

**ABSTRACTS - ELECTROHYPERSENSITIVITY**  
**NOVEMBER 28, 2012**

**[Augner C](#), [Hacker GW](#). Are people living next to mobile phone base stations more strained? Relationship of health concerns, self-estimated distance to base station, and psychological parameters. [Indian J Occup Environ Med](#). 2009 Dec;13(3):141-5.**

BACKGROUND AND AIMS: Coeval with the expansion of mobile phone technology and the associated obvious presence of mobile phone base stations, some people living close to these masts reported symptoms they attributed to electromagnetic fields (EMF). Public and scientific discussions arose with regard to whether these symptoms were due to EMF or were placebo effects. The aim of this study was to find out if people who believe that they live close to base stations show psychological or psychobiological differences that would indicate more strain or stress. Furthermore, we wanted to detect the relevant connections linking self-estimated distance between home and the next mobile phone base station (DBS), daily use of mobile phone (MPU), EMF-health concerns, electromagnetic hypersensitivity, and psychological strain parameters. DESIGN, MATERIALS AND METHODS: Fifty-seven participants completed standardized and non-standardized questionnaires that focused on the relevant parameters. In addition, saliva samples were used as an indication to determine the psychobiological strain by concentration of alpha-amylase, cortisol, immunoglobulin A (IgA), and substance P. RESULTS: Self-declared base station neighbors (DBS  $\leq$  100 meters) had significantly higher concentrations of alpha-amylase in their saliva, higher rates in symptom checklist subscales (SCL) somatization, obsessive-compulsive, anxiety, phobic anxiety, and global strain index PST (Positive Symptom Total). There were no differences in EMF-related health concern scales. CONCLUSIONS: We conclude that self-declared base station neighbors are more strained than others. EMF-related health concerns cannot explain these findings. Further research should identify if actual EMF exposure or other factors are responsible for these results.

**Belyaev IY, Hillert L, Protopopova M, Tamm C, Malmgren LO, Persson BR, Selivanova G, Harms-Ringdahl M. 915 MHz microwaves and 50 Hz magnetic field affect chromatin conformation and 53BP1 foci in human lymphocytes from hypersensitive and healthy persons. *Bioelectromagnetics*. 26(3):173-184, 2005. (C-P, G-C)**

We used exposure to microwaves from a global system for mobile communication (GSM) mobile phone (915 MHz, specific absorption rate (SAR) 37 mW/kg) and power frequency magnetic field (50 Hz, 15  $\mu$ T peak value) to investigate the response of lymphocytes from healthy subjects and from persons reporting hypersensitivity to electromagnetic field (EMF). The hypersensitive and healthy donors were matched by gender and age and the data were analyzed blind to treatment condition. The changes in chromatin conformation were measured with the method of anomalous viscosity time dependencies (AVTD). 53BP1 protein, which has been shown to colocalize in foci with DNA double strand breaks (DSBs), was analyzed by immunostaining in situ. Exposure at room temperature to either 915 MHz or 50 Hz resulted in significant condensation of chromatin, shown as AVTD changes, which was similar to the effect of heat shock at 41 degrees C. No significant differences in responses between normal and hypersensitive subjects were detected. Neither 915 MHz nor 50 Hz exposure induced 53BP1 foci. On the contrary, a distinct decrease in background level of 53BP1 signaling was observed upon these exposures as well as after heat shock treatments. This decrease correlated with the AVTD data and may indicate decrease in accessibility of 53BP1 to antibodies because of stress-induced chromatin condensation. Apoptosis was determined by morphological changes and by apoptotic fragmentation of DNA as

analyzed by pulsed-field gel electrophoresis (PFGE). No apoptosis was induced by exposure to 50 Hz and 915 MHz microwaves. In conclusion, 50 Hz magnetic field and 915 MHz microwaves under specified conditions of exposure induced comparable responses in lymphocytes from healthy and hypersensitive donors that were similar but not identical to stress response induced by heat shock.

