

# News from Science

**No effect of GSM fields on light sensitivity.** A Leipzig working group already years ago demonstrated experiments suggesting that human light sensitivity can be affected by the geomagnetic field (Thoss & Bartsch 2003, 2007). The question was: when do volunteers recognize that a spot gradually brightening on a projection screen stands out from the background? The threshold values were dependent on the orientation of the observer to the geomagnetic field. Are mobile communication fields effective as well regarding this sensitive system? This was tested in 33 healthy young volunteers (aged 19-27 years); the test persons were exposed on two days, separated by one week, for 30 min each to a GSM field (902.4 MHz, 217 Hz pulsation). The SAR value of the retina, averaged over 1 g, was calculated to be 7 mW/kg. But no significant differences between exposed and non-exposed persons were detected. The authors conclude that neither the retina nor the CNS are affected measurably by the GSM signals. By the way: a more encompassing literature study is recommended to the authors, so they wouldn't have claimed in the introduction and discussion that the findings of Salford et al. on the blood-brain barrier were „confirmed by other groups“, but would have found out about the publications of Finnie et al. 2002, Franke et al. 2005, Kuribayashi et al. 2005 and would have been convinced of the contrary.

*Irlenbusch, L.; Bartsch, B.; Cooper, J.; Herget, I.; Marx, B.; Raczek, J., and Thoss, F.: Influence of a 902.4 MHz GSM signal on the human visual system: Investigation of the discrimination threshold . *Bioelectromagnetics* (2007) **28**, 648-654.*

*Thoss, F. and Bartsch, B.: *J. Comp. Physiol.* (2003) **189**, 777; *Vision Research.* (2007) **47**, 1036*

*Finnie et al.: *Pathology* (2002) **34**, 344.*

*Franke et al.: *Bioelectromagnetics* (2005) **26**, 529; *Radiat. Res.* (2005) **164**, 258.*

*Kuribayashi et al.: *Bioelectromagnetics* (2005) **26**, 578.*

**Results from neurological tests with evoked potentials negative again.** The group around Yoshikazu Ugawa (Department of Neurology, University of Tokyo) had found out in earlier experiments that a transmitting mobile phone close to the head does not cause neural alterations which could express in delayed stimulus response (Arai et al. 2003, Yuasa et al. 2006, see: News from Science 4, 2003 and 3, 2006). The „evoked potential“ method uses one or several stimuli and measures the latency (magnitude of order: milliseconds) until it can be measured as effect. In a publication of this group that is available now, the motor cortex was stimulated by pulses of a magnetic stimulator and the electromyogram of the muscle was recorded as stimulus response. Compared are the latencies before and after a 30-min exposure to a mobile phone at the head (Matsushita Communication P97-7051-0, SAR averaged over 10 g: 0.054 W/kg). Besides in 10 healthy volunteers the tests were performed in two patients with multiple sclerosis suffering from a

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The influence of RF fields  
on the EEG and neural  
systems



„warm bath effect“, a particular temperature-dependent neural syndrome. In no case a difference between exposed persons and the controls could be shown. As already an increase in the core temperature of the body by tenths of a degree is sufficient to cause the „warm bath effect“ and the patients therefore respond sensitively already to exceptionally low heatings, similar thermal effects were expected by the mobile phone. It is stressed however by the authors that the present study includes only tests in few volunteers, and that potential long-term effects could not be examined. (In addition, the SAR value of exposure is exceptionally low and the occurring heatings thus cannot be compared to that of a full bath at 42 degrees.)  
*Inomata-Terada, S.; Okabe, S.; Arai, N.; Hanajima, R.; Terao, Y.; Frubayashi, T., and Ugawa, Y.: Effects of high frequency electromagnetic field (EMF) emitted by mobile phones on the human motor cortex. Bioelectromagnetics (2007) 28, 553-561.*

