SHISEIDO GROUP

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Shiseido Company, Limited

Press Release

Shiseido Succeeds in *In Vivo* Visualization of Dermal Capillaries

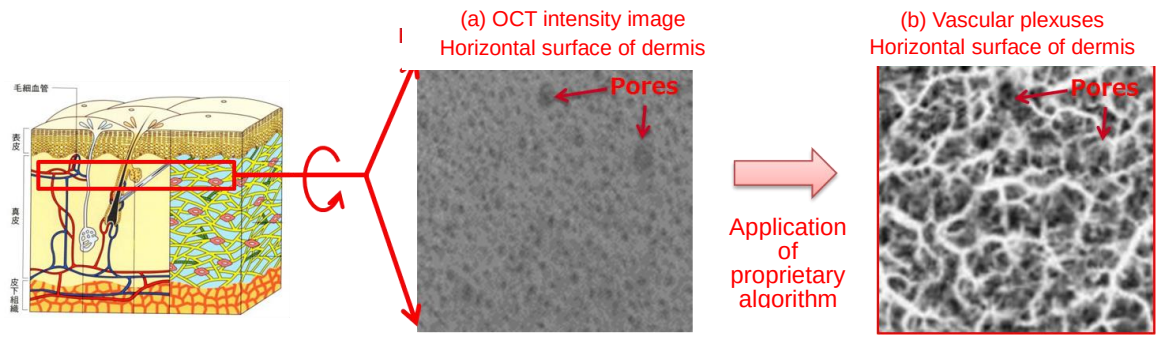
-Discovery of Malformation of Vascular Plexuses in Hyperpigmented Skin-

Shiseido Company, Limited (Shiseido) has succeeded in visualizing microvasculature in dermis regions, which is not visible to the naked eye, through a unique application of the latest imaging technology that uses light waves, without causing damage to the skin. Furthermore, by using this newly developed visualizing technology, Shiseido has discovered malformation of vascular plexuses in the upper reticular dermis in UV-induced hyperpigmentation (solar lentigo).

Establishment of a new vascular visualization technology

Skin vessels compose a complex capillary network running from subcutaneous tissue to upper dermis. Conventional research methods can only evaluate the blood flow of the skin overall, and cannot visualize capillary vessel structure. Amid such a situation, Shiseido has developed a high-resolution imaging technology, which allows clear visualization of the depth-resolved vascular plexuses image, by applying optical coherence tomographic (OCT) angiography that visualizes the skin structure with the use of near infrared light.

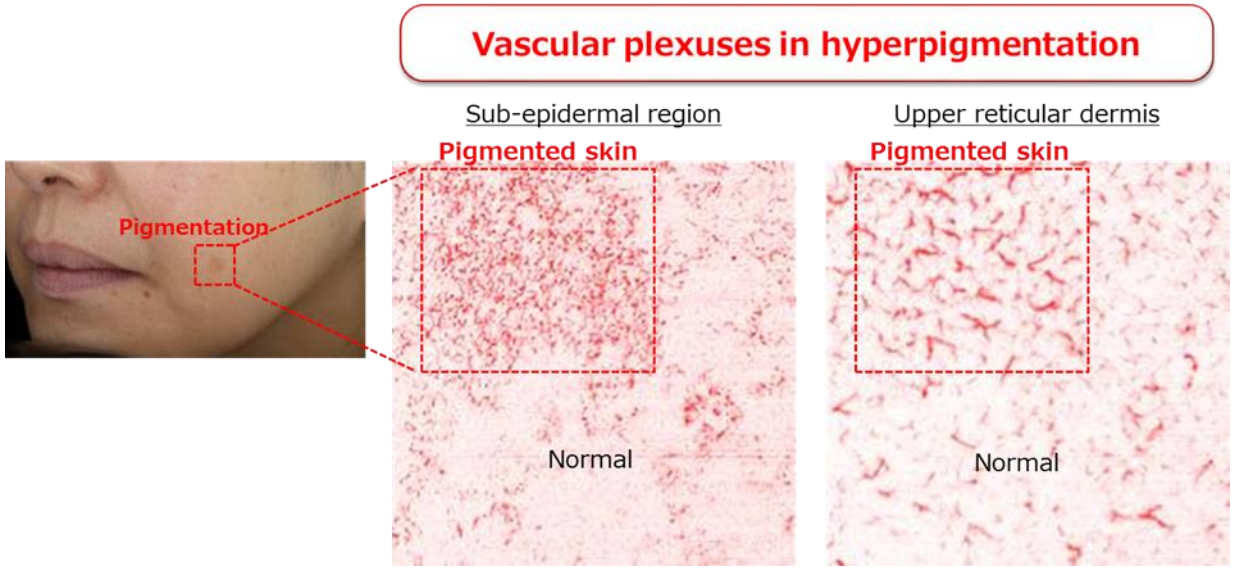
OCT angiogram of inner face skin layer reveals the structure of dermis (pic.1 (a)). After taking multiple OCT images of the same skin spot at high-speed and closely analyzing them, Shiseido found out that some parts see fluctuations in light intensity in accordance with the blood flow. Shiseido applied a proprietary algorithm and zoomed in the affected parts, and succeeded in visualizing the capillary plexuses in dermis (pic.1 (b)).



Picture 1. OCT angiogram of capillary vessels
(a) OCT intensity image (b) Capillary plexuses

Application of the newly developed technology: Relationship between hyperpigmentation and vascular plexuses

As a result of evaluating hyperpigmentation (solar lentigo) with this new visualizing technology, Shiseido has discovered malformation of vascular plexuses in lesional skin, compared to the surrounding normal skin.



Picture.2. Malformation of vascular plexuses in pigmented skin (red frame)

As these findings suggest that the malformation of vascular plexuses has a significant influence on development of hyperpigmentation, Shiseido will engage in further research based on these results with an aim of creating new value in skincare.

The results of this research will be partly presented at the 42nd Annual Meeting of the Japanese Society for Investigative Dermatology in December 2017, and at SPIE Photonics West BiOS 2018, which will be held in San Francisco, California, U.S.A. in January 2018.