Development of Acellular Artificial Dermis

Jung-Keug Park[1], Young-Kwon Seo[1], Kye-Yong Song[2], Young-Jin Kim[3],
[1]Department of Chemical and Biochemical Engineering,
Dongguk University 3-26, Choong-gu, Seoul, Korea
[2]Department of Pathology, Chung-Ang University, 221, Dongjak-gu, Seoul, Korea
[3]Biomedical Research Center, Lifecord Inc., 5, Paldal-gu, Suwon, Korea
TEL: 82-2-2260-3365, FAX: 82-2-2271-3489

Abstract

The use of allograft skin as a permanent skin replacement in the full-thickness burns is limited by its immunogenic properties. Allograft skin grafts will take to a full-thickness wound, but are ultimately rejected. This immune response to allograft skin is directed primarily against the cells of the epidermis and the endothelial and fibroblast cells in the dermis. The non-cellular components of dermis, consisting primarily of extracellular matrix proteins and collagen, has been shown to be relatively non-immunogenic. Acellular human dermis (ie, AlloDerm) is the first commercially available human collagen material in the sheet form that offers the real possibility of a collagen scaffold that can be replaced by native collagen. Another research for dermal substitutes was developed by Yannas and Burke. Their method consists of a porous biodegradable matrix formed of lyophilized collagen cross-linked with chondroitin-6-sulphate.

In this study, the fibroblasts that repopulated the developmented acellular artificical dermis maintained their capacityto produce a more mature dermis. This approach has focused on the matrix rather than the viable cell components of skin as the major dermal deficit in full-thickness skin loss. This substitute provides a dermal replacemente with a hige 'take' percentage and promotes host cell infiltration and neovascularization. It would support the amount of dermal substitute for split-thickness autografts in full-thickness skin injuries.

As a result, we can obtained in our study suggested that the developmented acellular artificial dermal substitute is able to provide an effective therapy for skin defects.

Reference

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