Shiseido Announces a New Evaluation Method and Ingredient for Stratum Corneum Intercellular Lipids to Improve Rough, Damaged Skin

Stratum corneum intercellular lipids (SCIL) found in the outer-most layer of the skin support various important functions including the vital barrier and moisturization functions of the skin to maintain biological functions. At the same time, they are also closely linked to rough skin conditions.

Shiseido has developed an evaluation method enabling a highly accurate analysis of SCIL to be conducted using an electron spin resonance (ESR) device. In conjunction, Cell Care PCL, an effective stratum corneum emollient ingredient, has been successfully developed to improve the condition of SCIL in order to repair rough, damaged skin.

Shiseido plans to apply this newly developed technology and ingredient to the future development of skincare products and strengthen its skincare theory.

Development of evaluation method alignment
Within the stratum corneum, which has a thickness of approximately 0.02 mm (roughly the same level of thickness as plastic wrapping for food packaging), horny cells build up to form 10-20 layers, much like bricks, and SCIL create bonds between the layered horny cells, serving as a mortar, to create a systematically aligned structure that induces barrier and moisturizing functions (diagram 1).

SCIL are mainly comprised of ceramides, fatty acids and cholesterols and have important functions that prevent moisture evaporation within the skin and the entry of foreign substances into the body. Furthermore, it has been recognized that SCIL found in healthy skin are systematically aligned into an organized structure, which is a contributing factor in maintaining optimal skin functions.

However, since a simple and quick, yet highly precise method of measurement had not yet been established to evaluate the alignment of SCIL, a detailed evaluation of the condition of SCIL in rough skin was not possible until now.

Research on the method of analyzing the condition of lipids in biological membranes was initially reported prior to 2005 when Shiseido started the development of an evaluation method using an ESR device. As a result of promoting research from various angles, Shiseido developed an attachment that directly measures stratum corneum cells extracted from the human body and an adjoining evaluation analysis method. With this development, a method was established for the first time enabling accurate evaluation of the alignment condition of human SCIL*1.

The development of this evaluation method also led to the discovery that when skin becomes rough or damaged due to external factors such as dryness, the alignment of SCIL degrades at a rate faster than previously expected (diagram 2).

Development of ingredient that improves rough, damaged skin
Research was conducted to quickly improve the disordered alignment of SCIL in damaged skin by using the newly developed evaluation method.

By combining Aquainpool ICL*2, an ingredient originally developed by Shiseido, and Phytosterol EX, a substance similar to cholesterol, the compound ingredient Cell Care PCL (stratum corneum emollient ingredient) was successfully developed to effectively improve the quality of the skin (diagram 3).

Test results have shown that under conventional evaluation methods Cell Care PCL increases the moisture content in the stratum corneum and contributes to improved skin texture, and in turn, achieves better skin conditions (diagram 4).

Shiseido will continuously work to actively promote research into skin beginning with SCIL and develop
skincare products to create healthy, beautiful skin to achieve greater customer satisfaction in the future.

Notes:
*1 The attachment for measurement is registered as a new concept for commercial use. The patent is pending for the evaluation analysis method for SCIL.

*2 Water and oil soluble moisturizing ingredient, (POE/POP) dimethyl ether

Diagram 1: Stratum corneum and composition of SCIL

Diagram 2: Change in alignment structure of SCIL caused by dryness

Diagram 3: 1) Effect of Cell Care PCL
Diagram 4: 2) Effect of Cell Care PCL