Ruodan Xu, J Health Edu Res Dev 2018, Volume 6
DOI: 10.4172/2380-5439-C2-008

Fibrogenic of hiPS-MSCs in 3D connective tissue growth factordelivering scaffold

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Scarcity and damaged fibroblasts is one cause of impaired healing. We developed a novel 3D biomimetic scaffold for stem cells augmentation and differentiation to fibroblasts. The 3D scaffold PFPC-C in this study was prepared using electrospun PCL/Col1 fibers which embedded in PEG-fibrinogen (PF) hydrogel and infiltrated with connective tissue growth factor (CTGF). In vitro, PFPC-C scaffold showed good biocompatibility confirmed by the human induced pluripotent stem cells derived mesenchymal stem cells (hiPS-MSCs) attachment, infiltration, and proliferation throughout the construct. CTGF loaded in this scaffold were sustained released and hiPS-MSCs coultured on the scaffolds showed stronger fibroblastic commitment. The performance of the scaffold was further evaluated in vivo. PFPC-C scaffolds seeded with or without hiPS-MSCs were implanted in the rat muscle injury model. 4 weeks, 12 weeks and 6 months later the mice were sacrificed respectively, the grafted implants were analyzed with histologic and mechanical examinations. Our results showed this 3D scaffold provided a suitable environment and well fibroblasts differentiation from hiPS-MSCs. This 3D scaffold could be potentially used in cell-based therapies for connective tissue related disorders.

Biography

Ruodan Xu has completed her PhD with cancer biology in 2010 from University of Copenhagen. Afterwards, she continued her postdoc in Geneva University, Cologne University and Aarhus University for studies on stem cells and tissue engineering. Currently, she is the associate professor of China Academy of Chinese Medicine Science. She has published more than 19 papers in reputed journals and has been serving as reviewers for many reputed journals. Her research interests focus on regenerative medicine, nanomedicine targeted elderly chronic disease including atherosclerosis and Alzheimer's disease.

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