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Susanti R Dewi et al., J Tissue Sci Eng 2017, 8:5(Suppl)
DOI: 10.4172/2157-7552-C1-042

2nd International Conference on
ADVANCES IN SKIN,
WOUND CARE AND TISSUE SCIENCE
November 9-10, 2017 | Frankfurt, Germany

TISSUE ENGINEERING AND REGENERATIVE MEDICINE (TERM) IN SKIN REGENERATION, WOUND HEALING AND THEIR CLINICAL APPLICATIONS

Susanti R Dewi[a], **Anggraini B**[b], **Regina Giovanni**[bc], **Ainun Julianto**[c] and **Indah Julianto**[ac]
[a]Moewardi General Hospital, Indonesia
[b]Bandung Institute of Technology (ITB), Indonesia
[c]PT. Dermama Bioteknologi Laboratorium, Indonesia

The skin is the largest organ of the body and has an array of functions. Skin compartments, epidermis, and hair follicles house stem cells that are indispensable for skin homeostasis and regeneration. These stem cells also contribute to wound repair, resulting in restoration of tissue integrity and function of damaged tissue. Unsuccessful wound healing processes often lead to non-healing wounds. Current chronic wound therapies are limited, so the search to develop better therapeutic strategies is ongoing. Tissue engineering and regenerative medicine (TERM) has caused a revolution in present and future trends of medicine and surgery. In different tissues, advanced TERM approaches bring new therapeutic possibilities in general population as well as in chronical wound healing, improving restoration of biological functions and rehabilitation. The mainstream components required to obtain a functional regeneration of tissues may include biodegradable scaffolds, drugs or growth factors and different cell types (either autologous or heterologous) that can be cultured in bioreactor systems (in vitro) prior to implantation into the patient. Particularly in the chronic wound bed is an environment of unabated inflammation, low mitogenic activity, excessive matrix metalloproteinases, extracellular matrix degradation, reduced angiogenesis, and premature fibroblast senescence, resulting in an overall delayed time to healing. The use of mesenchymal stem cells derived secretomes and biological scaffolding, is geared toward restoring the wound's ability to heal, either by supplanting ineffective healing mechanisms or by augmenting physiological processes. This paper will focus on the relevance of epidermal stem cells and other adult stem cells in the context of wound healing and skin disorders, and discuss their potential application in cell/scaffold-based wound therapies as well as their limitations.

Biography

Susanti Rosmala Dewi graduated as a general practitioner in 2010. Since 2015, she is studying as a dermatoveneraology resident in Sebelas Maret University of Surakarta. She has written two papers, which have been published in International and National Congress of Dermatology.

susantirosmala@gmail.com

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