Università degli Studi di Napoli Federico II

PhD in Biotechnology - 39th cycle

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Harnessing Extremophilic Microorganisms and enzymes for Innovative Biotechnological Strategies in Environmental Remediation

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The transition towards more sustainable economic models, such as the circular economy and bioeconomy, has increased interest in innovative approaches to waste management and valorisation [1]. Extremophiles, microorganisms adapted to thrive in extreme conditions, represent a valuable resource for biotechnology due to their ability to produce extremozymes and their resistance to heavy metals [2]. Several studies are focusing on the use of these extremophilic bacteria to degrade various biomasses, including lignocellulosic materials, and to produce high value bioproducts such as prebiotic molecules, antioxidants, and novel sustainable nanomaterials[3]. This project aims to deepen the characterization of extremozymes and their synergistic interactions for the valorisation of waste biomasses or others industrial applications, as well as the production of nanoparticles with potential applications in bioremediation. The goal is to maximize enzyme effectiveness and develop solutions for sustainable waste management, highlighting the importance of biotechnological innovations in addressing environmental challenges and responsibly utilizing resources.

References

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