Biofabrication and bio-instructive materials

Silesian University of Technology

We are announcing a position as

PhD Fellow

in the Biofabrication and Bio-Instructive Materials research group

TOPIC: Development of vascularized microfluidic in vitro skin models.
PROFILE: biomedical physics, material science, biomedical engineering or similar.

Outstanding PhD Candidate needed. Are you willing to take up the challenge?

Job description:

The skin is the largest and one of the most complex organs of the human body, acting as a critical barrier against mechanical injury, infection, dehydration, and harmful environmental factors. While minor wounds can heal spontaneously, extensive skin damage caused by severe burns, trauma, or congenital disorders remains a major therapeutic and clinical challenge. Existing treatments, including wound patches, grafts, commercial skin substitutes, and models, often fall short due to their limited functionality and inability to replicate the complex structure and physiology of native skin closely.

Therefore, in this project, supported by **the FNP FIRST TEAM FENG grant no. FENG.02.02-IP.05-0263/24** entitled **"3D Bioprinted Vascularized Full-Thickness Skin Models as Advanced Platforms for In Vitro Testing"** and conducted as **a double doctorate** in collaboration with **the University of Groningen,** we aim to develop advanced, personalised skin models that closely mimic the three-layered architecture of human skin: epidermis, dermis, and subcutaneous adipose tissue. The project will focus on the functional integration of cutting-edge biofabrication technologies, including melt electrowriting (MEW) and volumetric bioprinting (VBP), with microfluidic platforms. The engineered models will provide a highly tunable, vascularised, and biologically functional platform suitable for regenerative medicine, toxicology, and translational research.

LOCATION:
The Silesian University of Technology, Biotechnology Centre
Gliwice, Poland

&

The Groningen University
Groningen, Netherlands

WORKING CONDITIONS:
Full-time - Fellowship

APPLICATION DEADLINE:
6th November 2025

INTERVIEW:
18th November 2025

RESULTS:
End of November 2025

STARTING DATE:
December 2025/ January 2026

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Republic of Poland
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Requirements:

We are looking for an enthusiastic, adaptable, and intellectually curious doctoral candidate with a strong drive for research and scientific exploration. The ideal applicant will be eager to engage in a dynamic, cross-border doctoral programme, spending significant periods of study and research in both Poland and the Netherlands. We seek an individual who thrives in collaborative, interdisciplinary settings and is comfortable working within a culturally diverse, international research community.

A Master's degree in biomedical physics, materials science, biomedical engineering, or a related field is required. Candidates must have **proven experience in microfluidics and tissue engineering**, clearly demonstrated in their CV or publications. **Applicants lacking this experience will not be considered.** Additional assets include expertise in **materials engineering, 3D printing, microscopy** (light, fluorescence, and confocal), and **material testing**. Experience in **cell culture** will also be considered an advantage. Proficiency in **English**, both spoken and written, is required. **International research experience**, such as internships or publications in peer-reviewed journals, will be highly valued. The selected candidate will be expected to participate in the research project actively, attend doctoral-level courses at the Doctoral School, and take part in teaching activities at both the Silesian University of Technology (SUT) in Gliwice, Poland**,** and the University of Groningen in the Netherlands**.**

The PhD Fellow will play a key role in designing and fabricating functional tubular structures and creating perfusion systems for vascularized models of three-layered skin constructs, integrating fibrous MEW structures with gel-based matrices populated by various cell types. Their work will involve combining skin models with microfluidics and analysing these dynamic culture systems. This will include modelling and analysis of fluid flow, design of microfluidic chips, studies of cell performance under various perfusion conditions, and exploration of drug delivery through microfluidic channels. In addition to experimental contributions, the Fellow will actively participate in project dissemination through presentations at national and international scientific conferences and by publishing research findings in peer-reviewed journals.

Offer:

We offer a unique chance to earn two PhD diplomas (from the Silesian University of Technology and the University of Groningen) by participating in an exciting project that addresses relevant societal challenges. The successful candidate will join an attractive, interdisciplinary research environment within a newly established, enthusiastic international team. The project includes a minimum 1.5-year research stay with part of the group in Groningen, followed by continuation in Gliwice. This transnational arrangement is designed to foster international collaboration, enhance scientific impact, and elevate the overall quality of the research conducted. We offer excellent conditions for the development of your independent career and international scientific network.

The PhD Scholarship is offered for a period of four years. The Scholarship amounts to 7,000 gross PLN per month (approximately 5,970 net PLN, equivalent to approximately 1,400 EUR per month) for the entire duration of the studies. The top-up money for the stay in the Netherlands will be provided.

