

## Comparative analysis of the Gene expression profile of Chemokine Receptors between Adipose-derived and Bone marrow-derived Mesenchymal Stem Cells

\*Hamid Reza Bidkhor<sup>1,2</sup>, Moein Farshchian<sup>2,3</sup>, Asieh Heirani-Tabasi<sup>1</sup>, Hojjat Naderi-Meshkin<sup>1</sup>, Mahtab Dastpak<sup>2</sup>, Naghmeh Ahmadian Kia<sup>1,5</sup>, Ahmad Reza Bahrami<sup>2,4</sup>, Maryam M. Matin<sup>2</sup>

<sup>1</sup> Stem Cells and Regenerative Medicine Research Department, ACECR-Khorasan Razavi branch, Mashhad, Iran.

<sup>2</sup> Department of Biology, Ferdowsi University of Mashhad, Mashhad, Iran.

<sup>3</sup> Molecular Medicine Research Department, ACECR-Khorasan Razavi branch, Mashhad, Iran.

<sup>4</sup> Institute of Biotechnology, Ferdowsi University of Mashhad, Mashhad, Iran.

<sup>5</sup> Shahrood University of Medical Sciences, Shahrood, Iran.

### Introduction:

Mesenchymal stem cells (MSCs) hold great promise in the field of regenerative medicine. Although originally isolated from bone marrow, MSCs have since been obtained from a variety of adult and neonatal tissues including the adipose tissue. Stemness and multipotential features of Mesenchymal Stem Cells (MSC) has been highlighted in many studies but there are many dark aspects in exclusive capabilities of MSC derived from different sources. Regarding adipose-derived MSCs, Ad-MSCs, and bone marrow- derived MSC, BM-MSCs has been introduced and applicable in clinics, we designed a small molecule induction based approach for evaluation of gene expression response between these cells.

### Materials and Methods:

A panel of MSC specific genes encoding CXCR4, CXCR6, CX3CR1 and CCR1 has been comparatively analyzed between Ad-MSCs and BM-MSCs by Real-Time PCR, in response to hypoxia- mimicking agents CoCl<sub>2</sub>, DFX and VPA.

### Results:

Our results showed CXCR4 expression dramatically increased following DFX and VPA treatment in Ad-MSC but decreased in BM-MSCs, over expression of CCR1 was detected only in BM-MSCs but CXCR6 and CX3CR1 didn't show any detectable expression between these kinds of MSCs.

### Conclusion:

We speculate that differential expression profile of CXCR4 and CCR1 related to different capabilities of BM-MSCs and Ad-MSCs and further investigations necessary to determine which gene networks play the key roles in MSCs derived from different sources and these findings translated from bench to bed in novel cell therapies.

**Keywords:** Adipose-derived MSCs, Bone marrow-derived MSCs, Chemokine Receptors, Gene expression.

### Oral Presentation

\***Corresponding Author:** Hamid Reza Bidkhor, Stem Cells and Regenerative Medicine Research Department, ACECR-Khorasan Razavi branch, Mashhad, Iran.