

Mandom has successfully observed a three-dimensional view of human sebaceous glands and has established a unique method to evaluate sebum secretion

Mandom Corporation (headquarters: Osaka City, President & CEO: Motonobu Nishimura; hereinafter referred to as “Mandom”), through the Laboratory of Advanced Cosmetic Science (joint-research course between Mandom and Osaka University Graduate School of Pharmaceutical Sciences, hereafter referred to as “joint-research course”), is engaging in research to develop a method that evaluates the sebaceous gland to design products that control sebum secretion.

At this juncture, we have succeeded in isolating intact and observable sebaceous glands from human skin tissue (approved by an ethics review board) (Figure 1). By staining the sebaceous gland in an observable state, we have elucidated the three-dimensional location of sebum within sebaceous glands (Figure 2). When treated with reagents that either promote or suppress sebum secretion and stained, sebum formation and suppression of sebum formation (Figure 3) were observed in the sebaceous glands.

Since these results may help to reveal the mechanism of sebum secretion and evaluate sebum secretion in a near-in vivo state, we believe this can be applied to the development of products that excel in the control of sebum secretion.

These results will be presented at the 116th Annual Meeting of the Japanese Dermatological Association (June 2 to 4, 2017).

1. Successful removal of sebaceous glands from human skin tissue

Obtaining human sebaceous glands in an observable state required their removal from the dermis. Studies to date used enzymes to sever the sebaceous glands from its surrounding tissues. However, the use of enzymes strips and crumbles the outermost cells of the sebaceous glands. Therefore, by anatomically removing subcutaneous tissues and dermal fibers from the back side of skin tissue, we succeeded in removing sebaceous glands smoothly covered with outermost cells.

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2. Successful three-dimensional observation of sebum location in human sebaceous glands

As an observation of human sebaceous glands was possible, glands were stained with reagents used to stain sebum, and the state of sebum observed in the sebaceous glands. A three-dimensional view of the oil droplets of sebum encapsulated in the sebaceous glands was observed. In addition, we observed that the cells located more inward in the sebaceous glands contained greater amounts of sebum than cells toward the exterior.

3. Success in observing promotion and suppression of sebum secretion in human sebaceous glands

Using the impactful observation of the state of sebum in human sebaceous glands, we examined possible changes that may occur to the state of sebum when glands were treated with existing sebum secretion-promoting reagents or sebum secretion-suppressing reagents. Treatment with sebum secretion-promoting reagents resulted in the formation of new oil droplets on the outermost cells of sebaceous glands, while treatment with sebum secretion-suppressing reagent suppressed the formation of oil droplets.

The above results suggest that evaluations using human sebaceous glands would enable the identification of substances that would suppress sebum.

Mandom will continue to advance its research on sebaceous glands to develop products that alleviate skin issues such as acne and shine, that are related to sebum.

[Reference Material]

Figure 1. Sebaceous glands extracted from human skin tissue.

