Klaipėdos universiteto strateginės mokslo krypties
„Tvarių technologijų, mėlynojo bei žaliojo augimo ir sveikos jūros link“
podoktorantūros stažuotės temos paraiška (2025-2027)

Stažuotės temos pavadinimas	BIOAVAILABILITY AND RISK ASSESSMENT OF ORGANIC POLLUTANTS IN AQUATIC ENVIRONMENTS: AN ECOTOXICOLOGICAL AND ANALYTICAL APPROACH
Stažuotės mokslo kryptis (-ys), vykdantis padalinys, pradžia, trukmė	Natural Sciences, Ecology and Environmental Studies (N 012), Marine Research Institute, expected start date 1 October 2025, duration – 24 months.
Trumpas mokslinių tyrimų ir siekiamų rezultatų aprašymas (tikslas ir uždaviniai, raktažodžiai)	Anthropogenic activities have led to the widespread release of organic pollutants into aquatic systems, with contaminants of emerging concern such as phthalate esters (PAEs), per- and polyfluoroalkyl substances (PFAS), and pharmaceuticals posing long-term environmental risks. Their chemical stability allows them to persist, bioaccumulate, and exert toxic effects on aquatic ecosystems. While conventional risk assessments focus on total pollutant concentrations and bioavailability, the fraction available for biological uptake better determines their true ecological impact. Bioavailability governs pollutant fate and environmental toxicity depending on factors such as pH, salinity, organic matter, and sediment interactions. In this Postdoc project, a combination of analytical chemistry techniques, biological uptake studies, and ecotoxicological assays will be employed to assess bioavailability and its ecological implications accurately. Incorporating bioavailability considerations can improve exposure modelling by differentiating between bound and freely available pollutant fractions, enhance regulatory frameworks by establishing more accurate environmental quality thresholds, and support remediation strategies by identifying factors influencing pollutant mobility. This project aims to elucidate the key role of bioavailability in evaluating the environmental risks posed by organic pollutants within aquatic ecosystems. Through an integrative approach encompassing environmental chemistry, toxicology, and ecological assessments, this project seeks to refine risk assessment models and inform regulatory policies. Particular emphasis will be placed on long-term exposure scenarios, the synergistic effects of multiple pollutant interactions, and the development of bioavailability-based remediation strategies to mitigate contaminant impacts on aquatic ecosystems. Keywords: Contaminants of emerging concern (CECs), Bioavailability, Risk assessment, Ecotoxicity, Pollutants fate.
Temos atitiktis strateginės mokslo krypties tikslams ir prioritetams	Environmental chemistry research on organic pollution in aquatic environments is emerging at Klaipeda University. This proposed project will expand this domain by building a stronger foundation. Through comprehensive field and laboratory studies, it will investigate crucial aspects of marine ecosystem health, support sustainable coastal management, and strengthen Klaipeda University's expertise in organic aquatic pollution, reinforcing the role of the Marine Research Institute in environmental chemical science.

Planuojami tarpiniai ir galutiniai rezultatai (mokslinė produkcija: publikacijos, pranešimai ir kt.)	The intermediate research results achieved are one scientific article (in an international peer-reviewed journal, Q1-Q2, submitted) and one presentation at a national or international scientific conference. Final results: 2 scientific articles (in an international peer-reviewed scientific journal, Q1-Q2, 1 published, 1 submitted), presentations at two national or international scientific conferences.
Reikalavimai stažuotojui	The candidate should have a strong background in aquatic chemistry and ecological monitoring. Experience analysing organic pollutants in the environment, particularly in operating instruments such as GC-MS or LC-MS, is essential. Moreover, an understanding of risk assessment and procedures is mandated. Exceptional communication skills, encompassing both verbal and written fluency in the English language, are essential prerequisites.
Temos aprūpinimas (infrastruktūra, sąsaja su vykdomai projektais)	The Marine Research Institute of Klaipėda University offers state-of-the-art laboratory facilities equipped with sophisticated analytical instrumentation, including GC-MS and LC-MS, for precise quantification of organic pollutants present in environmental samples. The successful candidate will contribute to ongoing projects focused on pollutant distribution and environmental monitoring while immersing themselves in an environment that fosters practical application and scientific research in this field. The existing collaboration between the Marine Research Institute, Aquatic Institute of Latvia, Leibniz Institute for Baltic Sea Research, Gothenburg, and Stockholm Universities will provide access to the unique infrastructure needed to achieve specific tasks.
Numatomas stažuotės vadovas	Dr. Mindaugas Žilius (mindaugas.zilius@ku.lt)
Vadovo įdirbis siūlomoje temoje	Dr. Mindaugas Žilius is an established researcher in Environmental Chemistry, specializing in studying genes to entire ecosystems, encompassing oxygen, nutrient, and organic pollutant dynamics and transformations across the river–estuaries–sea continuum. He has achieved remarkable success in publishing in top peer-reviewed journals, such as Scientific Reports, Water Research, Biogeochemistry, Microbial Ecology, Limnology and Oceanography: Methods, Environment Pollution, etc., in this interdisciplinary field, and significant experience in managing large research projects and teams. Over the past decade, he has demonstrated an exceptional track record in securing substantial external funding for Environmental Chemistry research (over €1.2 million in research awards, where he acted as PI). His training in pollutant analysis, acquired at prestigious institutions like the University of Parma University (Italy), Montpellier University (France), and the University of Southern Denmark (Denmark), has facilitated his scientific growth and development. Consequently, he has developed a robust international network, collaborating with researchers from Europe, the USA, and South America. He has a proven record of successful recruitment, supervision, and outcomes for master's and doctoral students in Environmental Chemistry. His potential to produce internationally renowned research in Environmental Chemistry and Biogeochemistry was further solidified when he was appointed the lead researcher and head of the Coastal Environment and Biogeochemistry Laboratory, recently accredited following ISO/IEC 17025 standard.

	During his career, Dr. Mindaugas Žilius has published 49 peer-reviewed publications with internationally recognized co-authors, further cementing his reputation as a leading figure in Environmental Chemistry.