



**Università degli Studi di Napoli Federico II**

**PhD in Biotechnology - 40<sup>th</sup> cycle**

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## **Biotechnological Application of Bacteria and Their Functionalization for Sustainable Agriculture**

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Soil degradation due to heavy metal contamination, salinity, and drought poses serious risks to global food security and agricultural productivity [1,2]. Plant Growth-Promoting Rhizobacteria (PGPR) offer a promising sustainable solution to mitigate these challenges by enhancing nutrient availability, promoting plant growth, and facilitating bioremediation[3].

This project aims to identify and characterize new PGPR strains with high tolerance to environmental stresses, assess their biofertilization potential, optimize delivery strategies through microbial hitchhiking, and evaluate their efficacy in controlled agricultural environments. The results will contribute to developing innovative biofertilizer formulations to improve soil health and crop productivity under adverse conditions.

### **References**

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[2] Wang, Liuwei, et al. "A review of green remediation strategies for heavy metal contaminated soil." *Soil Use and Management* 37.4 (2021): 936-963.

[3] Abdelaal, K.; AlKahtani, M.; Attia, K.; Hafez, Y.; Király, L.; Künstler, A. The Role of Plant Growth-Promoting Bacteria in Alleviating the Adverse Effects of Drought on Plants Biology (2021), 10, 520