Editorial expression of concern regarding: Pilger A et al. (2004) No effects of intermittent 50 Hz EMF on cytoplasmic free calcium and on the mitochondrial membrane potential in human diploid fibroblasts, *Radiat Environ Biophys* 43:203–207

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Received: 19 March 2010 / Accepted: 19 March 2010 / Published online: 8 April 2010
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In 2004, *Radiation and Environmental Biophysics* published a manuscript showing no effects of intermittent 50 Hz electromagnetic fields (EMF) on cytoplasmic free calcium and the mitochondrial membrane potential, while a significant effect of the EMF on DNA breakage as measured by comet assay was reported (Pilger et al. 2004). This manuscript resulted from a collaboration between a group at the Medical University of Vienna headed by H.W. Rüdiger and a group at the University of Hannover headed by H.-A. Kolb.

A Letter to the Editor by A. Lerchl, which we received in May 2009, raised serious questions concerning the extremely small standard deviations of the data on DNA damage induced by EMF exposure, as shown in figure 1 of Pilger et al. (2004). We asked two experts on biostatistics whether or not the suspicion expressed by A. Lerchl is justified. The reviewers conceded that indeed the standard deviations are suspiciously low, but that the raw data have to be examined before scientific misconduct can unequivocally be proven. Based on their opinion, we decided (1) to follow the procedure suggested by the Committee on Publication Ethics (COPE) (http://publicationethics.org/files/u2/03B_Fabrication_Published.pdf) in case of suspected data fabrication and (2) to ask A. Lerchl for some minor editorial revisions of his Letter aiming at clarifying

his line of arguments before eventual publication of this letter.

On 10 Sep 2009, we contacted the corresponding author of the incriminated manuscript, A. Pilger, and supplied him with the revised version of the Letter to the Editor submitted by A. Lerchl on 30 August 2009. We asked A. Pilger for comment and specifically for raw data, lab books or any other material which would allow a detailed analysis of the data. On 28 September 2009, we received a letter from A. Pilger rejecting the allegations without, however, providing any raw data.

Since we were not sufficiently satisfied by A. Pilger's response, we decided to further follow the COPE guidelines and on 12 November 2009 we informed all authors of the incriminated manuscript of our intention to contact the Medical University of Vienna and request an investigation. On 15 December 2009, we wrote a letter to the Rector of the Medical University of Vienna, asking whether the University was in possession of any additional information that could shed light on the question of scientific misconduct, and whether an investigation of the allegations was underway or planned. On 1 February 2010, we were informed by the Medical University of Vienna that several publications of the group of H.W. Rüdiger, including the paper by Pilger et al. (2004), under discussion here, are currently being investigated by the Austrian Agency for Scientific Integrity (<http://www.oeawi.at>).

The question of when scientific papers should be retracted even if the authors do not agree is a difficult one, especially because proofs for data fabrication and other forms of scientific misconduct are difficult to provide. We decided to publish the Letter to the Editor by Lerchl (2010) and a response to this letter by Pilger (2010), to give our readers the chance to build their own opinion. We note, however, that accusations of data fabrication have been

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brought forward concerning several publications of the group of H.W. Rüdiger (Vijayalaxmi et al. 2006; Wolf 2008; Lerchl 2009; Drexler and Schaller 2009; Baan 2009; Lerchl and Wilhelm 2010) and that the lab member, E. Diem (later known as E. Kratochvil) according to a press release of the Medical University of Vienna admitted fabrication of data in at least one case (see [http://www.meduniwien.ac.at/homepage/news-and-topstories/en/?tx_ttnews\[tt_news\]=243&cHash=5flc9cf3a6](http://www.meduniwien.ac.at/homepage/news-and-topstories/en/?tx_ttnews[tt_news]=243&cHash=5flc9cf3a6)). We acknowledge that the paper in question is currently being investigated. In line with guidance from COPE, we decided to issue this expression of concern since the results of the investigation by the Austrian Agency for Scientific Integrity may not become available for a considerable time. This Editorial Expression of Concern is intended to make all readers of the paper by Pilger et al. (2004) aware of the fact that an investigation on the validity of the DNA strand break data published therein is currently being conducted. Finally, we will inform our readers about the outcome of the investigation in due time.

References

- Baan RA (2009) Editorial: controversy related to two published papers. *Mutat Res* 673:1
- Drexler H, Schaller KH (2009) Expression of concern. *Int Arch Occup Environ Health* 82:143–144
- Lerchl A (2009) Comments on “Radiofrequency electromagnetic fields (UMTS, 1,950 MHz) induce genotoxic effects in vitro in human fibroblasts but not in lymphocytes” by Schwarz et al. (*Int Arch Occup Environ Health* 2008; doi:10.1007/s00420-008-0305-5). *Int Arch Occup Environ Health* 82(2):275–278 (author reply 279–283)
- Lerchl A (2010) Are these data real? Comments on “No effects of intermittent 50 Hz EMF on cytoplasmic free calcium and on the mitochondrial membrane potential in human diploid fibroblasts.” by Pilger et al. (*Radiat Environ Biophys* 43:203–207). *Radiat Environ Biophys* (in press)
- Lerchl A, Wilhelm AF (2010) Critical comments on DNA breakage by mobile-phone electromagnetic fields [Diem et al. *Mutat. Res.* 583 (2005) 178–183]. *Mutat. Res.* (Epub ahead of print)
- Pilger A (2010) Answers to the comments of A. Lerchl on the paper “No effects of intermittent 50 Hz EMF on cytoplasmic free calcium and on the mitochondrial membrane potential in human diploid fibroblasts” by Pilger et al. (*Radiat Environ Biophys* 43:203–207 (2004)). *Radiat Environ Biophys* (in press)
- Pilger A, Ivancsits S, Diem E, Steffens M, Kolb HA, Rüdiger HW (2004) No effects of intermittent 50 Hz EMF on cytoplasmic free calcium and on the mitochondrial membrane potential in human diploid fibroblasts. *Radiat Environ Biophys* 43(3):203–207
- Vijayalaxmi, McNamee JP, Scarfi MR (2006) Comments on: “DNA strand breaks” by Diem et al. [*Mutat. Res.* 583 (2005) 178–183] and Ivancsits et al. [*Mutat. Res.* 583 (2005) 184–188], *Mutat Res* 603:104–106 (author reply 107–109)
- Wolf C (2008) Security considerations in blinded exposure experiments using electromagnetic waves. *Bioelectromagnetics* 29:658–659