

Radiofrequency Fields and Health – Conclusions after 17 years work of the Research Association for Radio Applications (FGF)

Special Topic: Radiofrequency Electromagnetic Fields and Brain Physiology – What is the Connection?

Scientific Workshop organized by the FGF (Forschungsgemeinschaft Funk e.V.; Research Association for Radio Applications) in cooperation with the Ministry of Environment, Baden-Württemberg, Germany

Stuttgart (Baden-Württemberg, Germany)

Tagungshotel der Telekom

November 23-25, 2009

Concept of the Workshop

The Research Association for Radio Applications (Forschungsgemeinschaft Funk e.V., FGF) will cease to exist on December 31st, 2009. This event will be used as an opportunity to summarize not only the work of FGF but also that of the whole scientific community in the field of biological and health effects of radiofrequency electromagnetic fields (RF-EMF). For this purpose representatives from different administrative and scientific bodies will present and discuss their assessment of the state of scientific research and necessary actions for the future.

Before these conclusions are drawn the workshop will be dedicated to the question whether RF-EMF used – for instance – for mobile communication can have effects on brain functions (e.g. the EEG, sleep patterns, and cognitive tasks). It will be a follow-up of a workshop in 2007 arranged by the same organizers (“Sleep Disorders, EEG-Changes, Altered Cognitive Functions – Is There a Connection with the Exposure to Mobile Communication RF Fields?”; see: http://www.fgf.de/english/research_projects/ws16.html) where the latest state of the art in this field of research was summarized. Almost no other research area investigating the exposure of RF-EMF has found such consistent positive results (apart from thermal effects at high exposures). Although these results are rather small biological effects and do not seem to imply any health risk, they stimulate the discussion about possible effects below the safety levels for RF-EMF. Additionally, they motivate the debate on so far

unknown demodulation mechanisms, because most of the effects were found only at exposure with low-frequency modulated RF-EMF. On the other side there are also a number of studies which could not find effects, sometimes with the same exposure conditions.

However, research in this area made progress and brought out a lot of significant new results. Recently, the International Commission on Non-Ionizing Radiation Protection (ICNIRP) stated in their review: “There is some evidence of small changes in brain physiology, notably on spontaneous EEG, and somewhat more variable evidence of changes in sleep EEG and regional cerebral blood flow but these may be of limited functional consequence; no changes were seen in cognitive function.”. The Scientific Committee on Emerging and Newly Identified Health Risks of the European Union (SCENIHR) recommended it its “Research needs and methodology to address the remaining knowledge gaps on the potential health effects of EMF” among others research on “RF field mechanisms and verification of important but preliminary findings (experiments testing the existence of modulation-specific effects or demodulation of RF signals in biological structures; experimental studies on EEG patterns and sleep)”.

The first two days of this workshop are meant to bring together representatives of the working groups which recently have worked on the topics of RF-EMF influence on brain physiology, including effects on sleep and cognitive functions as well as related research on mechanisms. The meeting will offer broad space for discussing their results.

As well as the seven workshops before that were organized by FGF together with the Ministry of Environment Baden-Württemberg, this probably last workshop in this sequence will aim to provide a consensus among the scientists regarding the scientific state of the art and recommendations on follow-up experiments.

Participation in this workshop is mainly by invitation. However, every scientist working in these fields of research is invited to send an abstract for presentation or to declare her or his interest for participation. Abstracts will be reviewed by a scientific committee. In the case your abstract will be accepted, your travel costs (economy fare) will be reimbursed by the organizers.

The number of participants is limited to 60 persons.

- Deadline for application (abstracts and participants): September 23, 2009
- Speakers and participants accepted for the workshop will be informed by October 7, 2009.

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Some recent publications:

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Daus, A., Goldhammer, M., and Thielemann, C. Novel 3D Cell Culture Systems for Electromagnetic Exposure Studies. *BioEM 2009 Conference* . 2009.

Hinrikus, H., Bachmann, M., Lass, J., Karai, D., and Tuulik, V. Effect of low frequency modulated microwave exposure on human EEG: Individual sensitivity. *Bioelectromagnetics* (2008).

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- Kwon, M.S. *et al.* Preattentive auditory information processing under exposure to the 902 MHz GSM mobile phone electromagnetic field: a mismatch negativity (MMN) study. *Bioelectromagnetics* **30**, 241-8 (2009).
- Kwon, Myoung-Soo, Jääskeläinen, Satu K., Toivo, Tim, and Hämäläinen, Heikki. No effects of mobile phone electromagnetic field on auditory brainstem response. *Bioelectromagnetics* . 2009.
- Landgrebe, M. *et al.* Neuronal correlates of symptom formation in functional somatic syndromes: a fMRI study. *Neuroimage* **41**, 1336-44 (2008).
- Landgrebe, M. *et al.* Cognitive and neurobiological alterations in electromagnetic hypersensitive patients: results of a case-control study. *Psychol Med* 1-11 (2008).
- Landgrebe, Michael, Frick, Ulrich, Hauser, Simone, Hajak, Goeran, and Langguth, Berthold. Association of Tinnitus and Electromagnetic Hypersensitivity: Hints for a Shared Pathophysiology? *PLoS ONE* 4(3), e5026. 2009. Public Library of Science.
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- Riddervold, I.S. *et al.* Cognitive function and symptoms in adults and adolescents in relation to RF radiation

from UMTS base stations. *Bioelectromagnetics* **29**, 257-267 (2008).

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