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The production of dopaminergic neuron-like cells induced from human umbilical cord mesenchymal stem cells by human fetal brain tissue extracts

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In order to obtain dopaminergic neuron-like cells from the human umbilical cord mesenchymal stem cells (hUMBCs) by induction using the human fetal brain tissue extracts. The hUMBCs were cultured in DMEM with 10% fetal bovine serum and 20% fetal brain tissue extracts. Morphologic changes were analyzed by microscopy, Gene expression were detected by RT-PCR, the expression of neuron markers (Nestin, NSE, GFAP, DBH and DAT) were detected by immunofluorescence and the presence of related proteins in neurons were analyzed by western blot. The expression of neuron markers (NSE, GFAP, and dopamine neurons transcription factor Nurr1, Wnt-1 and En-1) were detected during the cultivation of hUMBCs in DMEM with 10% fetal bovine serum only. On the first day of cultivation in DMEM with 10% fetal bovine serum and 20% fetal brain tissue extracts, the hUMBCs exhibit morphologic changes, on third day and fifth day, the hUMBCs showed neuron phenotype, according with the morphologic changes observed. The results suggests that the brain tissue extracts obtained from human inevitable abortion fetuses can induce the umbilical cord mesenchymal stem cells into neuron-like cells that can express dopamine transportor (DAT) and dopamine β-hydroxylase (DBH) this would be a good method to produce seed cells for the treatment of neuron damage or retrogressive disease.

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