



## Effects of 4G mobile phone frequency on liver, kidney, testis and blood parameters of male Wistar rat

**Rohit Gautam**, Sonali Pardhiya, Jay Prakash Nirala, Priyanka Sarsaiya and Paulraj R\*  
School of Environmental Sciences, Jawaharlal Nehru University, New Delhi, India  
rohitgautam.692@gmail.com, pardhiyasonali@gmail.com, nirala\_prakash@yahoo.com,  
sarsaiyapriyanka@gmail.com, Paulrajr@yahoo.com

Mobile phone has become vital part of everyone's life. As technology is advancing mobile phone subscribers are increasing rapidly. Mobile phone emits RFR (Radio Frequency Radiation) which is an area of concern among the public. In the present study male Wistar rat were exposed to the 4G mobile phone frequency (2350MHz). Animals were divided into two groups Exposed and Sham Exposed (Control) with six rats in each group. Animals were exposed to 2 hours per day for 56 days in a specially designed Anechoic chamber. Various biophysical parameters such as power density and SAR (Specific absorption rate) were measured[1]. After exposure the organs were excised out and histopathological analysis of various reproductive organs (testis, epididymis and vas deferens), liver and kidney were done. Various Sperm parameters such as sperm count, viability, morphology and mitochondrial activity were evaluated as per WHO protocol [2]. Oxidative stress parameters (lipid peroxidation and total antioxidant capacity), liver and kidney function test and hematological parameters were analysed. Result showed alterations in histopathology of liver, kidney and reproductive organs. Exposed group animals showed a significant decrease in sperm viability. However no significant changes in sperm count, morphology, mitochondrial activity and oxidative stress parameters were observed in exposed group animals as compared to sham exposed. Hematological parameters like Hemoglobin, Red blood cell, Packed cell volume showed significant increase with decrease in level of enzyme alkaline phosphatase in the exposed group animals. Thus, long term exposure to 4G mobile frequency may affect liver, kidney and reproductive health.

### References

- [1] C. H. Durney, M. F. Iskander, H. Massoudi, and C. C. Johnson, "An Empirical Formula for Broad-Band SAR Calculations of Prolate Spheroidal Models of Humans and Animals," *IEEE Trans. Microw. Theory Tech.*, vol. 27, no. 8, pp. 758–763, 1979, doi: 10.1109/TMTT.1979.1129720.
- [2] X. W. Cao, K. Lin, C. Y. Li, and C. W. Yuan, "[A review of WHO Laboratory Manual for the Examination and Processing of Human Semen (5th edition)]," *Zhonghua Nan Ke Xue*, vol. 17, no. 12, pp. 1059–1063, 2011.