



Università degli Studi di Napoli Federico II

PhD in Biotechnology - 37th cycle

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Algaceutical: when microalgae application meets innovation

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To date, several skin altered conditions originally treated only with cosmetics (i.e. hypersensitivity, dermatitis, irritations, and allergies) are now conceived as real skin diseases¹ since they have been found to be strictly linked to oxidative stress and inflammation². Thus, cosmeceuticals have gained more attention, as they act at cellular and molecular level. Moreover, the growing concern of consumers about the molecules present in final cosmeceutical products has given place to an interest in natural and cost-effective alternatives with competitive performances. In this scenario, the application of microalgae derived products as substitute of conventional active ingredients have gained more attention since microalgae can be used as cell-factories able to produce environmentally-friendly and safe bioactive molecules. Many of these molecules (such as carotenoids, phycobiliproteins and exopolysaccharides) are endowed with peculiar properties, as antioxidant, antibacterial, anti-inflammatory and anti-allergenic activity³⁻⁴. They can be also applied as anti-aging, emollients, protecting, regenerating and antioxidant skin care products⁵, able to improve skin structure, morphology and appearance. Last but not least, pigments produced by microalgae (carotenoids and phycobiliproteins) have photoprotective and antiadipogenic activity⁶. For these reasons, the aim of the present PhD project is the isolation of antioxidant molecules from microalgae and their application in cosmeceutical field. In particular, single molecules, as well as a mixture of them, will be tested for their activity in counteracting fat accumulation or inducing lipid degradation in different *in vitro* cell-based models. Finally, the most promising bioactive molecules will be encapsulated in different polymeric matrixes and the biological activity of the final product will be evaluated.

References

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