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In Vivo Study of Age-Related Skin Changes Using in Vivo Confocal Microscopy

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ABSTRACT

In the past decade laser-scanning confocal microscopy was developed as a non-invasive method providing in vivo images of human skin in real time.

The aim of the study was to observe and measure skin changes due to aging using in vivo confocal microscopy. Several parameters were analyzed such as stratum corneum and epidermal thickness, spinous and granular cell morphology, number, height and morphology of dermal papillae, and finally the collagen aspect. Twenty-five volunteers aged 20 to 70 were enrolled in this study.

Calculation of the correlation coefficient (r) demonstrated that the stratum corneum thickness and the epidermal thickness were very strongly linked to age. Observed with aging were cell disorganization, cell spreading as well as numerous cells showing irregular shapes and vacuoles. The number and height of dermal papillae showed a statistically significant reversed correlation with aging, suggesting that dermal papillae are a good indicator of aging.

In the younger groups collagen bundles were compact and dense, while in older groups filiform collagen bundles were observed. Finally, based on the method previously described, we assayed Compound IV08.009, a peptide designed to improve the epidermal niche, in an in vivo double blind study. We showed significant in vivo benefits such as an increase in the number of papillae and in the theoretical age in the group of volunteers after 28 days of treatment.