

Shiseido Reveals the Relevance of Capillaries in Skin Elasticity — Shiseido discovers that yeast extract helps the production of collagen —

Shiseido Company, Limited (“Shiseido”) has revealed that capillaries are involved in skin elasticity, using original technology to visualize the 3-dimensional (3D) structure of capillaries in the skin. Shiseido also discovered that yeast extract keeps capillaries healthy and helps the production of collagen which is important for maintaining skin elasticity. The results of this research are expected to develop skincare products that create an elastic skin while preventing skin problems caused by a decrease in skin elasticity, such as wrinkles and sagging.

A part of these research results was presented in the Podium Presentation category and won the top award at the IFSCC* Conference 2019 in Milan (September 30 to October 2, 2019). It is scheduled to be presented at the North American Vascular Biology Organization (October 27 to 31, 2019) as well.

*IFSCC (The International Federation of Societies of Cosmetic Chemists): An international organization dedicated to the development of highly functional and safe cosmetic technology through the world-wide cooperation of cosmetic societies.

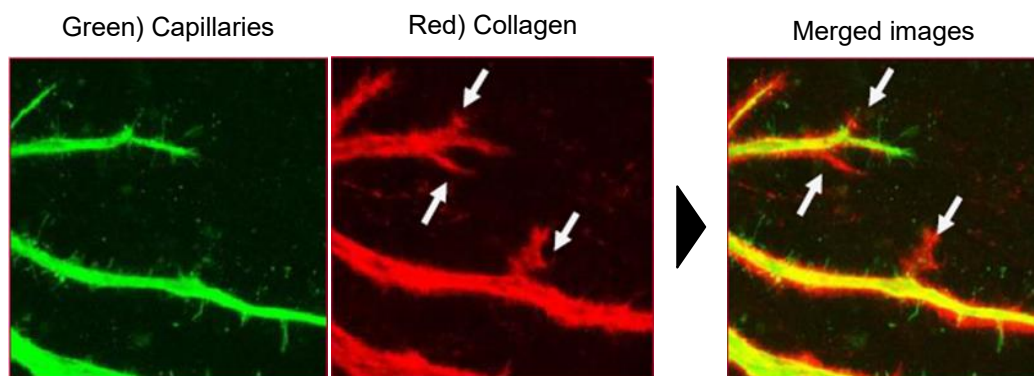


Figure 1. Collagen produced around capillaries (white arrows)

The relevance of capillaries in skin elasticity

Shiseido has conducted research on the relationship between skin elasticity and the state of capillaries using original 3D visualization technology, and found that capillaries are thick and dense in areas with high elasticity, like those of people in their 20s (Figure 2, 3). Through further research, it also observed that collagen is produced around capillaries (Figure 1). This suggests the possibility of capillaries playing a role in maintaining skin elasticity.

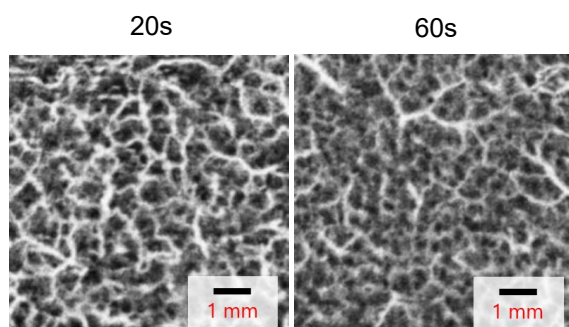


Figure 2. Capillaries in human skin

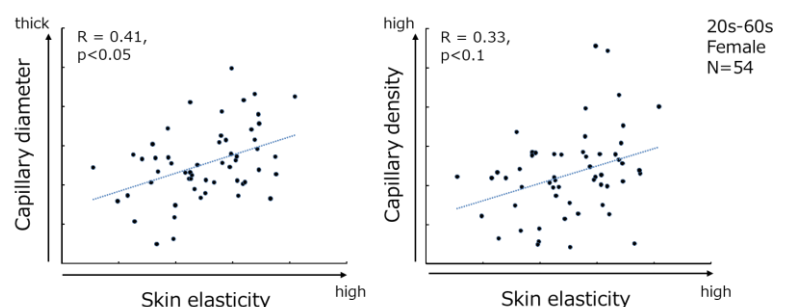


Figure 3. Relationship between skin elasticity and capillaries

Search for ingredients that increase integrin- α 5

Integrin- α 5 molecules, which are expressed by capillaries, are indispensable for keeping capillaries healthy and their expression is considered to affect the production of collagen in the skin.

