Epithelialization in Wound Healing: A Comprehensive Review.

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Public Summary: Significance: Keratinocytes, a major cellular component of the epidermis, are responsible for restoring the epidermis after injury through a process termed epithelialization. This review will focus on the pivotal role of keratinocytes in epithelialization, including cellular processes and mechanisms of their regulation during re-epithelialization, and their cross talk with other cell types participating in wound healing. Recent Advances: Discoveries in epidermal stem cells, keratinocyte immune function, and the role of the epidermis as an independent neuroendocrine organ will be reviewed. Novel mechanisms of gene expression regulation important for re-epithelialization, including microRNAs and histone modifications, will also be discussed. Critical Issues: Epithelialization is an essential component of wound healing used as a defining parameter of a successful wound closure. A wound cannot be considered healed in the absence of re-epithelialization. The epithelialization process is impaired in all types of chronic wounds. Future Directions: A comprehensive understanding of the epithelialization process will ultimately lead to the development of novel therapeutic approaches to promote wound closure.

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