**[Belyaev IY](#), [Markovà E](#), [Hillert L](#), [Malmgren LO](#), [Persson BR](#). **Microwaves from UMTS/GSM mobile phones induce long-lasting inhibition of 53BP1/gamma-H2AX DNA repair foci in human lymphocytes.** [Bioelectromagnetics](#). 2008 Oct 6. [Epub ahead of print]**

We have recently described frequency-dependent effects of mobile phone microwaves (MWs) of global system for mobile communication (GSM) on human lymphocytes from persons reporting hypersensitivity to electromagnetic fields and healthy persons. Contrary to GSM, universal global telecommunications system (UMTS) mobile phones emit wide-band MW signals. Hypothetically, UMTS MWs may result in higher biological effects compared to GSM signal because of eventual "effective" frequencies within the wideband. Here, we report for the first time that UMTS MWs affect chromatin and inhibit formation of DNA double-strand breaks co-localizing 53BP1/gamma-H2AX DNA repair foci in human lymphocytes from hypersensitive and healthy persons and confirm that effects of GSM MWs depend on carrier frequency. Remarkably, the effects of MWs on 53BP1/gamma-H2AX foci persisted up to 72 h following exposure of cells, even longer than the stress response following heat shock. The data are in line with the hypothesis that the type of signal, UMTS MWs, may have higher biological efficiency and possibly larger health risk effects compared to GSM radiation emissions. No significant differences in effects between groups of healthy and hypersensitive subjects were observed, except for the effects of UMTS MWs and GSM-915 MHz MWs on the formation of the DNA repair foci, which were different for hypersensitive ( $P < 0.02[53BP1]/0.01[\text{gamma-H2AX}]$ ) but not for control subjects ( $P > 0.05$ ). The non-parametric statistics used here did not indicate specificity of the differences revealed between the effects of GSM and UMTS MWs on cells from hypersensitive subjects and more data are needed to study the nature of these differences.

**Dahmen N, Ghezel-Ahmadi D, Engel A. Blood laboratory findings in patients suffering from self-perceived electromagnetic hypersensitivity (EHS).** [Bioelectromagnetics](#). 30(4):299-306, 2009.

Risks from electromagnetic devices are of considerable concern. Electrohypersensitive (EHS) persons attribute a variety of rather unspecific symptoms to exposure to electromagnetic fields. The pathophysiology of EHS is unknown and therapy remains a challenge. We hypothesized that some electrosensitive individuals are suffering from common somatic health problems. Toward this end we analysed clinical laboratory parameters including thyroid-stimulating hormone (TSH), alanine transaminase (ALT), aspartate transaminase (AST), creatinine, hemoglobine, hematocrit and c-reactive protein (CRP) in subjects suffering from EHS and in controls that are routinely used in clinical medicine to identify or screen for common somatic disorders. One hundred thirty-two patients (n = 42 males and n = 90 females) and 101 controls (n = 34 males and n = 67 females) were recruited. Our results identified laboratory signs of thyroid dysfunction, liver dysfunction and chronic inflammatory processes in small but remarkable fractions of EHS sufferers as potential sources of symptoms that merit further investigation in future studies. In the cases of TSH and ALT/AST there were significant differences between cases and controls. The hypotheses of anaemia or kidney dysfunction playing a major role in EHS could be unambiguously refuted. Clinically it is recommended to check for signs of treatable somatic conditions when caring for individuals suffering from self-proclaimed EHS.

**Furubayashi T, Ushiyama A, Terao Y, Mizuno Y, Shirasawa K, Pongpaibool P, Simba AY, Wake K, Nishikawa M, Miyawaki K, Yasuda A, Uchiyama M, Yamashita HK, Masuda H, Hirota S, Takahashi M, Okano T, Inomata-Terada S, Sokejima S, Maruyama E, Watanabe S, Taki M, Ohkubo C, Ugawa Y. Effects of short-term W-CDMA mobile phone base station exposure on women with or without mobile phone related symptoms. *Bioelectromagnetics*. 30(2):100-113, 2009.**

To investigate possible health effects of mobile phone use, we conducted a double-blind, cross-over provocation study to confirm whether subjects with mobile phone related symptoms (MPRS) are more susceptible than control subjects to the effect of electromagnetic fields (EMF) emitted from base stations. We sent questionnaires to 5,000 women and obtained 2,472 valid responses from possible candidates; from these, we recruited 11 subjects with MPRS and 43 controls. There were four EMF exposure conditions, each of which lasted 30 min: continuous, intermittent, and sham exposure with and without noise. Subjects were exposed to EMF of 2.14 GHz, 10 V/m (W-CDMA), in a shielded room to simulate whole-body exposure to EMF from base stations, although the exposure strength we used was higher than that commonly received from base stations. We measured several psychological and cognitive parameters pre- and post-exposure, and monitored autonomic functions. Subjects were asked to report on their perception of EMF and level of discomfort during the experiment. The MPRS group did not differ from the controls in their ability to detect exposure to EMF; nevertheless they consistently experienced more discomfort, regardless of whether or not they were actually exposed to EMF, and despite the lack of significant changes in their autonomic functions. Thus, the two groups did not differ in their responses to real or sham EMF exposure according to any psychological, cognitive or autonomic assessment. In conclusion, we found no evidence of any causal link between hypersensitivity symptoms and exposure to EMF from base stations.

