

Press Release

**Shiseido Clarifies “Propagation of Aging” in the Inner Skin
-Discovers stem cells inhibiting the propagation of aging are well maintained around sebaceous glands-**

Shiseido Company, Limited (“Shiseido”) has clarified that senescent cells, which are created in the skin with aging, are associated with deterioration in the functions of surrounding normal cells and cause aging-related changes in the skin through a research jointly conducted with Kyoichi Matsuzaki, Senior Professor of the Plastic and Reconstructive Surgery Department at the International University of Health and Welfare School of Medicine, and with the National Institute for Physiological Sciences. Furthermore, the research team identified that dermal stem cells suppress the “propagation of aging” and such stem cells, which drastically decrease with aging, are well maintained around the sebaceous glands even in aged skin. In addition, the team also discovered that iris extract attracts stem cells. These research results are expected to be a critical solution for skin rejuvenation with the utilization of stem cells, and Shiseido will apply these new findings to future product development.

The results of this research were partly introduced at the Podium Presentation of the 30th IFSCC*¹ Congress 2018 held in Munich, Germany and won the Congress Award.

*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. Details are in reference below.

Clarifying the propagation of aging in skin

Age-related facial wrinkles and sagging skin are major skin concerns among women. These changes in superficial morphology are chiefly caused by the degradation of the dermal layer*² with aging, however, the exact mechanism had not been clarified.

During this joint research, the team newly developed a technology for electron microscopy analysis and succeeded in observing even minute changes in cell shape. Analysis of the dermal layer with this technology showed that the dermal cells (fibroblasts) of young subjects have several dendrites whereas the cells from aged subjects lose dendrites and change in shape (hereinafter, aged cells) (Figure 1). The results of the experiment with fibroblasts indicated that aged cells have a negative influence on surrounding skin cells as they release an aging factor (hereinafter, aging factor), and it is clarified that age-related changes in the dermal layer are induced by this “propagation of aging” (Figure 2).

*² Dermal layer: Human skin consists of three layers such as epidermis, dermal layer and subcutaneous fat. The dermal layer contains an abundant extracellular matrix composed of collagen and hyaluronic acid which contribute to skin elasticity and retain superficial morphology.

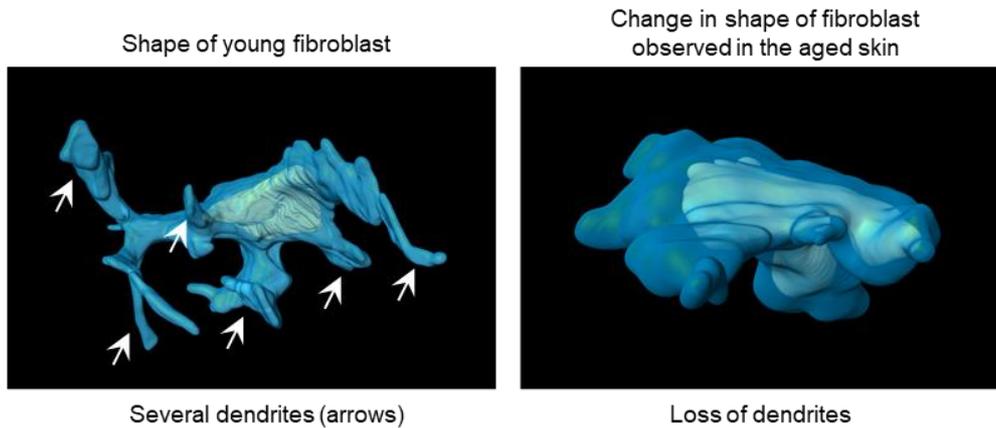


Fig.1 Shape of dermal cells; changed with aging

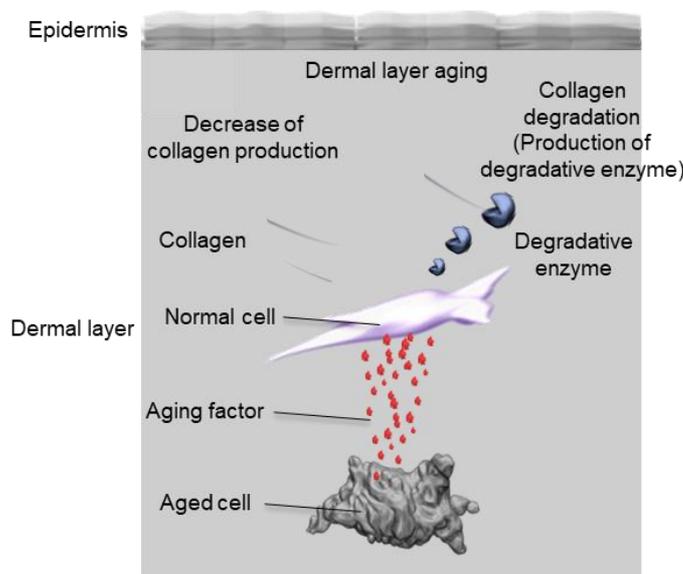


Fig.2 Propagation of aging in dermal layer : aged cells release aging factor, deteriorating functions of surrounding cells and leading to age-related changes in dermal layer .

Discovery of reservoirs of stem cells that inhibit the propagation of skin aging

While searching for methods to inhibit the propagation of aging, the team discovered that dermal stem cells suppress the generation of aging factor from aged cells. Dermal stem cells (with a positive expression of stem cell markers), while significantly reduced with aging, are well maintained around nearby sebaceous glands*³ even in aged skin (Figure 3). With these findings, it is identified that sebaceous glands act as a “reservoir” storing stem cells in the nearby area.

