

## عنوان مقاله:

Rat adipose-derived mesenchymal stem cells aging reduction by zinc sulfate under extremely low frequency electromagnetic field exposure is associated with increased telomerase reverse transcriptase gene expression

## محل انتشار:

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## خلاصه مقاله:

Zinc as an essential trace element was reported to be involved in regulation of the growth and aging of cells. In this study, rat adipose-derived mesenchymal stem cells were exposed to extremely low frequency electromagnetic field (ELF-EMF) of 50 Hz and 20 mT to evaluate whether exposure to ELF-EMF in the presence of zinc sulfate (ZnSO<sub>4</sub>) affects the telomerase reverse transcriptase (TERT) gene expression and aging in mesenchymal stem cells (MSCs). The cell plates were divided into four groups including group I (control without ZnSO<sub>4</sub> and ELF-EMF exposure); group II (ELF-EMF-exposure without ZnSO<sub>4</sub>); group III (ZnSO<sub>4</sub> treatment without ELF-EMF exposure) and group IV (ELF-EMF exposure with ZnSO<sub>4</sub>). In the presence of different concentrations of ZnSO<sub>4</sub>, cells viability, TERT gene expression and percentage of senescent cells were evaluated using colorimetric assay, real-time PCR and senescence-associated β-galactosidase activity assay, respectively. In this experiment, cells were exposed to ELF-EMF for 30 min per day for 21 days in the presence and absence of ZnSO<sub>4</sub>. The results revealed that ELF-EMF leads to a decrease in the expression of TERT gene and increase in the percentage of senescent cells. However, the ZnSO<sub>4</sub> could significantly increase the TERT gene expression and decrease the aging of ELF-EMF-exposed MSCs. It seems that ZnSO<sub>4</sub> may be a beneficial agent to delay aging of ELF-EMF-exposed MSCs due to the induction of TERT gene expression. Zinc as an essential trace element was reported to be involved in regulation of the growth and aging of cells. In this study, rat adipose-derived mesenchymal stem cells were exposed to extremely low frequency electromagnetic field (ELF-EMF) of 50 Hz and 20 mT to evaluate whether exposure to ELF-EMF in the presence of zinc sulfate (ZnSO<sub>4</sub>) affects the telomerase reverse transcriptase (TERT) gene expression and aging in mesenchymal stem cells (MSCs). The cell plates were divided into four groups including group I (control without ZnSO<sub>4</sub> and ELF-EMF exposure); group II (ELF-EMF-exposure without ZnSO<sub>4</sub>); group III (ZnSO<sub>4</sub> treatment without ELF-EMF exposure) and group IV (ELF-EMF exposure with ZnSO<sub>4</sub>). In the presence of different concentrations of ZnSO<sub>4</sub>, cells viability, TERT gene expression and percentage of senescent cells were evaluated using colorimetric assay, real-time PCR and senescence-associated β-galactosidase activity assay, respectively. In this experiment, cells were exposed to ELF-EMF for 30 min per day for 21 days in the presence and absence of ZnSO<sub>4</sub>. The results revealed that ELF-EMF

## کلمات کلیدی:

Adipose, Aging, Electromagnetic field, Mesenchymal stem cells, Zinc sulfate

## لینک ثابت مقاله در پایگاه سیویلیکا:

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