

Evaluation of liposomal and conventional formulations of octyl methoxycinnamate on human percutaneous absorption using the stripping method

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Abstract

The objective of this study was to determine the influence of vehicles on the penetration of octyl methoxycinnamate (OMC), as a UV absorber, to the stratum corneum by the stripping method. The experimental formulations consisted of a conventional o/w emulsion and multilamellar and small unilamellar liposomes (MLVs and SUVs) containing OMC. MLVs containing OMC were prepared by the fusion method and then converted to SUVs by probe sonication. Various formulations were then applied onto the midvolar forearms of six volunteers at a dose of 1 mg/cm². After determined timepoints, the stripping method was conducted whereby 12 tape strips were applied and subsequently divided into different stripping groups. The sunscreen agent was assessed by HPLC while the SPF (sun protection factor) of the formulations was determined in human volunteers in accordance with the Australian standard. Overall the results indicate that skin accumulation of OMC in MLVs was significantly greater than in the o/w emulsion and SUVs. Furthermore, SUVs penetration into the deeper skin layers was significantly greater than MLVs and that of a conventional o/w emulsion. Also, higher amounts of OMC were recovered from the upper layers of the stratum corneum than from the deeper layers in all the formulations tested. Finally, the SPF of the liposomes containing OMC was slightly greater than that of the control lotions at a similar concentration of OMC. In conclusion, the result of this study indicates that an MLV prepared by the fusion method could be a better vehicle for OMC as a sunscreen since it has a slightly better SPF compared to a conventional formulation and more remains in the stratum corneum, reducing its penetration to the deeper layers.

Reaxys Database Information

Indexed Keywords

EMTREE drug terms: cinnamic acid derivative; liposome; octylmethoxycinnamate; sunscreen

EMTREE medical terms: adult; article; emulsion; female; human; intradermal drug administration; male; skin absorption

MeSH: Administration, Cutaneous; Adult; Cinnamates; Emulsions; Female; Humans; Liposomes; Male; Skin Absorption; Sunscreening Agents

Medline is the source for the MeSH terms of this document.

Chemicals and CAS Registry Numbers: Cinnamates; Emulsions; Liposomes; octylmethoxycinnamate; Sunscreening Agents

ISSN: 10207881 **Source Type:** Journal **Original language:** English

PubMed ID: 1884130 **Document Type:** Article