

# Cell Tower Transmitter Studies – 28 Summary Findings

## Cell Tower Transmitter Studies Neurological Effects from Around the World

Brief Conclusion/ Country of Study	Study Publication	Title and Author	Link and Abstract
Electrohypersensitivity Symptoms Significantly Correlated –  <u>France</u>	Electromagnetic Biology and Medicine, 22: 41-49  (2003).	Survey Study of People Living in the Vicinity of Cellular Phone Base Stations.  Santini, R., Santini, P., Le Ruz, P., Danze, J. & Seigne, M.	<a href="http://www.emrpolicy.org/science/research/docs/santini_ebm_2003.pdf">http://www.emrpolicy.org/science/research/docs/santini_ebm_2003.pdf</a>  "A survey study was conducted, using a questionnaire, on 530 people (270 men, 260 women) living or not in proximity to cellular phone base stations. Eighteen different symptoms (Non Specific Health Symptoms-NSHS), described as radiofrequency sickness, were studied by means of the chi-square test with Yates correction. <u>The results that were obtained underline that certain complaints are experienced only in the immediate vicinity of base stations (up to 10 m for nausea, loss of appetite, visual disturbances), and others at greater distances from base stations (up to 100 m for irritability, depressive tendencies, lowering of libido, and up to 200 m for headaches, sleep disturbances, feeling of discomfort). In the 200 m to 300 m zone, only the complaint of fatigue is experienced significantly more often when compared with subjects residing at more than 300 m or not exposed (reference group).</u> For seven of the studied symptoms and for the distance up to 300 m, the frequency of reported complaints is significantly higher ( $P < 0.05$ ) for women in comparison with men. Significant differences are also observed in relation to the ages of subjects, and for the location of subjects in relation to the antennas and other electromagnetic factors."
Electromagnetic Hypersensitivity Symptoms –  <u>France</u>	<b>Pathol Biol (Paris) 50(6):369-373, 2002.</b> [Article in French]	<b>Study of the health of people living in the vicinity of mobile phone base stations: I. Influence of distance and sex</b>  Santini R, Santini P, Danze JM, Le Ruz P, Seigne M.	<a href="http://wifiinschools.com/uploads/3/0/4/2/3042232/santini_2002.pdf">http://wifiinschools.com/uploads/3/0/4/2/3042232/santini_2002.pdf</a>  <u>Comparisons of complaints frequencies (CHI-SQUARE test with Yates correction) in relation with distance from base station and sex, show significant (<math>p &lt; 0.05</math>) increase as compared to people living <math>&gt; 300</math> m or not exposed to base station, till 300 m for tiredness, 200 m for headache, sleep disturbance, discomfort, etc. 100 m for irritability, depression, loss of memory, dizziness, libido decrease, etc. Women significantly more often than men (<math>p &lt; 0.05</math>) complained of headache, nausea, loss of appetite, sleep disturbance, depression, discomfort and visual perturbations.</u> This first study on symptoms experienced