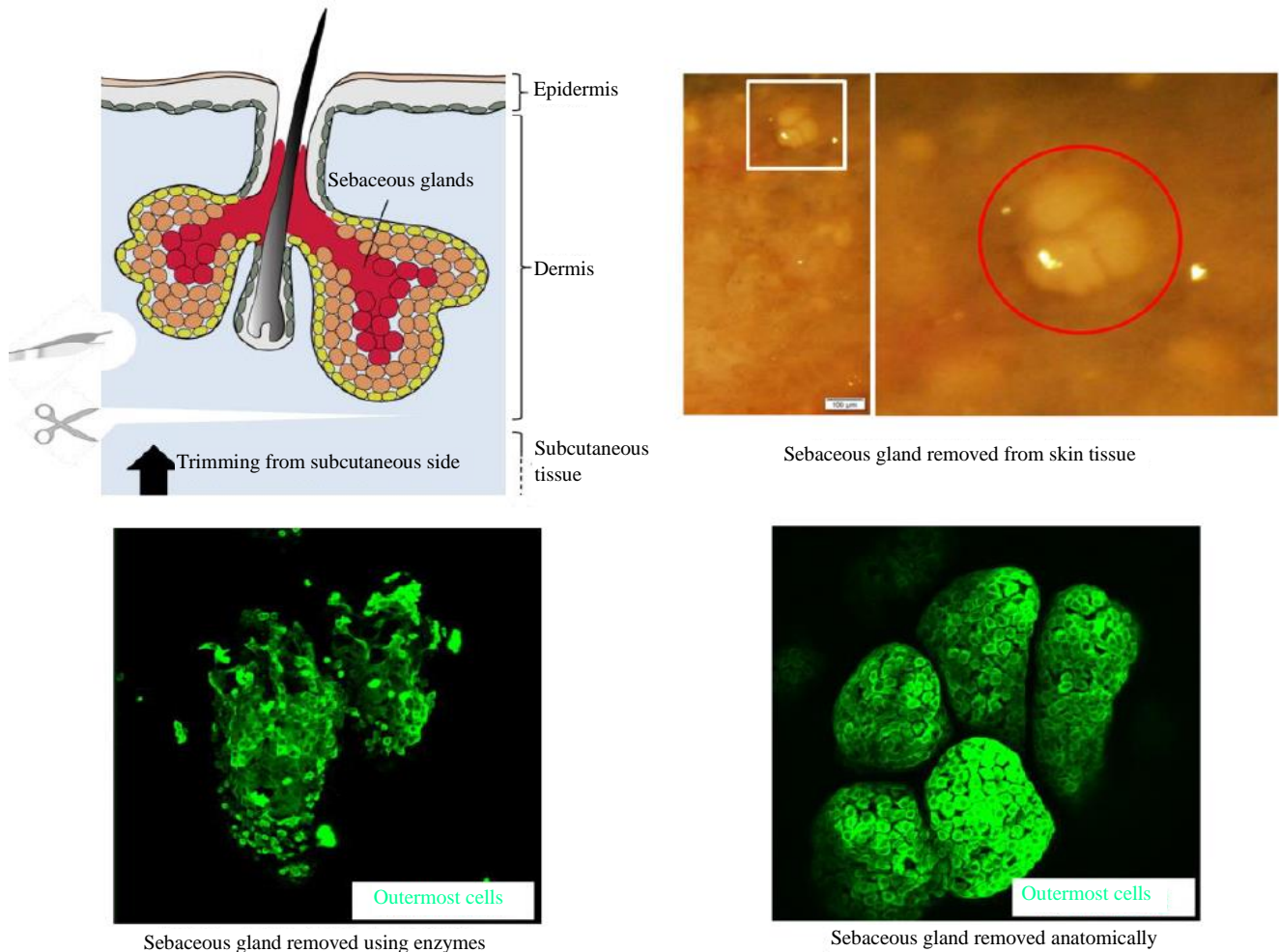


Figure 2. Observation of sebum in sebaceous glands.

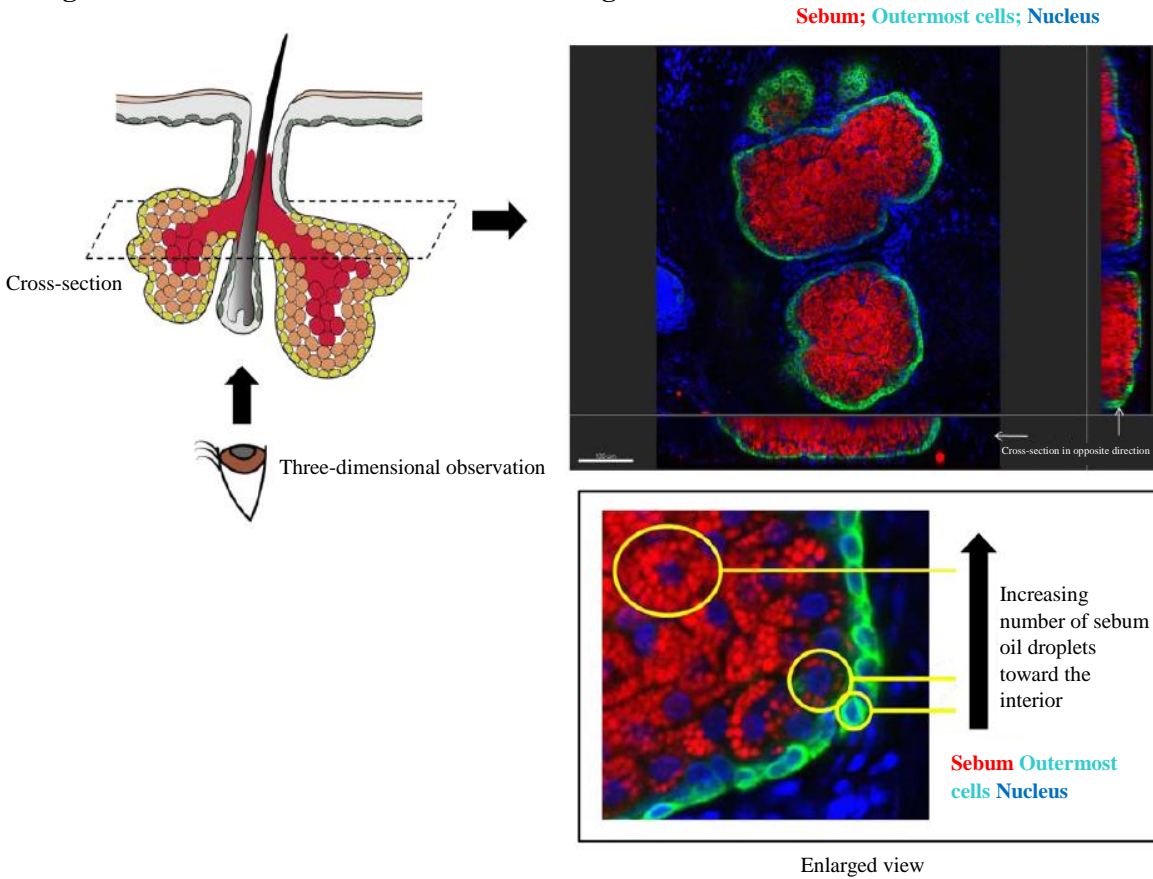


Figure 3. Observation of changes in sebaceous glands owing to the promotion/suppression of sebum secretion.

