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Protein binding capacity of nanostructured lipid carriers loaded with *Salvia off.* extract

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Having in mind the current options for Alzheimer's disease (AD) treatment and its limitations on the one hand, and advantages and possibilities offered by drug delivery carriers (DDS) on the other hand, nanostructured lipid carriers (NLC) would be potentially efficient in AD treatment. One of the most important factors that influence DDS in vivo faith is their plasma protein binding capacity, critical for formation of protein corona that largely defines their biological identity [1]. Understanding the influence of formulation composition and DDS physico-chemical properties upon affinity for protein corona formation might significantly contribute to development of new innovative functional therapies in AD. NLC loaded with freeze-dried *Salvia off.* methanolic extract (FSE) were formulated using solvent evaporation method previously described [2]. Phospolipon 90H (Phospholipid, Germany) and oleic acid (Sigma-Aldrich, Germany) were used as lipid phase (1:0.43). Ratio of total lipid to ethanol as organic solvent was 1:20, while total lipid to Tween 80 (Merck, Germany) ratio was 1:0.47, 1:0.84 and 1:1.16 for NLC-FSE5, NLC-FSE6 and NLC-FSE 7, respectively. Organic solvent with 0.58% FSE to water phase (0.5% Poloxamer 407, BASF, Germany) ratio was 1:2. Prepared formulations were characterized in terms of particle size and zeta potential (Zetasizer nano ZS, Malvern, UK). Protein binding capacity was determined by protein adsorption studies [3]. Obtained results indicated that by increasing the amount of surfactant (Tween 80) the particle size decreased (from 236±4 to 132±3 nm) probably due to the lower surface tension thus resulting with smaller NLC-FSE. Zeta potential values were in a range of -10±2.1 to -18±2.8 mV. At the same time protein binding capacity increased (from 33.74±3.2 to 50.76±4.1%), most likely due to the larger surface area exposed to the proteins as well as zeta potential values.

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