

〈シンポジウム〉

(Evidence にもとづく化粧品を求めて—化粧品はどこまでバリア機能を制御できるか?)

バリア機能における角層コーニファイドエンベロープの重要性

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Significance of Cornified Envelopes in Barrier Function of the Stratum Corneum

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Abstract

Cornified envelopes (CEs), which are rigid and insoluble structures surrounding the corneocytes, are assembled by cross-linking of several precursor proteins by transglutaminases and provide the basis for barrier function of the stratum corneum. We have recently established a novel double staining method to evaluate the level of CE maturity in stratum corneum samples collected by non-invasive tape stripping, in order to examine the relationship between CE maturation and barrier function. This method is based on both loss of involucrin antigenicity and acquisition of hydrophobicity during CE maturation. We applied it to various kinds of skin and found that immature CEs were abundant not only in involved areas of inflammatory dermatoses, such as psoriasis and atopic dermatitis, but also in the face of healthy subjects, and were associated with impaired barrier function of the stratum corneum. *Ex vivo* incubation of the outermost stratum corneum of the face in a humidified environment resulted in conversion of immature CEs to mature CEs, mediated by transglutaminases. This maturation process was inhibited under low humidity conditions and recovered on application of moisturizers to stratum corneum samples prior to the incubation. These results suggest that immature CEs in the face retain the potential to mature and that moisturization helps the maturation. These *ex vivo* results were consistent with *in vivo* findings that immature CEs in the face were increased in winter season, and that CE maturation was promoted by daily skin care treatment with a moisturizing cream. Although many studies on the stratum corneum barrier function have been carried out mainly focusing on the role of the intercellular lipids, a new approach of skin care cosmetics that will promote proper assembly of the stratum corneum through promoting the maturation of CEs is now available.

Key words: stratum corneum, cornified envelope, transglutaminase, barrier function moisturizer.