DERMOSCOPY AND SKIN IMAGING

NOVEL TECHNOLOGIES TO INVESTIGATE THE DISTRIBUTION OF FACIAL MELANIN PIGMENTATION

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Background: Cosmetic enhancement is oftentimes the primary objective for treating congenital and acquired pigmentary disorders. Accurate diagnosis of the nature of these disorders is fundamental for choosing safe and effective treatment therapies. In this diagnosis, determining the depth of pigmentation remains a crucial component for which current dermatological technologies provide limited solutions.

Objective: The here presented technologies and method intend to provide a new approach in visualising how the melanin deposits of pigmentary lesions are spatially distributed across the depth of the skin.

Materials and Methods: A significant part of light is refracted into the skin and propagates through different layers and various cells. The penetration depth of the light depends on the wavelength and the cell structure properties across each skin layer. Generally, the longer the wavelength, the deeper the penetration of the light into the skin. In this investigation; UV reflective; UV fluorescence and visible light imaging technologies are combined with a variety of illumination sources, ranging from 365 nm to 405 nm, to acquire multimodal images of various undefined facial pigmentary lesions of our subjects. Image processing algorithms developed during this study are used to investigate the possibilities to distinguish the visual depth in which the melanin pigments are distributed.

Results: Image data from a small group of volunteers, with various undefined facial pigmentary disorders, were collected. From both the detailed visual analysis of raw images and the differential analysis of images taken across the various wavelengths; transformations of the morphology of pigmentations spots and clusters were clearly observed.

Conclusions: The methods presented in this investigative study enable the visualisation of delicate differences of pigmentary formations at various wavelengths. Future research will focus on further defining the relationship between the actual spatial distribution of these pigmentation clusters and the visual transformation of the lesions across the wavelengths.