

〈シンポジウム〉

第 42 回日本香粧品学会 (2017) ・ シンポジウム 「皮膚の健康科学最前線」

保湿 温故知新

平尾 哲二 *

Review and New Concepts of Skin Moisturization

Tetsuji HIRAO*

Abstract

Stratum corneum (SC) is located at the outermost of the skin and plays pivotal roles in barrier function and moisturizing function of the skin. SC is composed of piled-up dead corneocytes with 10-20 layers and their intercellular spaces are filled with lipids. Major components of corneocytes are keratin fibers providing mechanical stiffness of the SC. Natural moisturizing factors (NMF) are a group of water-soluble small molecules, including amino acids, minerals, lactate and so on, which can retain water molecules to keratin fibers. Cornified envelope is a membrane-like insoluble structure surrounding corneocytes and acts as a scaffold for organization of intercellular lipids. Intercellular lipids are consisted of ceramides, free fatty acids, and cholesterol, which form packing crystal and lamellar structure. Any of these composite components is essential for healthy SC, and their defects may result in deterioration of SC function and dry skin. Mechanisms of moisturizers are classified into two groups. Emollients, such as oil, cover the skin surface without penetration into the skin, and moisturize the SC by their occlusive properties. Humectants, such as polyols and amino acids derivatives, can penetrate into the SC, and moisturize the SC like NMF. Thus, moisturizing effect of skincare products is well-recognized. However, hyper-moisturized SC may lead to deteriorated barrier function with pros and cons. Diaper dermatitis is a typical trouble with hyper-moisturized SC. On the other hand, a defect in barrier function is helpful for penetration of certain drugs into the skin known as occlusive dressing technique. Recent study shows that slow evaporation of water from SC make SC structure tightly packed with optical transparency and barrier function. In addition, this water evaporation-induced rearrangement process of SC can reduce formation of expression-induced residual wrinkle. These new concepts provide valuable information to understand real mechanisms of moisturization and suggest future innovation of moisturizers.

Key words: barrier, dry skin, moisturizer, stratum corneum, water.