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Dear Bob,

Back on August 18, 2004, you responded to an email message that posted a web link to a story concerning a biological effects study <http://ehp.niehs.nih.gov/press/012903.html> (*Mobile Phone Exposure Causes Brain Damage in Rats*) and a subsequent follow-up web article <http://www.wired.com/news/wireless/0,1382,57488,00.html> (*Phone Study: Holey Rat's Brains*) published on the web back in January 2003. One of the lead-in statements on the second article was: "Swedish scientists found that radiation emitted by the world's most common mobile phones burns holes in the brains of rats." Naturally, such statements could be cause for concern among the public and readers of the *CGC Communicator*. You forwarded the web link to me with a note asking for any comments I might have on the subject story. On August 27, 2004, I wrote back and suggested that you hold up on publishing a proposed article for the *CGC Communicator* due to my concerns over the quality of the original research report discussed in the web article. The paper referred to in the web articles is: Leif G. Salford, Arne E. Brun, Jacob L. Eberhardt, Lars Malmgren, and Bertil R. R. Persson, Nerve Cell Damage in Mammalian Brain after Exposure to Microwaves from GSM Mobile Phones, *Environmental Health Perspectives* Vol. 111, No. 7, June 2003.

I contacted several colleagues that I interact with in the context of the revision of the IEEE Standard C95.1 on RF human exposure limits and asked for their reactions to the referenced study. This letter is an attempt to summarize the take-home message I got from various responses to my query. Serious questions arose among independent researchers familiar with the approach and techniques used by Salford and his coauthors including:

- Histological techniques in which a semi-qualitative method was used to score so-called dark neurons followed by a quantitative statistical analysis of these numbers. This is considered to be an inappropriate use of statistics.
- Maximum effect (increase in dark neurons) was only seen in one or two slides out of the entire study.
- Control percentages of dark neurons were abnormally low making the exposed percentages appear to be significantly elevated.
- Suspiciously lacking in details, especially the histology.
- Questions about the dosimetry of the study.

- Looking for dead cells a long time after they should have been removed by the natural scavenger systems does not make sense biologically.
- A serious concern that if the nerve damage reported by Salford et al after only 2 hours of exposure to GSM signals really exists, then we have a problem in understanding where all of the damage went in at least 8 other chronic lifetime RF exposure studies of rats and mice in which absolutely none of the histopathological examinations of the brains reported necrosis (Fry et al (2 studies), Toler et al, Adey (2 studies), Chou and Guy).
- When questioned at a scientific conference later by Ohkubo after he could not observe RF effects even at high SAR values, Salford commented “try lower SARs!).
- Since rats exposed for prolonged periods to similar types of RF energy show no evidence for brain injury, it would seem that the Salford results are either an artifact or a measure of a biological phenomena that has no long term consequences for the animal.
- In less than 1 month, a new paper by Finnie and Gebiski (Institute of Medical & Veterinary Science, Adelaide) will be presented on "Neuronal Changes Produced in Mouse Brain After Short- and Long-Term Exposure to Global System for Mobile Communication (GSM)-like Radiofrequency Fields." This will provide some up-to-date data to distribute to readers of the *CGC Communicator* rather than re-hashing old (and poorly done) research. The paper will be presented at the upcoming meeting in Kos, Greece (*3rd International Workshop on Biological Effects of Electromagnetic Fields*, October 4-8, 2004). The titles of the papers and posters are available on the website (<http://imm.demokritos.gr/bioeffects>) but the abstracts are not shown as of this date.
- Salford's results are inconsistent with the weight of evidence of about 40 published, peer-reviewed studies on the effects of RF exposure on the blood-brain barrier as summarized in the development of most recent draft revised IEEE standard C95.1.

Based on these responses, I think that you can see that the articles posted on the internet need to be more critically reviewed before being taken as the whole truth of the matter. The weight of evidence approach to accepting biological effects research work in the area of RF field effects (last bullet above) is perhaps the strongest reason to be critical of fantastic claims. As they say, fantastic claims require fantastic evidence.

Respectfully yours,



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