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Promigratory and proangiogenic effects of adiporon on bone marrow-derived mesenchymal stem cells: *In vitro* study

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Mesenchymal stem cells (MSCs) are currently the most convenient primary source of stem cells applicable in cell therapy and regenerative medicine. Due to low number of viable MSCs after cell transplantation novel approaches are required to improve viability, robust migration and proper homing of the cells. Recent evidence demonstrated that AdipoRon, a small-molecule AdipoR agonist has cytoprotective effect on post-ischemic cardiomyocytes. Herein we investigated the effect of AdipoRon on major factors involved in survival, migration and angiogenesis of rat bone marrow-derived MSCs cells. The expression level of cyclooxygenase-2 (COX-2), hypoxia-inducible factor-1 (HIF-1), C-X-C chemokine receptor type 4 (CXCR4), C-C chemokine receptor type 2 (CCR2), vascular endothelial growth factor (VEGF), matrix metalloproteinase-2 (MMP-2) and MMP-9 were assessed by Real-Time PCR, compared to untreated MSCs. Prostaglandin E2 (PGE2) production was investigated using ELISA assay. Measurement of Caspase-3 activity was carried out by an enzymatic assay. The migration potential of MSCs was observed by scratch test. AdipoRon significantly promoted the MSCs viability. The Real-Time PCR results indicated that the expression of COX-2, HIF-1, CXCR4, CCR2, VEGF, MMP-2 and MMP-9 were higher in AdipoRon- treated MSCs compared to control groups. The PGE2 level was enhanced by AdipoRon preconditioning; in contrast the caspase-3 activity was attenuated in these cells compared to the control group. Scratch test showed that AdipoRon could promote the migration ability of MSCs. Preconditioning of MSCs with AdipoRon prior to transplantation could enhance cell survival, angiogenesis and migration via activating the COX-2/ PGE2/ HIF-1 pathway and other contributing factors.

Biography

Sara Malih has completed her MSc in Medical Biotechnology from Hamadan University of Medical Sciences. She has published more than 3 papers in reputed journals. She has 2 research articles under review. She is the Reviewer of Tumor Biology-Springer and has participated in more than 3 international congresses.

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