

Nanocarrier Systems Based on Natural Actives with Antiobesity and Antioxidant Actions

PhD Thesis Abstract

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The doctoral thesis entitled “**NANOCARRIER SYSTEMS BASED ON NATURAL ACTIVES WITH ANTI OBESITY AND ANTIOXIDANT ACTIONS**” highlights the original contributions to the synthesis of new nanocarrier systems based on active compounds with antiobesity and antioxidant actions.

The main aim of the thesis was the synthesis and characterization of nanostructured lipid carrier systems (NLC) based on vegetable active principles (caffeic acid, curcumin, piperine, capsaicin) in association with vegetable / mineral oil (linseed oil, argan oil, primrose oil, paraffin oil) and co-encapsulated with active synthetic principles. Endogenous lipids recognized by epithelial cells were used: oleoylethanolamide and phenylalaninol oleamide, which have the ability to release the active principle evenly and in a controlled manner.

The paper consists of 9 chapters, structured in two parts: 1. **Bibliographic research** and 2. **Experimental research**, and ends with the chapter “**Conclusions**” and with the **Bibliography** part.

The experimental research conducted in the doctoral thesis has shown that nanoencapsulation of active principles has led to obtaining of NLC systems with improved physicochemical and biological properties. The synthesized NLC systems were dimensionally characterized by evaluating the average nanoparticle diameter (Z_{ave}) and the polydispersity index (PDI) (by DLS method), in terms of physical stability by evaluating the potential zeta (ξ), morphological (by DSC technique), in terms of encapsulation efficiency (EE%) (by UV-VIS, HPLC), biological properties - antioxidant properties (by ABTS / chemiluminescence method), controlled release properties (by Franz diffusion) and anti-obesity effect (in the case of NLC systems based on capsaicin).

The experimental results show as a novelty the synergy between the bioactive effects of the lipid nanocarriers systems based on vegetable oil and the bioactive effects of both the natural active principles and the active synthetic principles. The complex chemical composition of vegetable oils used in association with natural active principles, but also with active synthetic principles explains the stability over time of NLC systems, so the new synthesized systems can be used for the development of effective and safe pharmaceutical formulations that can be used in anti-obesity therapy. At the end of the thesis the original contributions and perspectives of further research are presented.