

➤ [Environ Res.](#) 2020 Jul;186:109445. doi: 10.1016/j.envres.2020.109445. Epub 2020 Mar 30.

Electromagnetic hypersensitivity (EHS, microwave syndrome) – Review of mechanisms

Yael Stein ¹, Iris G Udasin ²

Affiliations + expand

PMID: 32289567 DOI: [10.1016/j.envres.2020.109445](#) 

 **Electromagnetic hypersensitivity:** biological effects of dirty electricity with emphasis on diabetes and multiple sclerosis.

Cite

Havas M.

Electromagn Biol Med. 2006;25(4):259-68. doi: 10.1080/15368370601044192.

PMID: 17178585 Review.

It flows along wires and radiates from them and involves both extremely low frequency **electromagnetic** fields and radio frequency **radiation**. Until recently, dirty electricity has been largely ignored by the scientific community. ...Several disorders, including asthma ...

Review

➤ [Rev Environ Health.](#) 2015;30(4):209-15. doi: 10.1515/reveh-2015-0012.

Electromagnetic hypersensitivity--an increasing challenge to the medical profession

Lena Hedendahl, Michael Carlberg, Lennart Hardell

PMID: 26372109 DOI: [10.1515/reveh-2015-0012](#) 

Review

➤ [Sci Total Environ.](#) 2012 Jan 1;414:103-12. doi: 10.1016/j.scitotenv.2011.11.008.

Epub 2011 Dec 5.

Electromagnetic hypersensitivity: fact or fiction?

Stephen J Genuis ¹, Christopher T Lipp

Affiliations + expand

PMID: 22153604 DOI: [10.1016/j.scitotenv.2011.11.008](#) 

[Review](#) > [Rev Environ Health](#). 2022 Mar 2;38(2):219-228. doi: 10.1515/reveh-2021-0169.

Print 2023 Jun 27.

Electromagnetic hypersensitivity close to mobile phone base stations – a case study in Stockholm, Sweden

Lennart Hardell ¹, Tarmo Koppel ²

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PMID: 35238501 DOI: [10.1515/reveh-2021-0169](https://doi.org/10.1515/reveh-2021-0169) [↗](#)

Free article

Electromagnetic fields act via activation of voltage-gated calcium channels to produce beneficial or adverse effects.

Pall ML.

J Cell Mol Med. 2013 Jun 26;17(8):958-65. doi: 10.1111/jcmm.12088.

PMCID: PMC3780531

[Central Causation of Autism/ASDs via Excessive \$\[Ca^{2+}\]_i\$ Impacting Six Mechanisms Controlling Synaptogenesis during the Perinatal Period: The Role of Electromagnetic Fields and Chemicals and the NO/ONOO\(-\) Cycle, as Well as Specific Mutations.](#)

Pall ML.

Brain Sci. 2024 Apr 30;14(5):454. doi: 10.3390/brainsci14050454.

PMCID: PMC11119459

[Low Intensity Electromagnetic Fields Act via Voltage-Gated Calcium Channel \(VGCC\) Activation to Cause Very Early Onset Alzheimer's Disease: 18 Distinct Types of Evidence.](#)

Pall ML.

Curr Alzheimer Res. 2022;19(2):119-132. doi: 10.2174/1567205019666220202114510.

PMCID: PMC9189734

[The Critical Importance of Molecular Biomarkers and Imaging in the Study of Electrohypersensitivity. A Scientific Consensus International Report.](#)

Belpomme D, Carlo GL, Irigaray P, Carpenter DO, Hardell L, Kundi M, Belyaev I, Havas M, Adlkofer F, Heuser G, Miller AB, Caccamo D, De Luca C, von Klitzing L, Pall ML, Bandara P, Stein Y, Sage C, Soffritti M, Davis D, Moskowitz JM, Mortazavi SMJ, Herbert MR, Moshhammer H, Ledoigt G, Turner R, Tweedale A, Muñoz-Calero P, Udasin I, Koppel T, Burgio E, Vorst AV.

