

Innovative Solutions to Combat Biofilms and Antimicrobial Resistance: Advancing with Marine Bioactives and Microbiome Research

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The rising challenge of antimicrobial resistance (AMR) and biofilm-associated infections is a significant global health concern, contributing to increased mortality rates worldwide. Traditional antibiotic therapies are often ineffective due to the robust defences that microorganisms, particularly those in biofilms, have developed. This presentation explores innovative approaches to combatting these challenges through the use of novel bioactive compounds found in marine species. First I will introduce the mechanisms behind biofilm-related antimicrobial tolerance and highlight the urgent need for novel antimicrobial agents. Subsequently I will present the results from the ProBio project, in which we focused on marine organisms from the Belgian North Sea as source for the discovery of bioactive compounds with antimicrobial and antibiofilm activities against clinically-relevant pathogens such as *Staphylococcus aureus*, *Pseudomonas aeruginosa*, and *Acinetobacter baumannii*. Our findings indicate that marine ecosystems are a promising source of new antimicrobial agents, with potential applications in treating biofilm-related infections. The results obtained in the ProBio project suggest that expanding research to marine species in other parts of the world could lead to the identification of additional antimicrobial leads and we believe this research has the potential to lead to innovative and sustainable solutions addressing the global AMR crisis.