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Study of RBCs structural changes as a result of exposure to extremely low frequency electric fields

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Effect of 50 Hz-6 KV/m electric field rats exposure on its red blood cells (RBCs) structural properties is studied. Six groups of animals are used; group A considered as sham group that housed at normal environmental conditions did not receive any treatments. The other five groups B, C, D, E and F exposed to electric fields for different exposure periods 5, 10, 15, 20, 30 days respectively. Blood samples are collected immediately after sacrificing from each animal and RBCs are separated for further investigations. Erythrocytes osmofragility is carried out for each sample and its hemolysis percentages are calculated. The results of different exposed groups indicated clear abnormality and significant changes in RBCs membrane fragility as compared with unexposed group A. It may be concluded that exposures to 50 Hz-6 KV/m electric fields may cause hematological diseases which lead to several defects on biological functions.

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DNA repair gene polymorphisms as genetic markers of breast cancer

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Breast cancer is the most common cancer in females both in the developed and developing countries and constitutes a major cause of cancer related morbidity and mortality. The etiology of breast cancer is multifactorial, where genetic, environmental, and lifestyle factors interact to produce the malignant transformation. Interest in single nucleotide polymorphism (SNPs) in different genes has gained considerable momentum and many genes have been investigated on the lookout for specific genetic markers of cancer. DNA repair genes constitute one such group. Defects in DNA repair pathways have been shown as predisposing factors to the development of several types of cancers. We investigated several SNPs in RAD51, XRCC2, XRCC4, XRCC3 involved in DNA double-strand break (DSB) repair mechanisms and ERCC1 and ERCC4 in involved in Nucleotide-excision repair (NER), using TaqMan genotyping assay, PCR-RFLP and sequencing. rs861539 and rs1799794 in XRCC3, rs1800067 in ERCC4, rs1801321 and rs2619681 in RAD51 were significantly associated with breast cancer in Saudi females. We compared the results in ER+/ER-, PR+/PR-, HER+/HER-, females with different stages of the disease and different age of disease development and identified several associations. When the results were compared with results reported in different populations and ethnic groups, significant differences were identified. This paper will cover a comprehensive overview of DNA repair mechanisms and the defects which have been observed linked to breast and other cancers in different populations and will also discuss the pros and cons of using SNPs as markers of breast cancer.

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