			by people living in vicinity of base stations shows that, in view of radioprotection, minimal distance of people from cellular phone base stations should not be < 300 m.
Electrohypersensitivity Symptoms Near Base Stations –  <u>Iran</u>	Electromagn Biol Med. 2014 Sep;33(3):206-10. doi: 10.3109/15368378.2013.801352. Epub 2013 Jun 19.	Health effects of living near mobile phone base transceiver station (BTS) antennae: a report from Isfahan, Iran.  Shahbazi-Gahrouei, D., Karbalae, M., Moradi, H. & Baradaran-Ghahfarokhi, M. (2013).	<a href="http://www.ncbi.nlm.nih.gov/pubmed/23781985">http://www.ncbi.nlm.nih.gov/pubmed/23781985</a>  "Results - The results showed that most of the symptoms such as nausea, headache, dizziness, irritability, discomfort, nervousness, depression, sleep disturbance, memory loss and lowering of libido were statistically significant in the inhabitants living near the BTS antenna less than 300 m distances) compared to those living far from the BTS antenna ( more than 300 m). Conclusion - It is suggested that cellular phone BTS antenna should not be sited closer than 300 m to populations to minimize exposure of neighbors."
Electrohypersensitivity Symptoms –  <u>Iran, USA</u>	EchoPsychology VOL. 9 NO. 2 JUNE 2017	A Multilayer Perceptron Neural Network–Based Model for Predicting Subjective Health Symptoms in People Living in the Vicinity of Mobile Phone Base Stations  Parsaei H., Faraz M., and Mortazavi S.M. J.	<a href="http://www.emfsa.co.za/ehs/multilayer-perceptron-neural-network-based-model-predicting-subjective-health-symptoms-people-living-vicinity-mobile-phone-base-stations/">http://www.emfsa.co.za/ehs/multilayer-perceptron-neural-network-based-model-predicting-subjective-health-symptoms-people-living-vicinity-mobile-phone-base-stations/</a>  About 25% of the general population reports different levels of environmental intolerance to factors such as EMFs, and studies performed in Europe show that about 75% of general practitioners had visited patients complaining of EHS...  <u>The performance of the developed system (sensitivity and specificity) in predicting the subjective health symptoms is as follows: headache (72%, 91%), fatigue (8%, 98%), sleep disturbance (97%, 93%), dizziness (65%, 85%), vertigo (65%, 84%).</u> These promising results suggest that this system might be useful as a means for predicting the health symptoms in people living in the vicinity of mobile phone base stations, which ultimately enhances the quality of life of these individuals through providing appropriate medical care and introducing effective methods for reducing the effect of these exposures.
Electromagnetic Hypersensitivity Symptoms –  <u>Japan</u>	<b><u>Pathophysiology.19(2) 95-100, 2012</u></b>	<b>Reported functional impairments of electrohypersensitive Japanese: A questionnaire survey</b>  <b><u>Kato Y, Johansson O</u></b>	<a href="https://www.ncbi.nlm.nih.gov/pubmed/22458999">https://www.ncbi.nlm.nih.gov/pubmed/22458999</a>  <u>Reported major complaints were "fatigue/tiredness" (85%), "headache", "concentration, memory, and thinking" difficulty (81%, respectively).</u> Seventy-two per cent used some form of complementary/alternative therapy. <u>The most plausible trigger of EHS onset was a mobile phone base station or personal handy-phone system (37%).</u> Sixty-five percent experienced health problems to be due to the radiation from other passengers' mobile phones in trains or buses, and 12% reported that they could not use public transportation at all. <u>Fifty-three percent had a job before the onset, but most had lost their work and/or experienced a decrease in income.</u> Moreover,

