

Shiseido Elucidates Mechanism by Which Capillaries Maintain Skin Elasticity

-Skincare to revitalize skin from inside by growing thick strong capillaries-

Shiseido Company, Limited (“Shiseido”) has gained understanding of the mechanism in which capillaries contribute to skin elasticity, and identified that neem leaf extract and *Houttuynia cordata* extract work effectively for maintaining thick (large diameter) and stable capillaries, which can become thinner and regress due to aging and ultraviolet rays, etc. Going forward, we will promote the development of skincare products that prevent skin troubles caused by decrease of skin elasticity, such as wrinkles and sagging, and create resilient skin through utilizing these findings and providing care for capillaries.

Part of these study results were presented in the Podium Presentation of the IFSCC*1 Conference 2019 held in Milan, Italy from September 30 to October 2, 2019 and won the Conference Award. In addition, the results were also presented at Vascular Biology 2019, the annual meeting of the North American Vascular Biology Organization, held from October 27 to 31, 2019.

*1 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.

“softness sensor” APJ is a key molecule to produce thick capillaries

Previous studies have revealed that maintaining healthy capillaries is important for skin elasticity*2, therefore we conducted an ongoing investigation of the mechanism that makes capillaries thicker and stronger to revive skin’s resilience.

In this study, we discovered that APJ (Fig. 1) which is a molecule expressing in capillaries, acts as a “softness sensor” that senses elasticity of the surrounding skin area and controls the thickness of the capillaries (Fig. 2). In an experiment using skin models with various elasticity levels, it was confirmed that an adequate elasticity environment upregulated APJ expression and induced thicker capillaries. On the other hand, in a low elasticity environment, APJ expression level was decreased and unstable thin capillaries were induced. Therefore, we experimentally increased the APJ expression level, and as a result, we succeeded in inducing thicker capillaries even in skin model with low elasticity.

*2 2019: Shiseido Reveals the Relevance of Capillaries in Skin Elasticity

<https://corp.shiseido.com/en/news/detail.html?n=00000000002780>

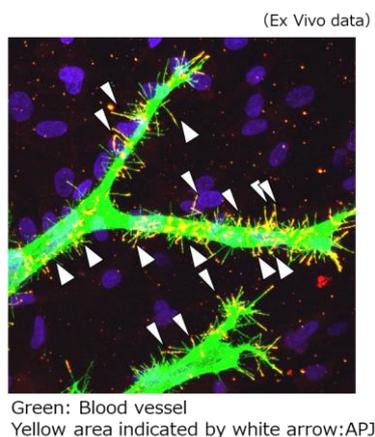


Fig. 1 Softness sensor APJ in capillaries



Fig. 2 High expression of APJ and stable thick (large diameter) capillaries induced by adequate elasticity

VE-cadherin is a key molecule to produce strong capillaries

In the downstream of APJ, which senses elasticity and leads to thick capillaries, a molecule called VE-cadherin strengthens blood vessels by promoting the adhesion between vascular endothelial cells. In this study, it was revealed that capillaries with low VE-cadherin level became thinner and regressed (Fig. 3). Furthermore, in the experiment using skin models, it was found that skin elasticity was reduced under the condition with decreased VE-cadherin in capillaries. In other words, maintaining thick and strong capillaries can improve skin elasticity, leading to the creation of resilient skin.

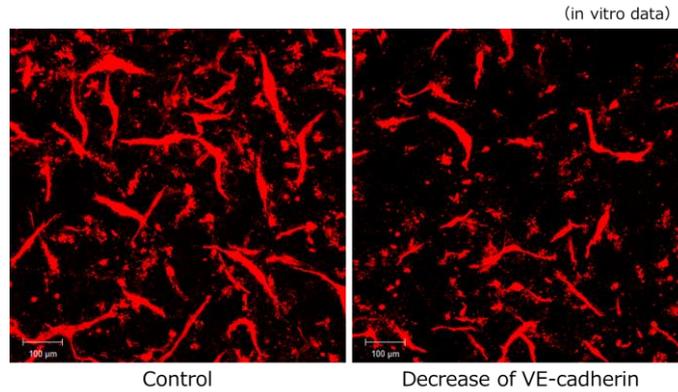


Fig. 3 Capillaries become thinner and regressed by low VE-cadherin expression.

The search for ingredients that keep capillaries thick and strong

Aging and UV-induced damage are thought to reduce skin elasticity and the expression of softness sensor APJ, and it is known that both also cause the VE-cadherin dysfunction. Given this, it can be said that capillaries become thinner and regress with aging. We conducted a screening of ingredients that strengthen capillaries, and found as a result that neem leaf extract increased APJ expression (Figs. 4 and 5), and *Houttuynia cordata* extract promoted VE-cadherin production (Figs. 6 and 7). The action of these ingredients can be expected to create thick and strong capillaries, and to revive skin resilience from the inside. Going forward, Shiseido will pursue the development of new skincare products that create resilient skin by utilizing these study results and providing care for capillaries.



Fig. 4 Neem leaf

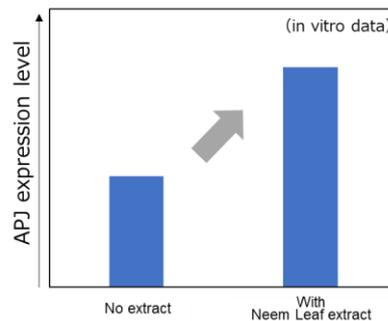


Fig. 5 Promotion of APJ expression with neem leaf extract



Fig. 6 *Houttuynia cordata*

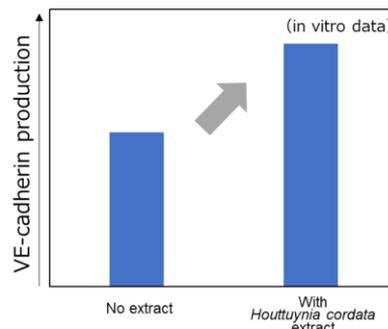


Fig. 7 Promotion of VE-cadherin production with *Houttuynia cordata* extract