

IAA/IAF SPACE LIFE SCIENCES SYMPOSIUM (A1)  
Radiation Fields, Effects and Risks in Human Space Missions (4)Author: Dr. Igor Smirnov  
United States, igor@gqusa.comTHE EFFECT OF MRET NOISE FIELD GENERATOR ON METABOLIC ACTIVITY OF  
ASTROCYTE CELLS EXPOSED TO RF RADIATION**Abstract**

This article is related to the experimental data revealing the ability of MRET noise field generator (NFG) to compensate the inhibition of Astrocyte cells metabolic activity when Astrocytes are exposed to RF radiation. Astrocyte samples exposed to RF (mobile phone) radiation were placed at the distance of 30 feet from NFG in this experiment. The core part of the generator is MRET polymer compound. Due to the fractal geometry structure of MRET polymer compound and the phenomenon of piezoelectricity, this polymer generates subtle, low frequency, non-coherent electromagnetic oscillations (composite noise field) when exposed to electromagnetic field of 7.8 Hz and 14.5 Hz frequency oscillating in a repeating sequence for 5 seconds each time. MRET polymer compound is driven by the solenoid that encapsulates this polymer material. The composite noise field can modify RF signals as a result of superposition phenomenon. The superposition of composite noise field generated by MRET generator on RF microwave signals leads to amplitude modulation of RF signals where random low frequency signal generated by MRET generator is a modulating signal and original microwave signal is a modulated one. Litovitz et al. proposed that living cells exist in an electrically noisy environment and these endogenous thermal noise fields are larger than those exogenous EMFs reported to cause effects. They suggested that only the EMFs that are temporally and spatially coherent such as radiofrequency fields could affect living cells while endogenous thermal noise fields, which cells do not respond to, were temporally and spatially incoherent. A number of observations have supported this theory. In one experiment, the cellular effects induced by acute microwave radiation were mitigated by superposing with electromagnetic noise in vitro. DNA damage induced by 1.8 GHz microwave radiation at the SAR of 3 W/kg and 4 W/kg was significantly higher than sham exposure ( $p < 0.001$ ) whereas no significant differences could be observed in other exposure groups compared with the sham exposure group ( $p < 0.05$ ). Electromagnetic noise alone did not increase DNA damage of HLEC, and when it was superposed on the radiofrequency field, the electromagnetic noise could block RF-induced DNA damage. To verify the compensatory effect of amplitude modulated signals on metabolic activity of living cells exposed to RF radiation the experiment was conducted at Molecular Diagnostic Services Inc., San Diego on normal human brain Astrocyte cell. The same approach and technology can be adopted to develop MRET generator that can protect humans against ionizing space radiation.