

Thermographic measurements on unrestrained Swiss albino mice exposed to non-ionizing electromagnetic field (EMF) of 2.14 GHz UMTS downlink frequency

ABSTRACT

Thermographic measurements were performed on *Mus musculus* (Swiss albino mice) exposed to non-ionizing electromagnetic field (EMF) of 2.14 GHz Universal Mobile Telecommunication System (UMTS) downlink frequency to determine thermal effect. Sham-exposed mice samples show consistent transient increase in daily mean body temperature. The mice samples were expected to experience a rise in body temperature when exposed to UMTS signal. However, the exposed samples show a gradual decrease in mean body temperature pattern for the first 10 days and then settled at a lower mean body temperature range until day 21. In conclusion, the thermographic measurement results did not demonstrate a significant thermal effect mediated by 2.14 GHz EMF exposure at 1 V/m, with highly variable individual response of the mice samples to the exposure observed in both groups. Actual thermal effects might have been masked by the thermoregulatory mechanism or other factors, or the exposure level applied was too low to produce any observable thermal effect. The measurement results also support that mice rarely survived when their body temperature dropped below 33.3°C of hypothermia endpoint temperature.

Keyword: ICNIRP; Thermal effects; Biological effects; Whole-body exposure; Thermoregulatory; Base station; RF EMF radiation; SAR; Hyperthermia; Hypothermia