			85.3% had to take measures to protect themselves from EMF, such as moving to low EMF areas, or buying low EMF electric appliances. <u>EHS persons were suffering not only from their symptoms, but also from economical and social problems.</u>
Cancer Death Rate Increase Near Cell Towers –  <u>Brazil</u>	<u>Sci Total Environ.</u> 2011 Sep 1;409(19):3649-65. doi: 10.1016/j.scitoten.v.2011.05.051. Epub 2011 Jul 13.	Mortality by neoplasia and cellular telephone base stations in the Belo Horizonte municipality, Minas Gerais state, Brazil.  Dode, A., Leao, M., Tejo, F., Gomes, A., Dode, D., Dode, M., Moreira, C., Condessa, V., Albinatti, C. & Caiaffa, W. (2011).	<a href="http://www.ncbi.nlm.nih.gov/pubmed/21741680">http://www.ncbi.nlm.nih.gov/pubmed/21741680</a>  "A descriptive spatial analysis of the BSs and the cases of death by neoplasia identified in the municipality was performed through an ecological-epidemiological approach, using georeferencing. ... Between 1996 and 2006, <u>7191 deaths by neoplasia occurred and within an area of 500m from the BS, the mortality rate was 34.76 per 10,000 inhabitants. Outside of this area, a decrease in the number of deaths by neoplasia occurred.</u> The greatest accumulated incidence was 5.83 per 1000 in the Central-Southern region and the lowest incidence was 2.05 per 1000 in the Barreiro region. During the environmental monitoring, the largest accumulated electric field measured was 12.4V/m and the smallest was 0.4V/m. The largest density power was 40.78uW/cm(2), and the smallest was 0.04uW/cm(2). ... <u>The mortality rates and the relative risk were higher for the residents inside a radius of 500 m from the BS, compared to the average mortality rate of the entire city, and a decreased dose-response gradient was observed for residents who lived farther away from the BS</u>
Electrohypersensitivity Symptoms –  <u>Germany</u>	Umwelt Medizin Gesellschaft, Feb. 2010: 130-139.	("Specific Health Symptoms and Cell Phone Radiation in Selbitz (Bavaria, Germany)-Evidence of a Dose-Response Relationship")  Eger, H. & Jahn, M. (2010).	<a href="http://www.umg-verlag.de/umwelt-medizin-gesellschaft/210_ej_z.pdf">http://www.umg-verlag.de/umwelt-medizin-gesellschaft/210_ej_z.pdf</a>  "The mean radiation measurements of the groups exposed at most in Selbitz (1.2 V/m) was substantially higher than the mean radiation of the study population studied in the QUEBEB study (1) of the German mobile telephone research program (Deutsches Mobilfunkforschungsprogramm DMF, established mean value DMF 0.07 V/m). <u>A significant correlation was found dependent on dose-effects for insomnia, depressions, cerebral symptoms, joint illnesses, infections, skin changes, heart and circulation disorders, and disorders of the optical and acoustic sensory systems and the gastro-intestinal tract with objectively determined locations of exposure, which can be related by the influence of microwaves on the human nervous system.</u> "
Electrohypersensitivity Symptoms-  <u>Egypt</u>	Neurotoxicology, 28(2), 434-40. (2007)	Neurobehavioral effects among inhabitants around mobile phone base stations,  Abdel-Rassoul, G., El-Fateh, O. A., Salem, M. A., Michael, A., Farahat, F. & El-Batanouny, M.	<a href="https://www.sciencedirect.com/science/article/pii/S0161813X06001835">https://www.sciencedirect.com/science/article/pii/S0161813X06001835</a>  <u>The prevalence of neuropsychiatric complaints as headache (23.5%), memory changes (28.2%), dizziness (18.8%), tremors (9.4%), depressive symptoms (21.7%), and sleep disturbance (23.5%) were significantly higher among exposed inhabitants than controls: (10%), (5%), (5%), (0%), (8.8%) and (10%), respectively (P &lt; 0.05).</u>

			Inhabitants living nearby mobile phone base stations are at risk for developing neuropsychiatric problems and some changes in the performance of neurobehavioral functions either by facilitation or inhibition. So, revision of standard guidelines for public exposure to RER from mobile phone base station antennas and using of NBTB for regular assessment and early detection of biological effects among inhabitants around the stations are recommended."
Health Effects are Not Explained by Cell Tower Concerns –  <u>Germany</u>	Occup Environ Med 66:118-123. (2009)	Mobile phone base stations and adverse health effects: phase 1 of a population-based, cross-sectional study in Germany.  Blettner, M., Schlehofer, B, Breckenkamp, J., Kowall, B., Schmiedel, S. Reis, U., Potthoff, P., Schüz, J. & Berg-Beckhoff, G.	<a href="http://www.ncbi.nlm.nih.gov/pubmed/19017702">http://www.ncbi.nlm.nih.gov/pubmed/19017702</a>  "In the initial phase, reported on in this paper, 30,047 persons from a total of 51,444 who took part in the nationwide survey also answered questions on how mobile phone base stations affected their health. A list of 38 health complaints was used. A multiple linear regression model was used to identify predictors of health complaints including proximity of residence to mobile phone base stations and risk perception. RESULTS: Of the 30,047 participants (response rate 58.6%), 18.7% of participants were concerned about adverse health effects of mobile phone base stations, while an additional 10.3% attributed their personal adverse health effects to the exposure from them. Participants who were concerned about or attributed adverse health effects to mobile phone base stations and those living in the vicinity of a mobile phone base station (500 m) reported slightly more health complaints than others. CONCLUSIONS: <u>A substantial proportion of the German population is concerned about adverse health effects caused by exposure from mobile phone base stations. The observed slightly higher prevalence of health complaints near base stations can not however be fully explained by attributions or concerns.</u> <b>Comment:</b> Those who were not concerned about base stations still reported more health problems close to the base station than people living more far away.
Microwave Sickness Significantly Correlated –  <u>Spain</u>	Electromagnetic Biology and Medicine, 22: 161-169. (2003)	The microwave Syndrome: A preliminary Study in Spain.  Navarro, E., Segure, J., Portelés, M., Gomez Perretta, C.	<a href="http://www.tandfonline.com/doi/abs/10.1081/JBC-120024625">http://www.tandfonline.com/doi/abs/10.1081/JBC-120024625</a>  "A health survey was carried out in Murcia, Spain, in the vicinity of a Cellular Phone Base Station working in DCS-1800 MHz. This survey contained health items related to "microwave sickness" or "RF syndrome." The microwave power density was measured at the respondents' homes. <u>Statistical analysis showed significant correlation between the declared severity of the symptoms and the measured power density. The separation of respondents into two different exposure groups also showed an increase of the declared severity in the group with the higher exposure.</u> "
Electrohypersensitivity Symptoms –  <u>Poland</u>	(Biuletyn PTZE, nr 14, Warszawa 2006, pp 23-26) December 2006	Assessment of subjective complaints reported by people living near mobile phone base stations. Nofer Institute of	<a href="http://www.emfresearch.com/epidemiological-research-on-cell-towers/">http://www.emfresearch.com/epidemiological-research-on-cell-towers/</a>  "The study subjects comprised 500 people from 5 regions of the city of Lodz, living in houses located at the

