



Recent scientific publications relevant to mobile telephony

April 2016

Belgium: Drone based measurement system for radiofrequency exposure assessment. Joseph W, Aerts S, Vendenbossche M, Thielens A, Martens L. *Bioelectromagnetics* 37:195–199, 2016.
<http://dx.doi.org/10.1002/bem.21964>

'For the first time, a method to assess radiofrequency (RF) electromagnetic field (EMF) exposure of the general public in real environments with a true free-space antenna system is presented. Using lightweight electronics and multiple antennas placed on a drone...outdoor measurements are performed as a function of height up to 60 m for Global System for Mobile Communications (GSM) 900 MHz base station...'

Belgium: Wireless Fidelity Electromagnetic Field Exposure Monitoring With Wearable Body Sensor Networks. Lecoutere J, Thielens A, Agneessens S, Rogier H, Joseph W, Puers R. *IEEE Trans Biomed Circuits Syst.* 10:779-786, 2016.
<http://www.ncbi.nlm.nih.gov/pubmed/?term=26841411>

'... the first experimental validation of a novel personal exposimeter system based on a distributed measurement approach to achieve higher measurement quality and lower measurement variability than the commonly used single point measurement approach...An important feature of the system is the integration of inertial sensors in order to determine activity and posture during exposure measurements. The system is designed to assess exposure to frequencies within the 389 to 464, 779 to 928 and 2400 to 2483.5 MHz bands using only two transceivers per node.'

Brazil: Cell phone use is associated with an inflammatory cytokine profile of parotid gland saliva. Siqueira EC, de Souza FT, Ferreira E, Souza RP, Macedo SC, Friedman E, Gomez MV, Gomes CC, Gomez RS. *J Oral Pathol Med.* 2016 Feb 14. [Epub ahead of print]
<http://www.ncbi.nlm.nih.gov/pubmed/?term=26876491>

In healthy volunteers, cell phone use was associated with changes in cytokine expression in saliva produced by the parotid gland. The authors concluded that the changes were '...consistent with a pro-inflammatory microenvironment that may be related to heat production.'

China: Effects of cell phone use on semen parameters: Results from the MARHCS cohort study in Chongqing, China. Zhang G, Yan H, Chen Q, Liu K, Ling X, Sun L, Zhou N, Wang Z, Zou P, Wang X, Tan L, Cui Z, Zhou Z, Liu J, Ao L, Cao J. *Environ Int.* 91:116-121, 2016.
<http://www.ncbi.nlm.nih.gov/pubmed/?term=26949865>

'Our results showed that certain aspects of cell phone use may negatively affect sperm quality in men by decreasing the semen volume, sperm concentration, or sperm count, thus impairing male fertility.'

Denmark: Absorption Related to Hand-Held Devices in Data Mode. Andersen JB, Nielsen JØ Pedersen GF. IEEE Transactions on Electromagnetic Compatibility 58:47-53, 2016.

<http://dx.doi.org/10.1109/TEMC.2015.2504398>

'In this paper, an experimental study involving four volunteers and three different devices is performed from 0.5 to 3 GHz. The devices are a laptop, a tablet, and a smartphone all held in the lap... The absorption varies from almost nothing to close to 100%... The losses in the in-built antennas are often dominating and with a maximum total loss of 99% for the smartphone for one user.'

France: A Wideband Microwave Exposure Setup for Suspended Cells Cultures: Numerical and Experimental EM Characterization. Collin A, Merla C, Perrin A, Arnaud-Cormos D, Leveque P. IEEE Antennas and Wireless Propagation Letters 15:278-281, 2016.

<http://dx.doi.org/10.1109/LAWP.2015.2440560>

'This dosimetric study demonstrated the ability of this system to expose cells in suspension at different frequencies in a controlled environment.'

