Review paper

KERATINOCYTE DIFFERENTIATION AND ACTIVATION

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SUMMARY

To understand properly the various phenotypes associated with hereditary disorders due to abnormal keratinization, we need to understand the physiology of keratinocytes and the role of the proteins that keratinocytes synthesize to perform their function. There are two physiologic pathways open to keratinocytes, differentiation and activation, each with characteristic function and battery of proteins produced. The biologically active substances can be for didactic purposes categorized into four groups: signaling molecules, receptors, transducing molecules and transcription factors.

KEY WORDS

keratinocyte, differentiation, activation, signaling molecules, receptors, transducing molecules, transcription factors

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Keratinocyte differentiation is associated with changes in gene expression, specifically of keratin genes, keratins being the most abundant epidermal proteins. The epidermis is composed of ten to twenty layers of keratinocytes, the predominant cell type of this tissue. During normal epidermal differentiation, four types of keratinocytes can be distinguished through their phenotypic and biochemical properties: basal, spinous, granular, and cornified [1][2]. Basal cells are characterized by their contact with the basement membrane, mitotic activity, and the expression of keratins K5 and K14 [3]. In response to unknown stimuli, the basal keratinocytes are triggered to differentiate terminally. They detach from the basement membrane, stop dividing, become spinous, and initiate their migration and maturation through the suprabasal layers. Concomitantly, they start to express the earliest markers of terminal differentiation, keratins K1 and K10, which are fully expressed only in the spinous and granular layers [4] [5][6]. In the granular layers, filaggrin and precursors of the cornified envelopes such, as loricrin and involucrin, as well as epidermal transgulatminase are expressed [7][8][9][10]. The final