

Scientific studies concerning the biological effects of RF radiation.

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There are more than 1,000 scientific studies conducted by independent researchers from around the world concerning the biological effects of RF radiation. Here we present some of the most recent. <https://www.telecompowergrab.org/science.html>

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. 5G Effects XII. Miscellaneous Articles

I. Effects On Fetal And Newborn Development

1. [“Exposure to Magnetic Field Non-Ionizing Radiation and the Risk of Miscarriage: A prospective Cohort Study.”](#) Li, De-Kun, et al. Scientific Reports(2017).
2. [“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).
3. [“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).
4. [“A Review on Electromagnetic Fields \(EMFs\) and the Reproductive System.”](#) Asghari, Khaki, et al. Electronic Physician 8(7):2655-2662 (2016).
5. [“Genotoxicity Induced by Foetal and Infant Exposure to Magnetic Fields and Modulation of Ionising Radiation](#)

- [Effects.](#) Udroi, Antoccia, et al. PLoS One (2015).
6. ["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).
 7. ["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).
 8. ["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).
 9. ["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).
 10. ["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).
 11. ["Oxidative Mechanisms of Biological Activity of Low-Intensity Radiofrequency Radiation."](#) Yakymenko, et al. Electromagnetic Biology and Medicine 34(3):1-16 (2015).
 12. ["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).
 13. ["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).
 14. ["Dosimetric Study of Fetal Exposure to Uniform Magnetic Fields at 50 Hz."](#) Liorni, et al. Bioelectromagnetics 35(8):580-97 (2014).

15. ["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).
16. ["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).
17. ["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).
18. ["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).
19. ["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).
20. ["Cranial and Postcranial Skeletal Variations Induced in Mouse Embryos by Mobile Phone Radiation."](#) Fragopoulou, Koussoulakos, et al. *Pathophysiology* 17(3):169-77 (2010).
21. ["Dysbindin Modulates Prefrontal Cortical Glutamatergic Circuits and Working Memory Function in Mice."](#) Jentsch, et al. *Neuropsychopharmacology* 34, 2601–8 (2009).
22. ["Stress Signalling Pathways that Impair Prefrontal Cortex Structure and Function."](#) Arnsten, A. F. *National Review of Neuroscience* 10, 410–22 (2009).
23. ["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).
24. ["Reproductive and Developmental Effects of EMF in Vertebrate Animal Models."](#) Pourslis, A.F. *Pathophysiology*

- 16(2-3):179-89 (2009).
25. [“Prenatal and Postnatal Exposure to Cell Phone Use and Behavioral Problems in Children.”](#) Divan, Kheifets, et al. *Epidemiology* 19(4):523-29 (2008).
 26. [“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).
 27. [“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).
 28. [“Cell Death Induced by GSM 900-MHz and DCS 1800-MHz Mobile Telephony Radiation.”](#) Panagopoulos, et al. *Mutation Research* 626, 69–78 (2006).
 29. [“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).
 30. [“Attention-Deficit Hyperactivity Disorder.”](#) Biederman, J. & Faraone, S. V. *Lancet* 366, 237–248 (2005).
 31. [“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).
5. ["A Prospective Study of In-Utero Exposure to Magnetic Fields and the Risk of Childhood Obesity."](#) Li, De-Kun, et al. Scientific Reports 2.540 (2012).
6. ["Exposure to Extremely Low-Frequency Magnetic Fields and the Risk of Childhood Cancer: Update of the Epidemiological evidence."](#) Schüz and Joachim. Progress in Biophysics and Molecular Biology 107(3):339-42 (2011).
7. ["Cell Phone Use and Behavioural Problems in Young Children."](#) Divan, Kheifets, et al. Journal of Epidemiol Community Health 66(6):524-9 (2010).
8. ["Mobile Phones, Radiofrequency Fields, and Health Effects in Children-Epidemiological Studies."](#) Feychting, Maria. Progress in Biophysics and Molecular Biology 107(3):343-348 (2010).
9. [Exposure to Radio-Frequency Electromagnetic Fields and Behavioral Problems in Bavarian Children and Adolescents."](#) Thomas, Silke, et al. European Journal of Epidemiology 25(2):135-41 (2009).
10. ["The Sensitivity of Children to Electromagnetic Fields."](#) Repacholi, et al. Deventer. Journal of Pediatrics 116(2):303-313 (2005).