**Hietanen M, Hämäläinen A-M, Husman T. Hypersensitivity symptoms associated with exposure to cellular telephones: No causal link. *Bioelectromagnetics* 23:264-270, 2002. (H-U, B-E, C-P)**

The hypothesis that there exist hypersensitive persons who perceive subjective symptoms from radiofrequency (RF) fields emitted by hand held mobile phones (cellular phones) was tested using double blind provocation experiments. We also tested whether sensitive subjects are able to determine whether the phone is on or off by sensing RF fields. The study group consisted of 20 volunteers (13 women and 7 men) who reported themselves as being sensitive to cellular phones. The RF exposure sources were one analogue NMT phone (900 MHz) and two digital GSM phones (900 and 1800 MHz). The duration of a test session was 30 min, and three or four sessions were performed in random order for each subject during 1 day. The subjects were asked to report symptoms or sensations as soon as they perceived any abnormal feelings. In addition, the subjects' blood pressure, heart rate, and breathing frequency were monitored every 5 min. The results of the study indicated that various symptoms were reported, and most of them appeared in the head region. However, the number of reported symptoms was higher during sham exposure than during real exposure conditions. In addition, none of the test persons could distinguish real RF exposure from sham exposure. Hence, we conclude that adverse subjective symptoms or sensations, though unquestionably perceived by the test subjects, were not produced by cellular phones.

**[Johansson A](#), [Nordin S](#), [Heiden M](#), [Sandström M](#). Symptoms, personality traits, and stress in people with mobile phone-related symptoms and electromagnetic hypersensitivity. [J Psychosom Res.](#) 68(1):37-45, 2010.**

OBJECTIVE: Some people report symptoms that they associate with electromagnetic field (EMF) exposure. These symptoms may be related to specific EMF sources or to electrical equipment in general (perceived electromagnetic hypersensitivity, EHS). Research and clinical observations suggest a difference between mobile phone (MP)-related symptoms and EHS with respect to symptom prevalence, psychological factors, and health prognosis. This study assessed prevalence of EMF-related and EMF-nonrelated symptoms, anxiety, depression, somatization, exhaustion, and stress in people with MP-related symptoms or EHS versus a population-based sample and a control sample without EMF-related symptoms. METHODS: Forty-five participants with MP-related symptoms and 71 with EHS were compared with a population-based sample (n=106) and a control group (n=63) using self-report questionnaires. RESULTS: The EHS group reported more symptoms than the MP group, both EMF-related and EMF-nonrelated. The MP group reported a high prevalence of somatosensory symptoms, whereas the EHS group reported more neurasthenic symptoms. As to self-reported personality traits and stress, the case groups differed only on somatization and listlessness in a direct comparison. In comparison with the reference groups, the MP group showed increased levels of exhaustion and depression but not of anxiety, somatization, and stress; the EHS group showed increased levels for all of the conditions except for stress. CONCLUSION: The findings support the idea of a difference between people with symptoms related to specific EMF sources and people with general EHS with respect to symptoms and anxiety, depression, somatization, exhaustion, and stress. The differences are likely to be important in the management of patients.

**Kim DW, Lee JH, Ji HC, Kim SC, Nam KC, Cha EJ. Physiological effects of RF exposure on hypersensitive people by a cell phone. Conf Proc IEEE Eng Med Biol Soc. 2008;1:2322-2325.**

Persons with electromagnetic hypersensitivity (EHS) complain of subjective symptoms such as headaches, insomnia, memory loss etc. resulting from radio frequency (RF) radiation by cellular phones. There have been various EHS provocation studies on heart rate, blood pressure, and subjective symptoms using GSM phones. However, there are few provocation studies on case-control study investigating simultaneously physiological parameters from CDMA phones. In this study, two volunteer groups of 18 self-declared EHS and 19 controls were exposed to both sham and real RF exposures by a CDMA cellular phone for half an hour each. We investigated the physiological parameters such as heart rates, respiration rates, and heart rate variability (HRV). In conclusion, the RF exposure by a CDMA cellular phone did not have any effects on the physiological parameters for both groups.

