Aegean Conferences Abstract Submission Form

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Meeting:	3rd International Conference on Tissue Engineering

II. Abstracts

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Title:

PULSED HEAT SHOCK TO ENHANCE EXPRESSION OF COLLAGEN BY HUMAN DERMAL FIBROBLASTS *IN VITRO*

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Aging of the skin is a universal process. Well-known characteristics of aging skin are the development of fine lines and wrinkles, but also changes in skin tone, skin texture, thickness and moisture content are aspects of aging. The aging process can be divided into intrinsic aging, changes in e.g. dermal components like collagen, elastic fibers, glucosaminogycans and fibroblasts, and extrinsic aging, which is caused by external factors e.g. damage by UV-radiation. Rejuvenation of the skin aims at reversing the intrinsic and extrinsic signs of skin aging and can be established at the level of the epidermis as well as at the level of the dermis. Here we aim to counteract the intrinsic aging processes. One of the aspects of interest of aging skin is that it has a degenerated collagen matrix. To regenerate this matrix, fibroblasts need to be stimulated to produce new collagen. In this study, the effects of pulsed heat shocks of different temperatures on the expression of procollagen 1, procollagen 3, hsp27, hsp47, and hsp70 of human dermal fibroblasts *in vitro*, is investigated. The heat shocks were applied by rinsing the cells twice for ± 2 seconds with heated PBS. Two different temperatures, 45^0C and 60^0C, were used for the heat shocks. The same protocol was followed using the reference temperature of 37^oC. Quantative PCR was performed at six different time points (t = 5, 15, 35, 65, 95 min) after the heat shock to determine expression levels relative to the reference temperature. The heat shocks at 45^0C and 60^0C were found to upregulate gene expression of procollagen 3 and hsp47. Additionally, the 60^0C heat shock also upregulated procollagen 1, hsp27 and hsp70. These data indicate that different processes occur after the heat shocks at the different temperatures. However, the increased expression of both procollagen 3 and hsp47 at both temperatures suggests stimulation of the human dermal fibroblasts as a reaction to the heat shocks. This implies that in the living dermis heat shocks induce regeneration of the collagen network.

Skin, Collagen, Fibroblast

Preferred form of presentation: oral (Session II)