III. Brain Tumors

1. ["Report of Final Results Regarding Brain and Heart Tumors in Sprague-Dawley Rats Exposed From Prenatal Life Unitl Natural Death to Mobile Phone Radiofrequency Field Representative of a 1.8 GHz GSM Base Station Environmental Emission."](#) Falcioni, L, et al. Environmental Research(2018).
2. ["The 2100 MHz Radiofrequency Radiation of a 3G-Mobile](#)

- [Phone and the DNA Oxidative Damage in Brain.](#) Sahin, Ozgur, et al. Journal of Chemical Neuroanatomy 75(B):94-98 (2016).
3. ["Mobile Phone and Cordless Phone Use and the Risk for Glioma – Analysis of Pooled Case- Control Studies in Sweden 1997-2003 and 2007-2009."](#) Hardell and Carlberg. PathoPhysiology 22(1):1-13 (2015).
 4. ["Mobile Phone Radiation Causes Brain Tumors and Should Be Classified as a Probable Human Carcinogen."](#) Morgan, Miller, et al. International Journal of Oncology 46:1865-1871 (2015).
 5. ["Mobile Phone Use and Brain Tumours in the CERENAT Case-Control Study."](#) Coureau, Bouvier, et al. Occupational & Environmental Medicine 71(7):514-22 (2014).
 6. ["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).
 7. ["Mobile Phones and Head Tumours: A Critical Analysis of Case-Control Epidemiological Studies."](#) Levis, Minicuci, et al. Open Environmental Sciences 6(1):1-12 (2012).
 8. ["On the Association Between Glioma, Wireless Phones, Heredity and Ionising Radiation."](#) Carlberg and Hardell. PathoPhysiology19(4):243-252 (2012).
 9. ["Mobile Phones and Head Tumours. The Discrepancies in Cause-Effect Relationships in the Epidemiological Studies – How Do They Arise?"](#) Levis, Minicuci, et al. Environmental Health 10:59 (2011).
 10. ["Indications of Possible Brain Tumour Risk in Mobile-Phone Studies: Should We Be Concerned?"](#) Cardis and Sadetzki. Occupational & Environmental Medicine 68:169-171 (2011).
 11. ["Estimating the Risk of Brain Tumors from Cell Phone Use: Published Case-Control Studies."](#) Morgan, LL. Pathophysiology 16(2-3):137-147 (2009).
 12. ["Cell Phones and Brain Tumors: A Review Including the Long-Term Epidemiologic Data."](#) Khurana, Teo, et al.

Surgical Neurology 72(3):205-14 (2009).

13. ["Epidemiological Evidence for an Association Between Use of Wireless Phones and Tumor Diseases."](#) Hardell, Carlberg, et al. Pathophysiology 16(2-3):113-122 (2009).
14. ["Histopathological Examinations of Rat Brains After Long-Term Exposure to GSM Mobile Phone Radiation."](#) Grafström, Gustav, et al. Brain Research Bulletin 77(5):257-63 (2008).
15. ["Mobile Phone Use and the Risk of Acoustic Neuroma."](#) Lonn, Ahlbom, et al. Epidemiology 15(6):653-659 (2004).

IV. Parotid Gland Tumors

1. ["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).
2. ["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).
3. ["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).
4. ["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).
5. ["Correlation Between Cellular Phone Use and Epithelial Parotid Gland Malignancies."](#) Duan, Zhang, et al. Clinical Paper Head and Oncology 40(9):966-7 (2011).
6. ["Mobile Phones Use and Risk of Tumors: A Meta-Analysis."](#) Mynf, Ju, et al. Journal of Clinical Oncology 27(33):5565-72 (2009).
7. ["Mobile Phone, Cordless Phones and the Risk for Brain Tumours."](#) Hardell and Carlberg. International Journal of

Oncology 35(1):5-17 (2009).

8. ["Public Health Implications of Wireless Technologies."](#) Sage and Carpenter. PathoPhysiology 16(2-3):233-46 (2009).
9. ["Epidemiological Evidence for an Association Between use of Wireless Phones and Tumor Diseases."](#) Hardell, Carlberg, et al. PathoPhysiology 16(2-3):113-122 (2009).
10. ["Cell Phone Use and Risk of Benign and Malignant Parotid Gland Tumors – A Nationwide Case- Control Study."](#) Sadetzki, Chetrit, et al. American Journal of Epidemiology 167(4):457-467 (2008).

