DIFFERENTIATION OF HUMAN MESENCHYMAL STEM CELLS THROUGH THE NATURAL MATRIX TO NEUROSPHERES FOR CHOLINERGIC-LIKE CELLS

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Abstract

This study aimed to differentiate human mesenchymal stem cells (hMSCs) from the human umbilical cord in cholinergic-like cells using a natural matrix. The isolation of hMSCs from Wharton's jelly (WJ) was carried out using "explant" and mononuclear cells by density gradient. hMSCs were plated in a natural functional biopolymer matrix for the production of neurospheres. Neural precursor cells were subjected to a standard cholinergic differentiation protocol. Dissociated neurospheres, neural precursor cells, and cholinergic-like cells were characterized by immunocytochemistry. The RT-PCR was performed. hMSCs were CD73+, CD90+, CD105+, CD34- and CD45- and demonstrated the trilineage differentiation. Neurospheres and their isolated cells were nestin-positive, and also expressed NESTIN, MAP2, ßIII-TUBULIN, GFAP genes. Neural precursor cells that were differentiated in cholinergic-like cells expressed ßIII-TUBULIN protein and choline acetyltransferase enzyme. hMSCs on the natural matrix were capable of differentiating hMSC into neurospheres, obtaining neural precursor cells without growth factors or gene transfection before cholinergic differentiation.

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