

“Oxidative damage and repair of membrane lipids in health and disease”

A fully funded PhD position for three years is offered at the Medical University of Innsbruck entitled:

3D-bioprinted tissue to study β -oxidation defects

Rare and severe metabolic diseases, like LCHADD or VLCADD, lack placebo controlled therapy groups for improving therapeutic standards. One important hallmark of these diseases is the impaired mitochondrial function (Hagenbuchner et al, Scientific reports, 2018). In this project we will develop a fully 3D bioprinted fibroblast model to study mitochondrial morphology, function and lipid composition in β -oxidation defects. A perfusable tissue-on-CHIP-system, as recently published (Nothdurfter et al, Biofabrication, 2022) will be used as testing platform for novel therapies.

The Goal: is to use this patient-derived 3D tissue model as standardized screening platform for novel treatments, and to understand how lipid composition impairs mitochondrial function in LCHADD-patients.

You will be supervised **in tandem by Judith Hagenbuchner and Katrin Watschinger**, both members of the FG-15. The team surrounding you during your PhD thesis is very dynamic and offers two fully established labs with state of the art equipment, supportive working atmosphere and an inspiring scientific community. The laboratory of PD Dr. Judith Hagenbuchner is part of the paediatrics research labs, whereas Prof. Watschinger is located in the Biocenter Innsbruck, Institute of Biological Chemistry

Specific questions:

- Establish/refine a fully 3D bioprinted model of healthy and β -oxidation defective fibroblasts to study the localization of mitochondrial oxidative damage in 3D tissue
- investigate mitochondrial interconnectivity and exchange between cells
- Analyze how ether lipid composition varies among different primary VLCADD and LCHADD fibroblasts and how it contributes to lipid damage
- monitor mitochondrial re-arrangement and sites of ROS accumulation after different stressors/rescuers to further understand the differences in β -oxidation defects for therapy

Qualification profile:

- master degree with strong background in biology, biotechnology, pharmacy, or related
- strong interest in molecular biology, tissue engineering and cellular pathways
- excellent communication and organisational skills
- highly self-motivated and enthusiastic

Application deadline: Sept 15 2022, application details can be found on <https://www.i-med.ac.at/fg15/application.html>