V. Other Malignancies

1. ["Tumor Promotion by Exposure to Radiofrequency Electromagnetic Fields Below Exposure Limits for Humans."](#) Lerchl, Klose, et al. Biochemical and Biophysical Research Communications 459(4):585-590 (2015).
2. ["Swedish Review Strengthen Grounds for Concluding that Radiation from Cellular and Cordless Phones is a Probable Human Carcinogen."](#) Davis, Kesari, et al. Pathophysiology 20(2):123-129 (2013).
3. ["Multifocal Breast Cancer in Young Women with Prolonged Contact Between Their Breasts and Their Cellular Phones."](#) West, Kapoor, et al. Case Reports in Medicine (2013).
4. ["Epidemiological Evidence for an Association Between Use of Wireless Phones and Tumor Diseases."](#) Hardell, Carlberg, et al. PathoPhysiology 16(2-3):113-122 (2009).
5. ["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).
 4. ["Gene and Protein Expression Following Exposure to Radiofrequency Fields from Mobile Phones."](#) Vanderstraeten and Verschaeve. Environmental Health Perspectives 116(9):1131-5 (2008).
 5. ["Nonthermal Effects of RadioFrequency-Field Exposure on Calcium Dynamics in Stem Cell-derived Neuronal Cells: Elucidation of Calcium Pathways."](#) Rao, Titushkin, et al. Radiation Research 169(3):319-329 (2008).
 6. ["Gene Expression Changes in the Skin of Rats Induced by Prolonged 35 GHz Millimeter-Wave Exposure."](#) Millenbaugh, Roth, et al. Radiation Research 169(3):288-300 (2008).
 7. ["DNA Damage in Molt-4 T-lymphoblastoid Cells Exposed to Cellular Telephone Radiofrequency Fields in Vitro."](#) Philips, Ivaschuk, et al. Bioelectrochemistry and Bioenergetics 45(1):103-110 (1998).

VII. Neurological/Cognitive Effects

1. ["A Prospective Cohort Study of Adolescents' Memory Performance and Individual Brain Dose of Microwave Radiation from Wireless Communication."](#) Foerster, M., et al. Environmental Health Perspectives 126(7) (2018).
2. ["Electromagnetic Radiation 2450 MHz Exposure Causes Cognition Deficit with Mitochondrial Dysfunction and Activation of Intrinsic Pathway of Apoptosis in Rats."](#) Gupta, S.K., Mesharam, M.K., and Krishnamurthy, S. Journal of Biosciences 43(2) 263-276 (2018).

3. ["The Effect of Wi-Fi Electromagnetic Waves in Unimodal and Multimodal Object Recognition Tasks in Male Rats."](#) Hassanshahi, A., et al. Neurological Sciences 38(6):1069-1076 (2017).
4. ["Effects of Short and Long Term Electromagnetic Fields Exposure on the Human Hippocampus."](#) Deniz, O.G., et al. Journal of Microscopy and Ultrastructure 5(4):191-197 (2017).
5. ["Effects of Long Term Exposure of 900-1800 MHz Radiation Emitted from 2G Mobile Phone on Mice Hippocampus – A Histomorphometric Study."](#) Mugunthan, Shanmugasamy, et al. Journal of Clinical and Diagnostic Research 10(8):AF01-6 (2016).
6. ["Effect of Mobile Phone Radiation on Pentylene-tetrazole-Induced Seizure Threshold in Mice."](#) Kouchaki, Motaghedifard, et al. Iranian Journal of Basic Medical Sciences 19(7):800-3 (2016).
7. ["Effects of 3 Hz and 60Hz Extremely Low Frequency Electromagnetic Fields on Anxiety-Like Behaviors, Memory Retention of Passive Avoidance and ElectroPhysiological Properties of Male Rats."](#) Rostami, Shahani, et al. J Lasers Medical Science 7(2):120-125 (2016).
8. ["Short-Term Memory in Mice is Affected by Mobile Phone Radiation."](#) Ntzouni, Stamatakis, et al. PathoPhysiology 18(3):193-199 (2011).
9. ["Use of Mobile Phones and Changes in Cognitive Function in Adolescents."](#) Thomas, Benke, et al. Occupational Environmental Medicine 67(12):861-866 (2010).
10. ["Increased Blood-Brain Barrier Permeability in Mammalian Brain 7 Days After Exposure to the Radiation from a GSM-900 Mobile Phone."](#) Nittby, Brun, et al. PathoPhysiology 16(2-3):103-112 (2009).
11. ["Effects of GSM 1800 MHz on Dendritic Development of Cultured Hippocampal Neurons."](#) Ning, Xu, et al. Acta Pharmacol Sin28(12):1873-1880 (2007).
12. ["Neurological Effects of Radiofrequency Electromagnetic Radiation."](#) Lai, Henry. Advances in Electromagnetic

Fields in Living Systems1:27-80 (1994).

