



Recent scientific publications relevant to mobile telephony

September 2006

Germany: Electro-optic fiber sensor for amplitude and phase detection of radio frequency electromagnetic fields, [Kramer et al, Optics Letters](#), 31(16):2402-2404, 25 July 2006.

'We present a miniature fiber-optic electromagnetic field (EMF) sensor that is capable of simultaneously detecting the amplitude and phase of an EMF in the range of 0.1-6 GHz....'

Germany: The influence of the molecular structure of lipid membranes on the electric field distribution and energy absorption, [Simeonova et al, Bioelectromagnetics](#), Published Online: 17 August 2006.

'...Averaging the membrane absorption over the layers resulted in a decreased absorption below 1 GHz but a more than 10-fold increase above 1 GHz, compared to a model with a homogeneous membrane of averaged properties. We propose single particle dielectric spectroscopy by AC electrokinetics at low-bulk medium conductivities for an experimental verification of our model.'

Germany: The microwave absorption of emulsions containing aqueous micro- and nanodroplets: A means to optimize microwave heating, [Holtze et al, Journal of Colloid and Interface Science](#), Available Online: 14 July 2006.

'...The microwave absorption at frequencies between 10 MHz and 4 GHz is measured for aqueous brine droplets dispersed in a dielectric medium ($\epsilon'=2.0$). By varying the size of the droplets, ion type and ion concentration, it is found that the microwave absorption goes through a maximum which depends on the type of ions and their concentration....'

Germany: Direct Measurement of Small Antenna Radiation Efficiency by Calorimetric Method, [Schroeder et al, IEEE Transactions on Antennas and Propagation](#), 54(9):2646-2656, September 2006.

'...Due to the calorimetric principle employed in the proposed new method, it qualifies equally well as a highly accurate reference method for radiation efficiency measurements and as a low-cost alternative to three-dimensional pattern integration and Wheeler cap type efficiency estimates.'

Germany: Comparative Study of Cell Cycle Kinetics and Induction of Apoptosis or Necrosis after Exposure of Human Mono Mac 6 Cells to Radiofrequency Radiation, [Lantow et al, Radiation Research](#), 166(3):539-543, September 2006.

'...RF EMF radiation did not induce cell cycle alterations or changes in BrdU incorporation or induce apoptosis and necrosis in Mono Mac 6 cells under the exposure conditions used.'

Netherlands: The use of MR B+1 imaging for validation of FDTD electromagnetic simulations of human anatomies, [Van den Berg et al, Physics in Medicine and Biology](#), 51(19):4735-4746, 7 October 2006.

'...The findings from this study demonstrate that B+1 imaging is a valuable experimental technique to gain more knowledge about the dielectric interaction of RF

fields with the human anatomy.'

Netherlands: Modelling the impact of blood flow on the temperature distribution in the human eye and the orbit: fixed heat transfer coefficients versus the Pennes bioheat model versus discrete blood vessels, [Flyckt et al, Physics in Medicine and Biology](#), 51(19):5007-5021, 7 October 2006.

'...It was concluded that the heat transfer coefficient describing the heat transport from the sclera to the body core reported in the literature for the first simplified model is too low. The bioheat approach is appropriate for a first-order approximation of the temperature distribution in the eye when exposed to a homogeneous power density, but the discrete vasculature down to 0.2 mm in diameter needs to be taken into account when the heterogeneity of the temperature distribution at a mm scale is of interest.'

Netherlands: The use of MR B+1 imaging for validation of FDTD electromagnetic simulations of human anatomies, [Van den Berg et al, Physics in Medicine and Biology](#), 51(19):4735-4746, 7 October 2006.

'...The findings from this study demonstrate that B+1 imaging is a valuable experimental technique to gain more knowledge about the dielectric interaction of RF fields with the human anatomy.'

Switzerland: Characterization of the electromagnetic near-field absorption in layered biological tissue in the frequency range from 30 MHz to 6000 MHz, [Christ et al, Physics in Medicine and Biology](#), 51(19):4951-4965, 7 October 2006.

