

Epidermal stem cells in wound healing

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The skin acts as the most efficient barrier against the entry of pathogens into the system which is the first layer of defence from the external environment. The epidermal stem cells (EPSCs) are multipotent cells that can be found in the base layers of the epidermis having some important functions, such as wound recovery, differentiation and regeneration of the epidermal cells. Thus, they are capable of making an efficient tissue layer and replacing the damaged regions of skin. The hair follicles located in the scalp are considered the most efficient regions for the extraction of epidermal stem cells for the development of skin tissue and injury repair. Therefore, EPSCs can be applied for skin injuries and help in the repair of wounds and regenerate the affected sites. Wound healing is a multi-mediated mechanism consisting of contraction, connective tissue matrix deposition and epithelialisation. Thus, during wound healing, the implantation of stem cells can contribute to it as they have the ability to differentiate into keratinocytes, sebaceous glands, and other skin cells. The vigorous and coherent activation of EPSCs is very useful for efficient re-epithelialisation. This is a key step as it forms layers of the specialised tissue to repair the wounded area. During wound healing, the special ability of hair follicle stem cells to repair neighbouring cells has been observed, as they act as a temporary bandage by contributing to re-epithelialisation soon after injury. EPSCs are indispensable for wound management and can be used for burn wounds, chronic wounds and for the regeneration of other damaged epithelia. Therefore, EPSCs combined with some progenitor cells can regenerate and stabilise wounds in an efficient manner, hence they can be applied in therapeutic strategies to cure different types of skin wounds.

Keywords: Epidermal stem cells, Wound healing, Hair follicle, Regeneration, Progenitor cells

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