VIII. Effects On Male Fertility

1. ["Aloe Arborescens Juice Prevents EMF-Induced Oxidative Stress and Thus Protects from Pathophysiology in the Male Reproductive System In Vitro."](#) Solek, P., Majchrowics, L., and Koziorowski, M. Environmental Research 166:141-149 (2018).
2. ["The Effects of Radiofrequency Electromagnetic Radiation on Sperm Function."](#) Houston, Nixon, et al. Reproduction (2016)
3. ["Male Fertility and its Association with Occupational and Mobile Phone Tower Hazards: An Analytical Study."](#) Al-Quzwini, Al-Tae, et al. Middle East Fertility Society Journal (2016).
4. ["Sperm DNA Damage – The Effect of Stress and Everyday Life Factors."](#) Radwan, M, et al. International Journal of Impotence Research 28, 148-154 (2016).
5. ["Electromagnetic Radiation at 900 MHz Induces Sperm Apoptosis through bcl-2, bax and caspase-3 Signaling Pathways in Rats."](#) Liu, Si, et al. Journal of Reproductive Health 12:65 (2015).
6. ["Habits of Cell Phone usage and Sperm Quality – Does It Warrant Attention?"](#) Zilverlight, Wiener-Megnazi, et al. Reproductive BioMedicine Online 31(3):421-426 (2015).
7. ["Extremely Low frequency Magnetic Fields Induce Spermatogenic Germ Cell Apoptosis: Possible Mechanism."](#) Lee, Park, et al. BioMed Research International (2014).
8. ["In Vitro Effect of Cell Phone Radiation on Motility, DNA Fragmentation and Clusterin Gene Expression in Human Sperm."](#) Zalata, El-Samanoudy, et al. International Journal of Fertility and Sterility 9(1):129-136 (2014).
9. ["Effect of Electromagnetic Field Exposure on the Reproductive System."](#) Gye and Park. Journal of Clinical and Experimental Reproductive Medicine 39(1):1-19 (2012).
10. ["Effects of the Exposure of Mobile Phones on Male](#)

[Reproduction: A Review of the Literature.](#)" Vignera, Condorelli, et al. Journal of Andrology 33(3):350-356 (2012).

11. ["Mobile Phone Radiation Induces Reactive Oxygen Species Production and DNA Damage in Human Spermatozoa In Vitro."](#) Luliis, Newey, et al. PLoS ONE 4(7) (2009).
12. ["Exposure to Magnetic fields and the Risk of Poor Sperm Quality."](#) Li, Yan, et al. Journal of Reproductive Toxicology 29(1):86-92 (2009).
13. ["Radio Frequency Electromagnetic Radiation \(Rf-EMR\) from GSM Mobile Phones Induces Oxidative Stress and Reduces Sperm Motility in Rats."](#) Mailankot, Kunnath, et al. Clinical Science 64(6):561-5 (2009).
14. ["Cell Phones: Modern Man's Nemesis?"](#) Makker, Varghese, et al. Reproductive BioMedicine Online 18(1):148-157 (2008).
15. ["Indicative SAR Levels Due to an Active Mobile Phone in a Front Trouser Pocket in Proximity to Common Metallic Objects."](#)Whittow, Panagamuwa, et al. Propagation Conference 149-152 (2008).
16. ["Cell Phones and Male Infertility: Dissecting the Relationship."](#) Deepinder, Makker, et al. Reproductive BioMedicine Online 15(3):266-270 (2007).
17. ["Evaluation of the Effect of Using Mobile Phones on Male Fertility."](#) Wdowiak, Wiktor, et al. Annals of Agricultural and Medicine14(1):169-172 (2007).
18. ["Effect of Cell Phone Usage on Semen Analysis in Men Attending Infertility Clinic: An Observational Study."](#) Agarwal, Deepinder, et al. American Society for Reproductive Medicine 89(1):124-8 (2008).

