Isolation of Adipose Tissue Stem Cells with Organ Culture Method

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Background

Isolation of adipose tissue mesenchymal stem cells (MSCs) with current enzymatic methods has some limitations. For example, it is costly and time-consuming and results in a heterogeneous cell population that making compromise proliferation and differentiation of MSCs. Also, it is accompanied with the increased risk of culture contaminations because of several handling steps. In this article we present a non-enzymatic method for isolation of MSCs.

Methods

Small pieces of rat adipose tissue and also human liposuction sample were placed in the culture flask, covered with fetal bovine serum (FBS) and maintained in incubator for 24 h. Then, the FBS was changed with DMEM medium containing 20% FBS. When the fibroblast-like cells were appeared around the tissue they were expanded through 3 passages and used for Immunophenotype and differentiation assays.

Results

Flow cytometric analysis showed that the cells isolated with organ culture method expressed CD44 and CD105 but did not express CD34 and CD45 markers. The isolated cells also differentiated into adipocyte and osteoblast. Therefore, consistent with classically isolated MSCs, the cells isolated with our method express the stem cell surface markers and have pluripotent property.

Conclusion

The presented method is an easy and cheap procedure and can be used for harvesting MSCs from very small fat samples of human or animals.

Key Words: Adipocyte, Human, Osteoblast, Stem cell.

Poster Presentation

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