

Morphological aspects of an artificial skin

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SUMMARY

Culture technology have permitted the generation of an artificial skin using human neonatal stem cells. A major advantage of this model is that epithelial-mesenchymal interactions are maintained. We have studied some morphological aspects concerning tissue organisation and cell differentiation using immunohistochemistry and electron microscopy. The epidermal equivalent was composed by a stratified and keratinized epithelium. The cells of this epithelium were cytokeratin-positive and disposed in different layers corresponding to natural skin, i.e. basal, spinous, granular and keratinized layers. The ultrastructural aspects concerning keratinocyte differentiation were comparable to natural epidermis. The dermal equivalent was composed by a loose connective tissue. The cells of the dermal equivalent were vimentin-positive and belonged to the fibroblast lineage. Although poorly developed, a basement membrane was detectable in the dermo-epidermal junction. The organ architecture and the high level of cell differentiation suggest that this bioengineered skin might be considered a useful substitute for natural skin in clinical, biological and pharmacological applications.