**[Landgrebe M](#), [Hauser S](#), [Langguth B](#), [Frick U](#), [Hajak G](#), [Eichhammer P](#). Altered cortical excitability in subjectively electrosensitive patients: results of a pilot study. [J Psychosom Res.](#) 62(3):283-288, 2007.**

OBJECTIVE: Hypersensitivity to electromagnetic fields is frequently claimed to be linked to a variety of unspecific somatic and/or neuropsychological complaints. Whereas provocation studies often failed to demonstrate a causal relationship between electromagnetic field exposure and symptom formation,

neurophysiological examinations highlight baseline deviations in people claiming to be electrosensitive. **METHODS:** To elucidate a potential role of dysfunctional cortical regulations in mediating hypersensitivity to electromagnetic fields, cortical excitability parameters were measured by transcranial magnetic stimulation in subjectively electrosensitive patients (n=23) and two control groups (n=49) differing in their level of unspecific health complaints. **RESULTS:** Electrosensitive patients showed reduced intracortical facilitation as compared to both control groups, while motor thresholds and intracortical inhibition were unaffected. **CONCLUSIONS:** This pilot study gives additional evidence that altered central nervous system function may account for symptom manifestation in subjectively electrosensitive patients as has been postulated for several chronic multisymptom illnesses sharing a similar clustering of symptoms.

**[Landgrebe M](#), [Frick U](#), [Hauser S](#), [Langguth B](#), [Rosner R](#), [Hajak G](#), [Eichhammer P](#). Cognitive and neurobiological alterations in electromagnetic hypersensitive patients: results of a case-control study. *Psychol Med.* 38(12):1781-1791, 2008.**

**BACKGROUND:** Hypersensitivity to electromagnetic fields (EMF) is frequently claimed to be linked to a variety of non-specific somatic and neuropsychological complaints. Whereas provocation studies often failed to demonstrate a causal relationship between EMF exposure and symptom formation, recent studies point to a complex interplay of neurophysiological and cognitive alterations contributing to symptom manifestation in electromagnetic hypersensitive patients (EHS). However, these studies have examined only small sample sizes or have focused on selected aspects. Therefore this study examined in the largest sample of EHS EMF-specific cognitive correlates, discrimination ability and neurobiological parameters in order to get further insight into the pathophysiology of electromagnetic hypersensitivity. **METHOD:** In a case-control design 89 EHS and 107 age- and gender-matched controls were included in the study. Health status and EMF-specific cognitions were evaluated using standardized questionnaires. Perception thresholds following single transcranial magnetic stimulation (TMS) pulses to the dorsolateral prefrontal cortex were determined using a standardized blinded measurement protocol. Cortical excitability parameters were measured by TMS. **RESULTS:** Discrimination ability was significantly reduced in EHS (only 40% of the EHS but 60% of the controls felt no sensation under sham stimulation during the complete series), whereas the perception thresholds for real magnetic pulses were comparable in both groups (median 21% versus 24% of maximum pulse intensity). Intra-cortical facilitation was decreased in younger and increased in older EHS. In addition, typical EMF-related cognitions (aspects of rumination, symptom intolerance, vulnerability and stabilizing self-esteem) specifically differentiated EHS from their controls. **CONCLUSIONS:** These results demonstrate significant cognitive and neurobiological alterations pointing to a higher genuine individual vulnerability of electromagnetic hypersensitive patients.

**Landgrebe M, Frick U, Hauser S, Hajak G, Langguth B. Association of tinnitus and electromagnetic hypersensitivity: hints for a shared pathophysiology? PLoS One. 2009;4(3):e5026.**

