

Characteristics of Serum Exosomes after Burn Injury and Dermal Fibroblast Regulation by Exosomes in Vitro

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Abstract : Background: Exosomes (EXOs) have been considered a new target that is thought to be involved in and treat wound healing. More research is needed to fully understand the EXO characteristics and mechanisms of EXO-mediated wound healing, especially wound healing after burn injury. Methods: Total EXOs were isolated from 85 serum samples of 29 burn patients and 13 healthy individuals. We characterized the EXOs for morphology and density, serum concentration, protein level, marker expression, size distribution, and cytokine content. After confirmation of EXO uptake by dermal fibroblasts, we also explored functional regulation of primary human normal skin and hypertrophic scar fibroblast cell lines by the EXOs in vitro, including cell proliferation and apoptosis. Results: EXOs dynamically changed their morphology, density, size, and cytokine level during wound healing in burn patients, which were correlated with burn severity and the stages of wound healing. EXOs from both burn patients and healthy individuals stimulated dermal fibroblast proliferation and apoptosis. Conclusion: EXO features may be important signals that influence wound healing after burn injury; however, to understand the mechanisms by which EXOs regulated the fibroblasts in healing wounds, further studies will be required in the future.

Keywords : exosome, burn, wound healing, hypertrophic scarring, cytokines

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