

## Reply to the Letter Sent by Prof. Viroj Wiwanitkit Entitled “Radiofrequency Radiation and Human Ferritin”

Sir,

Authors of the article entitled “Effects of Radiofrequency Radiation on Human Ferritin: An *In-vitro* Enzymun Assay”<sup>[1]</sup> would like to express their satisfactions, since the manuscript have been accessed and used as an element of reflection by renowned researchers such as Prof. Wiwanitkit.

This letter is just to discuss the issues raised and the suggestions made by Prof. Wiwanitkit in his letter to the editor commenting our article.

The first point refers to the principle that in an actual *in-vivo* case, the dosage of radiation is very different from the simple *in-vitro* study. Hence, the exact *in-vivo* situation cannot be concluded from the published paper.<sup>[2]</sup> While, in our paper, we stated that “due to limitations and difficulties associated with *in-vivo* studies, at this work an *in-vitro* experiment was performed to investigate the effects of exposure to the cell phone on the ferritin level. Nevertheless, *in-vivo* studies, whether on animals or human beings, may provide more convincing evidence of the Electro Magnetic Field (EMF) effects.”<sup>[3,4]</sup> Even though, we studied only one aspect of the human serum, using available *in-vitro* methods. In another experiment, Barteri *et al.* studied the *in-vitro* interaction between Radio Frequency (RF) radiation and proteins of different species. They have demonstrated that mobile phone exposure, affects the structural and biochemical characteristics of an important central nervous system enzyme.<sup>[5]</sup>

Furthermore, it has been shown that RF fields at 300 MHz to about 3 GHz, at which significant local and non-uniform absorption occurs, induce torques on molecules that can result in displacement of ions from unperturbed positions, vibrations in bound charges (both electrons and ions), and rotation and reorientation of dipolar molecules such as water.<sup>[6]</sup> This may lead to oxidative stress and rapid diffusion of the human ferritin level.

Considering the second point, it should be noted that the mobile phone used in our study, worked at 900 MHz frequency. Although, the mentioned study indicating that the ultrasonic radiofrequency signal had no effect on ferritin level in thalassemia patients was performed using 2.5 and 3.5 MHz transducers. Moreover, in our work the samples were exposed in the assay cycle, discussed in the

paper. It means that, it was impossible that the diagnostic system interfered by the phones radiation, causing spurious results. Meanwhile, we are agreeing that the protection of the laboratory analyzer from radiofrequency interference is important.

**Jafar Fattahi-asl, Molood Baradaran-Ghahfarokhi<sup>1</sup>,  
Mojtaba Karbalaee<sup>2</sup>, Milad Baradaran-Ghahfarokhi<sup>2</sup>,  
Hamid Reza Baradaran-Ghahfarokhi<sup>3</sup>**

*Department of Medical Physics, School of Medicine, Ahvaz  
Jundishapour University of Medical Sciences, Khozestan,*

<sup>1</sup>*Department of Electrical and Computer Engineering, Isfahan  
University of Technology, and Biosensor Research Center,*

<sup>2</sup>*Department of Medical Physics and Medical Engineering, School  
of Medicine, Isfahan University of Medical Sciences, Isfahan,*

<sup>3</sup>*Department of Molecular Medicine, Reproductive Endocrinology  
Research Center, Shahid Beheshti University of Medical Sciences,  
Tehran, Iran. E-mail: milad\_bgh@yahoo.com*

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