About the organisation:

This project will be conducted at the Biotechnology Centre of the Silesian University of Technology (SUT) in Gliwice and the University of Groningen. SUT is one of the leading scientific institutions in Poland (ranked within the top 10 Polish research institutions), equipped with cutting-edge infrastructure. The Biotechnology Centre brings together specialists from computer science, environmental science, chemistry, and biology to collaborate on innovative projects in the fields of bioinformatics, medical, environmental, and industrial biotechnology. The research lines include the development of new biomaterials, controlled cellular differentiation, and modelling of bioprocesses.

The Włodarczyk-Biegun lab, established here in 2019, is equipped with several printers, including a multifunctional GeSiM bioprinter with a melt electrowriting printhead, a Felix bioprinter, an FDM printer, an advanced rheometer with DMA function, a goniometer, and its own biological and chemical labs. A state-of-the-art volumetric printer (the second one in Poland) will be purchased from FNP First Team funds to implement the project. The group has solid experience in the field of biofabrication, developing new printable materials, new printing tools for hydrogel-based inks, electrowriting for the reconstruction of hierarchical structures and detailed characterisation of (bio)inks and printed scaffolds (e.g. rheology, SEM, and mechanical research).

The University of Groningen (RUG) is a highly interdisciplinary and translational science centre, recognised as one of the top research universities in Europe. RUG is a research powerhouse in key domains, including chemistry, biomedicine, materials science, and environmental sciences, with a strong emphasis on both applied and fundamental research. It is equipped with the most modern infrastructure, including advanced facilities for molecular biology, nanotechnology, computational modelling, and clinical research. Research at RUG is characterised by its integrative approach, bringing together specialists from disciplines such as molecular biology, chemistry, physics, artificial intelligence, and medical sciences. Major research lines include the development of molecular machines, biomaterials, systems biology, and personalised medicine, with extensive expertise in bioprocess optimisation and biomedical applications.

Additional information:

Offers that are incomplete or submitted after the deadline will not be considered. The candidates selected for an interview will be contacted **after November 6th** (please be advised that only candidates selected for an interview will be contacted). The recruitment decision will be based on a combination of scientific merit, motivation, and the applicant's potential fit within our interdisciplinary and collaborative team culture. The expected date of the final selection is the **end of November 2025**.

For more information about this position and the project, please contact dr hab. inż. Malgorzata Wlodarczyk-Biegun, prof. PŚ (Associate Professor): gosia@biofabrication.group

How to apply:

1. Submit your application in English by e-mail to: recruitment@biofabrication.group

2. In the subject, include "PhD Fellow – microfluidics" and your first and last name.

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3. Your application should contain: a motivation letter describing your research interests and expertise in microfluidic and tissue engineering; a short CV with the description of your key achievements; a copy of your diplomas; your contact details (e-mail and telephone number); names and contact details of at least two potential referees.

4. Please include the following statement in your application: “I hereby agree to the processing of my data included in the application documents by Silesian University of Technology, Gliwice, Poland, to carry out the recruitment process.”

Informative clause:

According to art. 13 of the Regulation on Personal Data Protection of 27 April 2016, please be informed:

1) the controller of your personal data is the Silesian University of Technology with its registered office at Akademicka 2A St, 44-100 Gliwice;
2) the Silesian University of Technology has appointed the Data Protection Officer who can be contacted via the email address: iod@polsl.pl;
3) personal data will be processed for the purpose of conducting the recruitment process for employment at the Silesian University of Technology;
4) the legal basis for processing personal data is Article 6(1)(c) of the GDPR (a legal obligation to which the controller is subject) in connection with Article 221 of the Labour Code and the Act of 20 July 2018 – Law on Higher Education and Science, as well as Article 6(1)(a) and Article 9(2)(a) of the GDPR (consent) in the case of personal data other than those indicated in Article 221 of the Labour Code;
5) personal data will not be disclosed to other entities, except in cases provided for by law. Personal data may also be transferred to partners providing technical and organizational IT support;
6) personal data will be stored for the period necessary to complete the recruitment process, or for up to 6 months after the conclusion of the recruitment process, if you have given consent for the processing of personal data for future recruitment processes;
7) you have the right to request the access to the content of your data and, to the extent provided for by applicable regulations, the right to: rectify, delete, limit processing, raise objections; if you consent to the processing of data, you have the right to withdraw your consent at any time;
8) you have the right to lodge a complaint with the President of the Office for Personal Data Protection, if you feel that the processing of your personal data violates the provisions of the General Data Protection Regulation;
9) providing data is voluntary, but necessary to achieve the purposes for which they are collected.