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Does skin hydration influence keratinocyte biology? In vivo evaluation of microscopic skin changes induced by moisturizers by means of Reflectance Confocal Microscopy.

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ABSTRACT

BACKGROUND: Skin hydration is defined as the water content of the epidermis and the dermis. In vivo reflectance confocal microscopy offers the opportunity to determine in vivo the kinetics of the skin after the application of topical products. **OBJECTIVE:** To define confocal features associated with dry skin and assess the microscopic effects of different moisturizers. **METHODS:** Ten healthy volunteers were enrolled for the study. Two different formulations were tested: petrolatum and a commercially available emulsion. Measurements were performed from baseline to 3 h after removal of the occlusion at regular time points. Nine confocal features were assessed: furrows' size, overall interkeratinocyte reflectance, furrows' morphology, scales, skin surface irregularity, non-rimmed dermal papillae, exocytosis, dermal inflammation and collagen type. Furrows' size and interkeratinocyte reflectance were also quantitated using a digital analysis. Stratum corneum capacitance was recorded. **RESULTS:** At baseline, RCM showed the presence of micro-scales and high skin surface irregularity score. After the application of topical products, the scale score decreased significantly; Furrow's size and Digital Furrow's Size had a marked and directly correlated decrement. Furrow's morphology and Epidermal Irregularity scores decreased from baseline to 30 min, the latter reaching a plateau in product application areas. Interestingly, interkeratinocyte reflectance progressively increased with the application of the topical products, while remained stable in the control area, confirmed by Digital Interkeratinocytes reflectance quantitation. **CONCLUSION:** RCM revealed that the changes involve the skin surface by reducing the micro-scales and epidermal irregularity. Even more interestingly, RCM showed that higher interkeratinocytes' brightness is seen for moisturizer, but not for the control area. This RCM finding could be linked to keratinocyte membrane protein exposure and/or substance release in the interkeratinocytic space. To sum up, RCM represents a useful imaging tool to analyze the morphologic changes at different time points following the application of topical products.