



Międzynarodowa Środowiskowa Szkoła Doktorska
przy **Centrum Studiów Polarnych**
w Uniwersytecie Śląskim w Katowicach

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IEDS/2026/IO/A

Induction and functional characterization of antimicrobial peptides from *Mytilus* spp. in in vitro models

The leading unit:

Institute of Oceanology of the Polish Academy of Sciences (IOPAN) in Sopot

Scientific discipline:

Biological Sciences

Requirements:

- Master's degree or equivalent in biology, biotechnology, microbiology, molecular biology or a related field, qualifying the holder for doctoral education;
- documented laboratory experience;
- knowledge of aseptic technique, cell biology, molecular biology or microbiology;
- readiness for regular work with primary cultures and bacterial strains;
- ability to maintain records and analyse results;
- English sufficient for scientific literature, communication and doctoral training.

Additional assets:

- hands-on experience with eukaryotic or primary cell culture;
- command of Polish will be an asset;
- experience in RNA isolation, RT-qPCR, RNA-Seq library preparation or expression analysis;
- experience with MIC/time-kill/checkerboard assays, AMR strains;
- publications, conference presentations, research visits, training or project participation relevant to the position.

Tasks description:

- establishing reproducible primary cell cultures from *Mytilus* tissues;
- optimizing culture conditions, aseptic workflow and FDA viability assessment;
- stimulation with LPS, β -glucan, poly(I:C), bacterial lysates and live AMR strains;
- RNA extraction, preparation of material for RNA-Seq and RT-qPCR validation;
- antimicrobial assays, including broth microdilution, MIC, time-kill, checkerboard and serial-passage experiments;
- data analysis, laboratory documentation, publications and doctoral dissertation preparation.



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Summary of a doctoral project:

The doctoral project will focus on experimental induction, detection and functional characterization of antimicrobial peptides (AMPs) from *Mytilus* spp. The doctoral researcher will establish and optimize primary cultures of gill and mantle cells and examine their responses to immune stimuli and live antimicrobial-resistant bacterial strains. Expression profiling (RNA-Seq and RT-qPCR) will guide candidate selection, followed by microbiological activity testing. The work combines cell biology, molecular biology, microbiology and peptide biochemistry, with a strong laboratory and *in vitro* focus.

Other information:

The work will be carried out under supervision of Prof. Artur Burzyński (e-mail: aburzynski@iopan.pl),

Contact to the secretary of the IEDS doctoral school: +48 32 3689 380, e-mail: polarknow@us.edu.pl.

Website: <https://www.mssd.us.edu.pl/en/admission-2026-2027/>