Title of the doctorate theme	**MICROBIAL COMMUNITIES AND PATHOGENS IN BATHING WATERS UNDER CLIMATE CHANGE AND EUTROPHICATION**
Brief description of the topic	Climate change and eutrophication alter microbial dynamics in bathing waters and coasts (Brandão et al., 2022), increasing risks from pathogenic microorganisms (Gyraitė et al., 2024). Rising temperatures, extreme weather, and salinity shifts in eutrophic conditions may promote pathogen proliferation. The PhD aims to advance microbial risk assessment in recreational aquatic environments by integrating long-read sequencing for high-resolution taxonomic and functional profiling with digital PCR (dPCR) for absolute quantification of targeted pathogens. This approach aims to assess spatial and temporal dynamics of microbial communities, including emerging pathogens and antimicrobial resistance genes (ARGs), in response to environmental and seasonal variability in coastal and inland bathing sites. The novelty lies in combining long-read sequencing and dPCR to enhance microbial risk assessment beyond conventional methods.
Requirements for a candidate	Candidate should have an MSc in microbiology, environmental science, biology, or a related field. Essential skills include molecular biology techniques (DNA/RNA extraction, PCR, sequencing), bioinformatics (metagenomics, long-read sequencing), and statistical analysis (R/Python). Experience in environmental microbiology and bathing water monitoring is desirable. Strong analytical and problem-solving skills and the ability to work independently and in a team are needed. Good English is required.
Existing research infrastructure and support	The institute will provide all necessary work facilities (digital PCR, Minion sequencer). The work will be related to projects dedicated to bathing water quality assessment.
How the topic advances the research capacity of the Klaipeda University	Topic aligns with MRI's expertise in coastal ecosystem management and health while integrating advanced methodologies (as a long-read sequencing and digital PCR) for enhanced pathogen detection. This research fills a critical gap in climate-driven microbial risks, supporting regional R&D and policy development for water quality management.
Potential scientific supervisor	dr. Marija Kataržytė, https://scholar.google.com/citations?user=_uTqmSgAAAAJ&hl=en&oi=ao
Potential scientific advisor	An additional advisor will be assigned depending on the needed expertise.