**BACKGROUND:** Tinnitus is a frequent condition with high morbidity and impairment in quality of life. The pathophysiology is still incompletely understood. Electromagnetic fields are discussed to be involved in the multi-factorial pathogenesis of tinnitus, but data proofing this relationship are very limited. Potential health hazards of electromagnetic fields (EMF) have been under discussion for long. Especially,

individuals claiming themselves to be electromagnetic hypersensitive suffer from a variety of unspecific symptoms, which they attribute to EMF-exposure. The aim of the study was to elucidate the relationship between EMF-exposure, electromagnetic hypersensitivity and tinnitus using a case-control design. **METHODOLOGY:** Tinnitus occurrence and tinnitus severity were assessed by questionnaires in 89 electromagnetic hypersensitive patients and 107 controls matched for age-, gender, living surroundings and workplace. Using a logistic regression approach, potential risk factors for the development of tinnitus were evaluated. **FINDINGS:** Tinnitus was significantly more frequent in the electromagnetic hypersensitive group (50.72% vs. 17.5%) whereas tinnitus duration and severity did not differ between groups. Electromagnetic hypersensitivity and tinnitus were independent risk factors for sleep disturbances. However, measures of individual EMF-exposure like e.g. cell phone use did not show any association with tinnitus. **CONCLUSIONS:** Our data indicate that tinnitus is associated with subjective electromagnetic hypersensitivity. An individual vulnerability probably due to an over activated cortical distress network seems to be responsible for, both, electromagnetic hypersensitivity and tinnitus. Hence, therapeutic efforts should focus on treatment strategies (e.g. cognitive behavioral therapy) aiming at normalizing this dysfunctional distress network.

**Lipping T, Rorarius M, Jantti V, Annala K, Mennander A, Ferenets R, Toivonen T, Toivo T, Varri A, Korpinen L. Using the nonlinear control of anesthesia-induced hypersensitivity of EEG at burst suppression level to test the effects of radiofrequency radiation on brain function. *Nonlinear Biomed Phys.* 18;3(1):5, 2009.**

**ABSTRACT: BACKGROUND:** In this study, investigating the effects of mobile phone radiation on test animals, eleven pigs were anaesthetised to the level where burst-suppression pattern appears in the electroencephalogram (EEG). At this level of anaesthesia both human subjects and animals show high sensitivity to external stimuli which produce EEG bursts during suppression. The burst-suppression phenomenon represents a nonlinear control system, where low-amplitude EEG abruptly switches to very high amplitude bursts. This switching can be triggered by very minor stimuli and the phenomenon has been described as hypersensitivity. To test if also radio frequency (RF) stimulation can trigger this nonlinear control, the animals were exposed to pulse modulated signal of a GSM mobile phone at 890 MHz. In the first phase of the experiment electromagnetic field (EMF) stimulation was randomly switched on and off and the relation between EEG bursts and EMF stimulation onsets and endpoints were studied. In the second phase a continuous RF stimulation at 31 W/kg was applied for 10 minutes. The ECG, the EEG, and the subcutaneous temperature were recorded. **RESULTS:** No correlation between the exposure and the EEG burst occurrences was observed in phase I measurements. No significant changes were observed in the EEG activity of the pigs during phase II measurements although several EEG signal analysis methods were applied. The temperature measured subcutaneously from the pigs' head increased by 1.6 degrees Celsius and the heart rate by 14.2 bpm on the average during the 10 min exposure periods. **CONCLUSIONS:** The hypothesis that RF radiation would produce sensory stimulation of somatosensory, auditory or visual system or directly affect the brain so as to produce EEG bursts during suppression was not confirmed.

**[Markova E](#), [Hillert L](#), [Malmgren L](#), [Persson BR](#), [Belyaev IY](#). Microwaves from GSM Mobile Telephones Affect 53BP1 and gamma-H2AX Foci in Human Lymphocytes from Hypersensitive and**

**Healthy Persons. *Environ Health Perspect.* 113(9):1172-1177, 2005. (C-P, G-C)**

The data on biologic effects of nonthermal microwaves (MWs) from mobile telephones are diverse, and these effects are presently ignored by safety standards of the International Commission for Non-Ionizing Radiation Protection (ICNIRP). In the present study, we investigated effects of MWs of Global System for Mobile Communication (GSM) at different carrier frequencies on human lymphocytes from healthy persons and from persons reporting hypersensitivity to electromagnetic fields (EMFs). We measured the changes in chromatin conformation, which are indicative of stress response and genotoxic effects, by the method of anomalous viscosity time dependence, and we analyzed tumor suppressor p53-binding protein 1 (53BP1) and phosphorylated histone H2AX (gamma-H2AX), which have been shown to colocalize in distinct foci with DNA double-strand breaks (DSBs), using immunofluorescence confocal laser microscopy. We found that MWs from GSM mobile telephones affect chromatin conformation and 53BP1/gamma-H2AX foci similar to heat shock. For the first time, we report here that effects of MWs from mobile telephones on human lymphocytes are dependent on carrier frequency. On average, the same response was observed in lymphocytes from hypersensitive and healthy subjects. Key words: 53BP1 and gamma-H2AX foci, chromatin, DNA double-strand breaks, hypersensitivity to electromagnetic fields, stress response.

