IJAE
Vol. 120, n. 1 (Supplement): 119, 2015
ITALIAN JOURNAL OF ANATOMY AND EMBRYOLOGY

Interleukin 17 affects early and late biomarkers of terminal differentiation in a three-dimensional model of normal human skin

Nicolino Mastroianni[1], Laura Cornaghi[1], Francesca Arnaboldi[1], Federica Landoni[1], Francesca Prignano[2], Elena Donetti[1]

[1] Dipartimento di Scienze Biomediche per la Salute, Università degli Studi di Milano, Milano, Italy -
[2] Dipartimento di Chirurgia e Medicina Traslazionale, Università degli Studi di Firenze, Firenze, Italy

Interleukin (IL)-17 expression has been correlated with the pathogenesis of multiple autoimmune diseases, as rheumatoid arthritis, multiple sclerosis, and, more recently, psoriasis (1). During plaque formation, the interplay between immunocytes and keratinocytes is deregulated, resulting in the altered expression of keratin (K) 17, occludin, and filaggrin in psoriatic lesional epidermis (2, 3). The involvement of IL-17 in psoriasis pathogenesis has been identified (4), but the specific and intrinsic effects exerted by this cytokine have not been thoroughly investigated. The aim of the present work was to study by indirect immunofluorescence the expressions of K17, K10, filaggrin, and occludin in a three-dimensional model of normal human skin standardized in our laboratory (5). Human skin samples (n = 5) obtained from healthy 20-40 years-old women after plastic surgery, were exposed to IL-17 in a Transwell system at air-liquid interface as previously described (5). Samples were harvested 24 (T24), 48 (T48), and 72 (T72) hours after IL-17 stimulation and processed for paraffin embedding and immunofluorescence analysis for expressions of K17, K10, filaggrin, and occludin. After IL-17 exposition, K17 immunostaining progressively increased with time in the upper stratum spinosum, while K10 expression resulted homogeneously distributed in the suprabasal layers. In IL-17 treated samples occludin staining became irregular starting from 24 hours. On the other hand, filaggrin distribution was affected in T48 samples, where the immunolabelling was discontinuously punctuate. In conclusion, our results strongly support the use of this experimental setting for investigating the time-dependent early effects induced by IL-17 in normal human skin.

References

[1] Chang et al. (2009) IL-17F: regulation, signalling and function in inflammation. Cytokine 46: 7
[2] Fu et al. (2012) Keratin 17 as a therapeutic target for the treatment of psoriasis. J Derm Sci 67: 161
[3] Gutowska-Owsiak et al. (2012) IL-17 downregulates filaggrin and affects keratinocyte expression of genes associated with cellular adhesion. Exp Dermatol 21: 104
[4] Mabuchi et al. (2012) Chemokine receptors in the pathogenesis and therapy of psoriasis. J Derm Sci 65: 4
[5] Donetti et al. (2014) An innovative three-dimensional model of normal human skin to study the proinflammatory psoriatic effects of tumor necrosis factor-alpha and interleukin-17. Cytokine. 68: 1

Keywords

Psoriasis; cytokines; keratins; occludin; filaggrin.