IX. Electromagnetic Sensitivity

1. ["Functional Brain MRI in Patients Complaining of Electrohypersensitivity After Long Term Exposure to Electromagnetic Fields."](#) Heuser, G. & Heuser, S. Reviews on Environmental Health 32(3):291-299 (2016).
2. ["Hot Nano Spots" as an Interpretation of So-Called Non-](#)

- [Thermal Biological Mobile Phone Effects.](#) Pfutzner, Helmut. Journal of Electromagnetic Analysis and Applications 8(3):62-69 (2016).
3. ["Analysis of the Genotoxic Effects of Mobile Phone Radiation Using Buccal Micronucleus Assay: A Comparative Evaluation."](#) Banerjee, Singh, et al. Journal of Clinical and Diagnostic Research 10 (3):ZC82-ZC85 (2016).
 4. ["Tinnitus and Cell Phones: The Role of Electromagnetic Radiofrequency Radiation."](#) Medeiros and Sanchez. Brazilian Journal of Otorhinolaryngology 82(1):97-104 (2016).
 5. ["Microwave Frequency Electromagnetic Fields \(EMFs\) Produce Widespread Neuropsychiatric Effects Including Depression."](#) Pall, Martin L. Journal of Chemical Neuroanatomy (2015).
 6. ["Subjective Symptoms Related to GSM Radiation from Mobile Phone Base Stations: a Cross- Sectional Study."](#) Gomez-Perretta, Navarro, et al. BMJ Open 3.12 (2013).
 7. ["Green Communication- A Stipulation to Reduce Electromagnetic Hypersensitivity from Cellular Phones."](#) Kumar, Khan, et al. Procedia Technology 4:682-686 (2012).
 8. ["Electromagnetic Hypersensitivity: Fact or Fiction?"](#) Genius and Lipp. Science of the Total Environment 414(1):103-112 (2012).
 9. ["Neurobehavioral Effects Among Inhabitants Around Mobile Phone Base Stations."](#) Abdel-Rassoul, El-Fateh, et al. NeuroToxicology 28(2):434-440 (2007).
 10. ["Establishing the Health Risks of Exposure to Radiofrequency Fields Requires Multidisciplinary Research."](#) Hietanen, Maila. Scandinavian Journal of Work, the Environment, and Health 32(3):169-170 (2006).
 11. ["Hypersensitivity of Human Subjects to Environmental Electric and Magnetic Field Exposure: A Review of the Literature."](#) Levallois, Patrick. Environmental Health Perspectives 110(4):613-8 (2002).
 12. ["Electric Hypersensitivity and Neurophysical Effects of](#)

[Cellular Phones – Facts or Needless Anxiety?](#) Harma, Mikko Ilmari. Scandinavian Journal of Work, the Environment and Health 26(2):85-86 (2000).

X. Effects On Implanted Medical Devices

1. [“Ad Hoc Electromagnetic Compatibility Testing of Non-Implantable Medical Devices and Radio Frequency Identification.”](#) Seidman and Guag. Biomedical Engineering OnLine 12:71 (2013).
2. [“Electromagnetic Interference of Pacemakers.”](#) Lakshmanadoss, Chinnachamy, et al. Interchopen 229-252 (2011).
3. [“Interference Between Mobile Phones and Pacemakers: A Look Inside.”](#) Censi, Calcagnini, et al. Annali dell’Istituto superiore di sanità 43(3):254-259 (2007).
4. [“Electromagnetic Interference on Pacemakers.”](#) Erdogan, Okan. Indian Pacing and Electrophysiology Journal 2(3):74-78 (2002).
5. [“Electromagnetic Interference in Patients with Implanted Cardioverter-Defibrillators and Implantable Loop Recorders.”](#) Sousa, Klein, et al. Indian Pacing and Electrophysiology Journal 2(3):79-84 (2002).
6. [“Radiofrequency Interference with Medical Devices. A Technical Information Statement.”](#) IEEE Committee on Man and Radiation, Institute of Electrical and Electronics Engineers 17(3):111-4 (1998).
7. [“Cellular Telephones and Pacemakers: Urgent Call or Wrong Number?”](#) Ellenbogen and Wood. Journal of the American College of Cardiology 27(6):1478-9 (1996).

XI. 5G Effects

1. [“5G Wireless Telecommunications Expansion: Public Health and Environmental Implications.”](#) Russell, C.L. Environmental Research 165:484-495 (2018).
2. [“The Human Skin As A Sub-THz Receiver – Does 5G Pose a Danger To It or Not?”](#) Betzalel, N., Ishai, P.B., and Feldman, Y. Environmental Research 163:208-216 (2018).

