DIFFERENTIATION POTENTIAL OF RAT BONE MARROW MESENCHYMAL STEM CELLS (BM-MSCS) INTO CARDIOMYOCYTE-LIKE CELLS AFTER ZEBULARINE AND 5-AZACYTIDINE TREATMENTS

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The use of adult stem cells, particularly bone marrow derived mesenchymal stem cells; to safely facilitate recovery of cardiac function after myocardial infarctions has recently received a lot of interest. This study investigated the potential of rat bone marrow-mesenchymal stem cells (BM-MSCs) to differentiate in vitro into cardiomyocyte-like cells. MSCs were isolated and cultured in DMEM Medium. Cultured MSCs were first analyzed and confirmed using specific protein surface markers (CD44, CD45, CD117 and CD34) by immunocytochemistry and flow cytometry. Passage1 cultured MSCs were then treated separately with optimized concentration of two synthetic compounds, zebularine and 5-azacytidine. Treated cells were then analyzed for the expression of cardiac specific gene (GATA-4, cTnT, CAMHC and GAPDH) by RT-PCR. Isolated BM-MSCs exhibited a fibroblast-like morphology and positively stained for CD44, CD45, and CD117. However, they were negative for CD34, hence, confirming the absence of hematopoietic lineage. Upon induction, PCR data indicated higher gene expression level of cardiogenic genes compared to untreated culture. Cardiogenic mentioned gene expression levels were detected to be slightly higher in 5-azacytidine treated culture compared to zebularine.