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INFLUENCE OF THE RELEASE PROPERTIES OF NANOLIPOSOMES ON THE ANTIOXIDANT CAPACITY OF ENCAPSULATED ROSEMARY EXTRACT

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Free radicals induce lipid peroxidation in cell membranes and initiate neuronal dysfunction and death. Therefore, oxidative stress is a cardinal hallmark of neurodegenerative disorders such as Alzheimer's disease (AD). In addition to the numerous effects, Rosemary extract (RE) exhibits an antioxidant activity, considered as a possible source for AD prevention. Within this framework RE loaded NLs were prepared and the correlation between *in vitro* drug release properties and antioxidant potential was examined.

RE loaded NLs (lechitin:cholesterol:PEG = 8.7:1:1.7 and 9:1:0.17 for S1 and S2, respectively) were prepared by modified lipid film hydration technique. RE loading was determined and *in vitro* release from NLs was carried out in phosphate buffer pH 7.4 by previously validated HPLC method. Antioxidant capacity of RE loaded NLs and RE was determined using Oxygen Radical Antioxidant Capacity (ORAC) assay based on the oxidation of a fluorescent probe by peroxyl radicals from 2,2'-Azobis (2-amidinopropane) dihydrochloride. Fluorescence was measured every 30 min (VICTOR, Perkin Elmer, USA) during the examination period of 120 min. All experiments were conducted in triplicate and statistical analysis was done using ANOVA. RE loading, expressed through rosmarinic acid (RA), in NLs was 4.10 - 4.28 mg/100 mg lipid. Obtained drug release profiles pointed that prepared NLs were characterized with controlled release properties (0.55 and 0.99 mg RA released within 120 min for S1 and S2, respectively). RE loaded NLs showed statistically significant higher antioxidant activity (95.03±0.69% and 96.40±0.73% of the initial fluorescence) compared to native RE (90.04±2.51%), probably due to the presence of lecithin in the formulations and their controlled release properties. In this study an efficient *in vitro* antioxidant capacity of RE loaded NLs was confirmed, which may serve as a promising strategy for AD prevention.