

# PhD in a Cultured Meat project (m/f/d)

## Project description

MeatPrint is a cooperation project with the Institute of Printing Science and Technology at the University of Darmstadt and funded by the German Research Foundation (DFG).

The project aims to explore how the **mechano-physical properties** of **hydrogel-additive formulations** interact with the biochemical characteristics of primary bovine muscle and fat cells at various maturation stages during large-scale 3D bioprinting. To achieve this, 3D-bioprinted co-cultures are analyzed for cell-cell interactions and tissue maturation.

The core hypothesis is that printing parameters affect cell behavior and tissue development when primary bovine muscle and fat cells are embedded in hydrogels at different maturation stages.

To replicate animal meat in vivo, it's essential to mimic its sensory and nutritional properties. Precise placement of muscle and fat (progenitor) cells creates distinct muscle and fat compartments. Constructs are screen-printed in 300-500 µm thick layers, cultured individually, and later assembled by transglutaminase-induced fusion, allowing nutrient diffusion during maturation and avoiding the need for vascularization.

Using mature and precursor muscle and fat cells in co-culture allows for more realistic tissue properties like fat content, texture, and consistency. Mature cells reduce the need for in vitro differentiation, leading to shorter culture times, simpler media, and resource efficiency.

To improve the sensory and nutritional profile, additives such as plant proteins and essential amino acids are incorporated into polysaccharide-based hydrogels. These are tested for their impact on both the physical properties of the material and cell survival as well as differentiation.

The influence of printing processes – microextrusion and screen-printing-based bioprinting – on cell behavior is investigated by printing muscle and fat cells at different stages into tissue-like structures. The focus is on how shear stress affects fat cell degradation, and how this, in turn, affects muscle cell survival and differentiation within the co-culture.

We are looking for a motivated candidate for the MeatPrint project at the IGVP as:

**PhD student (m/f/d).**

## Your profile

- 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 sound knowledge of cell culture, preferably with isolation procedures with primary bovine cells
- Ideally, you have experience in bioprinting and hydrogel development and setup

- 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

- 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](mailto: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.