Unit: Institute of Genetics and Biotechnology, Faculty of Biology, University of Warsaw
Project title: Invadopodia in AXL receptor-dependent cancer cell invasion and drug resistance
NCN funding scheme: OPUS
Principal Investigator at the University of Warsaw: Dr Daria Zdżalik-Bielecka
Position: PhD student – scholarship holder
Number of positions: 1

Brief project description

One of the greatest challenges in cancer treatment is not the primary tumor itself, but the metastases it forms in other organs, which are responsible for approximately 90% of cancer-related deaths. Another major cause of treatment failure is the development of drug resistance, whereby cancer cells become insensitive to anticancer drugs administered to patients. Cancer cells form various actin-based protrusions that facilitate their migration and invasion. One example is invadopodia, which secrete metalloproteinases and thereby enable cancer cells to degrade the basement membrane and extracellular matrix. Studies indicate that invadopodia formation can be activated by receptor tyrosine kinases (RTKs) located at the cell surface. RTKs regulate cellular functions and mediate signal transduction between cells and their extracellular environment, as well as between cells. However, both the process of invadopodia formation and the mechanisms regulating it remain incompletely understood.

The proposed project aims to identify novel RTK-dependent cellular mechanisms and regulatory proteins underlying cancer cell invasiveness, metastasis, and drug resistance. Among RTKs, the AXL receptor is uniquely associated with both the development of resistance to anticancer therapies and an increased metastatic capacity of cancer cells. Moreover, numerous studies have demonstrated that AXL expression and activation are increased during epithelial–mesenchymal transition (EMT), a process critically involved in metastasis and drug resistance. However, despite intensive efforts to develop AXL inhibitors for clinical use in oncology, surprisingly little is still known about the intracellular mechanisms through which this receptor exerts its effects.

Description of tasks:

The PhD student will carry out research tasks within the OPUS project entitled “Invadopodia in AXL receptor-dependent cancer cell invasion and drug resistance.” In particular, the successful candidate will investigate how the GAS6–AXL signaling pathway regulates the formation, activity, and dynamics of invadopodia in different cancer cell lines, and whether these invasive structures contribute to EMT and drug resistance in cancer cells.

Responsibilities:

- Experimental work, including cancer cell culture, generation of knockout cell lines using CRISPR–Cas9, and investigation of invadopodia formation, activity, and dynamics by live-cell and fixed-cell imaging using fluorescence confocal microscopy.
- Processing and analysis of experimental data.
- Keeping up to date with the relevant scientific literature and presenting research findings at internal and external meetings, including seminars and scientific conferences in Poland and abroad.
- Contributing to the preparation of project reports and scientific publications.

Requirements

- Master’s degree or equivalent in biology, biotechnology, or a related field.
- Experience in cell line culture and basic techniques in biochemistry, molecular biology, and cell biology.
- Experience in cancer cell biology and fluorescence imaging will be considered an additional advantage.
- Very good command of spoken and written English.
- Proactive approach to tasks and goals, good interpersonal skills, and a collaborative attitude.
- Strong motivation and enthusiasm for experimental research.

We offer

- Research work in a friendly and supportive environment.
- Scientific supervision and support throughout the project and during the preparation of the PhD dissertation.
- Opportunity to learn a broad range of methods and techniques used in biochemistry, molecular biology, and cell biology.
- Support in professional and career development, including mentoring.
- Participation in courses, training programs, and scientific conferences.

Application deadline: 13 September 2026, 17:59
Application method: by email
Conditions:
Scholarship start date at the Faculty of Biology, University of Warsaw: October 2026
Scholarship amount: 3000 PLN gross-gross per month (years I-III), 5000 PLN gross-gross per month (year IV)
Scholarship duration: 48 months

Required documents

- Curriculum vitae, with particular emphasis on previous scientific achievements, including participation in conferences, research stays in Poland and abroad, participation in research projects (including the project number and the name of the Principal Investigator), awards and distinctions resulting from research activities, and a complete list of scientific publications.
- Letter of intent describing the applicant's competencies relevant to the specific tasks to be carried out within the research project.
- A scan (or original) of the candidate's signed consent to the processing of personal data for the purposes of the recruitment process (available at: https://bsp.adm.uw.edu.pl/bsp-druki-do-pobrania/).

Applications, required documents, and any additional questions regarding the recruitment process should be sent to: d.zdzalik-bielecka@uw.edu.pl – Dr Daria Zdżalik-Bielecka, Institute of Genetics and Biotechnology, Faculty of Biology, University of Warsaw.
The complete application must be submitted to the Principal Investigator (Dr Daria Zdżalik-Bielecka) by **13 September 2026, 17:59.**
The email subject line should read: Scholarship in the OPUS competition
The recruitment process will be concluded by 20 September 2026.

We reserve the right to contact only selected candidates.