P47 Human Adipose Tissue-derived Stem Cells Have Characteristics of Multipotent Stem Cells

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Objectives: The purpose of this study is to isolate human adult stem cells from the adipose tissues for the cell therapy.

Materials and Methods: Human adipose tissue-derived stem cells (HAD) were isolated from the eyelid, abdomen and cheek obtained during plastic operation. The phenotypic characteristics of HAD were examined using RT-PCR and immunocytochemistry. Multipotent differentiation potential for osteogenesis, chondrogenesis, adipogenesis and neurogenesis was also examined using Von Kossa, Oil red O, Alcian Blue and Neu N stainings.

Results: Four lines of multipotent stem cells were established from the human adipose tissue and their biological characteristics at earlier and later passages were analyzed and compared to each other. RT-PCR analyses of the HAD of four lines showed the prominent expression of Oct-4, Rex-1, SCF, vimentin, CK18, FGF-5, BMP-4, nestin, NCAM and HLA ABC genes at both earlier and later passages. Immunocytochemical study demonstrated the distinct expression of collagen II, III, IV and XII, fibronectin, ICAM-1, VCAM-1, desmin, vWF, Thy-1, HLA ABC, TRA-1-60, SSEA-3 and -4 in all four types of HAD. HAD except for type isolated from the cheek were stained against alpha-smooth muscle actin, vimentin, CD54 and HLA DR. However, HAD from the cheek were only stained with anti-CD106 and CD31 antibodies. All HAD cultured in the specific differentiation medium exhibited positive staining with each stain, implying that they could differentiate into osteocytes, adipocytes, chondrocytes and neuronal cells under appropriate conditions.

Conclusions : Profiles of gene expression and protein localization of HAD showed typical features of known adult stem cells. Considering their multi-differentiation potential in addition to the above propertis, HAD could be an excellent alternative source for the human cell therapy, replacing MSC and other stem cells.

Key Words : HAD, Stem cells, Gene expression, Immnuocytochemistry, Cell therapy

P48 Human Cord Serum As A Fetal Bovine Serum Substitute For The Culture of Human Amnion-derived Stem Cells

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Objectives: Mesenchymal stem cells (MSC) are promising candidates for cell-based therapies. One major obstacle for their clinical use is the biosafety of fetal bovine serum (FBS), which is a crucial part of all media currently used for the culture of MSC. We evaluated the growth response, mRNA and protein expression of human amnion-derived stem cells (HAM) in human code serum (HCS).

Materials and Methods: HAM were isolated from the amnion after a Caesarean section and cultured in DMEM supplemented with 10% FBS, 5% HCS or 10% HCS. The phenotypic characteristics of HAM were examined using RT-PCR and immunocytochemistry.

Results: HAM were cultured in DMEM supplemented with 10% FBS, 5% HCS or 10% HCS and their biological characteristics at earlier and later passages were analyzed and compared to each other. RT-PCR analyses of the HAM cultured in FBS or HCS showed the prominent expression of Oct-4, Rex-1, SCF, FGF-5, BMP-4, nestin, NCAM, GATA-4 and HLA ABC genes at earlier and later passages. Immunocytochemical study after 4 passages of HAM cultured in FBS or HCS demonstrated the distinct expression of collagen I, III and XII, fibronectin, α-smooth muscle actin, vimentin, CK18, CD54, FSP, TRA-1-60, SSEA-3, -4 and HLA ABC. However, desmin was expressed by HAM only in the presence of 10% FBS. In contrast, CD44 and vWF was expressed by HAM only in the presence of either 5% or 10% HCS.

Conclusions: Profiles of gene expression and protein localization of HAM cultured in HCS showed typical features of known adult stem cells. However, HAM in HCS exhibited a few different properties fro those in FBS.

Key Words : HCS, FBS, HAM, Gene expression, Cell therapy