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Combining in vivo reflectance with fluorescence confocal microscopy provides additive information on skin morphology

Skvara H, Plut U, Schmid JA, Jonak C.; *Dermatol Pract Concept.* 2012;2(1):2

ABSTRACT

Background: Within the last decade, confocal microscopy has become a valuable non-invasive diagnostic tool in imaging human skin in vivo. Of the two different methods that exist, reflectance confocal microscopy (RC M) displays the backscattering signal of naturally occurring skin components, whereas fluorescence confocal microscopy (FCM) provides contrast by using an exogenously applied fluorescent dye.

Methodology: A newly developed multilaser device, in which both techniques are implemented, has been used to combine both methods and allows to highlight different information in one image. In our study, we applied the fluorophore sodium fluorescein (SFL) intradermally on forearm skin of 10 healthy volunteers followed by fluorescence and reflectance imaging.

Results: In fluorescence mode the intercellular distribution of SFL clearly outlines every single cell in the epidermis, whereas in reflectance mode keratin and melanin-rich cells and structures provide additional information. The combination of both methods enables a clear delineation between the cell border, the cytoplasm and the nucleus. Imaging immediately, 20, 40 and 60 minutes after SFL injection, represents the dynamic distribution pattern of the dye.

Conclusion: The synergism of RC M and FCM in one device delivering accurate information on skin architecture and pigmentation will have a great impact on in vivo diagnosis of human skin in the future.