid classes is not easy to characterize due to the huge amount of neutral lipids accumulating in these cells. We aim to characterize the lipid composition of selected donor cells in context with basic blood parameters as well as selective routes in lipid biosynthesis.

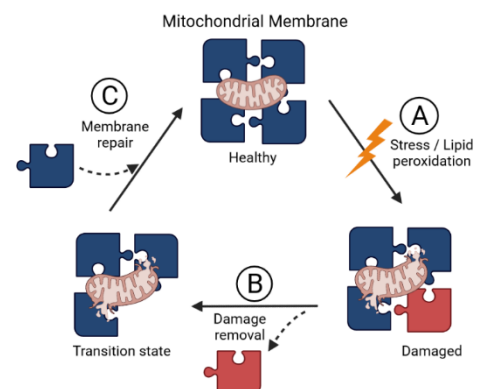
What you can expect: Your task is to analyze the AA composition from a representative population across all ages and statistically evaluate the data. The second part comprises the optimization of lipid extraction procedures from human adipocytes. You will be trained in analytical methods like chromatography, mass spectrometry, data analysis and statistical evaluation.

Project 2:

Characterization of lipid peroxidation in mitochondrial membranes

Short project description: As a byproduct of oxidative phosphorylation, reactive oxygen species (ROS) are formed. These ROS are able to damage mitochondrial phospholipids by (per)oxidation **(A)**. As a result, crucial mitochondrial functions including energy homeostasis and intracellular signaling are impaired. Our main goal is to understand the contribution of mitochondrial lipid damage to the pathology of inherited metabolic diseases, including their recognition, removal **(B)** and repair mechanisms **(C)**.

What you can expect: You will investigate the cellular and molecular consequences of oxidation mechanisms and explore strategies to specifically induce oxidative stress. Thereby you will be trained in standard cell culture techniques, lipidomics/tandem mass spectrometry, flow cytometry and other analytical, cell biology and biochemical techniques.



Application

Applications consisting of a CV detailing your education & experience, a motivational statement, and when applicable details for a reference, should be addressed to Dr. Markus A. Keller at humgen@i-med.ac.at.