

Over 200 Independent Science Studies on the Effects of Microwave Radiation Radio Frequencies (RF) on Human Health

Exposure to wireless radiation is a proven health hazard. Microwave Radiation Radio Frequencies (RF) and Electro Magnetic Frequencies (EMF) put everyone's health, privacy, security and safety at risk. Following are a few of many of the thousands of scientific studies conducted by independent researchers from around the world concerning the biological effects of RF radiation. Below are some of the most recent:

- I. Effects on Fetal and Newborn Development
- II. Effects on Young Children
- III. Brain Tumors
- IV. Parotid Gland Tumors
- V. Other Malignancies
- VI. Effects on DNA
- VII. Neurological/Cognitive Effects
- VIII. Effects on Male Fertility
- IX. Electromagnetic Sensitivity
- X. Effects on Implanted Medical Devices
- XI. Continued Increase in Ever More Exposures, including 5G Effects
- XII Other Important Articles

I. Effects On Fetal And Newborn Development

- 1 [Mother's Exposure to Electromagnetic Fields Before and During Pregnancy is Associated with Risk of Speech Problems in Offspring.](#) Zarei, S., et al. Journal of Biomedical Physics and Engineering 9(1):61-68 (2019).
- 2 [Prenatal Exposure to Extremely Low Frequency Magnetic Field and Its Impact on Fetal Growth.](#) Ren, Y., et al. Environmental Health (2019).
- 3 [The Effects of Radio Frequency Radiation on Mice Fetus Weight, Length and Tissues.](#) Alimohammadi, I., et al. Data in Brief 19:2189-2194 (2018).
- 4 [Effects of Prenatal Exposure to WiFi Signal \(2.45 GHz\) on Postnatal Development and Behavior in Rat: Influence of Maternal Restraint.](#) Othman, H., et al. Behavioral Brain Research 326: 291-301 (2017).
- 5 [Exposure to Magnetic Field Non-Ionizing Radiation and the Risk of Miscarriage: A prospective Cohort Study.](#) Li, De-Kun, et al. Scientific Reports (2017).
- 6 [Postnatal Development and Behavior Effects of In-Utero Exposure of Rats to Radiofrequency Waves Emitted From Conventional WiFi Devices.](#) Othman, H., et al. Environmental Toxicology and Pharmacology 52:239-247 (2017).
- 7 [Lasting Hepatotoxic Effects of Prenatal Mobile Phone Exposure.](#) Yilmaz, A., et al. The Journal of Maternal-Fetal & Neonatal Medicine 30(11): 1355-1359 (2017).
- 8 [Multiple Assessment Methods of Prenatal Exposure to Radio Frequency Radiation from Telecommunication in the Mothers and Children's Environmental Health](#)