*³ Sebaceous gland: An organ that secretes a sebum and exists in the dermal layer. Sebaceous glands abundantly exist in the dermal layer of facial skin.

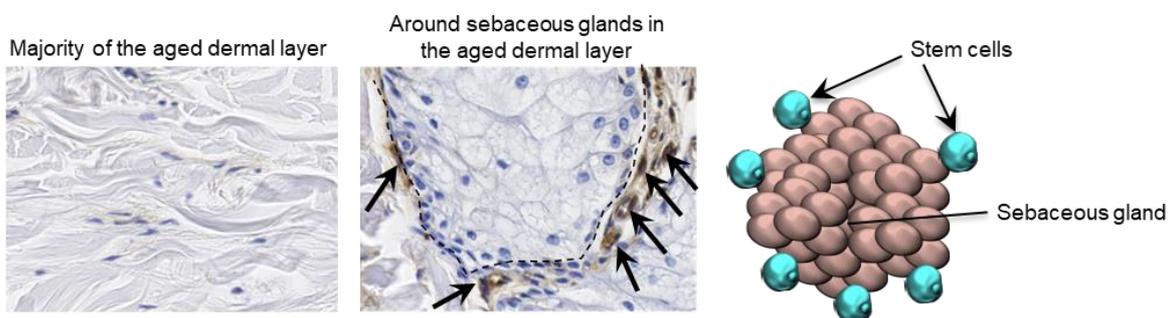


Fig.3 Stem cells around sebaceous glands in aged skin: dermal stem cells, which decrease with aging, are well maintained in surrounding sebaceous glands in aged dermal layer (arrows).

The effect of iris extract on stem cells

These lines of findings suggest that by inducing the generation of stem cells from reservoirs and expanding them into the aged dermal layer, the propagation of aging can be inhibited, and the dermal layer may be maintained in good condition (Figure 4). Moreover, by further pursuing research with stem cells, the team discovered that the extract of irises (Figure 5) attracts stem cells.

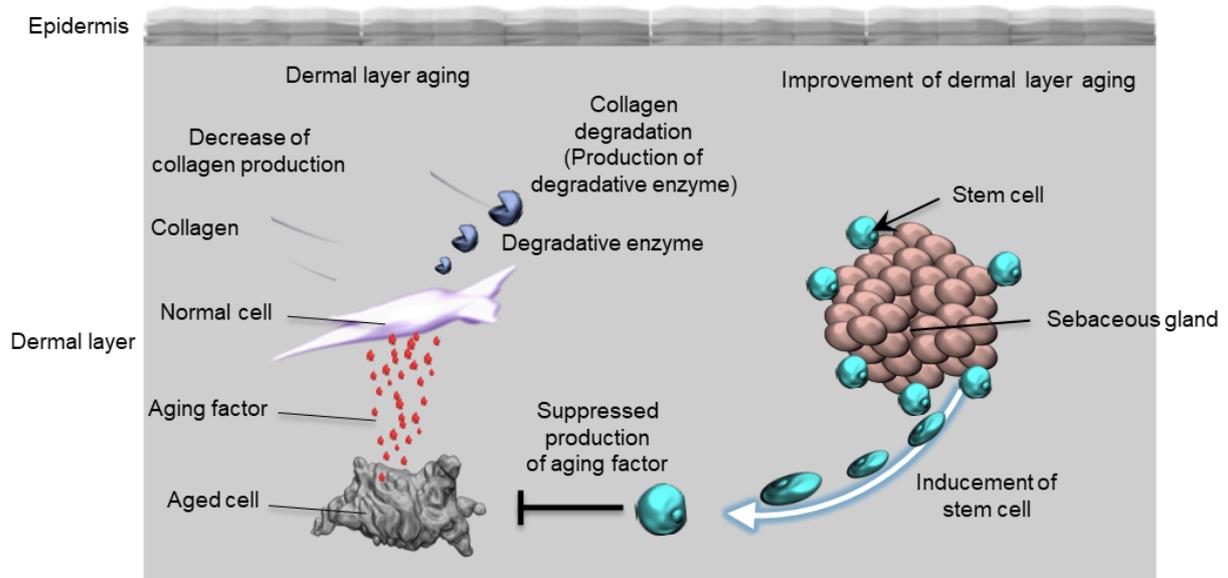


Fig.4 Improvement of dermal layer through induced stem cells: stem cells induced from reservoirs suppress production of aging factor and improve dermal condition (Image).



Fig.5 Italian iris, particularly rich scent among iris family

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【Reference】

Won the Congress Award at the 30th IFSCC Congress in Munich

The results of this research were partly introduced in the Podium Presentation Basic Research category at the 30th IFSCC^{*1} Congress 2018 held in Munich, Germany and won the Congress Award (Figure 6). The IFSCC is the world's largest association of cosmetic chemists and whose membership comprises societies of cosmetic chemists in 74 countries and regions with more than 16,000 cosmetic chemists. The IFSCC Congress Award, which is presented once every two years, is recognized as the world's most authoritative award in the cosmetics industry. Going forward, Shiseido will apply such highly acclaimed achievements to future product development.



Fig.6 Award ceremony at 30th IFSCC Congress in Munich

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