Can mussels help fight antibiotic resistance? A research project at the Institute of Oceanology PAS aims to discover new antimicrobial compounds from marine organisms – specifically, mussels of the *Mytilus* genus, common in the Baltic Sea. As bacterial resistance to current drugs increases, scientists are searching for new molecules capable of stopping infections, ideally through mechanisms different from today's antibiotics.

This study focuses on analyzing mussel genomes to identify genes coding for antimicrobial peptides (AMPs). These short proteins are part of the natural immune system in many animals, including mussels, which live surrounded by microbes. The project's goal is not only to locate these genes but also to verify if the peptides they encode are effective against bacteria. To this end, researchers will use lab-grown mussel cells and test the peptides on resistant bacterial strains.

Why mussels? *Mytilus* genomes are extremely rich and diverse, with hundreds of immune-related genes that may contain novel defense strategies. Mussels are also easily accessible and biologically well-studied, making them an ideal model for this type of research.

Expected outcomes include a curated library of antimicrobial peptides, some of which may serve as leads for new drug development. The project will also introduce new methodologies for marine cell research and contribute to our understanding of how evolution has shaped natural immunity in ocean ecosystems.