



## Biophysical, biochemical and morphological alterations in rat exposed to microwave radiation

**Paulraj Rajamani\***, K.V. Singh, R. Gautam, J.P. Nirala, S. Pardhiya and J. Behari

<sup>1</sup>School of Environmental Sciences, Jawaharlal Nehru University, New Delhi –110 067, India.

E-mail. [paulrajr@hotmail.com](mailto:paulrajr@hotmail.com)

Electromagnetic radiation emitted from different gadgets becomes a major concern among the general public concerning potential health hazards. These radiations may induce various alterations in growth related enzymes, antioxidative enzymes and DNA. Therefore the present investigation is aimed to study the DNA strand breaks, histopathology, various enzymatic activities, such as catalase, glutathione peroxidase, super oxide dismutase, protein kinase C (PKC) ornithine decarboxylase (ODC), level of inflammatory cytokines, corticosterone and hippocampus dependent memory etc. in rat exposed to different frequencies of microwave radiation.

Male Wistar rats (Young and Adult) were exposed 2 h/day for 30-35 days at different frequencies starting from 1800 MHz, 2100 MHz, 2.45 GHz, 9.9, 26.5 GHz at low power density. Exposure was carried out in a specially designed anechoic chamber. After the exposure rats were sacrificed and various organs such as whole brain, hippocampus, liver, spleen and testis etc. were dissected out and used for various assays[1,2].

A significant increase in the level of pro-inflammatory cytokines, hypothalamic pituitary adrenal axis (HPA) activity and oxidative stress in hippocampus of exposed rats. However there is no significant impairment in hippocampus dependent contextual memory. Statistically significant increase in the ODC activity was observed. On the other hand a significant decrease in PKC activity was observed in exposed group as compared to their control counterpart. It is noted that the activity of hippocampus showed a significant decline as compared to hypothalamus and the rest of the brain. In additions a significant alteration in anti-oxidative enzymes, such as catalase, glutathione peroxidase, super oxide dismutase, was observed in rats exposed to above mentioned radiation as compared to control groups. It is clear from the present study that prolonged exposure to these radiation causes significant alteration in different organs of rat, suggesting a transductive coupling to the cytoplasm. These results indicate a possibility that these type of radiations may also affect DNA damage, induce oxidative stress mediated activity in antioxidative system. In addition these radiation alter the activity of growth related enzymes such as PKC and ODC, which are associated with the cell proliferation and differentiation [3,4]. It is also observed that an alteration in sperm parameters such as sperm count, viability, morphology, membrane integrity in the head and the tail of sperm [5].

### References

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