- (MOCEH) Study. Choi, Ha, et al. International Journal of Occupational Medicine and Environmental Health 29(6):959-972 (2016).
- 9 [The Use of Signal-Transduction and Metabolic Pathways to Predict Human Disease Targets from Electric and Magnetic Fields Using in vitro Data in Human Cell Lines.](#) Parham, Portier, et al. Frontiers in Public Health (2016).
 - 10 [A Review on Electromagnetic Fields \(EMFs\) and the Reproductive System.](#) Asghari, Khaki, et al. Electronic Physician 8(7):2655-2662 (2016).
 - 11 [Genotoxicity Induced by Foetal and Infant Exposure to Magnetic Fields and Modulation of Ionising Radiation Effects.](#) Udroui, Antoccia, et al. PLoS One (2015).
 - 12 [Oxidative Stress of Brain and Liver is Increased by Wi-Fi \(2.45 GHz\) Exposure of Rats During Pregnancy and the Development of Newborns.](#) Çelik, Ömer, et al. Journal of Chemical Neuroanatomy 75(B):134-139 (2015).
 - 13 [Neurodegenerative Changes and Apoptosis Induced by Intrauterine and Extrauterine Exposure of Radiofrequency Radiation.](#) Güler, Göknur, et al. Journal of Chemical Neuroanatomy 75(B):128-133 (2015).
 - 14 [Maternal Exposure to a Continuous 900-MHz Electromagnetic Field Provokes Neuronal Loss and Pathological Changes in Cerebellum of 32-Day-Old Female Rat Offspring.](#) Odaci, Ersan, et al. Journal of Chemical Neuroanatomy 75(B):105-110 (2015).
 - 15 [Different Periods of Intrauterine Exposure to Electromagnetic Field: Influence on Female Rats' Fertility, Prenatal and Postnatal Development.](#) Alchalabi, Aklilu, et al. Asian Pacific Journal of Reproduction 5(1):14-23 (2015).
 - 16 [Use of Mobile Phone During Pregnancy and the Risk of Spontaneous Abortion.](#) Mahmoudabadi, Ziaei, et al. Journal of Environmental Health Science and Engineering 13:34 (2015).
 - 17 [Oxidative Mechanisms of Biological Activity of Low-Intensity Radiofrequency Radiation.](#) Yakymenko, et al. Electromagnetic Biology and Medicine 34(3):1-16 (2015).
 - 18 [Effects of Prenatal 900 MHz Electromagnetic Field Exposures on the Histology of Rat Kidney.](#) Ulubay, et al. International Journal of Radiation Biology 91(1):35-41 (2015).
 - 19 [The Effect of Exposure of Rats During Prenatal Period to Radiation Spreading from Mobile Phones on Renal Development.](#) Bedir, et al. Renal Failure 37(2):305-9 (2014).
 - 20 [Dosimetric Study of Fetal Exposure to Uniform Magnetic Fields at 50 Hz.](#) Liorni, et al. Bioelectromagnetics 35(8):580-97 (2014).
 - 21 [Influence of Pregnancy Stage and Fetus Position on the Whole-Body and Local Exposure of the Fetus to RF-EMF.](#) Varsier, et al. Physics in Medicine and Biology 59(17):4913-26 (2014).
 - 22 [Autism-Relevant Social Abnormalities in Mice Exposed Perinatally to Extremely Low Frequency Electromagnetic Fields.](#) Alsaeed, et al. International Journal of Developmental Neuroscience 37:58-6 (2014).
 - 23 [Pyramidal Cell Loss in the Cornu Ammonis of 32-day-old Female Rats Following Exposure to a 900 Megahertz Electromagnetic Field During Prenatal Days 13–21.](#) Bas, et al. NeuroQuantology Volume 11, Issue 4: 591-599 (2013).

- 24 [The Effects of 900 Megahertz Electromagnetic Field Applied in the Prenatal Period on Spinal Cord Morphology and Motor Behavior in Female Rat Pups.](#) Odaci, et al. NeuroQuantology Volume 11, Issue 4: 573-581 (2013).
- 25 [Fetal Radiofrequency Radiation Exposure From 800-1900 MHz-Rated Cellular Telephones Affects Neurodevelopment and Behavior in Mice.](#) Aldad, Gan, et al. Scientific Reports 2(312) (2013).
- 26 [Cranial and Postcranial Skeletal Variations Induced in Mouse Embryos by Mobile Phone Radiation.](#) Fragopoulou, Koussoulakos, et al. Pathophysiology 17(3):169-77 (2010).
- 27 [Dysbindin Modulates Prefrontal Cortical Glutamatergic Circuits and Working Memory Function in Mice.](#) Jentsch, et al Neuropsychopharmacology 34, 2601–8 (2009).
- 28 [Stress Signalling Pathways that Impair Prefrontal Cortex Structure and Function.](#) Arnsten, A. F. National Review of Neuroscience 10, 410–22 (2009).
- 29 [Maternal Occupational Exposure to Extremely Low Frequency Magnetic Fields and the Risk of Brain Cancer in the Offspring.](#) Li, McLaughlin, et al. Cancer Causes & Control 20(6):945-55 (2009).
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- 31 [Prenatal and Postnatal Exposure to Cell Phone Use and Behavioral Problems in Children.](#) Divan, Kheifets, et al. Epidemiology 19(4):523-29 (2008).
- 32 [Effects of Prenatal Exposure to a 900 MHz Electromagnetic Field on the Dentate Gyrus of Rats: A Stereological and Histopathological Study.](#) Odaci, et al. Brain Research 1238: 224–229 (2008).
- 33 [Exposure to Cell Phone Radiation Up-Regulates Apoptosis Genes in Primary Cultures of Neurons and Astrocytes.](#) Zhao, et al. Science Digest 412: 34–38 (2007).
- 34 [Cell Death Induced by GSM 900-MHz and DCS 1800-MHz Mobile Telephony Radiation.](#) Panagopoulos, et al. Mutation Research 626, 69–78 (2006).
- 35 [Ultra High Frequency-Electromagnetic Field Irradiation During Pregnancy Leads to an Increase in Erythrocytes Micronuclei Incidence in Rat Offspring.](#) Ferreira, Knakievicz, et al. Life Sciences 80(1):43-50 (2006).
- 36 [Attention-Deficit Hyperactivity Disorder.](#) Biederman, J. & Faraone, S. V. Lancet 366, 237–248 (2005).
- 37 [Attention-Deficit/Hyperactivity Disorder: An Overview of the Etiology and a Review of the Literature Relating to the Correlates and Lifecourse Outcomes for Men and Women.](#) Brassett-Harknett, A. & Butler, N. Clinical Psychology Review 27,188–210 (2005).