		Occupational Medicine, Lodz, Poland. Workshop PTZE Electromagnetics technics in preventive health, Lodz, Poland 13-15 December 2006  Gadzicka, E., Bortkiewicz, A., Zmyslony, M., Szymczak, W. & Szyjkowska, A. (2006).	distances of up to 50 m, 50-100m, 100-150m, 150-200m and over 200m from the base station. The distance from base station is the estimated value of exposure to EMF. There were 181 (36.2%) men aged 46.2- 29.0 years and 319 (63.8%) women aged 50.1-17.0 years. ...A significant relationship was found to occur between the frequency of some symptoms and the distance from the base station. <u>Everyday headaches were most frequent in respondents living at the distance 100-150 m from the base station in comparison with subjects living in farther distances. Differences were statistically significant (p=0.013). Symptoms of depression were most frequently reported by people living at the distance 50-100 m (23,3%) and over 200 m (21,3%). Differences were at the borderline of statistical significance (p=0.059). It seems important to note that only 1.8% of subjects reported their concern about possible harmful effects of the base stations."</u>
Electrohypersensitivity Symptoms Present for Both Concerned and Unconcerned Residents –  <u>Poland</u>	Med Pr. 2004; 55(4):345-51.	[Subjective symptoms reported by people living in the vicinity of cellular phone base stations: review]. [Article in Polish]  Bortkiewicz A, et al.	<a href="http://www.ncbi.nlm.nih.gov/pubmed/15620045">http://www.ncbi.nlm.nih.gov/pubmed/15620045</a> .  "The results of the questionnaire survey reveal that people living in the vicinity of base stations report various complaints mostly of the circulatory system, but also of sleep disturbances, irritability, depression, blurred vision, concentration difficulties, nausea, lack of appetite, headache and vertigo....The performed studies showed the relationship between the incidence of individual symptoms, the level of exposure, and the distance between a residential area and a base station. This association was observed in both groups of persons, those who linked their complaints with the presence of the base station and those who did not notice such a relation."
Study Recommends Decrease Standards to 0.0001 $\mu\text{W}/\text{cm}^2$ In  <u>Austria</u>	Presented at an International Conference in Kos, Greece May 2004	The Microwave Syndrome: Further Aspects of a Spanish Study.  Oberfeld, G., Navarro, A., Enrigue, Portoles, M., Maestu, Ceferino, Gomez- Perretta, C. (2004).	<a href="http://www.apdr.info/electrocontaminacion/Documentos/Investigacion/ESTUDOS%20EPIDEMIOLOGICOS%20EN%20ANTENAS/The%20Microwave%20Syndrome%20-%20Further%20Aspects%20of%20a%20Spanish%20Study.pdf">http://www.apdr.info/electrocontaminacion/Documentos/Investigacion/ESTUDOS%20EPIDEMIOLOGICOS%20EN%20ANTENAS/The%20Microwave%20Syndrome%20-%20Further%20Aspects%20of%20a%20Spanish%20Study.pdf</a>  "Based on the data of this study the advice would be to strive for levels not higher than 0.02 V/m for the sum total, which is equal to a power density of 0.0001 $\mu\text{W}/\text{cm}^2$ or 1 $\mu\text{W}/\text{m}^2$ , which is the indoor exposure value for GSM base stations proposed on empirical evidence by the Public Health Office of the Government of Salzburg in 2002."
Microwave Sickness Significantly Correlated –  <u>Spain</u>	BMJ Open 2013;3:e003836.doi:10.1136/bmjopen-2013-003836	Subjective symptoms related to GSM radiation form mobile phone base stations: a cross-sectional study.  C. Gomez-Perretta, E. Navarro, J. Segura, M. Portoles	<a href="http://bmjopen.bmj.com/content/bmjopen/3/12/e003836.full.pdf">http://bmjopen.bmj.com/content/bmjopen/3/12/e003836.full.pdf</a>  <u>This study confirms our preliminary results. We observed that the incidence of most of the symptoms was related to exposure levels— independently of the demographic variables and some possible risk factors. Concerns about adverse effects from exposure, despite being strongly</u>

