PHOTOBIOLOGY AND PHOTOPROTECTION

AN ENLARGED FILTRATION OF UVA1 IMPROVES SKIN PHOTOPROTECTION IN VITRO AND IN VIVO

C Marionnet [1] - C Tran [1] - P Bastien [2] - A Bielicki [1] - C Golebiewski [1] - Dl Vieu [1] - A Suida-batista [3] - D Candau [3] - F Bernerd [1]

L'oreal Research And Innovation, Knowledge And Performance, Aulnay Sous Bois, France [1] - L'oreal Research And Innovation, Statistics, Aulnay Sous Bois, France [2] - L'oreal Research And Innovation, Applied Research Photoprotection, Chevilly Larue, France [3]

Introduction: UVA1 rays (340-400 nm) represent the majority of UV rays reaching the Earth level. UVA1 contribute to skin darkening, photoaging, immunosuppression and carcinogenesis in human and, at the molecular and cellular level, induce epidermal and dermal damage, and alter gene and protein expression. However, sunscreen formulae, that efficiently filter UV wavelengths up to 370 nm, lack a sufficient absorption in the range of 370-400 nm UVA1 wavelengths.

Objectives: The present study aimed at testing if an enlargement of spectral absorption would increase the protection against UVA1-induced biological and clinical impacts.

Materials & Methods: The efficiency of a state of the art formulation (absorbing 280-370 nm rays), and of two formulations constituted by the state of the art formulation to which was added prototype UVA1 filters, allowing a gain of absorption in the UVA1 range (280-385 nm, 280-395 nm, respectively) were tested. In vitro, cell and tissue morphology, as well as gene expression (Q-PCR) and soluble protein expression (ELISA) were assessed at different time points, after topical application onto reconstructed skin, prior exposure to UVA1. In vivo, human skin darkening was assessed in 16 subjects, using colorimetric measurements (Chromameter, Minolta CR300) and visual scoring, after topical application of the formulations on their back, followed by UVA1 exposure.

Results: The use of formulae enriched whith prototype UVA1 filters afforded a superior protection than a state of the art sunscreen, with regard to epidermal and dermal damage, as well as to the expression of genes and proteins involved in essential biological pathways in vitro, and to skin darkening in vivo (ΔL*, ΔITA, ΔE).

Conclusions: This proof of concept study demonstrated that an enlarged absorption profile in the UVA1 range improves the prevention of UVA1-induced effects in vitro and in vivo, and

thus pleas for a broader photoprotection in this domain of wavelengths.