

Nano Structured Lipid Carriers (NLCs) Incorporating Prickly Pear Seed Oil for the Encapsulation of Vitamin A

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Abstract

This work aims to investigate the potential advantage of using Prickly Pear (PP) seed oil to develop nanostructured lipid carrier (NLC) for topical delivery of vitamin A. The release patterns of four PP-based NLC formulations with varying amounts of surfactant to solid lipid ratio, and amounts of Prickly Pear Seed oil have been developed using the hot homogenization method, and compared with a solid lipid nanoparticle (SLN) formulation that is free of PP oil. The effect of the variation in the constituting matrix of the nano-carriers on entrapment efficiency, in-vitro release behavior, and ex-vivo permeation using Franz Diffusion Cell, was investigated. Additionally, particle size and polydispersity index (PDI) upon storage, zeta potential, and thermal behavior were characterized. PP-based NLCs exhibited smaller particle size in the range of 215-244 nm, and PDI < 0.3. In contrast, SLN having no PP oil had a larger diameter of 365 nm, with heterogeneous distribution (0.92 PDI). In assessing the in-vitro release, an inverse relationship was observed between the diffusion flux and the entrapment efficiency. The changes in the constituting matrix of the NLCs lead to a significant potential variation in their properties, and hence allowing it to be tailored for specific usages.

Biography

Sham AlZahabi has graduated from the American University in Cairo with MSc in Chemistry, was senior RnD researcher at local cosmetic factory, Eva cosmetics for 3 years. Following her masters, got awarded several scholarships in both Cambridge University and Oxford University to continue her research. She went to Cambridge to begin her PhD journey, where she studied biomimicry of skin modeling in the group of Professor Duer, and interrupted her study to come back to Egypt and open her skin clinic, Dao Derma, where now she's continuing both.

Publications

Sham AlZahabi, Omar Shoukry Sakr, Adham A. Ramadan, Journal of Cosmetic Dermatology 18(4)

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