France: Disturbed sleep in individuals with Idiopathic environmental intolerance attributed to electromagnetic fields (IEI-EMF): Melatonin assessment as a biological marker. Andrianome S, Hugueville L, de Seze R, Hanot-Roy M, Blazy K, Gamez C, Selmaouiet B. Bioelectromagnetics 37:175-182, 2016.

<http://dx.doi.org/10.1002/bem.21965>

'Despite significantly different sleep scores between the two groups, with a lower score in the IEI-EMF group... no statistical difference was found between the two groups for...' melatonin in saliva and its major metabolite in urine.

India: Effect of electromagnetic radiations from mobile phone base stations on general health and salivary function. Singh K, Nagaraj A, Yousuf A, Ganta S, Pareek S, Vishnani P. J Int Soc Prev Community Dent. 6:54-59, 2016.

<http://www.ncbi.nlm.nih.gov/pubmed/?term=27011934>

'...a majority of the subjects who were residing near the mobile base station complained of sleep disturbances, headache, dizziness, irritability, concentration difficulties, and hypertension. A majority of the study subjects had significantly lesser stimulated salivary secretion... compared to the control subjects...'

Iran: Association between overuse of mobile phones on quality of sleep and general health among occupational health and safety students. Eyvazloua M, Zareib E, Rahimic A, Abazarid M. Chronobiology International 33(3), 1-8, Published online: 04 Mar 2016.

<http://dx.doi.org/10.3109/07420528.2015.1135933>

A study of 450 university students who used mobile phones found '...that half of the students had a poor level of sleep quality and most of them were considered unhealthy.'

Iran: Increased Release of Mercury from Dental Amalgam Fillings due to Maternal Exposure to Electromagnetic Fields as a Possible Mechanism for the High Rates of Autism in the Offspring: Introducing a Hypothesis. Mortazavi G, Haghani M, Rastegarian N, Zarei S, Mortazavi SM. J Biomed Phys Eng. 6:41-46, 2016.

<http://www.ncbi.nlm.nih.gov/pubmed/?term=27026954>

'...maternal exposure to electromagnetic fields in mothers with dental amalgam fillings may cause elevated levels of mercury and trigger the increase in autism rates.'

Iran: Short-Term Exposure to Electromagnetic Fields Generated by Mobile Phone Jammers Decreases the Fasting Blood Sugar in Adult Male Rats. Shekoohi Shooli F, Mortazavi SA, Jarideh S, Nematollahii S, Yousefi F, Haghani M, Mortazavi SM, Shojaei-Fard MB. J Biomed Phys Eng. 6:27-32, 2016.

<http://www.ncbi.nlm.nih.gov/pubmed/?term=27026952>

'Short-term exposure to electromagnetic field generated by mobile phone jammer can reduce blood sugar level in adult male rats. These findings, in contrast with our previous results, lead us to this conclusion that the use of these signal blocking devices in very specific circumstances may have some therapeutic effects.'

Israel: Use of Rod Reflectors for SAR Reduction in Human Head, Haridim M. IEEE Transactions on Electromagnetic Compatibility 58:40-46, 2016.

<http://dx.doi.org/10.1109/TEMC.2015.2500818>

'...one or more metallic rod reflectors are installed near a transmitting antenna in order to create an additional field needed for decreasing the antenna's field inside the user's head...rod-antenna structures can be used as an effective method for SAR reduction.'

Italy: Provocative Testing for the Assessment of the Electromagnetic Interference of RFID and NFC Readers on Implantable Pacemaker. Mattei E, Lucano E, Censi F, Triventi M, Calcagnini G. IEEE Transactions on Electromagnetic Compatibility 58:314-322, 2016.

<http://dx.doi.org/10.1109/TEMC.2015.2504602>

'Pacemakers (PMs) were affected by EMI for all three frequency bands [LF (125 kHz), HF and NCF (13.56 MHz), and UHF (900 MHz)]. '...For the PMs evaluated, the provocative tests performed in this study revealed that the safety margin is narrow in the LF and HF/NFC bands, whereas a fair margin exists in the UHF band.'