II. Effects On Young Children

- 1 [Electromagnetic Fields, Pulsed Radiofrequency Radiation, and Epigenetics: How Wireless Technologies May Affect Childhood Development.](#) Sage, C. & Burgio, E. Child Development (2017).
- 2 [Prospective Cohort Analysis of Cellphone Use and Emotional and Behavioural Difficulties in Children.](#) Sudan, M, et al. Journal of Epidemiology and Community Health (2016).
- 3 [Why Children Absorb More Microwave Radiation than Adults: The Consequences.](#) Morgan, Kesari, et al. Journal of Microscopy and Ultrastructure 2(4):196-204 (2014).
- 4 [Epidemiological Characteristics of Mobile Phone Ownership and Use in Korean Children and Adolescents.](#) Byun, Yoon-Hwan, et al. Environmental Health and Toxicology 28 (2013).
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- 10 [The Sensitivity of Children to Electromagnetic Fields.](#) Repacholi, et al. Deventer. Journal of Pediatrics 116(2):303-313 (2005).

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III. Brain Tumors (Note - cell phone studies included due to the claim that the RF meters are safer than cell phones.)

- 1 [Simulation of The Incidence of Malignant Brain Tumors in Birth Cohorts That Started Using Mobile Phones When They First Became Popular in Japan.](#) Sato, Y., Kojimahara, N., and Yamaguchi, N. Bioelectromagnetics 40(3): 143-149 (2019).
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- 9 [Use of Mobile Phones and Cordless Phones is Associated with Increased Risk for Glioma and Acoustic Neuroma.](#) Hardell, Carberg, et al. PathoPhysiology 20(2): 85-110 (2013).
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- 14 [Estimating the Risk of Brain Tumors from Cell Phone Use: Published Case-Control Studies.](#) Morgan, LL. Pathophysiology 16(2-3):137-147 (2009).
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- 18 [Mobile Phone Use and the Risk of Acoustic Neuroma.](#) Lonn, Ahlbom, et al. Epidemiology 15(6):653-659 (2004).

IV. Parotid Gland Tumors (Note - cell phone studies included due to the claim that the RF meters are safer than cell phones.)

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- 2 [Does Cell Phone Use Increase the Chances of Parotid Gland Tumor Development? A Systematic Review and Meta-Analysis](#). De Siqueira, de Souza, et al. Journal of Oral Pathology and Medicine 45(11) (2016).
- 3 [Pooled Analysis of Case-Control Studies on Acoustic Neuroma Diagnosed 1997-2003 and 2007- 2009 and Use of Mobile and Cordless Phones](#). Hardell, Carlberg, et al. International Journal of Oncology 43(4):1036-144 (2015).
- 4 [Using the Hill Viewpoints from 1965 for Evaluating Strengths of Evidence of the Risk for Brain Tumors Associated with use of Mobile and Cordless Phones](#). Hardell and Carlberg. Reviews on Environmental Health 28(2-3):97-106 (2013).
- 5 [Case-Control study of the Use of Mobile and Cordless Phones and the Risk for Malignant Melanoma in the Head and Neck Region](#). Hardell, Carlberg, et al. Pathophysiology 18(4):325-333 (2011).
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- 8 [Mobile Phone, Cordless Phones and the Risk for Brain Tumours](#). Hardell and Carlberg. International Journal of Oncology 35(1):5-17 (2009).
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V. Other Malignancies