Int J Mol Sci. 2021 Jul 7;22(14):7321. doi: 10.3390/ijms22147321.

PMCID: PMC8304862

[Is Open-angle Glaucoma Caused by the NO/ONOO\(-\) Cycle Acting at Two Locations in the Eye?](#)

Pall ML.

Med Hypothesis Discov Innov Ophthalmol. 2014 Spring;3(1):1-2.

PMCID: PMC4010916

> [J Cutan Pathol.](#) 2001 Nov;28(10):513-9. doi: 10.1034/j.1600-0560.2001.281004.x.

Cutaneous mast cells are altered in normal healthy volunteers sitting in front of ordinary TVs/PCs-- results from open-field provocation experiments

[O Johansson](#) ¹, [S Gangi](#), [Y Liang](#), [K Yoshimura](#), [C Jing](#), [P Y Liu](#)

Affiliations + expand

PMID: 11737520 DOI: [10.1034/j.1600-0560.2001.281004.x](https://doi.org/10.1034/j.1600-0560.2001.281004.x) [x](#)

A theoretical model based upon mast cells and histamine to explain the recently proclaimed sensitivity to electric and/or magnetic fields in humans.

Gangi S, Johansson O.

Med Hypotheses. 2000 Apr;54(4):663-71. doi: 10.1054/mehy.1999.0923.

PMID: 10859662

Photohardening of polymorphic light eruption patients decreases baseline epidermal Langerhans cell density while increasing mast cell numbers in the papillary dermis.

Wolf P, Gruber-Wackernagel A, Bambach I, Schmidbauer U, Mayer G, Absenger M, Fröhlich E, Byrne SN.

Exp Dermatol. 2014 Jun;23(6):428-30. doi: 10.1111/exd.12427.

PMID: 24758562

Skin changes in "screen dermatitis" versus classical UV- and ionizing irradiation-related damage--similarities and differences.

Gangi S, Johansson O.

Exp Dermatol. 1997 Dec;6(6):283-91. doi: 10.1111/j.1600-0625.1997.tb00174.x.

PMID: 9412815 Review.

> [Int J Radiat Biol.](#) 2018 Sep;94(9):850-857. doi: 10.1080/09553002.2018.1490039. Epub 2018 Aug 10.

Radiofrequency radiation emitted from Wi-Fi (2.4 GHz) causes impaired insulin secretion and increased oxidative stress in rat pancreatic islets

Ali Masoumi ¹, Narges Karbalaei ^{1 2}, S M J Mortazavi ³, Mohammad Shabani ⁴

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PMID: 29913098 DOI: [10.1080/09553002.2018.1490039](#) [↗](#)

Review

> [Biomed Pharmacother.](#) 2008 Feb;62(2):104-9. doi: 10.1016/j.biopha.2007.12.004.

Epub 2007 Dec 31.

Biological effects from electromagnetic field exposure and public exposure standards

Lennart Hardell ¹, Cindy Sage

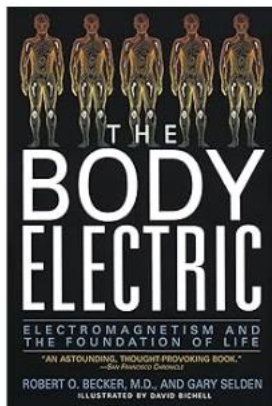
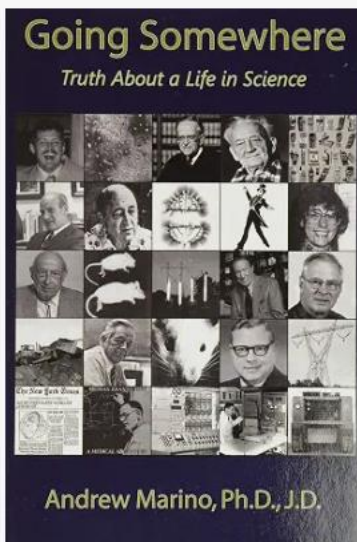
Affiliations + expand

PMID: 18242044 DOI: [10.1016/j.biopha.2007.12.004](#) [↗](#)



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