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Poster Presentation

In Vitro Investigation of Genes Which Derive BMSC-Derived Neurosphere Motility

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Abstract

It is estimated that annually 10 million people are affected by traumatic brain injury and it is one of the major causes of death and disability in accidents. Studies have shown the potential therapeutic value of neural stem cell therapies. Also, neural stem cell motility and migration to the site of injury has a great regeneration value of the damaged tissues. Extracellular and intracellular factors orchestrate this complicated process. In this work, we tried to elucidate the intracellular and indeed effectors of the cell motility and migration in neurosphere formations under in vitro conditions. After isolation and culture of bone marrow stromal cells (BMSCs) from rat; the cells were cultured in DMEM/F12 medium supplemented with 2% B27, 20 ng/ml basic fibroblast growth factor, 20 ng/ml epidermal growth factor, 100 U/ml penicillin, and 100 mg/ml streptomycin. After passing the incubation time; total RNA were extracted from the cells and cDNA synthesis were performed for different time i.e. at the times of 0, 1, 5 and 30 minutes as well as 1, 2, 4, 6, 12 and 24 hours. These cDNA were subjected to RT-PCR and real time RT-PCR reactions. At aforementioned different time courses; RT-PCR and real time RT-PCR results showed that there are substantial differences in the expression of the genes which regulate polymerization and depolymerization of intracellular actin protein and thus cell cytoskeleton dynamics including; Cdc42, Ctnn, Pak1, Rock1 genes. Actin protein dynamic causes cell membrane protrusions and filopodia formation and thus cell migration. Discovering of the underlined signaling mechanisms and pathways that guide the cell motility has a great importance, especially neurosphere cell motility in the field of CNS regeneration medicine. In conclusion, our results show that Cdc42, Ctnn, Pak1, Rock1 are effector genes in the cell motility of neurosphere formations.

Keywords: Bone Marrow Stromal Cells, Cell Therapy, Neurosphere.

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