

LETTER TO THE EDITOR (JULY 26, 2017) CONCERNING THE PAPER “IMPACT OF ELECTROMAGNETIC RADIATION EMITTED BY MONITORS ON CHANGES IN THE CELLULAR MEMBRANE STRUCTURE AND PROTECTIVE ANTIOXIDANT EFFECT OF VITAMIN A – *IN VITRO* STUDY”

Dear Editor,

With great enthusiasm I read the paper authored by Lewicka et al. entitled “Impact of electromagnetic radiation emitted by monitors on changes in the cellular membrane structure and protective antioxidant effect of vitamin A – *In vitro* study” [1]. Authors of this paper had evaluated the effect of electromagnetic radiation (1 kHz frequency, 220 V/m electric field) emitted by liquid-crystal-display (LCD) monitors on the concentration of malondialdehyde (MDA) as a marker of lipid peroxidation. They had also studied the antioxidant role of vitamin A during the exposure of blood platelets to electromagnetic radiation generated by liquid-crystal-display (LCD) monitors. These authors concluded that electromagnetic radiation possibly had a negative effect on the cellular membrane structure (observed as alterations in MDA concentration) and reported a possible protective role of vitamin A.

Over the past decade, my colleagues and I have studied the health effects of electromagnetic fields. The paper authored by Lewicka et al. has some major shortcomings. The first shortcoming of this paper is due to its problematic radiation source. The authors state “In a laboratory

stand designed for reconstruction of the parameters of electromagnetic radiation generated by display screens (1 kHz, 220 V/m), a flat capacitor was the source of electromagnetic field.” Although the majority of modern LCD monitors generate weak electric fields in the kilohertz range [2], the strength of the electromagnetic fields produced by each LCD depends on many parameters such as the size of display. By the way, it’s not clear that the parameters used in this study (1 kHz, 220 V/m) correspond to which type of LCD monitor.

Another major shortcoming comes from the distance between the samples and the source of electromagnetic radiation. Lewicka et al. [1] state that “Preserving constant conditions of the environment the preparation was exposed to the activity of the electromagnetic field of 1 kHz frequency and 220 V/m intensity (corresponding to a distance of 15 cm from the monitor) for 30 min and 60 min.” According to the Occupational Safety and Health Administration (OSHA), the preferred viewing distance from the eye to the front surface of the computer screen is 50–100 cm (20–40 inches) [3]. In this light, simulating the electromagnetic radiation at a distance of 15 cm away

from a LCD display is irrational and cannot represent a normal viewing distance.

Furthermore, LCD monitors not only generate electromagnetic radiation but also emit high levels of blue light [4] which possibly induces damage associated with oxidative processes [5]. Substantial evidence now shows that the emission of blue light by digital devices may cause some health problems [6]. Therefore, the radiation source used in the study conducted by Lewicka et al. [1] cannot model a real LCD monitor.

Key words:

Electromagnetic fields, EMF, Monitors, Cell membrane, Antioxidants, Vitamin A

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