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Code: P172

Abstract: 173

Comparison of differentiation potential of male mouse adipose tissue and bone marrow derived-mesenchymal stem cells into germ cells

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Background: Recent publications about differentiation of stem cells to germ cells have motivated researchers to make new approaches to infertility. In vitro production of germ cells improves understanding differentiation process of male and female germ cells. Due to the problem of using embryonic stem cells (ESC), it's necessary the mentioned cells be replaced with some adult multi-potent stem cells in laboratories.

Objective: The aim of this study was to obtain germ cells from appropriate source beyond ESC and compare differential potentials of adipocytes derived stem cells (ADMSCs) with bone marrow derived stem cells (BMMSCs).

Materials and methods: To find multi-potential entity, after providing purified ADMSCs and BMMSCs, differentiation to osteoblast and adipocyte was confirmed by using appropriate culture medium. To confirm mesenchymal lineage production superficial markers (expression of CD90 and CD44 and non-expression of CD45 and CD31) were investigated by flowcytometry. Then the cells were differentiated to germ cells in inductive medium containing retinoic acid for 7days. To evaluate germ cells characteristic markers [Dazl (Deleted in azoospermia-like), Mvh (Mouse vasa homolog gene), Stra8 (Stimulated by retinoic acid) and Scp3 (Synaptonemal complex protein 3)] flowcytometry, immunofluorescence and real time PCR were used.

Results: Both types of cells were able to differentiate into osteoblast and adipocyte cells and presentation of stem cell superficial markers (CD90, CD44) and absence of endothelial and blood cell markers (CD31, CD45) were confirmative. The flowcytometry, immunofluorescence and real time PCR results showed remarkable expression of germ cells characteristic markers (Mvh, Dazl, Stra8, and Scp3).

Conclusion: It was found that although ADMSCs were attained easier and also cultured and differentiated rapidly, germ cell markers were expressed in BMMSCs significantly more than ADMSCs. This article extracted from M.Sc. thesis. (Maryam Hosseinzadeh Shirzeily).

Keywords: Germ cells; Infertility; Mesenchymal stem cells; Retinoic acid

Disclosure: Nothing to disclose