

Cell-Free, Conditioned Media from Mouse Bone Marrow Macrophages Improve the Healing of Dermal Injuries in Mouse

Authors : Yixuan Zhou, Ming Zhang, Liang Qin, Fanglin Lu

Abstract : Wound healing is a vital physiological process that supports the body's ability to repair itself. Impaired healing can lead to complications such as infections, chronic ulcers, or tissue damage. Understanding the pathogenesis of wound healing is essential for developing targeted interventions to promote optimal healing outcomes and prevent complications associated with impaired wound healing. However, the underlying mechanism remains elusive. Macrophages play a crucial role in wound healing, and their function varies with the healing stage. Two main phenotypes of macrophages, known as M1 and M2, have been identified, each with distinct functions. The transition from M1 to M2 macrophages is a process that occurs during the healing of an injury. Dysregulation of macrophage polarization can impair wound healing and lead to chronic wounds. Therefore, understanding the roles of M1 and M2 macrophages and their regulation in the wound microenvironment is important for developing therapeutic strategies to promote optimal wound healing. We evaluated the efficacy of conditioned cell-free media from mouse bone marrow macrophages (BMMs) to improve wound healing in mouse models. M1 or M2 polarizations of BMMs are assessed in vitro post-stimulations using published protocols. In vivo, efficacies are assessed in a mouse model of wound healing. Macroscopy and histological data show a consistent effect of daily treatments with cell-free media from M2 BMMs on the healing of wounds in mice. These results are illustrated by a smaller wound area size, fewer inflammatory infiltrations, and enhanced angiogenesis in the healing stage. This multi-modal investigation suggests the potential of M2 macrophages for the healing of dermal injuries.

Keywords : wound healing, bone marrow macrophages, mouse model, polarization

Conference Title : ICBAHS 2025 : International Conference on Biomedical and Health Sciences

Conference Location : Ottawa, Canada

Conference Dates : March 24-25, 2025