Japan: Study of Interference Voltage of an Implanted Pacemaker by Mobile Terminals. Endo Y, Saito K, Watanabe S, Takahashi M, Ito K. IEEE Transactions on Electromagnetic Compatibility 58:30-39, 2016.

<http://dx.doi.org/10.1109/TEMC.2015.2506183>

'In this study, a mobile phone with an internal antenna was modeled with a planar inverted-F antenna (PIFA) mounted on a metallic case, in order to calculate the interference voltage induced at the pacemaker due to the internal antenna...It is shown that the PIFA has interference voltage characteristics, which differ from those of the half-wavelength dipole antenna.'

Korea: The use of cell phone and insight into its potential human health impacts. Kim KH, Kabir E, Jahan SA. Environ Monit Assess. 188:221, 2016.

<http://www.ncbi.nlm.nih.gov/pubmed/?term=26965900>

'This article reviews the present knowledge concerning the health effects stemming from the use of cellular phones by emphasizing adverse biological effects, epidemiological issues, and indirect health effects. A line of epidemiological evidence suggests that there is no concrete association between mobile phone radiation and cancer. The evidence regarding the occurrence of cancer due to

exposure to the radio frequency energy of mobile phones is nonetheless conflicting. Consequently, long-term research in this field is necessary to account for the vital issue of this scientific research to the public in a meaningful way.'

Mauritius: Does chronic exposure to mobile phones affect cognition? Mohan M, Khaliq F, Panwar A, Vaney N. *Functional Neurology* 31:47-51, 2016.
http://www.functionalneurology.com/index.php?PAGE=articolo_dett&id_article=7440&ID_ISSUE=687

Results of a study of 90 subjects aged 17-25 years who used mobile phones '...suggest that chronic mobile phone exposure does not have detrimental effects on cognition.'

Saudi Arabia: Controversies on electromagnetic field exposure and the nervous systems of children. Warille AA, Onger ME, Turkmen AP, Deniz ÖG, Altun G, Yurt KK, Altunkaynak BZ, Kaplan S. *Histol Histopathol.* 31:461-468, 2016.
<http://www.ncbi.nlm.nih.gov/pubmed/?term=26661935>

'This paper reviewed possible health effects from exposure to low levels of electromagnetic field (EMF) in children, arising from electrical power sources and mobile phones. Overall, the information about effects on developmental processes and cognitive functions is insufficient and further research on children and adolescents is critically needed...When the current data were considered in detail, it was noted that children's unique vulnerabilities make them more sensitive to EMFs emitted by electronics and wireless devices, as compared to adults.'

Turkey: The effect of prenatal exposure to 1800 MHz electromagnetic field on calcineurin and bone development in rats. Erkut A, Tumkaya L, Balik MS, Kalkan Y, Guvercin Y, Yilmaz A, Yuces S, Cure E, Sehitoglu I. *Acta Cir Bras.* 31:74-83, 2016.
<http://www.ncbi.nlm.nih.gov/pubmed/?term=26959616>

'Bone and muscle tissue development was negatively affected due to prenatal exposure to 1800 MHz radiofrequency electromagnetic field.'

Turkey: Disruption of the ovarian follicle reservoir of prepubertal rats following prenatal exposure to a continuous 900-MHz electromagnetic field. Türedi S, Hancı H, Çolakoğlu S, Kaya H, Odacı E. *International Journal of Radiation Biology*, 1-9, Published online: 23 Mar 2016.
<http://dx.doi.org/10.3109/09553002.2016.1152415>

'Prenatal exposure to continuous 900-MHz EMF for 1 h each day from days 13-21 led to a decrease in ovarian follicle reservoirs in female rat pups at the beginning of the prepubertal period.'

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The GSM Association (GSMA) is the global trade association that exists to promote, protect and enhance the interests of GSM mobile operators throughout the world. www.gsma.com/mobile-and-health

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