

PhD Position Announcement

Title: *Advancing Microbial Risk Assessment in Recreational Waters Using Long-Read Sequencing and Digital PCR*

Background:

Climate change and eutrophication are reshaping microbial dynamics in bathing waters and coastal environments, increasing the prevalence and risks associated with pathogenic microorganisms (Brandão et al., 2022; Gyraitė et al., 2024). Rising temperatures, extreme weather events, and shifts in salinity—especially under eutrophic conditions—may promote the proliferation of pathogens and the spread of antimicrobial resistance.

PhD Aim:

This PhD project seeks to improve microbial risk assessment in recreational aquatic environments by integrating **long-read sequencing** for high-resolution taxonomic and functional profiling with **digital PCR (dPCR)** for the absolute quantification of targeted pathogens. The study will assess spatial and seasonal dynamics of microbial communities, including emerging pathogens and antimicrobial resistance genes (ARGs), in both coastal and inland bathing sites. The novelty lies in combining cutting-edge sequencing and dPCR technologies to move beyond conventional water quality monitoring approaches.

Candidate Requirements:

- **Education:** MSc in Microbiology, Environmental Science, Biology, or a related field.
- **Essential Skills:**
 - Molecular biology techniques (DNA/RNA extraction, PCR, sequencing)
 - Bioinformatics skills (metagenomic analysis)
 - Statistical/data analysis (R and/or Python)
- **Desirable Experience:**
 - Environmental microbiology
 - Shotgun data analysis, long-read data interpretation
 - Bathing water quality monitoring
- **Other Requirements:**
 - Strong analytical and problem-solving skills
 - Ability to work both independently and collaboratively
 - English

Research Environment and Infrastructure:

The selected PhD candidate will benefit from well-equipped laboratory facilities, including access to a **MinION long-read sequencer** and a **digital PCR system**. The research is embedded within ongoing national and international projects focused on bathing water quality and microbial risks.

Research Capacity and Institutional Context:

The topic strengthens Klaipėda University's Marine Research Institute (MRI) by advancing its expertise in **coastal ecosystem health and management**. The project integrates state-of-the-art

molecular techniques to address **climate-driven microbial risks**, supporting **regional R&D**, evidence-based policymaking, and sustainable water quality management.

Supervision:

- **Principal Supervisor:** Dr. Marija Kataržytė
[Google Scholar Profile](#)
- **Additional Advisor:** To be assigned based on specific expertise required.

PhD programme “Ecology and Environmental Sciences” at Klaipeda University, Lithuania. The enrolling department is the [Marine Research Institute](#) of Klaipeda University.

The Doctorate school operates since 2003 and is largely oriented to coastal and marine environmental research and aquatic biology. The PhD Study is international and runs in English. Duration of the PhD study – 4 years, PhD students receive scholarship, support for travel, training, and basic consumables, also are eligible to live in a modern dormitory in the campus.

More info about the Doctorate School is available on the Institute’s website
<https://jti.ku.lt/en/studies-1-3/doctoral-studies-in-ecology-and-environmental-science>

The call for Admission is open until the 25th of June, 2025 with two cut-off dates:

- June 13th, 2025 Deadline for submission of a research project based on chosen topic from the [List of available topics](#)

- June 25th, 2025 Deadline of application submission

Admission rules and selection criteria, including requirement for a research project are available here: <https://www.ku.lt/en/studies-admission/admission/application-procedure/application-procedure-for-phd-students>