Biofabrication and bio-instructive materials

Politechnika Śląska

UCZELNIA BADAWCZA

We are announcing a position as

PhD Fellow

in the Biofabrication and Bio-Instructive Materials research group

TOPIC: Microgel-based 3D bioprinted scaffolds for dynamic and adaptable breast cancer models.

PROFILE: material science, biomedical engineering, tumor biology or similar.

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

Job description:

Native tissues are characterized by hierarchical organization of structural proteins, the content of bioactive molecules, and stiffness values. The tumor microenvironment (TME) is equally complex, comprising dynamically organized and interconnected extracellular matrix (ECM) proteins, cancer cells, and stromal cells. The stiffness and structure of the matrix influence the growth and metastasis of cancer, and their changes can regulate cancer progression and spread. The lack of truly biomimetic models and controlled heterogeneous 3D systems leads to discrepancies between the results of in vitro studies and clinical outcomes. Therefore, in this project, partially supported by **an ERC Strating Grant** and **conducted as double** doctorate in collaboration with the University of Groningen, the PhD Fellow will develop heterogeneous cell culture structures to create accurate testing platforms for studying the in vitro progression of breast tumors.

Within the project, new materials based on microgels produced from biomaterials (e.g. alginate, hyaluronic acid) will be developed and enriched with dynamic bonds to obtain control over rheological and structural properties. Different structural organizations of models will be tested, and the behaviour of TME cells will be subject to detailed analysis.

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

&

The Groningen University
Groningen, Netherlands

WORKING CONDITIONS:
Full-time - Fellowship

APPLICATION DEADLINE:
30th June 2025

INTERVIEW:
after 30th June 2025

RESULTS:
August / September 2025

STARTING DATE:
1st October 2025

erc
European Research Council
Established by the European Commission

Requirements:

We are seeking a highly motivated, open-minded, creative, and **mobile candidate**, willing to conduct thrilling research and live through the course of the studies in both Poland and the Netherlands - a passionate scientist who enjoys working with others in a multidisciplinary and multinational environment.
A Master's degree in material science, biomedical engineering, cell biology, or a similar field is required. Candidates should have **experience** in biomedical research, microscopy (including light, fluorescent, and confocal microscopy), and material testing. Expertise in cell culture is needed. **Proficiency in English**, in speech and writing, is required. Foreign internships and publications in international peer-reviewed journals will be highly rated. We expect the chosen candidate to participate in the research project, third-cycle courses in the Doctorate School, and some teaching duties at the Silesian University of Technology (SUT) in Gliwice, Poland, and University of Groningen in The Netherlands.

The Fellow will play a key role in advancing the project's objectives by developing novel biomaterial-based microgels. These engineered materials will be integrated with TME cell populations and optimized for compatibility with 3D bioprinting technologies. Various architectural configurations of the resulting models will be fabricated and systematically evaluated, with particular emphasis on analyzing cellular behavior, phenotypic changes, and cell–matrix interactions. The outcomes of this work will contribute to a deeper understanding of breast cancer pathophysiology and support the development of advanced, functional in vitro models. 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 an excellent opportunity 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. You will work in an attractive, interdisciplinary environment with a newly formed international, enthusiastic Research Group. You will spend a minimum of 1.5 years working with a part of the Group in Groningen, and the remainder of the time in Gliwice, which will facilitate international collaborations and lead to increased impact and quality in the work 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 3,466.90 gross PLN per month (approximately 800 EUR per month), exempt from tax, for the first two years of studies (before the mid-term assessment) and 5,340.90 gross PLN per month (approximately 1,250 EUR per month) for the next two years after the mid-term evaluation. The top up money for the stay in the Netherlands will be provided.

About the organization:

This project will be conducted at the Biotechnology Center 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 state-of-the-art 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. The group has a 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 characterization of (bio)inks and printed scaffolds (e.g. rheology, SEM, and research mechanical).

The University of Groningen (RUG) is a highly interdisciplinary and translational science center, recognized 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 state-of-the-art infrastructure, including advanced facilities for molecular biology, nanotechnology, computational modelling, and clinical research. Research at RUG is characterized 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 personalized medicine, with extensive expertise in bioprocess optimization and biomedical applications.

Additional information:

Offers that are incomplete or submitted after the deadline will not be considered. We will contact only selected candidates who meet the competition's criteria. The expected date of the final selection is **August / September 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:

Submit your application on the website:

https://irk.polsl.pl/en-gb/offer/REK2025_2026_WSD/programme/WSD_P_F/?from=registration:REK2025_2026_WSD

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 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) Your personal data will be processed in order to carry out the recruitment process for work at the Silesian University of Technology,
4) The basis for the processing of your personal data is art. 221 of the Labour Code and, if you agree to use your CV in future recruitments at the Silesian University of Technology, art. 6, clause 1 point a of the GDPR Regulation shall apply,
5) Only employees authorized to process personal data to the necessary extent will have access to your personal data within the organizational structure of the Silesian University of Technology,
6) Your personal data shall not be disclosed to other entities, except in cases provided for by law,
7) Your personal data shall be stored for the period necessary to carry out the recruitment process or for the next 9 months from the end of the recruitment process, if you authorize the processing of personal data in future recruitment processes,
8) 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,
9) 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,
10) Providing data is voluntary, but necessary to achieve the purposes for which they are collected.