'...This paper identifies two different effects which can lead to increased SAR in layered tissue in comparison to the SAR assessed using homogeneous tissue simulating liquid: (1) for larger distances between the tissue and the antenna, standing wave effects occur depending on the frequency and fat layer thickness. (2) In the very close near-field..., reactive E-field components lead to high local absorption in the skin. The latter effect occurs at lower frequencies and depends on the antenna type. Modification of the parameters of the homogeneous liquids cannot compensate for these effects...'

Switzerland: Source of Funding and Results of Studies of Health Effects of Mobile Phone Use: Systematic Review of Experimental Studies, [Huss et al, Environmental Health Perspectives](#), Online: 15 September 2006.

'...Studies exclusively funded by industry reported the largest number of outcomes but were least likely to report a statistically significant result: the odds ratio was 0.11 (95% confidence interval 0.02 to 0.78), compared to studies funded by public agencies or charities. This finding was not materially altered in analyses adjusted for the number of outcomes reported, study quality and other factors...The interpretation of results from studies of health effects of radiofrequency radiation should take sponsorship into account.'

Taiwan: Temperature Increase in Human Heads Due to Different Models of Cellular Phones, [Chen et al, Electromagnetics](#), 26(6):439-459, August-September 2006.

'...Computed results show that the temperature increase in the head reaches the steady-state value for exposure time of about 20 minutes. For worst-case, the maximum temperature increase the head is found to be 0.19° C at 900 MHz and 0.055° C at 1800 MHz...'which can cause neuron damage.

Turkey: GSM Base Station Electromagnetic Radiation and Oxidative Stress in Rats, [Yurekli et al, Electromagnetic Biology and Medicine](#), 25(3):177-188, 2006.

'...MDA (malondialdehyde) level was found to increase and GSH (reduced glutathione) concentration was found to decrease significantly ($p < 0.0001$). Additionally, there was a less significant ($p = 0.0190$) increase in SOD (superoxide dismutase) activity under EM exposure.'

Turkey: Influence of Electromagnetic Fields and Protective Effect of CAPE on Bone Mineral Density in Rats, [Yildiz et al, Archives of Medical Research](#), 37(7):818-821, October 2006.

'...BMD [bone mineral density] was found to be decreased in the irradiated groups and to be increased in the treatment groups...The changes were not significant ($p > 0.05$).'

USA: Cytogenetic Studies in Human Blood Lymphocytes Exposed In Vitro to 2.45 GHz or 8.2 GHz Radiofrequency Radiation, [Vijayalaxmi, Radiation Research](#), 166(3):532-538, September 2006.

'...Under the conditions used to perform the experiments, the levels of damage in RF-radiation-exposed and sham-exposed lymphocytes were not significantly different...'

USA: Cellular telephones and non-Hodgkin lymphoma, [Linnet et al, International Journal of Cancer](#), 119(10):2382-2388, 15 November 2006.

'...Among regular users compared to those who had never used hand-held cellular telephones, risks of NHL [non-Hodgkin lymphoma] were not significantly associated with minutes per week, duration, cumulative lifetime or year of first use, although NHL was non-significantly higher in men who used cellular telephones for more than 8 years. Little evidence linked use of cellular telephones with total, diffuse large B-cell lymphoma or follicular NHL. These findings must be interpreted in the context of less than 5% of the population reporting duration of use of 6 or more years or lifetime cumulative use of 200 or more hours.'

USA: HSP27 phosphorylation increases after 45°C or 41°C heat shocks but not after non-thermal TDMA or GSM exposures, [Vanderwaal et al, International Journal of Hyperthermia](#), 22(6):507-519, September 2006.

'...Acute and moderate hyperthermia significantly increase HSP27 phosphorylation, but there was no significant change in the levels of HSP27 following non-thermal exposure to TDMA and GSM modulated RF radiations.'

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