

**THE EFFECT OF EXTREMELY LOW FREQUENCY
MAGNETIC FIELD ON DIFFERENT TISSUES OF ALBINO
RATS**

Thesis

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SUMMARY

The human has created different intensities of magnetic field sources, communication services and various electrical devices. But alongside the benefits of these technologies, there are worries about the influences of electric, magnetic and electromagnetic fields on the metabolism and biological processes and molecular mechanisms and cellular organisms. These fields and the growing controversy over their potential effects on living systems have stimulated the research community to define more precisely the physical properties of these fields and to delineate the thresholds for their possible effects on human health and the environment.

This work is devoted to creating a technique of experimental application of magnetic field using coils interact with the biological object which resembles the general kind of exposure of humans near technical devices and used in research as well as in therapy. Also this work is done to study the hazard health effects accompanied with the exposure to ELF-MF on RBCs of albino rats as a reasonable biomarker to reflect any deterioration attributed to the exposure of the Circulatory system. An investigation carried out immediately after 10-days continuous exposure (24 hours/day) for groups of animals that exposed to different doses of extremely low frequency magnetic field and then examine the influence of the exposure (under our circumstances) on osmotic fragility of the RBCs membrane, solubility of cell membrane proteins, viscosity of blood and the morphological shape of RBCs in blood films.

The results taken after the exposure to lower doses of ELF MF can give a good information about the changes that may occur in the elasticity and ionic permeability of the RBCs membrane, which play the major role in the metabolic activities of RBCs. The changes in the RBCs permeability will cause disturbance in their function and mutual interactions with neighboring cells. The results also depicted the RBCs solubilization characteristics which suffered pronounced changes after the exposure which indicates the structural changes. The viscosity results illuminate remarkable changes in the rheological properties of the exposed blood samples. The structural and mechanical changes of the RBCs supported by the data obtained from the blood film test.

It was concluded from the results that, prolonged exposures to 50 Hz low magnetic fields are biologically toxic and cause hazardous effects on blood. It's recommended not to allow exposure to such fields for a long time. Also it's necessary to revise the dose limits recommended by different commissions for exposure to extremely low frequency magnetic fields below 0.5 mT which need a further scientific researches and governmental recommendations should be done in a way that exposure to such fields are omitted.