			related with sleep disturbances, do not influence the direct association between exposure and sleep.
Review - Classic Microwave Sickness	Environ. Rev. Downloaded from www.nrcresearchpress.com November 5, 2010	Biological effects from exposure to electromagnetic radiation emitted by cell tower base stations and other antenna arrays  B. Blake Levitt and Henry Lai	<a href="http://www.nrcresearchpress.com/doi/pdf/10.1139/A10-018?src=recsys&amp;">http://www.nrcresearchpress.com/doi/pdf/10.1139/A10-018?src=recsys&amp;</a>  <u>Symptoms reported today may be classic microwave sickness, first described in 1978. Nonionizing electromagnetic fields are among the fastest growing forms of environmental pollution. Some extrapolations can be made from research other than epidemiology regarding biological effects from exposures at levels far below current exposure guidelines.</u>

## Cell Tower Transmitter Studies – Cancer

Brain Cancer in Young Military Radar Workers	Arch Environ Health. 2002 Jul-Aug;57(4):270-2.	Brain cancer with induction periods of less than 10 years in young military radar workers.  Richter ED, Berman T, Levy O.	<a href="https://www.ncbi.nlm.nih.gov/pubmed/12530592">https://www.ncbi.nlm.nih.gov/pubmed/12530592</a>  <u>The authors have reported on 5 young patients who had brain tumors that appeared within 10 yr of initial occupational exposures to radar. Four of the patients were less than 30 yr of age when the diagnoses were initially made. Brief induction periods that follow high exposures in individual sentinel patients are a recognized indicator of impending group risk, and these periods call attention to the need for precautionary measures. Similarly, reports of short induction periods for brain cancer on the side of the head in which there has been prior use of cell phones may also indicate increased risk.</u>
<b>4.15 times more Cancer in Women</b>	<b>Inter J Cancer Prev 1(2):123-128, 2004.</b>	Increased incidence of cancer near a cell-phone transmitter station.  Wolf R, Wolf D.	<a href="https://www.emf-portal.org/en/article/19820">https://www.emf-portal.org/en/article/19820</a>  Cancer incidence of women in area A was thus significantly higher (p<0.0001) compared with that of area B and the whole city. A comparison of the relative risk revealed that there were 4.15 times more cases in area than in the entire population. <u>The study indicates an association between increased incidence of cancer and living in proximity to a cell-phone transmitter station.</u>
<b>Cancer increase for humans and Animals Studies</b>	<a href="#">Exp Oncol.</a> 2011 Jun;33(2):62-70.	Long-term exposure to microwave radiation provokes cancer growth: evidences from radars and mobile communication systems.  <a href="#">Yakymenko I, Sidorik E, Kyrlyenko S, Chekhun V.</a>	<a href="https://www.ncbi.nlm.nih.gov/pubmed/21716201">https://www.ncbi.nlm.nih.gov/pubmed/21716201</a>  In this review we discuss alarming epidemiological and experimental data on possible carcinogenic effects of long term exposure to low intensity microwave (MW) radiation. Recently, a number of reports revealed that under certain conditions the irradiation by low intensity MW can substantially induce cancer progression in humans and in animal models. The carcinogenic effect of MW irradiation is typically manifested after long term (up to 10 years and more) exposure. We conclude that recent data strongly point to the need for re-elaboration of the