*Arai, N. et al.: Clin. Neurophysiol. (2003) 114, 1390.*

*Yuasa, K. et al.: Clin. Neurophysiol. (2006) 117, 900.*

**No effects of GSM-pulsed or continuous 882 MHz fields on the vestibulo-cochlear function in reportedly sensitive volunteers either.** In a British study nine persons with reported complaints during or after mobile phone use (numbness, headaches, nausea, etc.) and 21 control persons were subject to a „transient evoked otoacoustic emission test“ (TEOAE) and videoculography (VOG) after 30-min exposure each (1.3 W/kg) in a double-blind test. In the first test, the acoustic waves generated by the inner ear auditory cells after excitation by a short acoustic impulse were registered. The VOG test registers eye movement as a result of stimulation of the vestibular organ. Both are sensitive audiology tests. In concordance with studies of other authors, which, for the most part, had used shorter exposure periods and sometimes did not use double-blind conditions, also this time no effect of the pulsed (217 Hz) or unpulsed RF fields could be found, neither in the persons reporting field sensitivity nor in controls. The authors regret that they could not find more volunteers among those reporting field sensitivity ready to participate in the test. They emphasize that both tests respond sensitively to the generation of thermal gradients in the head.

*Bamiou, D-E.; Ceranic, B.; Cox, R.; Watt, H.; Chadwick, P.; Luxon, L. M.: Mobile telephone use effects on peripheral audiovestibular function: A case-control study. Bioelectromagnetics (2008) 29, 108-117.*

**Errors in the ODC publications of Litovitz due to lack of temperature control.** This working group (Catholic University, Washington, DC) has warned repeatedly against the danger of cancer of HF fields by showing that special amplitude modulated fields enhance the activity of the enzyme ornithine-decarboxylase (ODC) in cell cultures by a factor of 1.4-1.9 (see e.g. Penafiel 1997). Besides the fact that an association between ODC activity and cancer has been proven only at a 20fold increase, even these results could not be reproduced by anyone until now. A recent study of the University of Kuopio (Finland) tried it again - and failed again. It has been shown once and again that this system is very temperature-dependent and responds to smallest inaccuracies in the temperature control of the exposure system (see also Hoyto 2007, in: News from Science 3, 2007).

Mobile communication and cancer

Hoyto, A.; Juutilainen, J., Naarala, J.: Ornithine decarboxylase activity of I929 cells after exposure to continuous wave or 50 Hz modulated radiofrequency radiation - a replication study. *Bioelectromagnetics* (2007) **28**, 501-508.

Penafiel et al.: *Bioelectromagnetics* (1997) **18**, 132.

**No change in melatonin production due to TETRA- and GSM-modulated RF fields.**

Repeatedly it is suggested that the fields of mobile communication, similar to visible light, might change the production of the hormone of the epiphysis, melatonin, and thus might affect the normal circadian rhythm. First tests of the Bremen group on isolated organs did not result in clear findings (Sukhotina et al. 2006, see: News from Science 2, 2006). Long-term experiments with hamsters are available now, animals which, due to their physiology, are particularly appropriate as an incicator. Large groups of 120 animals each were continuously exposed to fields of 383, 900 and 1800 MHz for 60 days (mean SAR value 0.08 W/kg). Compared to the animals of an equally large sham-exposed group, no differences in melatonin production could be detected. Amazing was the relative increase in the weight of the animals of the 383 and 900 groups, but not the 1800 MHz group. The authors assume an association between the absorbed heat energy and the energy metabolism of the animals.

Lerchl, A.; Krüger, H.; Niehaus, M.; Streckert, J. R.; Bitz, A. K.; Hansen, V.: Effects of mobile phone electromagnetic fields at nonthermal SAR values on melatonin and body weight of Djungarian hamsters (*Phodopus sungorus*). *J. Pineal Res. OnlineEarly Articles Published article online: 25-Oct-2007.*

Sukhotina et al.: *J. Pineal Res.* (2006) **40**, 86.