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In vivo anti-inflammatory activity by trans-resveratrol loaded-solid lipid nanoparticle for skin disorders

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Trans-resveratrol (RES) presents important action to prevent and treat skin disorders. Cutaneous administration of RES has being explored in order to find it on their site of action. Solid lipid nanoparticles (SLN) due to interaction characteristics with skin have being used to drug delivery system for topical application. The aim was to verify *in vivo* anti-inflammatory activity of SLN with RES for cutaneous application therapy. The formulations developed were composed by stearic acid (SA) as solid lipid, polysorbate 80 (P80) and soy phosphatidylcholine (SP) as surfactants and poloxamer 407 (P407) and glycerin as stabilizers (F1). Cetrimonium bromide (CB) was added as cationic surfactant to promote positive superficial charge (F2). The formulations was add of 0.25% RES (F1.RES and F2.RES). The average hydrodynamic diameters were 195.0±3.34 nm, 241.3±48.33 nm, 159.15±4.78 nm e 158.25±33.92 nm to F1, F1.RES, F2 e F2.RES, respectively. Zeta potentials (mV) were -25.5±1.01; -26.0±1.67; 30.6±1.13 e 30.0±1.85 mV for F1, F1.RES, F2 e F2.RES, respectively. Entrapment efficacy was analyzed using validated analytical methodology and both formulations (F1.RES and F2.RES) present ~50% of RES entrapped. RES solution (1:1 ethanol and water) and F2.RES presented reduction of nociception similar to dexametasone commercial cream, which suggest potent anti-inflammatory activity of RES and SLN with RES. The results demonstrated the importance to investigate the RES action when it is entrapped in drug delivery system for topical application.

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Physicochemical stability evaluation of liquid crystalline O/W emulsions

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Liquid crystals are applied in the pharmaceutical and cosmetic industries due to the fact that they can promote a controlled drug delivery system and more physicochemical stability when it compare to emulsions. The aim of this study was verify the stability of liquid crystals in cosmetic formulations. Liquid crystal structures were confirmed by polarized light microscopy. Physicochemical characteristics were measured during 60 days and formulations were stored in different conditions of temperature. Organoleptic characteristics, centrifugation, pH value, viscosity and rheological behavior were evaluated to verify the formulations stability. The results demonstrated that there was no alteration in the organoleptic characteristics in any samples and there was no phase's separation after centrifugation process. The pH values changed after 60 days when storage in different temperatures, however changes in pH may not affect the physiological skin surface pH. The lamellar liquid crystal was observed in all formulations analyzed; however some formulations presented also hexagonal liquid crystal. All samples presented non-Newtonian pseudoplastic behavior ($n<1$) and thixotropic. Cetearyl alcohol and sodium cetearyl sulfate promoted more stability in crystalline liquid and viscosity maintenance ($p<0.01$) for all storage temperature, during 60 days, proving the good physical stability. It was observed also good stability in viscosity and crystalline liquid structures maintenance ($p<0.01$) for the formulation composed by cetearyl alcohol, sodium cetearyl sulfate, tricetheareth-4 phosphate and oleth-10. All results demonstrated that the presence of thick agent cetearyl alcohol and the surfactant sodium cetearyl sulfate can promote the formation of liquid crystal structures with good physicochemical stability.

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