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Isolation, Characterization and Myogenic Differentiation of Synovial Mesenchymal Stem Cells

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Abstract : Objectives: The objectives of this study aimed to isolate and characterize mesenchymal stem cells (MSCs) derived from synovial membrane. Then to assess the potentiality of myogenic differentiation of these isolated MSCs. Methods: The MSCs were isolated from synovial membrane by digestion method. Three adult rats were used. The 5 -azacytidine was added to the cultured cells for one day. The isolated cells and treated cells are assessed using immunoflouresence, flowcytometry, PCR and real time PCR. Results: The isolated stem cells showed morphological aspect of stem cells they showed strong positivity to CD44 and CD90 in immunoflouresence while in CD34 and CD45 showed negative reaction. The treated cells with 5-azacytidine was shown to have positive reaction for desmin. Flowcytometric analysis showed that synovial MSCs had strong positive percentage for CD44(%98)and CD90 (%97) and low percentage for CD34 & CD45 while the treated cells showed positive percentage for myogenic marker myogenin (85%). As regard the PCR and Real time PCR, the treated cells showed positive reaction to the desmin primer. Conclusion: The adult MSCs were isolated successfully from synovial membrane and characterized with stem cell markers. The isolated cells could be differentiated in vitro into myogenic cells. These differentiated cells could be used in auto-replacement of diseased or traumatized muscle cells as a regenerative therapy for muscle disorders and trauma.

Keywords : mesenchymal stem cells, synovial membrane, myogenic differentiation
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