			<p>current safety limits for non-ionizing radiation using recently obtained knowledge.</p> <p>.....</p> <p><u>even a year of operation of a powerful base transmitting station for mobile communication reportedly resulted in a dramatic increase of cancer incidence among population living nearby. In addition, model studies in rodents unveiled a significant increase in carcinogenesis after 17-24 months of MW exposure both in tumor-prone and intact animals</u></p>
<p>Cancer Cases Significantly Higher –</p> <p><u>Germany</u></p>	<p>Umwelt Medizin Gesellschaft 17,4 2004, as: "Einfluss der räumlichen Nähe von Mobilfunksendeanlagen auf die Krebsinzidenz".</p>	<p>The Influence of Being Physically Near to a Cell Phone Transmission Mast on the Incidence of Cancer.</p> <p>Eger, H., Hagen, K., Lucas, B. Vogel, P. &amp; Voit, H. (2004).</p>	<p><a href="http://avaate.org/IMG/pdf/20041118_naila.pdf">http://avaate.org/IMG/pdf/20041118_naila.pdf</a></p> <p><a href="http://www.hese-project.org/de/emf/Studien/StudienDiskussion/NailaStudie/20050226_naila-studie.pdf">http://www.hese-project.org/de/emf/Studien/StudienDiskussion/NailaStudie/20050226_naila-studie.pdf</a></p> <p>"The result of the study shows that the <u>proportion of newly developing cancer cases was significantly higher among those patients who had lived during the past ten years at a distance of up to 400 metres from the cellular transmitter site, which has been in operation since 1993, compared to those patients living further away, and that the patients fell ill on average 8 years earlier.</u> In the years 1999-2004, ie after five years operation of the transmitting installation, the relative risk of getting cancer had trebled for the residents of the area in the proximity of the installation compared to the inhabitants of Naila outside the area."</p>
<p>Neurobehavioral and Cancer Increase</p>	<p>INT J OCCUP ENVIRON HEALTH 2010;16:263–267</p>	<p><b>Epidemiological Evidence for a Health Risk from Mobile Phone Base Stations</b></p> <p><b>VINI G. KHURANA, LENNART HARDELL, JORIS</b></p>	<p><a href="http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.654.8551&amp;rep=rep1&amp;type=pdf">http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.654.8551&amp;rep=rep1&amp;type=pdf</a></p> <p>We found epidemiological studies pertaining to the health effects of mobile phone base station RF emissions to be quite consistent in pointing to a possible adverse health impact. <u>Eight of the 10 studies reported increased prevalence of adverse neurobehavioral symptoms or cancer in populations living at distances &lt; 500 meters from base stations...</u></p> <p><u>none of the studies that found adverse health effects of base stations reported RF exposures above accepted international guidelines, the implication being that if such findings continue to be reproduced, current exposure standards are inadequate in protecting human populations.</u></p>
<p>DNA Damage Leading to Cancer</p>	<p><u>Electromagn Biol Med.</u> 2017;36(3):295-305. doi: 10.1080/15368378.2017.1350584. Epub 2017 Aug 4.</p>	<p><b>Impact of radiofrequency radiation on DNA damage and antioxidants in peripheral blood lymphocytes of humans residing in the vicinity of mobile phone base stations</b></p>	<p><a href="https://www.ncbi.nlm.nih.gov/pubmed/28777669">https://www.ncbi.nlm.nih.gov/pubmed/28777669</a></p> <p>present study was envisaged to evaluate the effect of RFR on the DNA damage and antioxidant status in cultured human peripheral blood lymphocytes (HPBLs) of individuals residing in the vicinity of mobile phone base stations and comparing it with healthy controls. Multiple linear regression analyses revealed a significant association among reduced GSH concentration (p &lt; 0.05), CAT (p &lt; 0.001) and SOD (p &lt; 0.001) activities and elevated MN frequency (p &lt; 0.001) and LOO (p &lt; 0.001)</p>

