

Shiseido Discovers Cedar Pollen Lowers the Skin's Protective Function

Shiseido has discovered that the antigen protein "Cry j1" contained in cedar pollen lowers the skin's protective function. So far, "Cry j1" has been known to trigger allergic reactions affecting the eyes and nose. However, this is the first time that its effect on epidermal cells has been proven. Based on the results of this study, the importance of keeping cedar pollen from adhering to the skin, with a view toward preventing skin roughness, was discovered, in addition to countermeasures against cedar pollen allergies.

This study was published in the Jan. 2016 issue^{*1} of the dermatological science journal "Archives of Dermatological Research" as an achievement by the Project for the Promotion of Strategic, Creative Studies CREST of the Japan Science and Technology Agency, under the title "Clarification of Dermatological Disease Mechanisms through Collaboration of Physiology and Mathematical Science" (principal researcher: Professor Masaharu Nagayama, Research Institute for Electronic Science, Hokkaido University), which Shiseido has participated in since 2010.

Skin's protective function is lowered using antigen protein "Cry j1" in cedar pollen

In order to reveal the effects of the skin's protective function, Shiseido measured the volume of water and intercellular lipids when a solution containing antigen protein "Cry j1" in cedar pollen was applied after the stratum corneum was peeled off from tissue-cultured epidermis using sticky tape to artificially destroy the barrier. As a result, compared to when water was applied, it was revealed that the volume of water evaporation from skin to which the "Cry j1" solution was applied was significantly higher (Figure 1), and the skin was dehydrated. Furthermore, it was revealed that intercellular lipids involved in maintenance and recovery of the protective function in the form of oil derived from the skin itself did not secrete as easily (Figure 2), and the supply of intercellular lipids was delayed. Based on these findings, it was determined that the protective function was lost due to "Cry j1."

Normally, even when the skin's protective function is temporarily lowered, it is understood that the skin would recover to its original state by the skin's own restorative power (homeostasis)^{*2}. It is, however, especially crucial for those whose skin-protection function has been lowered to protect the skin in order to prevent cedar pollen from attaching.

Mechanism of skin-protection function to be determined

Furthermore, as part of this study, another result was also obtained which indicates that a specific protease and receptor serve as a switch causing a lowering of the skin's protective function. This is the first study to isolate the enzyme and receptor to confirm the relation

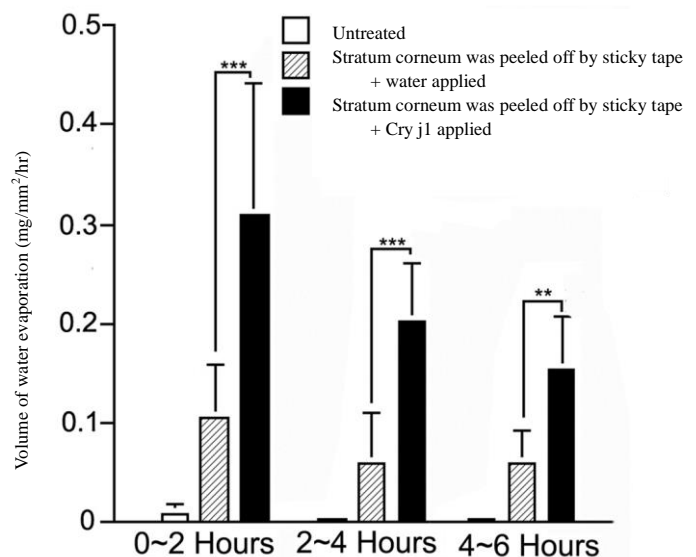


Figure 1: Volume of water evaporation on the tissue-cultured epidermis to which cedar pollen antigen protein "Cry j1" was applied.

between cedar pollen and lowering of the protective function in epidermal cells.

Based on this series of findings, a determination of the mechanism of the skin's protective function as basic knowledge leading to radical treatment for atopic dermatitis and rough skin will be promoted in the future.

*1 Kumamoto J. et al. (2016) *Archives of Dermatological Research*. 308: 49-54

*2 Denda M. et al. (1997) *Journal of Investigative Dermatology*. 109: 84-90

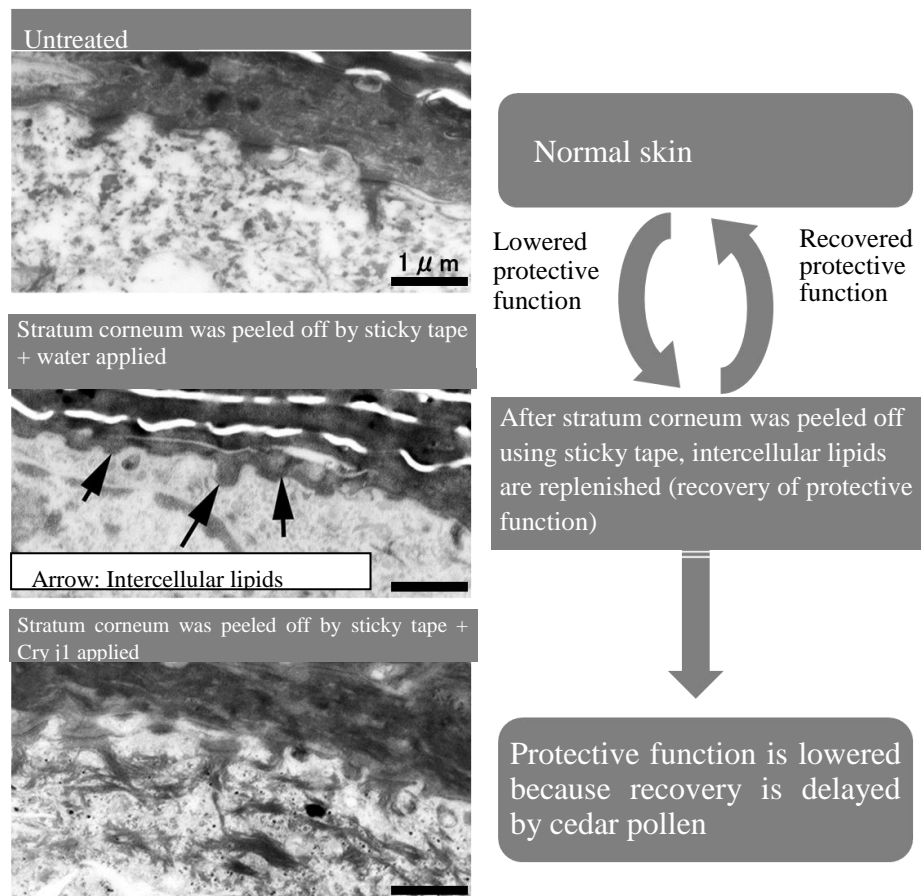


Figure 2: Secretion of intercellular lipids when cedar pollen antigen protein "Cry j1" was applied to the tissue-cultured epidermis

Japanese and pollinosis (hay fever)

According to the Health Care Manual 2014, "For the population as a whole, the prevalence of pollinosis is 29.8%" (*) and pollinosis can be regarded as a national epidemic in Japan. While various theories exist for the cause, the cause of the most common Japanese cedar pollinosis is thought to be cedar pollen scattered from the large number of cedar trees planted after the war. (*Based on a national epidemiological survey conducted in 2008)