

Cosmetic & Pharmaceutical Research > Cosmetic & Pharmaceutical Research > Sunburn

5

In vivo assessment of pigmentary and vascular compartments changes in UVA exposed skin by reflectance-mode confocal microscopy.

Yamashita T, Akita H, Astner S, Miyakawa M, Lerner EA, González S.; Exp Dermatol. 2007 Nov;16(11):905-11.

ABSTRACT

Exposure of the skin to ultraviolet A (UVA) results in various biological responses, skin-colour changes being among the major ones. Although intense research has been performed on UVA-induced pigmentation and vascular changes, the process of skin-colour changes after UVA irradiation remains unclear.

For a better understanding of the UVA tanning mechanism, we here performed a human study in 27 healthy volunteers with skin phototype (SPT) II to VI.

After a single UVA exposure to inner forearm, the skin sites were imaged using reflectance-mode confocal microscopy (RCM), for analysis of melanin and vascular changes.

Punch biopsies were also taken from the UVA-exposed or non-exposed sites for histological examination.

Skin sections were stained with Fontana-Masson and evaluated by a sensitive tyrosinase assay for comparison with RCM images.

Furthermore, the effect of blood flow on skin-colour changes was evaluated visually after administration of an intradermal anesthesia of lidocaine with or without epinephrine.

Our RCM analysis showed dendritic melanocytes and a different melanin distribution in the epidermal layer, clearly visible 1 week

after the UVA exposure in subjects of SPT V which were supported by histological examination. However, no melanin distribution pattern changes were apparent immediately after the exposure, while RCM images showed accelerated capillary flow patterns.

The restriction of this UVA induced-accelerated blood flow by epinephrine inhibited partially or completely the immediate pigment darkening and delayed tanning.

These in vivo studies confirmed that vascular change is an important factor for the development of the immediate pigment darkening and delayed tanning.