Nanoemulsion stabilized by safe surfactin from *Bacillus subtilis* as a multifunctional, custom-designed smart delivery system.

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Rok wydania

2020

Czasopismo

Pharmaceutics

Numer woluminu

12

Strony

953/1-953/21

DOI

10.3390/pharmaceutics12100953

Kolekcja

Naukowa

Język

Angielski

Typ publikacji

Artykuł

Streszczenie

The developing field of bio-nanotechnology aims to advance colloidal research via the introduction of multifunctional nanoparticles to augment the dermal effectiveness of active substances. Self-emulsifying drug delivery systems (SEDDS)—isotropic mixtures of oils, surfactants, solvents and co-solvents or surfactants—are attracting interest in the cosmeceutical field. As part of this study, SEDDS systems containing vitamin C or vitamin E and curcumin were developed, whereby the bioavailability of the active compounds increased by enhancing their permeability to deeper layers of the skin. A composition consisting of 50% surfactin from Bacillus subtilis, 30% Transcutol and 20% oil phase was designed to encapsulate the active substances, i.e., vitamin C or vitamin E and curcumin, contained in the oil phase. The developed carriers were characterized by average particle sizes of 69–183 nm. The formulations with the vitamins were found to be physically and chemically stable for 6 months. Transdermal tests were carried out, showing that the carriers enable the transport of active substances deep into the skin, stopping at the dermis border. The formulations with vitamin C and vitamin E reduced the discoloration, the vascular lesions, and the depth of the wrinkles on the tested skin, which can be useful in cosmetics in the treatment of problem skin, including capillary and sensitive skin.

Słowa kluczowe

surfactin, surfactant, Bacillus subtilis, delivery system, nanocarrier, skin, Stability

Adres publiczny

http://dx.doi.org/10.3390/pharmaceutics12100953

Strona internetowa wydawcy

http://www.mdpi.com/journal/metals