

**Exposure to electromagnetic fields enhances neural differentiation of bone marrow mesenchymal stem cells incorporated with MNPs**

최윤경, 박정극\*

동국대학교

(jpark@dongguk.edu\*)

Mesenchymal stem cells (MSCs) have been investigated as new cell-therapeutic solution due to their capacity that differentiate into cells of connective tissues. Many studies have proved that human bone marrow-derived MSCs (hBM-MSCs) have neural differentiate potential by treating mechanical stimulation. In our study, we chose electromagnetic fields as mechanical stimulus. Recently, magnetic iron oxide nano particles (MNPs) have been suggested new method for neural cell transplantation because MNP-labeled cells are non-invasive imaging for cell tracking and can delivery of therapeutic bio-molecules strongly. We used PEG-phospholipid encapsulated magnetite (Fe<sub>3</sub>O<sub>4</sub>) nanoparticles on hBM-MSCs to improve their intracellular uptake and help differentiate neural cells. So, we measured cell viability and exposed to 50Hz electromangetic fields in neurobasal media. After exposing, we analyzed by RT-PCR, western blotting using neural cell type-specific genes and antibodies. So these results suggest that electromagnetic fields enhances neural differentiation on hBM-MSCs incorporated with MNPs and it would be effective method to differentiate neural cell.