Cosmetic & Pharmaceutical Research > Cosmetic & Pharmaceutical Research > Pigmentation / Melasma

29 | Detection of UV-induced pigmentary and epidermal changes over time using in vivo reflectance confocal microscopy.

Middelkamp-Hup MA, Park HY, Lee J, Gilchrest BA, Gonzalez S.; J Invest Dermatol. 2006 Feb;126(2):402-7.

ABSTRACT

In vivo reflectance confocal microscopy (RCM) provides high-resolution optical sections of the skin in its native state, without needing to fix or section the tissue.

Melanin provides an excellent contrast for RCM, giving a bright signal in the confocal images.

The pigmented guinea-pig is a common animal model to study human pigment induction and modulation, as its tanning response is comparable to human tanning after exposure to ultraviolet radiation (UVR).

We investigated the applicability of RCM to detecting UVR-induced pigmentary changes in this model.

Animals were exposed to solar simulator radiation for 7 days. RCM was performed during the irradiation and follow-up period.

Compared to non-irradiated skin, an increase in melanocyte size, dendricity, and number, as well as increased pigment in keratinocytes, was seen in the irradiated epidermis. Interestingly, these changes could be detected even before a tanning response was clinically visible. UVR-induced epidermal hyperplasia could also be detected and quantified.

In conclusion, in vivo RCM is a sensitive non-invasive imaging technique that can repeatedly measure epidermal pigmentation and thickness, as demonstrated in the guinea-pig model. This technique should greatly enhance our appreciation of dynamic pigmentary changes in human or animal skin over time and in response to specific stimuli.