

Short-term exposure to 1439-MHz TDMA signal does not have the estrogenic activity in rats

**Hiroharu Yamashita^{1,2}, Keisuke Hata¹, Hironori Yamaguchi¹, Giichirou Tsurita¹, Kanako Wake³,
Soichi Watanabe³, Masao Taki⁴, Shoogo Ueno², Hirokazu Nagawa¹.**

1Department of Surgical Oncology, The University of Tokyo, 7-3-1, Bunkyo-ku, Tokyo, 113-8655, Japan.

hyamashi-ky@umin.ac.jp

2Department of Biomedical Engineering, Graduate School of Medicine, The University of Tokyo, Tokyo, Japan.

3Communications Research Laboratory, Tokyo, Japan.

4Department of Electrical Engineering, Graduate School of Engineering, Tokyo Metropolitan University, Tokyo, Japan.

INTRODUCTION: Exposure to electromagnetic fields (EMF) has been suggested to increase the risk of hormone-dependent cancers such as breast and endometrial. One suggested pathway is that deficient melatonin function might have anti-estrogenic properties. Postmenopausal women have a decreased melatonin level, and are known to have a higher risk of endometrial cancer. Recently, we have shown that melatonin synthesis is not affected by short-term and long-term exposure to 1439-MHz pulsed EMF used for Japanese Personal Digital Cellular (PDC) system with time division multiple access (TDMA) signal, in rats [1, 2]. Thus, it seems unlikely that such a pulsed EMF decreases melatonin function and subsequently allows estrogen level to rise. However, its estrogenic activity is not fully investigated. The aim of this study was to clarify whether the exposure to the 1439-MHz TDMA signal results in estrogenic activity in the target organ. **METHODS:** A total of 64 ovariectomized female Sprague-Dawley (SD) rats were used in this study. They were divided into four groups; the electromagnetic field (EM), the sham, the cage control, and 17 beta-estradiol injected groups (as a positive control). The EM group was exposed to the 1439-MHz TDMA signal by a carousel type exposure system for 4 hours on three consecutive days, the sham group was placed in the exposure system without feeding TDMA signal to the antenna, and the cage control group was not placed in the exposure system. The average specific absorption rate of the brain and that of the whole body were estimated as 7.5 W/kg and 1.2 W/kg, respectively. One day after treatment, under sufficient anesthesia, the uterine was removed, and then stripped of fat and connective tissue in order to determine uterine wet weight. Concurrently, blood was collected and the serum estradiol level was measured by radioimmunoassay.

RESULTS and DISCUSSION: Neither uterine wet weight nor serum estradiol level was altered with short-term TDMA exposure. These results indicated that short term exposure of a 1439-MHz TDMA signal did not have the estrogenic activity in rats. Further investigation for long-term TDMA exposure or in other exposure settings is warranted.

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