

Nanoencapsulation of nutraceuticals in nanostructured lipid systems for obtaining advanced food supplements

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PhD Thesis Abstract

The PhD thesis entitled "*Nanoencapsulation of nutraceuticals in nanostructured lipid systems for obtaining advanced food supplements*" aims to obtain Nanostructured Lipid Carriers (NLC) that include different phytochemicals principles (lipophilic and hydrophilic), in order to improve therapeutic actions and develop some food supplements with complementary and/or synergistic properties. The main objectives were: *i*). Obtaining NLCs with multiple therapeutic response, by association at least two categories of phytochemical active principles (individual or as a mixture): Diosgenin, *Wild yam*, *Glycyrrhiza Glabra*, *Polygonum cuspidatum* and *Cimicifuga racemosa* extracts. *ii*). Morpho-structural characterization of the NLC (*e.g.* morphological, spectral, chromatographic analyses), in order to demonstrate their ability to coopt both categories of lipophilic and hydrophilic phytochemicals. *iii*). Comparative evaluation of the *in vitro* therapeutic responses of NLC containing phytochemicals, by determining the controlled release profiles, antioxidant activity and anti-inflammatory action. The developed NLC-phytochemicals presented an ideal balance in terms of cytotoxicity, coupled with high antioxidant and anti-inflammatory efficiencies, which can compensate or even substitute the analogous properties of conventional synthetic drugs.