		<a href="#">Zothansiam</a> <sup>1</sup> , <a href="#">Zosangzuali M</a> <sup>1</sup> , <a href="#">Lalramdinpuii M</a> <sup>1</sup> , <a href="#">Jagetia GC</a> <sup>1</sup> .	with increasing RF power density. LOO - lipid peroxidation SOD - superoxide dismutase CAT - activities of catalase GSH - glutathione Excerpt: <u>The present study demonstrated that staying near the mobile base stations and continuous use of mobile phones damage the DNA, and it may have an adverse effect in the long run. The persistence of DNA unrepaired damage leads to genomic instability which may lead to several health disorders including the induction of cancer.</u>
Genetic Damage	Int J Hum Genet, 14(3,4): 107-118 (2014)	DNA and Chromosomal Damage in Residents Near a Mobile Phone Base Station  G. Gandhi <sup>1</sup> *, Jasmine Naru, Maninder Kaur and Gurpreet Kaur	<a href="http://www.krepublishers.com/02-Journals/IJHG/IJHG-14-0-000-14-Web/IJHG-14-3-4-000-14-Abst-PDF/IJHG-14-3-4-107-14-572-Gandhi-G/IJHG-14-3-4-107-14-572-Gandhi-G-Tx[1].pdf">http://www.krepublishers.com/02-Journals/IJHG/IJHG-14-0-000-14-Web/IJHG-14-3-4-000-14-Abst-PDF/IJHG-14-3-4-107-14-572-Gandhi-G/IJHG-14-3-4-107-14-572-Gandhi-G-Tx[1].pdf</a>  Damage frequency, damage index, mean DNA migration length, frequencies of micronucleated, basal and pyknotic cells were significantly elevated (p=0.000) in the sample group... <u>Hence the observations indicate that 24x7 continuous exposure from base stations may pose genetic-damage threat to the populace residing nearby.</u>
Genetic Damage	<b>Electromagn Biol Med. 2014 Jul 9:1-11.</b>	<b>A cross-sectional case control study on genetic damage in individuals residing in the vicinity of a mobile phone base station.</b>  <b>Gandhi G, Kaur G, Nisar U</b>	<a href="https://www.ncbi.nlm.nih.gov/pubmed/25006864">https://www.ncbi.nlm.nih.gov/pubmed/25006864</a>  <u>The linear regression analysis further revealed daily mobile phone usage, location of residence and power density as significant predictors of genetic damage. The genetic damage evident in the participants of this study needs to be addressed against future disease-risk, which in addition to neurodegenerative disorders, may lead to cancer.</u>
<b>Cell Tower Transmitter Studies – Other Health Effects</b>			
Infertility	<b>Bioelectromagnetics 18(6):455-461, 1997</b>	<b>RF radiation-induced changes in the prenatal development of mice. Bioelectromagnetics</b>  <b>Magras, IN, Xenos, TD</b>	<a href="https://www.ncbi.nlm.nih.gov/pubmed/9261543">https://www.ncbi.nlm.nih.gov/pubmed/9261543</a>  This study consisted of RF level measurements and in vivo experiments at several places around an "antenna park." At these locations RF power densities between 168 nW/cm <sup>2</sup> and 1053 nW/cm <sup>2</sup> were measured. Twelve pairs of mice, divided in two groups, were placed in locations of different power densities and were repeatedly mated five times.  <u>A progressive decrease in the number of newborns per dam was observed, which ended in irreversible infertility.</u>