Shiseido's research revealed that the expression levels of integrin- α 5 in capillaries decrease with age along with skin elasticity. This result suggests that maintaining the expression of integrin- α 5 in capillaries is crucial for skin elasticity.

Shiseido searched for ingredients that increase integrin- α 5 expression, and confirmed that yeast extract extracted from *Saccharomyces* yeast using a special method (Figure 4) is effective for that purpose (Figure 5). As the result, the team found the possibility that yeast extract increases the expression levels of integrin- α 5 which decrease with age, facilitates the production of collagen, and helps create an elastic skin.

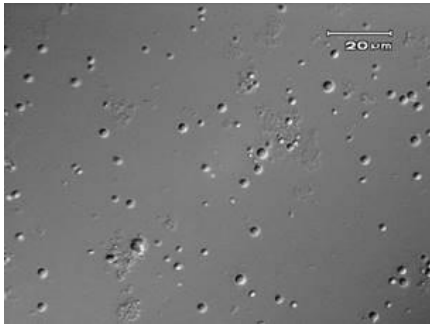


Figure 4. Yeast extract extracted from *Saccharomyces* yeast

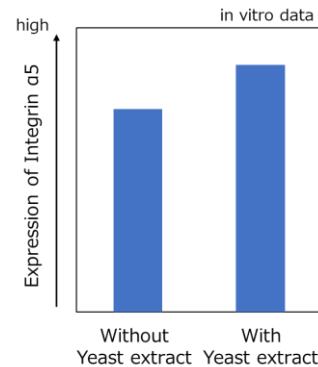


Figure 5. Expression of integrin- α 5 facilitated by yeast extract

Reference: Shiseido's 3D visualization technology

Shiseido has conducted research on the relationship between capillaries and skin and reported various findings, including the fact that capillaries which are damaged or decrease due to aging and UV rays are one of the fundamental causes of skin aging. However, traditional methods did not allow for full understanding of the complex network of capillaries in the skin. Therefore, in 2018, Shiseido developed original technology to broadly visualize the 3D structure of capillaries in the skin using a tissue-clearing technique. This technology led to the discovery that capillaries form an extremely dense network (Figure 6) as if they are physically holding up the skin, which resulted in the reveal of the relevance of capillaries in skin elasticity.

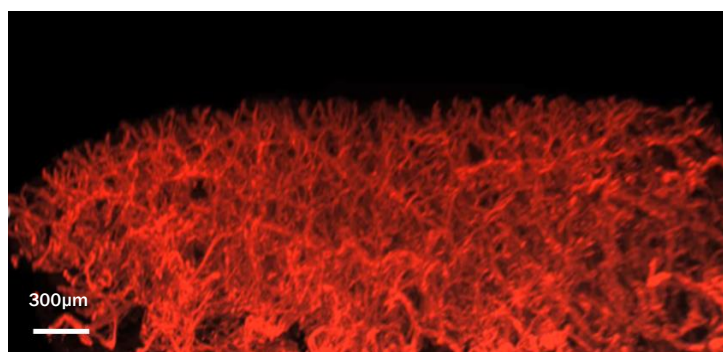


Figure 6. Capillaries in the skin observed with the 3D visualization technology

[Reference materials] Related past technology releases

- 2019: Shiseido Wins Top Award at IFSCC Conference 2019 in Milan
<https://www.shiseidogroup.com/news/detail.html?n=0000000002769>
- 2018: Shiseido Succeeds in 3D Visualization of Vascular Malformation in Pigmented Skin
<https://www.shiseidogroup.com/news/detail.html?n=0000000002498>
- 2017: Shiseido Succeeds in In Vivo Visualization of Dermal Capillaries
<https://www.shiseidogroup.com/news/detail.html?n=0000000002271>