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FULL TEXTElectromagn Biol Med. 2007;26(3):179-90.**Effects of weak, low-frequency pulsed electromagnetic fields (BEMER type) on gene expression of human mesenchymal stem cells and chondrocytes: an in vitro study.**Walther M, Mayer F, **Kafka W**, Schütze N.Department of Foot and Ankle Surgery, Orthocentre Munich, Munich, Germany.  
MWalther@schoen-kliniken.de**Abstract**

In vitro effects of electromagnetic fields appear to be related to the type of electromagnetic field applied. Previously, we showed that human osteoblasts display effects of BEMER type electromagnetic field (BTEMF) on gene regulation. Here, we analyze effects of BTEMF on gene expression in human mesenchymal stem cells and chondrocytes. Primary mesenchymal stem cells from bone marrow and the chondrocyte cell line C28I2 were stimulated 5 times at 12-h intervals for 8 min each with BTEMF. RNA from treated and control cells was analyzed for gene expression using the affymetrix chip HG-U133A. A limited number of regulated gene products from both cell types mainly affect cell metabolism and cell matrix structure. There was no increased expression of cancer-related genes. RT-PCR analysis of selected transcripts partly confirmed array data. Results indicate that BTEMF in human mesenchymal stem cells and chondrocytes provide the first indications to understanding therapeutic effects achieved with BTEMF stimulation.

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