Death – Animal Study	<b>IEEE Trans Microwave Theor Tech 57: 2488-2497, 2009.</b>	<b>Results of a long-term low-level microwave exposure of rats.</b>  <b>Adang D, Remacle C, Vorst AV</b>	<a href="http://ieeexplore.ieee.org/document/5232818/">http://ieeexplore.ieee.org/document/5232818/</a>  <u>After three and eight months of exposure, we found a statistically significant difference of about 20% between the 970-MHz continuous wave group and sham-exposed group regarding the monocytes in both considered periods. After 14 and 18 months of exposure, we observed a significant increase in white blood cells and neutrophils of about 15% and 25%, respectively. Lymphocytes fell down after 18 months of exposure with about 15% compared to the sham-exposed group.... The most obvious effect we detected is the increase in mortality rate of the exposed groups with respect to the sham-exposed group after 21 months of exposure at the age of 25 months. This increase even increases when observing rats until the age of 28 months: mortality in exposed groups then reaches almost twice the value observed in the sham-exposed group.</u>
Pituitary-Adrenal axis – Effects on Hormones	<b>Clin Biochem. 45(1-2):157-161, 2012</b>	<b>How does long term exposure to base stations and mobile phones affect human hormone profiles?</b>  <b>Eskander EF, Estefan SF, Abd-Rabou AA</b>	<a href="http://www.escuelasinwifi.org/sites/default/files/imagenes/13-84_11-18-2013_catherine_kleiber_3_of_5_7520958240.pdf">http://www.escuelasinwifi.org/sites/default/files/imagenes/13-84_11-18-2013_catherine_kleiber_3_of_5_7520958240.pdf</a>  <b>Objectives:</b> This study is concerned with assessing the role of exposure to radio frequency radiation (RFR) emitted either from mobiles or base stations and its relations with human's hormone profiles.  <b>RESULTS:</b> <u>This study showed significant decrease in volunteers' ACTH, cortisol, thyroid hormones, prolactin for young females, and testosterone levels.</u> <b>CONCLUSION:</b> The present study revealed that high RFR effects on pituitary-adrenal axis.
Thyroid Gland	<a href="#"><u>Int J Radiat Biol.</u></a> <b>86(12):1106-1116, 2010.</b>	<b>Pulse modulated 900 MHz radiation induces hypothyroidism and apoptosis in thyroid cells: A light, electron microscopy and immunohistochemical study.</b>  <b>Eşmekaya MA, Seyhan N, Omeroğlu S.</b>	<a href="https://www.ncbi.nlm.nih.gov/pubmed/20807179">https://www.ncbi.nlm.nih.gov/pubmed/20807179</a>  <u>The overall findings indicated that whole body exposure to pulse-modulated RF radiation that is similar to that emitted by global system for mobile communications (GSM) mobile phones can cause pathological changes in the thyroid gland by altering the gland structure and enhancing caspase-dependent pathways of apoptosis.</u>

## Cell Tower Transmitter Studies – Effects Animals and Plants

Cows	<b>Der Praktische</b>	<b>Extraordinary</b>	<a href="http://www.teslabel.be/001/documents/Conspicuous%20b">http://www.teslabel.be/001/documents/Conspicuous%20b</a>
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	<p><b>Tierarz 79:437-444, 1998.</b> (Article in German)</p>	<p><b>behavior disorders in cows in proximity to transmission stations</b></p> <p><b>Loscher W, Kas G</b></p>	<p><a href="#">ehavioural%20abnormalities%20in%20a%20dairy%20cow%20herd.pdf</a></p> <p><u>In addition to reduction of milk yield and increased health problems, behavioral abnormalities were observed over a period of two years in a herd of dairy cows maintained in close proximity to a TV and cell phone transmitting antenna. . . . An experiment in which a cow with abnormal behavior was brought to a stable 20 km away from the antenna resulted in a complete normalization of the cow within five days, whereas symptoms returned when the cow was brought back to the stable nearby the antenna. In view of the previous described effects of electromagnetic fields, it might be possible that the observed abnormalities in cows are related to electromagnetic field exposure. (power densities measured 0.02-7 mW/m2).</u></p>
Frogs	<p><b><u>Electromagn Biol Med.</u> 29(1-2):31-35, 2010</b></p>	<p><b>Mobile Phone Mast Effects on Common Frog (Rana temporaria) Tadpoles: The City Turned into a Laboratory.</b></p> <p><b>Balmori A.</b></p>	<p><a href="https://www.ncbi.nlm.nih.gov/pubmed/20560769">https://www.ncbi.nlm.nih.gov/pubmed/20560769</a></p> <p>These results indicate that radiation emitted by phone masts in a real situation may affect the development and may cause an increase in mortality of exposed tadpoles. This research may have huge implications for the natural world, which is now exposed to high microwave radiation levels from a multitude of phone masts.</p>