

Title: R/F Radiation on Biological Systems II

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It is estimated that, as of August 2005, there were more than 2 billion mobile phone users worldwide. According to the World Health Organisation (WHO), health effects due to radiofrequency cell phone radiation, particularly with respect to cancer proliferation and alterations in sleep patterns, have been negligible thus far. Organisations such as the International Commission on Non-Ionizing Radiation Protection (ICNIRP) and the Institute of Electrical and Electronics Engineers (IEEE), have made several revisions to the Specific Absorption Rate (SAR) standard over the last few years. Accepted values now stand at 1.6 W/kg taken over 1g of tissue in the United States and 2 W/kg taken over 10g of tissue in countries of the European Union. Though present mobile phone emissions fall below these limits, recent research has reported that dangers still exist.

This paper intends to give a review of several experiments, conducted over a period of 11 years (1997 – 2008), on the effects of non-thermal cell phone radiation on the central nervous system. In particular, focus was on the permeability of the blood brain barrier (BBB), the risk of brain cancer, disturbances in sleep and influence on cognitive functions. Additionally, the effects on children were also considered. In total, 66 papers were reviewed and conclusions drawn based on their results. For the BBB, approximately 66% of the papers found no conclusive effects. With respect to cancer of the brain, roughly 38% of the papers examined found a significant risk in cancer overall, with significant findings pertaining to high grade astrocytoma. It was also discovered that brain cancers were more pronounced in subjects with ten or more years of usage. For sleep pattern disturbance, 7 out of 12 papers suggested considerable consequences of

exposure to radiation, the majority agreeing on the alteration of the alpha-frequency range during sleep. With regard to cognitive functions, out of 9 papers, 7 negated any effects on reaction times, memory and other functions related therein. For assessment of children, 45% of the papers concluded that electromagnetic radiation does indeed affect children, whereas 27% found no effects, and the remainder was uncertain.

In addition to the papers mentioned above, our research team executed a test on 30 subjects, both male and female, between the ages of 20 to 30 years. All were given a questionnaire, while 27 were also tested for IQ scores and memory. No correlation was found between sleeping patterns for light (<900 lifetime hours) or heavy (>900 lifetime hours) cell phone users. With the exception of 5 subjects, all users reported at least one symptom related to radiation hypersensitivity. No relationship was found between heavy phone use and light phone use with respect to memory.

In consideration of all results, most cases experimented on only short-term exposure, and this showed no certainty of danger in any of the areas considered. It is necessary for more research of long-term usage, particularly for brain cancer, to be done in order to fully understand all implications associated with using a cell phone.