



Università degli Studi di Napoli Federico II

PhD in Biotechnology - 35th cycle

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Microalgae as biorefinery: development of processes for the green extraction of high added value antioxidants

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Microalgae are prokaryotic or eukaryotic microorganisms whose diversity is not yet fully explored [1]. Microalgae are considered an important and reliable source of commercially high-value chemicals, including carbohydrates, long-chain polyunsaturated fatty acids (PUFAs) and phycobiliproteins (PBSs). Carbohydrates, in particular exopolysaccharides (EPSs), are secreted by marine red microalgae and exert their primary antioxidant action by scavenging free radicals. PBSs are brilliant colored and fluorescent proteins, which find application as fluorescent tags and as antioxidant. PUFAs are rich in omega-3 and omega-6 and are endowed with many health benefits. The aim of the present PhD project is to identify a red microalga able to produce high amount of molecules endowed with antioxidant activity. In the perspective of the circular economy, EPSs will be isolated from the culture medium. Then, PBSs will be extracted from the biomass by using green techniques. Finally, from the residual biomass, lipids will be isolated to obtain an alternative to fish oil.

References

- [1] Á.-D. González-Delgado and V. Kafarov, "Biorefinery : Issues," *CT&F - Ciencia, Tecnol. y Futur.*, vol. 4, pp. 5–22, 2011.