

Pulsed electromagnetic fields promotes differentiation and cell survival of human BM-MSCs through activation of Akt and Rsk/Creb: in vivo and in vitro study

박정극[†], Enerelt Urnukhsaikhan, 조현진

동국대학교

(jkpark@dongguk.edu[†])

PEMF is known to have effects on biological properties, such as differentiation, regulation of transcription factor and cell proliferation. However, the cell protective effect of PEMF exposure is largely unknown. The aim of this study is to understand the underlying mechanisms that PEMF suppressing apoptosis and promoting survival, including PEMF induced neuronal differentiation. To find out the signaling pathways involved in the survival and neural differentiation of BM-MSCs by PEMF in vivo and in vitro, we examined the Creb, Akt and Rsk phosphorylation, also BAD, Bcl-xL activation as a downstream of Akt and Rsk. PEMF effectively reduces apoptosis of cells and induced a significant effect on the BM-MSC differentiation of neuron. PEMF effectively reduces apoptosis of cells and induced a significant effect on the BM-MSC differentiation of neuron. PEMF increased the expression of phosphorylated AKT level, and phosphorylated AKT play an important role in regulating BAD function. Our result suggest that AKT signaling pathway may be possible mechanism involved in the cell survival effect of PEMF.