

**The influence of cisplatin combined with extremely low- frequency electromagnetic field on antioxidative enzyme activities and lipid peroxidation in megacolonies of squamous cell carcinoma**

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Physical factors, such as 60-kHz electromagnetic fields, can affect cell metabolism. Exposure to ELF-EMF (frequencies below 200-300 Hz) lead to generation of reactive oxygen species (ROS). ROS are known to cause DNA damage and lipid peroxidation in the biological membranes. Cellular membranes are the most probable target of ELF-EMF field's influence at the cell level. Several anticancer agents, such as cisplatin increase levels of ROS in cancer cells *in vitro*. The aim of this work was to assess the influence of a simultaneous use of cisplatin and an extremely low frequency electromagnetic field (ELF-EMF) emitted by equipment used in magnetostimulation (MRS-2000) on antioxidative enzyme activities and lipid peroxidation levels in squamous media cells AT478, cultured *in vitro* as megacolonies. Results: A treatment with both cisplatin and ELF-EMF for 72 hours increased antioxidative enzyme activity and prevented lipid peroxidation, compared to the untreated group. We speculate that cisplatin stimulation triggers redox adaptations, leading to an upregulation of antioxidant capacity and a shift in redox dynamics with high ROS generation and elimination to maintain ROS levels below the toxic threshold. We conclude that increased activity of antioxidant enzymes after exposure to ELF-EMF and cisplatin may represent a compensatory response to oxidative stress.