THREE-DIMENSIONAL HUMAN SKIN MODEL TO EVALUATE THE PHOTOTOXICITY OF UVA AND UVB PHOTOPROTECTORS: HISTOLOGICAL ANALYSES

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An in vitro full thickness three-dimensional human skin model represents the possibility of assess the photodamage and the photoprotection afforded by sunscreens, being able to overcome the need for animal models at least in the early stages of the photoprotection tests. The effects of sunlight exposures on such a biological arrangement like the skin cells are well featured by sunburn and suntan, as well known short-term reactions and the more profound and serious long-term consequences like the photoaging and photocancers. The aim of this study was to determine the phototoxicity effect of two usual photoprotectors active cosmetic ingredients with different SPF using the direct cytotoxicity approach to detecting the early signs of UV-induced cellular damage in a human skin model, comprising a differentiated epidermis and a living dermal equivalent. Both sunscreen agents used in the tests are widely recognized by the pharmaceutical community and worldwide employed as sunscreens. The Octyl Methoxycinnamate is currently the most frequently sunscreen component used for protection of UVB short wavelength radiation. The Butyl Methoxydibenzoylmethane or Avobenzone is the only agent that protects specifically of the UVA long wavelength radiation. The UV-induced cell damage was accessed using the in vitro colorimetric assay that is far the most extensively used assay called Neutral Red (NR). Since this is an in vitro assay based on human cells, this non-invasive technique represents a very plausible alternative way of animal substitution models for testing of toxicity in general. It is expected that the standardization of this technique can make the assessment of a new active sunscreen easier, regarding their phototoxicity at the cellular level having as future prospect the ability to assess the photoprotection in both, innovative formulations as well as those already marketed.

Key words: Three-dimensional human skin model, phototoxicity, photoprotectors, UV-induced cell damage, NR.

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