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PREPARATION AND CHARACTERIZATION OF FERULIC ACID ENCAPSULATED DEFORMABLE LIPOSOMES

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Deformable liposomes are liposomes with both phospholipids and surfactants in the lipid component. Since those hybrid liposomes are deformable and since those vesicles contain surfactants that function as skin penetration enhancers, those liposomes are preferred in formulations designed for topical application. Thus, the aim of this research was to prepare and characterize deformable liposomes containing ferulic acid which is a potent antioxidant used in pharmaceutical and cosmeceutical products. Deformable liposomes were made using phosphatidylcholine incorporating polysorbate 80 in the membrane following the proliposome method. Both plain liposomes and ferulic acid encapsulated liposomes were prepared and those liposomes were characterized. Incorporation of surfactants in the lipid component of liposomes resulted in an increase in the size of liposomes. However, encapsulation of ferulic acid in liposomes resulted in a decrease in the size of those vesicles. This result indicates that ferulic acid interacts with the lipid bilayers of liposomes. Furthermore, our results suggest that ferulic acid may be embedded in the lipid bilayers changing the curvature of liposomal bilayers. As expected, incorporation of polysorbate 80 in the lipid bilayer of liposomes did not affect the zeta-potential of liposomes. However, incorporation of ferulic acid resulted in less negative zeta-potentials, which again reveals interactions of ferulic acid with the head groups of phosphatidylcholine. The encapsulation efficiency and loading capacity of deformable liposomes revealed that those values are dependent on the lipid composition of those hybrid liposomes. Thus, these results indicate that the components that constitute the lipid membrane of ferulic acid encapsulated deformable liposomes play a vital role in determining the properties of those liposomes.

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