

PhD in a biofabrication project (m/f/d)

Project description

3D-IMAT is a cooperation project with the Institute of Clinical Chemistry and Pathobiochemistry at Tübingen University Hospital and funded by the Baden-Württemberg Stiftung.

Adipose tissue located between skeletal muscle fibers is called intermuscular adipose tissue. It is associated with various diseases. These include obesity, diabetes, muscular dystrophies, and age-related sarcopenia. Research is underway to determine whether intermuscular adipose tissue is a potential cause of these diseases or a secondary condition. All these diseases are characterized by their increasing prevalence. According to the World Health Organization, age-related sarcopenia alone is expected to affect more than 2 billion people worldwide by 2050. The loss of muscle mass leads to reduced mobility and physical performance and is a risk factor for diabetes and fall-related injuries, significantly reducing quality of life. This results in high treatment costs for healthcare systems.

Research is urgently needed into this tissue and potential treatment approaches. Most current insights are based on in vivo imaging techniques for quantitatively measuring fat tissue and associating it with clinical parameters. Direct investigations into the biological function of this fat tissue are scarce, as corresponding biopsies in humans are very challenging due to the tissue's location.

The development of experimental intermuscular adipose tissue models is the critical solution to fill this research gap. In the 3D-IMAT research project, we are developing in vitro 3D intermuscular adipose tissue models. These models will serve as patient-specific test systems to investigate the role of intermuscular fat tissue in diseases such as obesity, diabetes, and degenerative muscle disorders. We are confident that the construction of these complex 3D tissue models will be achieved using automated and AI-supported biofabrication techniques.

The project involves producing two types of tissue models: A non-differentiated model consisting of precursor cells using extrusion-based bioprinting, and a pre-differentiated model through the bioassembly of fat spheroids around muscle fibers.

Following functional characterization and validation, these models will be treated with factors that induce muscle growth, muscle wasting, and fibrosis. This will allow us to examine how intermuscular fat tissue influences these physiological and pathological processes in muscle.

We are looking for a motivated candidate for the 3D-IMAT project at the IGVP:

PhD student (m/f/d).

Your profile

We are looking forward to applicants with enthusiasm for the topic of biofabrication and tissue engineering:

- You have a Master's degree in life sciences or a similar fields like biology, biomedical engineering, material science, biotechnology or other interdisciplinary study programs
- You are a self-motivated person that is able to work independently with a good time management
- You can plan your work detailed, think critically and cope with stressful situations

- You enjoy working in a team, are communicative and interested in international exchanges as part of the promotion
- You would like to take part in teaching
- You have a broad knowledge of cell culture, preferably with primary human cells
- Ideally, you have experience in 3D bioprinting and are able to extract information from image files using AI-based applications or are interested in it
- You are familiar with routinely used methods such as (RT)qPCR, western blot, agarose gel electrophoresis, enzyme-based assays, histology, antibody staining and microscopy
- You would like to publish papers in international journals and travel to (inter)national congresses

We offer

- Working in a dynamic team with a lot of individual responsibility
- A versatile working environment with various modern technologies
- Exciting tasks in the field of biofabrication and tissue engineering
- A future-proof workplace and location as well as attractive remuneration including a company pension scheme (VBL) with flexible working hours

The position is to be occupied in July 2025 or as soon as possible thereafter. The position is limited to 3 years in pay group E13 TV-L (65%). The University of Stuttgart is actively committed to equal opportunities. We therefore particularly welcome applications from women. Severely disabled persons will be given priority if equally qualified. Recruitment is carried out by the Central Administration of the University of Stuttgart.

Interested?

Then please send your application (cover letter, résumé, relevant certificates) as a PDF via email to: bewerbung@igvp.uni-stuttgart.de. If this is not possible for you, you can also send us your application in paper form. Please submit application documents only as copies, as they will be destroyed after the conclusion of the process in accordance with data protection regulations. Information on the handling of applicant data pursuant to Article 13 of the GDPR can be found online <https://www.uni-stuttgart.de/datenschutz/bewerbung>. Unfortunately, we cannot reimburse any application or interview costs.

We look forward to receiving your application!

Application deadline: June 20, 2025.