



Università degli Studi di Napoli Federico II

PhD in Biotechnology - 38th cycle

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Bioactivity testing and generation of reporter cell lines for the primary screening of natural compounds for the pharmaceutical and nutraceutical industry

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Natural products are compounds or substances produced by living organisms including plants, fungi, or microorganisms. Nowadays epidemiological studies indicate that high consumption of foods rich in bioactive compounds has a positive effect on human health. From the viewpoint of general pathology, most human diseases are associated with systemic inflammation, ROS imbalance and oxidative stress (Lugrin et al., *Biol Chem.* 2014; 395 (2):203-230). The general aim of the present PhD project is to generate stable reporter systems in immortalized/transformed cell lines as well as in mesenchymal pluripotent stem cells for automated primary screening of antioxidant compounds from natural sources. Starting from the most disparate natural sources we intend to identify, antioxidant compounds using a rapid screening by redox-sensitive reporter activity. Once identified, the antioxidant compounds will be characterized for their potential protective effects from harsh environmental conditions as well as for their effects on stem cell viability, regeneration and differentiation by classical bioactivity assays and transcriptomic analyses on compound-treated mesenchymal stem cells. Selected extracts or purified metabolites will then be incorporated in polysaccharide-based particles to exploit them for applications in the cosmeceutical, pharmaceutical and nutraceutical industries.

References

Lugrin Jérôme, Rosenblatt-Velin Nathalie, Parapanov Roumen and Liaudet Lucas The role of oxidative stress during inflammatory processes. *Biol Chem.* 2014; 395 (2):203-230.