

KERATINOCYTE & SKIN PHYSIOLOGY

H. Aoki, Shiseido, Japan

The skin microrelief: Importance of the dermal structure and the stratum corneum

The microrelief structure that covers the skin surface is responsible for the appearance and physical functioning of the skin^{1,2}. For an in-depth study of the internal and surface structure of the skin microrelief, we studied the histochemical features of the dermis and the shapes of cornified cells of the stratum corneum.

Skin specimens were obtained from the abdomen of volunteers, sectioned, and stained after marking the position of the crista cutis (ridges) and sulcus cutis (furrows) of the microrelief. Many vertical elastic fibers (oxytalan fibers) were observed in the papillary dermis of the crista cutis^{3,4}. On the other hand, horizontal fibers were in majority among the elastic fibers in the dermis of the sulcus cutis. In addition, oxytalan fibers in the crista cutis were found to decrease with age⁵. This change could be responsible for the flatness of the skin microrelief and poor appearance of aged skin^{6,7}.

The shapes of the cornified cells were compared before and after stretching of the skin surface⁸. The sulcus cutis opened with the stretching of the skin; however, the size of the cornified cells of the crista cutis did not change. This result indicates that the stratum corneum has a bellows (folding) structure. The vertical fibers in the sulcus cutis support the smooth opening and closing of this structure.

These organized microrelief structures are easily degraded by external stress factors such as drying⁹. The cornified cells shrink by 5–10% with drying, causing a shrinkage in the crista cutis and disappearance of the sulcus cutis.

This change impairs function and diminishes the beauty of the skin surface, and causes a weakening in the resistance of the skin barrier to inner and external stress. We developed the “phyto-resist complex,” which is effective in enhancing the shrinkage resistance of cornified cells. This complex has anti-shrink, moisture and microrelief maintenance functions.