Proposed thesis topic for the Doctoral degree studies (2021-2025) in Ecology and Environmental Science at Marine Research Institute (Klaipėda University)

Title	Nature-based solution strategies to mitigate pathogenic vibrios in Baltic Sea ecosystems
Brief description of the topic	*Vibrio*–microbes that are part of the natural bacterioplankton in temperate marine waters – have in recent years flourished in the Baltic Sea, probably stimulated by elevated surface water temperatures. Several *Vibrio* species are human pathogens. It is hence of great concern that *Vibrio*-related wound infections and fatalities have increased dramatically along the Baltic coasts. Future climate change is predicted to escalate this problem, posing a significant threat to human health and the Baltic tourism industry. However, the projections do not yet take into account the influence of 'ecosystem engineers' such as mussels and macrophytes on *Vibrio* diversity and abundance. Recent data indicate that in some of the 'ecosystem engineers' habitats, especially seagrass, the abundance of pathogenic *Vibrio* spp. is reduced. This opens up the option for nature-based solution (NbS) strategies to control pathogenic vibrios in the nearshore habitat where humans interact with the sea. Thus, the PhD topic is to identify NbSs to mitigate the problem. One NbS which will be used are so-called floating islands, which can be anchored in the Baltic Sea. The investigations and evaluations are partly carried out by incubation experiments in the German laboratory, but also partly by field experiments in Lithuania or Germany to cover different colonisation structures. This will be accomplished through interdisciplinary integration of marine, microbiological, and molecular expertise carried by partners from seven Baltic nations.
Requirements for a candidate	The successful candidate is required to have a Diploma or Master degree in (micro-) biology or related fields such as bioinformatics, environmental sciences and technologies, or comparable. Profound knowledge of molecular biology techniques is essential. The candidate needs the capability to work in an inter-disciplinary research environment and very good English language skills.
Existing research experience	The supervisor, M. Labrenz, is author of 100+ international publications on marine/environmental microbiology and molecular biology. The last 5 five years he was/is PI or Co-PI of 10+ national and international projects as BONUS AFISmon, BONUS BLUEPRINT, INA (development of new molecular tools in collaboration with Baltic Sea or Chinese scientists), MikrOMIK, BONUS MICROPOLL (role of microbial biofilms on microplastics), or ECOLOC, VibrioMV (relevance of Vibrios in anthropogenic influenced systems).
Existing research infrastructure and support	The research is a co-operation between Klaipėda University and the Leibniz-Institute for Baltic Sea Research, Rostock Germany. The research infrastructure, laboratory and field equipment as well as methodological approaches are available (e.g. S1, S2 laboratories). The Environmental Microbiology group of ML ensures complementary funding and an international research environment. The PhD will be embedded in the EU-funded international Biodiversa project "Pathogenic Vibrio bacteria in the current and future Baltic Sea waters: mitigating the problem (BaltVib)", which will start in April 2021.
Supervisor	Prof. Dr. habil. Matthias Labrenz, matthias.labrenz@io-warnemuende.de http://www.io-warnemuende.de/environmental-microbiology.html Advisors Dr. Marija Kataržytė, Greta Gyraite