

P54. Effect of hydroxypropyl- β -cyclodextrin on butyl methoxydibenzoylmethane skin permeation from lipid microparticles

S. Scalia^a, G. Coppi^b, V. Iannuccelli^b

^a Department of Pharmaceutical Sciences, University of Ferrara, Ferrara, Italy

^b Department of Pharmaceutical Sciences, University of Modena and Reggio Emilia, Modena, Italy

Butyl methoxydibenzoylmethane (BMDBM), the most widely used UVA absorber has been shown to be photo-unstable and to exhibit appreciable permeation into human stratum corneum and viable epidermis. In earlier investigations we demonstrated that complexation of BMDBM with hydroxypropyl- β -cyclodextrin (HP- β -CD) reduced the sunscreen degradation under simulated sunlight although no significant influence on the percutaneous penetration of the UVA filter was observed. The purpose of this study was to evaluate whether the encapsulation of the BMDBM/HP- β -CD complex into lipid microparticles could affect the skin permeation of the sunscreen agent. Microparticles loaded with free BMDBM or its complex with HP- β -CD were prepared by the melt emulsification technique using tristearin as lipidic material and hydrogenate phosphatidylcholine as the surfactant. The lipoparticles loaded with free BMDBM or BMDBM/HP- β -CD complex were incorporated in a model O/W emulsion and their influence on the UV filter percutaneous penetration was assessed *in vivo* on humans by the tape-stripping technique. Compared to the formulation with the non-encapsulated sunscreen agent (percentage of the applied dose penetrated, 9.7% \pm 2.5), the amount of BMDBM diffusing into the stratum corneum was increased by the formulations containing the BMDBM/HP- β -CD complex (17.1% \pm 3.2 of the applied dose) or the microparticles loaded with BMDBM only (15.1% \pm 2.7 of the applied dose). On the contrary, a significant reduction in the level of UV filter retained into the stratum corneum was achieved by the formulation containing the microencapsulated BMDBM/ HP- β -CD complex (percentage of the applied dose penetrated, 6.0% \pm 1.5). Differences were detected among the formulations also in the sunscreen distribution in the horny layer, statistical significance being measured in the intermediate part of the stratum corneum (strips 5-7). The reduced BMDBM percutaneous penetration achieved by the lipid microparticles incorporating the sunscreen in the cyclodextrin complex form, should enhance the UV filter efficacy and limit potential toxicological risks.