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Photoaging-associated changes in epidermal proliferative cell fractions

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The epidermis is a dynamic epithelium with constant renewal throughout life. Epidermal homeostasis depends on two types of proliferative cells, keratinocyte stem cells (KSCs), and transit amplifying (TA) cells. In the case of chronologic aging, levels of KSCs tend to decrease and change functionally. However, little is known about the effect of photoaging on epidermal proliferative subtype populations. The aim of this study was to validate involucrin/beta1-integrin ratio as a molecular marker of epidermal photoaging, and to investigate the effects of photoaging caused by chronic UV exposure on the proliferative subtype populations. A total of 15 male volunteers (age range 20-24 and 77-85 years) provided sun-exposed and sun-protected skin samples. The expression of beta1-integrin was found to be significantly reduced in photoaged skin and ratios of the expressions of involucrin to beta1-integrin were increased 2.6-fold only in elderly subjects. Interestingly, immunostaining of the sun-exposed skins of elderly subjects showed aberrant beta1-integrin expression over the basal layer and greater numbers of Ki-67-positive cells than in sun-protected buttock skin. Flow cytometric analysis revealed that the proportion of KSCs to TA cells was reversed in sun-exposed and sun-protected skins of elderly subjects. Our results suggest that KSC numbers may be lower in photoaged skin than in chronologically aged skin and could be applied to hyperplastic pattern of photoaging. These findings suggest that the epidermis of photoaged skin is impaired in terms of its proliferative potential by attempting to repair chronic UV exposure and that photoaging may be associated with alteration in the two proliferative cell fractions.

Biography

Oh Sang Kwon has completed his Ph.D at the age of 31 years from Seoul National University and postdoctoral studies from University of Pennsylvania School of Medicine. He has published more than 25 papers in reputed SCI journals

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