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Development of Astaxanthin loaded Solid lipid nanoparticles (SLNs) versus nanostructured lipid carriers (NLCs) for dermal delivery.

Ching-Hsiang Huang(黃敬翔),Wei-Chao Lin(林維炤)*

Department of cosmetic science and institute of cosmetic science, Chia-Nun University of Pharmacy and Science

The aim of this study was to develop and assess nanostructured lipid carriers (NLC) compared to solid lipid nanoparticles (SLN) encapsulated with Astaxanthin. The purpose of the present research was to avoid oxidation and degradation of the active ingredient then prolonged storage. In the this study, Encapsulation of Astaxanthin in SLN(Astaxnthin-SLN) and NLC(Astaxnthin-NLC) were prepared by high pressure homogenizers technique (500 bars 5cycles). The experimental results show that SLN and NLC particle were around 120nm-170nm with a narrow distribution and a stable zeta potential were around -25mV~-41mV. For all tested the total recovery of formulations were more than 90% and the encapsulation efficiency was 100%.We used Cetyl palmitate、Caprylic/Capric Triglyceride and Alkyl polyglucoside (APG) were prepared NLC ,that had better stability and less degradation than SLN. After storage for 3 months at 45℃, Astaxnthin-NLC were a most stable formulations that total recovery were more than 90% ,and by the skin irritation test result was After storage for 3 months at 45℃,Astaxnthin-NLC were a most stable formulations that total recovery were more than 90% ,and by the skin irritation test result was low irritation. The NLC has a characteristic of Occlusion effect, so we applied the serum containing NLC(S-NLC) on the face. The number of test 10 people and results showed that 70% of people improved in moisture ($P<0.05$). The in vitro percutaneous absorption of Franz cell results showed that Emulsion containing NLC(E-NLC) transdermal permeation of Astaxanthin was greater than traditional-emulsion(T-emulsion), they were significant increased ($P < 0.05$). These findings indicated that NLC could add to the traditional emulsion to improve the skin penetration.