Immediately after injury, several events occur to repair the damaged tissue. Wound healing is a complex and dynamic process involving soluble mediators, blood cells, extracellular matrix components and resident cells, in particular fibroblasts. Briefly, three interactive phases take place during the wound healing process (inflammation, granulation tissue formation and remodelling). Thus, the “quality” of the healing, i.e. disappearance of scar and recovery of tissue functions, depends on a delicate equilibrium, and the remodelling phase, in which fibroblasts play a key role, is crucial for the rebuilding of the tissue as close as possible with origin.

When the injured area is too large, grafting becomes necessary, but in very large skin defects such as in burns, the amount of non-injured available skin is not sufficient. Skin substitutes are then alternative solutions.

The minimum requirement is to re-establish a barrier function obtained by the presence of the horny layer of the epidermis but there is a consensus as to the necessity of a dermal component. Various dermal substitutes have been developed. Some are acellular matrices, while others combine fibroblasts and extracellular matrix components. The presence of living fibroblasts has been shown to promote the rapid emergence of a functional dermis and consequently to permit efficient epidermal anchoring. However, the use of fibroblasts from sources other than the dermis needs to be evaluated to tend towards embryonic healing without scar and fibrosis.