- 1 [The Carcinogenic Potential of Non-Ionizing Radiations: The Cases of S-50 Hz MF and 1.8 GHz GSM Radiofrequency Radiation](#). Soffritti, M. and Giuliani, L. Basic & Clinical Pharmacology & Toxicology (2019).
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- 5 [Epidemiological Evidence for an Association Between Use of Wireless Phones and Tumor Diseases](#). Hardell, Carlberg, et al. PathoPhysiology 16(2-3):113-122 (2009).

- 6 [Study on Potential Effects of "902 MHz GSM-type Wireless Communication Signals" on DMBA-Induced Mammary Tumours in Sprague-Dawley Rats.](#) Hruby, Neubauer, et al. Mutation Research 649(1-2):34-44 (2008).

VI. Effects On DNA

- 1 [Microwaves from Mobile Phones Inhibit 53BP1 Focus Formation in Human Stem Cells More Strongly Than in Differentiated Cells: Possible Mechanistic Link to Cancer Risk.](#) Markova, Malmgren, et al. Environmental Health Perspectives 118(3): 394-399 (2010).
- 2 [Radiofrequency Radiation and Gene/Protein Expression: A Review.](#) McNamee and Chauhan. Radiation Research 172(3):265-287 (2009).
- 3 [Evaluation of HSP70 Expression and DNA Damage in Cells of a Human Trophoblast Cell Line Exposed to 1.8GHz Amplitude-Modulated Radiofrequency Fields.](#) Valbonesi, Franzellotto, et al. Radiation Research 169(3):270-279 (2008).
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VII. Neurological/Cognitive Effects

- 1 [Early-Life Exposure to Pulsed LTE Radiofrequency Fields Causes Persistent Changes in Activity and Behavior in C57BL/6 J Mice.](#) Broom, K., et al. Bio Electro Magnetism 40(7):498-511 (2019).
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VIII. Effects On Male Fertility

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IX. Electromagnetic Sensitivity

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XI. Continued Increase in Ever More Exposures, including 5G Effects

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Conclusion

The notion that exposure to radio-frequency microwave radiation (RF) is not harmful to humans, which has been the underlying principle of all federal legislation and regulations regarding wireless technologies for more than twenty years, has more than been proven false.

- The substantial body of credible science documenting harm from exposure to various levels and frequencies of wireless radiation mandate a precautionary approach to the widespread deployment of wireless technologies to reduce potential harm to the public and the environment. (See Additional References #1 below.)
- While some studies on wireless radiation exposure found no effects, hundreds of studies did find biological effects occurring at levels at or below current U.S. standards. This has prompted more than 240 scientists with published peer-reviewed research on wireless radiation and health to sign an appeal to the World Health Organization and the United Nations, calling for precautionary health warnings and stronger regulation of wireless radiation. (See Additional References #2 below.)
- As the wireless industry ramps up for the next generation of wireless communication, hundreds of thousands of new cellular antennas will be deployed on the ground and in the air, resulting in an increase in the complexity of EMR frequencies, pulsations and density which have not been shown safe for humans. Respected researchers have given us a

much better foundation from which we can extrapolate that this increased EMR exposure is an undeniable risk to our health and the environment. (See Additional References #3 below.)

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Companies selling “smart” tech products claim that their wireless devices meet all Federal Communications Commission (FCC) exposure limits, and while that may be true, the guidelines themselves are almost 25 years out of date and were never designed to protect children. In 2013, the American Academy of Pediatrics (AAP) sent a formal letter to the FCC complaining that its wireless radiation exposure limits do not account for the unique physiological vulnerabilities of children, nor do they reflect current use patterns of wireless devices.