Recent scientific publications relevant to mobile telephony

February 2015

Details

Australia: Reduced growth of soybean seedlings after exposure to weak microwave radiation from GSM 900 mobile phone and base station, Halgamuge et al., *Bioelectromagnetics*, Published online: 21 JAN 2015.

> *'...Exposure to higher amplitude CW radiation resulted in reduced outgrowth of the roots whereas lower CW exposure resulted in a reduced outgrowth of the hypocotyl...'*

Austria: The discrepancy between maximum in vitro exposure levels and realistic conservative exposure levels of mobile phones operating at 900/1800 MHz, Schmid et al., *Bioelectromagnetics*, Published online: 30 JAN 2015.

> *'...In vitro studies reporting minimal or no effects in response to maximum exposure of 2 W/kg or less averaged over the cell media, which includes the cells, may be of only limited value for analyzing risk from realistic mobile phone exposure...'*

China: Exposure to 900 MHz electromagnetic fields activates the mkp-1/ERK pathway and causes blood-brain barrier damage and cognitive impairment in rats, Tang et al., *Brain Research*, Available online 15 January 2015.

> *'...These results demonstrated that exposure to 900 MHz EMF radiation for 28 days can significantly impair spatial memory and damage BBB permeability in rat by activating the mkp-1/ERK pathway...'*

China: Microwave Exposure Impairs Synaptic Plasticity in the Rat Hippocampus and PC12 Cells through Over-activation of the NMDA Receptor Signaling Pathway, Xiong et al., *Biomedical and Environmental Sciences*, 28(1):13-25, January 2015.

> *'...Microwave exposure resulted in alterations of synaptic structure, amino acid neurotransmitter release and calcium influx. NMDAR signalling molecules were closely associated with impaired synaptic plasticity...'*

China: Reduction of Exposure Inhomogeneity for Millimeter-Wave Experiments on Cells In Vitro, Zhao et al., *IEEE Transactions on Microwave Theory and Techniques*, 63(2):533-545, February 2015.

> *'...Exposure scenarios include the plane-wave exposure and antenna exposures with different half-power widths, incident waves of various propagation and polarization directions, and frequencies of 42.3, 53.6, 61.2, and 60.5 GHz. The exposure with the upward wave is confirmed for the lowest SAR SD, which is reduced to well below 10% by using choke rings...'*

France: Mobile telephones: A comparison of radiated power between 3G VoIP calls and 3G VoCS calls, Jovanovic et al., *Journal of Exposure Science and Environmental Epidemiology*, 25(1):80-83, January/February 2015.

> *'...The mean normalised power radiated by a telephone in 3G VoIP calls was evaluated at 0.75% maximum power of the smartphone, compared with 0.22% in*

3G VoCS calls. The very low average power levels associated with use of 3G devices with VoIP or VoCS support the view that RF exposure resulting from their use is far from exceeding the basic restrictions of current exposure limits in terms of SAR...'

Greece: Response of Caenorhabditis elegans to wireless devices radiation exposure, Fasseas et al., *International Journal of Radiation Biology*, Posted online on January 29, 2015.

'...No statistically significant differences were found between the exposed and the sham/control animals in any of the experiments concerning lifespan, fertility, growth, memory, ROS, apoptosis or gene expression...'

India: Behavioral in-effectiveness of high frequency electromagnetic field in mice, Salunke et al., *Physiology & Behavior*, 140(0):32-37, 1 March 2015.

'...Up to 120 days of exposure to HF-EMF does not produce anxiety, OCD and depression-like behavior in mice...'

Israel: Distribution of energy absorption in an inhomogeneous head model at 900 MHz, Haridim et al., Electromagnetic Compatibility Magazine, *IEEE*, 3(4):43-48, 4th Quarter 2014.

'...The homogeneous and inhomogeneous models lead approximately to the same total SAR, but the magnitudes of the maximal point SAR and the local SAR in the inhomogeneous model are significantly higher than in the homogeneous one...'

Netherlands: Actual and perceived exposure to electromagnetic fields and non-specific physical symptoms: An epidemiological study based on self-reported data and electronic medical records, Baliatsas et al., *International Journal of Hygiene and Environmental Health*, Available online 7 February 2015.

'...There is no convincing evidence for an association between everyday life RF-EMF exposure and NSPS [nonspecific physical symptoms] and sleep quality in the population…We argue that perceived exposure is an independent determinant of NSPS...'

Russia: Modifying effects of low-intensity extremely high-frequency electromagnetic radiation on content and composition of fatty acids in thymus of mice exposed to X-rays, Gapeyev et al., *International Journal of Radiation Biology*, Posted online on January 30, 2015.

'...Exposure of mice to EHF EMR before or after X-irradiation prevented changes in the total FA content in thymic tissue, returned the summary content of PUFA and MUFA to the control level and decreased the summary content of SFA on the 30th day after the treatments, and promoted the restoration of the thymus weight of X-irradiated mice to the 40th day of the observations...'

Spain: Evaluation of Electromagnetic Interference and Exposure Assessment from s-Health Solutions Based on Wi-Fi Devices, de Miguel-Bilbao et al., *BioMed Research International*, 9, 2015.

'...General compliance with exposure levels and the impact of overall network deployment, which can be optimized in order to reduce overall interference levels while maximizing system performance...'

Poland: The Influence of Electromagnetic Radiation Generated by a Mobile Phone on the Skeletal System of Rats, Sieroń-Stołtny et al., *Biomedical Research International*, 11, 2015.

'...Electromagnetic field generated by 900 MHz mobile phone does not have a direct impact on macrometric parameters of bones; however, it alters the processes of bone mineralization and the intensity of bone turnover processes...'

Turkey: The effect of 900 and 1800 MHz GSM-like radiofrequency irradiation and nicotine sulfate administration on the embryonic development of Xenopus laevis, Boga et al., *Ecotoxicology and Environmental Safety*, 113:378-390, March 2015.

'...The study results appear to suggest that the combined use of nicotine and cell phones might result in more pronounced detrimental effects on the health of smokers...'

Turkey: The effects of N-acetylcysteine and epigallocatechin-3-gallate on liver tissue protein oxidation and antioxidant enzyme levels after the exposure to radiofrequency radiation, Ozgur et al., *International Journal of Radiation Biology*, Posted online on January 27, 2015.

'...Significant decreases in the activities of SOD were observed in the liver of guinea pigs after RFR exposure. Protein damage did not change due to RFR exposure...'

USA: Allergic to Technology: Ethics and the "Electrically Hypersensitive" Individual, Foster et al., *Ethics in Biology, Engineering and Medicine: An International Journal*, 5(1):39-50, 30 January 2015.

'...Ethical issues raised by IEI-EMF are generally similar to those raised by other forms of medically unexplained illness; however, they have significant social implications in view of the reliance of modern society on the electromagnetic spectrum. Implications for social policy include how to respond to the desires of affected individuals to be protected against the effects of low-level EMF in the environment, and possible harms to the individuals from well-meaning but inappropriate treatment...'

USA: Safe for Generations to Come – Considerations of Safety for Millimeter Waves in Wireless Communications, Wu et al., *IEEE Microwave Magazine*, 16(2):65-84, March 2015.

'...Current understanding of the potential biological effects of nonionizing mmWave radiation on the human body with a focus on what is required to ensure the safety of emerging mmWave technologies for next-generation (5G) mobile communications networks...'