[Nieto-Hernandez R](#), [Rubin GJ](#), [Cleare AJ](#), [Weinman JA](#), [Wessely S](#).

**Can evidence change belief? Reported mobile phone sensitivity following individual feedback of an inability to discriminate active from sham signals. *J Psychosom Res.* 65(5):453-460, 2008.**

**OBJECTIVE:** In this study, we tested whether providing individuals, who described being sensitive to mobile phone signals, with accurate feedback about their ability to discriminate an active mobile phone signal from a sham signal had any impact on their subsequent symptom levels or their perceived sensitivity to mobile phones. **METHODS:** Sixty-nine participants who reported sensitivity to mobile phones took part in a double-blind, placebo-controlled provocation study. Perceived sensitivity to mobile phones was assessed using a version of the Sensitive Soma Assessment Scale (SSAS) and the severity of any symptoms attributed to mobile phones was recorded. Both the overall ("negative") findings of the provocation study and the participant's own individual results ("correct" or "incorrect" at detecting a mobile phone signal) were then described to them. Six months later, perceived sensitivity and symptom severity were measured again. **RESULTS:** Fifty-eight participants (84%) received feedback and participated in the 6-month follow-up. No significant differences in SSAS scores or in symptom severity scores were found between individuals told that they were correct (n=31) or incorrect (n=27) in their ability to detect mobile phone signals in the provocation study. **CONCLUSION:** The provision of accurate feedback was insufficient to change attributions or reduce symptoms in this study. However, an overtly negative reaction to feedback was not observed among most participants, and some participants were willing to consider that factors other than electromagnetic field may be relevant in causing or exacerbating their symptoms. Discussing possible psychological factors with electromagnetic hypersensitivity patients may be beneficial for some.

[Regel SJ](#), [Negovetic S](#), [Roosli M](#), [Berdinas V](#), [Schuderer J](#), [Huss A](#), [Lott U](#), [Kuster N](#), [Achermann P](#).  
**UMTS Base Station-like Exposure, Well-Being, and Cognitive Performance. *Environ Health Perspect.* 114(8):1270-1275, 2006. (C-P, B-E, H-U)**

**Background:** Radio-frequency electromagnetic fields (RF EMF) of mobile communication systems are widespread in the living environment, yet their effects on humans are uncertain despite a growing body of literature. **Objectives:** We investigated the influence of a Universal Mobile Telecommunications System (UMTS) base station-like signal on well-being and cognitive performance in subjects with and without self-reported sensitivity to RF EMF. **Methods:** We performed a controlled exposure experiment (45 min at an electric field strength of 0, 1, or 10 V/m, incident with a polarization of 45 degrees from the left back side of the subject, weekly intervals) in a randomized, double-blind crossover design. A total of 117 healthy subjects (33 self-reported sensitive, 84 nonsensitive subjects) participated in the study. We assessed well-being, perceived field strength, and cognitive performance with questionnaires and cognitive tasks and conducted statistical analyses using linear mixed models. Organ-specific and brain tissue-specific dosimetry including uncertainty and variation analysis was performed. **Results:** In both groups, well-being and perceived field strength were not associated with actual exposure levels. We observed no consistent condition-induced changes in cognitive performance except for two marginal effects. At 10 V/m we observed a slight effect on speed in one of six tasks in the sensitive subjects and an effect on accuracy in another task in nonsensitive subjects. Both effects disappeared after multiple end point adjustment. **Conclusions:** In contrast to a recent Dutch study, we could not confirm a short-term effect of UMTS base station-like exposure on well-being. The reported effects on brain functioning were marginal and may have occurred by chance. Peak spatial absorption in brain tissue was considerably smaller than during use of a mobile phone. No conclusions can be drawn regarding short-term effects of cell phone exposure or the effects of long-term base station-like exposure on human health. **Key words:** base station, cognitive function, electromagnetic hypersensitivity, human exposure, mobile phones, RF EMF.