

An Ideal Skin Substitute for Wound Regeneration

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ABSTRACT

Ageing, obesity and diabetes closely correlated with the increase of various kinds of wounds. In spite of progress in wound management, still many patients suffer from wounds fail to heal or their ulcers relapse. This cause organ amputations, morbidity and mortality of many patients worldwide. In addition, wounds impose enormous and rapidly growing costs for health care systems, besides psycho-social burden and the individual distress. Therefore; treatment methods that are medically effective, safe and inexpensive are desperately needed. Tissue engineering by employing a source of cells/stem cells and a biomaterial on which the cells can grow, proliferate, and differentiate as well as exploiting growth factors take part in developing engineered tissues/organs. Tissue engineered organs can compensate the scarcity of donor organs. However, despite significant advances have been made particularly in skin tissue engineering, the field so far has failed to fulfil the expectations and is still need further development. Generally, current trend of wound care has shifted from solely achieving satisfactory survival rate to improvement in function and quality of healed wound (for example, being scar-free). The change in the trend has demanded for ideal skin substitutes and the emergence of various skin substitutes in the management of skin injury such as the acutely burned patients as well as diabetic foot ulcers. Conventionally, autologous split or full-thickness skin graft have been recognized as the gold standard of burn wound treatment, however, it is constrained by the low availability of donor source, especially in vast and severe burns. Moreover, autograft application creates additional wounds and scarring at the donor site. Thus, bioengineered skin substitutes (BSS) might represent artificial, off-the-shelf alternatives to the skin grafts with the benefits of less pain, less risk of cross-infection, less/no need for graft harvesting and etc.

Keywords: Bioengineered Skin Substitutes (BSS), Wound Healing, Stem Cells, Regenerative Medicine, Innovative Approaches