



## **Dosimetric analysis for RF radiation using rat muscle phantom model**

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Wireless communication has completely transformed the way we communicate. Mobile communication technology has come a long way since the introduction of 1G, 2G, 3G, 4G, and 5G in the market. The risk of radio frequency (RF) exposure and its potentially harmful effects on living beings, particularly humans, have increased as a result of our growing dependence on cell phones and the exponential rise in their number over the past few decades. RF exposure is measured using the mass-normalized rate of electromagnetic energy absorption, often known as the specific absorption rate (SAR).

The present study is a dosimetric investigation for better understanding the variation in the quantity of RF-EMF absorbed in a rat muscle phantom model that simulates the entire body of an adult Wistar rat. A plexiglass model containing rat muscle phantom media was designed and two 4G smartphones, Samsung Galaxy A9 and the Redmi Note7, were employed as EMF sources in our research. The values of SAR obtained when Redmi Note 7 was used as source of radiation was slightly higher than those obtained by Samsung. For both phones SAR value obtained was maximum at the surface level of muscle phantom and as the probe was inserted deeper in the muscle phantom the SAR value started decreasing. The muscle phantom mimics the electrical characteristics of whole body of rat and therefore can be employed for compliance study of effects of various Electromagnetic radiation. The results may be corroborated by implementing on actual cells and tissue

1.J. Behari, J.P Nirala, "SAR measurement due to mobile phone exposure in a simulated biological media", *Electromagnetic biology and medicine*, 31(3), pp. 195-203, 2012, doi: 10.3109/15368378.2012.700294.

2.IARC, "International Agency for Research on Cancer, Non- ionizing radiation, Part 2: Radiofrequency electromagnetic fields" *IARC monographs on the evaluation of carcinogenic risks to humans*", **102**, 2013, pp. 1-421.