Human Adipose Tissue-Derived Stem Cells Differentiate to Neuronal-like Lineage Cells without Specific Induction

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Abstract:

Adipose tissue is an attractive source for generating pluripotent stromal cells which can differentiate also into ectodermal cell types. Mesenchymal stem cells are promising candidates for cell therapy and tissue regeneration. Several studies tried to differentiate Adipose tissue-Derived Stem Cells (ADSCs) into neurogenic cells with expression of some neural markers using specific chemical induction protocols. Meanwhile it is proven that toxic chemicals used in the induction media generate artifacts due to cell stress which mimic neural differentiation. In this study the differentiation of human ADSCs into neuronal-like lineage cells without using any induction protocol is investigated. ADSCs were cultured over 65 days and their morphological appearance and the expression of specific neural markers on the posttranscriptional as well as the posttranslational level were studied by RT-PCR and immunocytochemistry. The results suggest the differentiation of ADSCs into characteristic neuronal-like cells with the expression of a wide scale of typical neuronal and glial markers. Whether this is a true reprogramming differentiation and whether this neuronallike lineage cells can produce mature functional neurons must be evaluated by further investigations

Keywords: ADSCs; Differentiation without induction protocol; Neuronal-like lineal cells; Long term cultivation