3. [“The Modeling of the Absorbance of Sun-THz Radiation by Human Skin.”](#) Betzalel, N., Feldman, Y., and Ishai, P.B. IEEE Transactions on Terahertz Science and Technology 7(5):521-528 (2017).

XII. Miscellaneous Articles

1. [“Non-Ionizing EMF Hazard in the 21st Century.”](#) Koh, W.J., and Moochhala, S.M. IEEE (2018).
2. [“Thermal and Non-Thermal Health Effects of Low Intensity Non-Ionizing Radiation: An International Perspective.”](#) Belpomme, D., et al. Environmental Pollution 242(A):643-658 (2018).
3. [“Comparison of Radiofrequency Electromagnetic Field Exposure Levels in Different Everyday Microenvironments in an International Context.”](#) Sagar, S, et al. Environmental International 114:297-306 (2018).
4. [“Radiation from Wireless Technology Elevates Blood Glucose and Body Temperature in 40-Year-Old Type 1 Diabetic Male.”](#) Kleiber, C. Electromagnetic Biology and Medicine 36:3 259-264 (2017).
5. [“Cardiovascular Disease: Time to Identify Emerging Environmental Risk Factors.”](#) Bandara, P. & Weller, S. European Journal of Preventative Cardiology (2017).
6. [“An Investigation of the Effect of Extremely Low Frequency Pulsed Electromagnetic Fields on Human Electrocardiograms \(ECGs\).”](#) Fang, Mahmoud, et al. International Journal of Environmental Research and Public Health 13(11) (2016).
7. [“Effects of Exposure to 2100MHz GSM-like Radiofrequency Electromagnetic Field on Auditory System of Rats.”](#) Celiker, Ozgur, et al. Brazilian Journal of Otorhinolaryngology (2016).
8. [“Evaluation of the Protective Role of Vitamin C on the Metabolic and Enzymatic Activities of the Liver in the Male Rats After Exposure to 2.45 GHz of Wi-Fi Routers.”](#) Shekoohi-Shooli, F., et al. Journal of Biomedical Physics and Engineering 6(3):157-164 (2016).

9. ["Exposure of ELF-EMF and RF-EMF Increase the Rate of Glucose Transport and TCA Cycle in Budding Yeast."](#) Lin, Yan, et al. *Frontiers in Microbiology* (2016).
10. ["Awareness Campaign Against Cell Phone Radiation Hazard: Case Study Oman."](#) Osmen and Saar. *Procedia – Social and Behavioral Sciences* 205(9):381-385 (2015).
11. ["Electromagnetic Energy Radiated from Mobile Phone Alters Electrocardiographic Records of Patients with Ischemic Heart Disease."](#) Alhusseiny, Al-Nimer, et al. *Annals of Medical and Health Science Research* 2(2):146-151 (2012).
12. ["Effects of Radiofrequency Radiation on Human Ferritin: An in vitro Enzymun Assay."](#) Fattahi-asl, Baradaran-Ghahfarokhi, et al. *Journal of Medical Signals and Sensors* 2(4):235-240 (2012).
13. ["Apoptosis is Induced by Radiofrequency Fields through the Caspase-Independent Mitochondrial Pathway in Cortical Neurons."](#)Joubert, Bourthoumieu, et al. *Radiation Research* 169(1):38-45 (2008).
14. ["Source of Funding and Results of Studies of Health Effects of Mobile Phone Use: Systematic Review of Experimental Studies."](#)Huss, Egger, et al. *Environmental Health Perspectives* 115(1):1-4 (2007).
15. ["Epidemiology of Health Effects of Radiofrequency Exposure."](#) Ahlbom, Green, et al. *Environmental Health Perspectives* 112(17):1741-1753 (2004).
16. ["The Possible Role of Radiofrequency Radiation in the Development of Uveal Melanoma"](#) Stang, Anastassiou, et al. *Journal of Epidemiology* 12(1):7-12 (2001).
17. ["Biological Effects of Amplitude-Modulated Radiofrequency Radiation."](#) Juutilainen and Seze. *Scandinavian Journal of Work, the Environment and Health* 24(2):245-254 (1998).

ELECTROMAGNETIC RADIATION SPECTRUM

