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http://dx.doi.org/10.5339/qfarc.2016.HBPP2772

Substances Secreted by Starved Human Dermal Fibroblasts Enhancing the Wound Healing Process in Rat without Scar: A Potential Acellular System for Wound Healing

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Background

Despite being a major cellular component of various engineered skin substituent, underlying mechanism of successful fibroblast transplantation in wound healing is not clear. Here we show that substances derived from starved fibroblast accelerate wound healing process in rat.

Material and methods

Starved human fibroblast cell culture supernatant (SFS) was prepared and tested for its wound healing capacity on rat skin. Twelve Wistar adult male rats were randomized into four different groups of three. On the back of each rat two wounds were created with area of 452 mm^2. Each wounds were treated daily with one milliliter of SFS or cell culture medium (DMEM). The size of the wounds was measured daily until crust formation. The animals were scarified on 4th, 8th, 11th and 15th day of experiment and skin was removed for H&E and trichrome staining. Infiltration of fibroblast and inflammatory cells and collagen formation were analyzed.

Results

The diameter of the wounds treated the SFS solution was significantly decreased within the first week of treatment, compared with control wound receiving DMEM only (p

Cite this article as: Hanifi-Moghaddam P, Mostafazadeh A. (2016). Substances Secreted by Starved Human Dermal Fibroblasts Enhancing the Wound Healing Process in Rat without Scar: A Potential Acellular System for Wound Healing. Qatar Foundation Annual Research Conference Proceedings 2016: HBPP2772 http://dx.doi.org/10.5339/qfarc.2016.HBPP2772.