Università degli Studi di Napoli Federico II

PhD in Biotechnology - 34th cycle

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Fungal proteic biosurfactants for the development of biosensing and biomedical platforms

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Biosurfactants are amphiphilic molecules mainly produced by microorganisms (including bacteria, yeast and fungi). They possess both hydrophilic and hydrophobic moieties and are able to display a variety of surface activities (Desai et al, 1997). Some proteic biosurfactants can be able to **modify the physicochemical properties of surfaces** making them useful in several application fields. These proteins can also exhibit **anti-microbial** and **anti-biofilm** activities, inhibiting the adhesion of pathogenic microorganism on functionalized surfaces (Janek et al, 2012) (Artini et al, 2017). Biofunctionalized surfaces can be useful for the immobilization of biomolecules with specific activity to develop novel and innovative **biosensors,** suitable for monitoring analytes in different matrices (Sorrentino et al, 2019). Moreover, for **nanotechnological** applications, proteic biosurfactants can be immobilized on 2D nanomaterials, making their dispersion biofunctionalized and stable in water solution.

The main purposes of this PhD project are focused on:

A. Selection, identification and characterization of novel fungal biosurfactant proteins.
B. Selection of adhesive proteic biosurfactants and their recombinant expression.
C. Design and recombinant production of adhesive proteic biosurfactants fused to antibodies.
D. Exploitation of proteic biosurfactants in other application fields.

References

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