Commission K (Electromagnetics in Biology & Medicine) Activity Report
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by
Tsukasa Shigemitsu

1. Update on EMF safety issue

During the period from last regular meeting of Japanese URSI to this meeting, we had two advanced topics in both ELF and RF fields. Concerning ELF field, METI had invited comments on the setting of the limited value of the magnetic field regulation, its value 200uT, in electric equipments. The invitation of public comment ended on 16 March 2011. After arrangement of public comments, the announcement appeared in the official on 31 March. Its announcement is that the new regulation-setting of magnetic field will be started on 1 October, 2011.

The second topic is that International Agency for Research on Cancer (IARC) classifies radiofrequency electromagnetic fields as possibly carcinogenic to humans, group 2B. From May 24-31, 2011, a working group meeting with 31 scientists was held in Lyon, France to assess the potential carcinogenic hazards from exposure to radiofrequency electromagnetic fields. As a result, working group discussed the possibility that RF exposures might induce long-term health effects, in particular an increased risk of cancer. The cancer evidence was evaluated as being limited among users of wireless telephones for glioma and acoustic neuroma, and inadequate to draw conclusions for other types of cancers. The assessment of this carcinogenic hazard will be published as Volume 102 of the IARC Monographs.

2. Meetings

(a) Past meetings

(1) 5th course: “Medical applications of electromagnetic fields”. 22-23 November 2010, Erice (Sicily), Italy (http://www.ebea.org/ebea_schol_2010.htm)


(6) 33th BEMS Annual Meeting, June 12-17, 2011, Halifax, Nova Scotia, Canada (http://www.bioelectromagentic.org/)

(b) Future meetings

(1) 14th International Congress of Radiation Research (14th ICRR 2011). 28 August – 1 September, 2011, Warsawa, Poland (http://www.icrr2011.org)


(4) 6th International EMF Seminar in China: Electromagnetic Fields and Biological Effects. 20-23 October, 2011, Chongqing, China (http://www.emfchannel.org/)

(5) 7th ICNIRP International NIR Workshop. 9-11, May, Edinburgh, Scotland, United Kingdom, 2012.

(6) 34th BEMS Annual Meeting, 17-22 June 2012, Brisbane, Australia

(7) 11th International Congress of Hyperthermic Oncology (ICHO) & 29th Japanese Congress of
3. Publications


• Cespedes O, O.Inomoto, S.kai, Y.Nibu, T.Yamaguchi and N.Sakamoto [2010], “Radiofrequency magnetic field effects on molecular dynamics and iron uptake in cage proteins.” Bioelectromagnetics, vol.31, pp.311-317.


• Higashiyama J. and Tarusawa Y. [2009b], “Electric field distribution excited from indoor radio source for exposure compliance assessment,” EMC’09/Kyoto, 22S4-1, July
• Hirata H, T.Ishii, Y.Okita and T.Sugiura [2010a], “Validity of Inverse Coupler to Improve Temperature Resolution of One-band Microwave Radiometer for Non-invasive Brain


• Ikehara T, Nishisako H, Ichinose Shiraishi T and M. Kitamura [2010], “Effects of exposure to a time-varying 1.5 T magnetic field on the neurotransmitter-activated increase in intracellular Ca (2+) in relation to actin fiber and mitochondrial functions in bovine adrenal chromaffin cells.” Biochem Biophys Res Commun (in press)


• Ikehata, M., S. Yoshie, Y. Suzuki, T. Hayakawa [2007b], “Mutagenicity and co-mutagenicity of strong static magnetic field in yeast cells,” 1st Asian Conference on Environmental Mutagens


• Iyama, T. and Onishi, T. [2009b], “SAR measurement procedure for multi-antenna transmitters,” EMC’09/Kyoto, 21S4-2, July.
• Kanezaki A., Hirata A, Watanabe S and Shirai H [2009], “Effects of dielectric permittivities on skin heating due to millimeter wave exposure.” Biomedical Engineerin online vol.8 (20) pp1-23.
• Kikuchi S., Saito K., Takahashi M., Ito K., and Ikehira H. [2009a], “SAR computation inside fetus by RF coil during MR imaging employing realistic numerical pregnant woman model.”


Miyakoshi, J. [2008], “Effects of Static Magnetic Field at the Cellular Level,” ISMRM 16th Scientific Meeting and Exhibition and the SMRT 17th Annual Meeting, May.


Moriguchi H, Tamai N, Takayama Y, Kotani K, and Jimbo Y [2008d], “Site-selective
- Narita, E., T. Sakurai, M. Taki and J. Miyakoshi [2009], “Influence of a high-frequency electromagnetic field at 2.45 GHz on neurite outgrowth in PC12VG cells,” The proceedings of

Nishimura I, Imai T and Negishi T [2009], “Lack of chick embryotoxicity after 20 kHz, 1.1 mT magnetic field exposure,” Bioelectromagnetics vol.30 (7), pp.573-582.


Ohkubo C and H.Okano [2010], “Clinical aspects of static magnetic field effects on circulatory system.” The Environmentalist (in press)

Okano H, Tomita N and Ikada Y [2008a], “Spatial gradient effects of 120 mT static magnetic field on endothelial tubular formation in vitro.” Bioelectromagnetics, vol. 29, pp.233-236.


Onishi, T., Iyama, T., and Kiminami, K. [2009b], “Faster specific absorption rate measurement techniques,” EMC’09/Kyoto, 2151-6, June.


Saito A, Takayama Y, Moriguchi H, Kotani K, Jimbo Y [2008], “Effects of ELF MF exposure on


- Salama N., Kishimoto T and Kanayama HO [2009], “Authors response on letter to the editor on ‘Effects of exposure to a mobile phone on testicular function and structure in adult Rabbit’ by Salama et al.” Int J Androl (in press)

• Soda A, Ikehara T, Kinouchi Y and Yoshizaki K [2008], “Effect of exposure to an extremely low frequency-electromagnetic field on the cellular collagen with respect to signaling pathway in osteoblast-like cells,” Journal of Medical Investigation, vol.55, pp.267-278.


- Tanaka K., Mizuno Y and Naito K [2009], “Quantification of low frequency magnetic fields generated by household appliances,” IEEJ vol.129(9), pp.627-632 (in Japanese)

- Tanaka K, Mizuno Y and Naito K [2010], “Effect of power frequency magnetic field on acute, chronic, and genetic toxicities of fruit flies.” IEEJ-A vol.130(12), pp.1053-1059


- Tokuhara Y., F. Sato, H. Matsuki and T. Sato [2008], “Examination to Improve Transmissible

deficient mammalian cells and mutation assay”, Proceedings of the 2010 Asia-Pacific Radio Science Conference (APRASC’10), K1·4, Toyama, Sep.