

RFI response on 10-20-26 Dan Harrison

refers to Requirements document: <https://www.regulations.gov/document/HHS-OASH-2026-0397-0001>

This RFI response is based on peer-reviewed research and Engineering knowledge,

Executive Summary

It's well known, to EMF Engineers, that Near-field radiation can bring very intense radiation within inches to human organs (i.e. Brain, auditory channel, Eye, etc.) primarily because being within particular frequency wavelengths and close proximity antennas can concentrate radiated energy to organ structures.

In 4-7-2023, Dr. Lai published a paper: Henry Lai* and B. Blake Levitt, Cellular and molecular effects of non-ionizing electromagnetic fields, Environ Health 2024; 39(3): 519–529 { <https://doi.org/10.1515/reveh-2023-0023> } .

This paper integrates much knowledge gained over several decades in bio-electromagnetic research and points to a likely unifying mechanism which explains both the many adverse and beneficial effects seen with exposure to man-made EMFs. Dr. Lai paper cites many other studies over +44 years

Most of the RFI responses (below) reference Dr. Lai paper, which I Dan Harrison felt it necessary to submit this relevant RFI to HHS {HHS–OASH–2026–0397}.

Response to RFI Topics

refers to Requirements document: <https://www.regulations.gov/document/HHS-OASH-2026-0397-0001>

which cites peer-reviewed research,

Instructions:

1] describe perspective(s) - former medical equipment Engineer; I've always had a keen interest in Man-Machine Symbiosis and particular a Research Scientist Prof. Henry Lai, who has contributed greatly to issues of environmental EMF and their effect on Humans. Responses to Questions are written referring to footnotes from document paper: Henry Lai* and B. Blake Levitt, Cellular and molecular effects of non-ionizing electromagnetic fields, Environ Health 2024; 39(3): 519–529 { <https://doi.org/10.1515/reveh-2023-0023> }

Questions Public Experiences and Reported Potential Adverse Health Effects

2] I am a former medical equipment Engineer who gained knowledge of EMF radiation characteristics in the course of RF/EMF {Radiated & Conducted} testing from 1972(~4

months) and medical device qualification from 1980 - 2006. I worked in the Medical device field for 38 years and am still involved with the IEEE since 1972 and hosted IEEE-EMBS in Seattle for 7 years for fellow engineers. I don't know of anyone harmed by RFI/EMF, my perspective is from my familiarity of EMF radiation characteristics in the course of RF/EMF testing

3a) I had been involved with RF/EMF testing of medical equipment per MS-461, FCC, IEC, FDA...etc. std.

3c) ..adverse health effects? none; equipment testing only.

3g) [4] Sun G, Li J, Zhou W, Hoyle RG, Zhao Y. Electromagnetic interactions in regulations of cell behaviors and morphogenesis. *Front Cell Dev Biol* 2022;10:1014030.

4] Ref. 5] BioInitiative Report, a Rationale for a Biologically-based Public Exposure Standard for Electromagnetic Fields (ELF and RF), Sage C, Carpenter DO, editors; 2012. Report updated: 2014-2022. Available from: www.bioinitiative.org [Accessed 1 Jul 2023].

Exposure Standards and Risk Assessment

5n) RF/EMF test standards { MS-461, FCC, IEC 60601,...etc. std. } provide a carefully controlled environment for test repeatability to assess potentials affects at Cellular level ([6] Apoptosis, Cryptochromes[7], Lipid[20],), test Animals and Human Injury/Death [i.e. Cancer, damaged DNA [13], Cognitive disorder, etc.] where attributed to RF/EMF harm.

5o) Cancer improvements: [27] Prasad S, Gupta SC, Tyagi AK. Reactive oxygen species (ROS) and cancer: role of antioxidative nutraceuticals. *Cancer Lett* 2017;387: 95–105.

[28] Fanelli C, Coppola S, Barone R, Colussi C, Gualandi G, Volpe P, et al. Magnetic elds increase cell survival by inhibiting apoptosis via modulation of Ca²⁺ in ux. *FASEB J* 1999;13:95–102.

5p) Exposure-related characteristics; [6] Barati M, Darvishi B, Javidi MA, Mohammadian A, Shariatpanahi SP, Eisavand MR, et al. Cellular stress response to extremely low-frequency electromagnetic fields (ELF-EMF): an explanation for controversial effects of ELF-EMF on apoptosis. *Cell Prolif* 2021;54:e13154.

[7] Sherrard RM, Morellini N, Jourdan N, El-Esawi M, Arthaut L-D, Niessner C, et al. Low-intensity electromagnetic elds induce human cryptochrome to modulate intracellular reactive oxygen species. *PLoS Biol* 2018;16:e2006229.

[13] Al-Serori H, Ferk F, Kundi M, Bileck A, Gerner C, Mišík M, et al. Mobile phone speci c electromagnetic elds induce transient DNA damage and nucleotide excision repair in serum-deprived human glioblastoma cells. *PLoS One* 2018;13:e0193677.

[20] Lai H. Exposure to static and extremely-low frequency electromagnetic elds and cellular free radicals. *Electromagn Biol Med* 2019;38:231–48.

5p) SAR effect? Guy AW (1971a): Analysis of electromagnetic fields induced in

biological tissues by thermographic studies on equivalent phantom models. IEEE Trans Microwave Theory Tech 19(2): 205–214.

6) Scientific evidence exists about potential adverse health effects? [21] Tofani S. Magnetic fields and apoptosis: a possible mechanism. Electromagn Biol Med 2022;41:293–303; Magnetic fields and apoptosis: a possible mechanism. Electromagn Biol Med 2022;41:293–303;

Martinelli , I, Cinato, M, Keita S. Cardiac Cell Exposure to Electromagnetic Fields- Focus on Oxidative Stress and Apoptosis, <https://www.mdpi.com/2227-9059/10/5/929>; & Supplement 5 { <https://www.degruyterbrill.com/document/doi/10.1515/reveh-2023-0023/html#supplementaryMaterials> .

Glioma appearance-[26] Carlberg M, Hardell L. Evaluation of mobile phone and cordless phone use and glioma risk using the Bradford Hill viewpoints from 1965 on association or causation. BioMed Res Int 2017;2017:9218486.

Measuring Human Exposure and Public Health Surveillance

7] scientific methods? Existing RF/EMF test standards could provide a general test set-up framework, but eventual goal would be to duplicate real-world EMF Human exposure conditions.

8] improvements in exposure assessment methodologies are needed? [1] Lai H, Levitt BB. The roles of intensity, exposure duration, and modulation on the biological effects of radio-frequency radiation and exposure guidelines. Electromagn Biol Med 2022;41:230–55. and See 5o) {above} for Cancer therapy. and

9] “ It is essential to better investigate the interactions among the different parameters of EMF exposure, such as frequency, intensity, exposure duration, and modulation, to prevent harmful effects and achieve beneficial effects, e.g., bone and wound repair, cancer treatment, and reversal/retardation of neurodegenerative diseases [1]. It is especially important to recognize more subtle effects at cellular levels in exposure standards setting– something that is not happening today.” [1] Lai H. Exposure to static and extremely-low frequency electromagnetic fields and cellular free radicals. Electromagn Biol Med 2022; 41: 230-55.

10] data sources or surveillance systems?

10 f) review of adverse events? FDA Adverse Event Reporting System (FAERS)

database

10 g) illness clusters? epidemiological studies

11] sensitive populations- population subgroups exist and should be considered.

Existing Evidence

12] Does evidence exist regarding potential adverse health effects associated with RF radiation? “Human-made EMF can disturb the homeostasis of free radicals leading to dysfunctions such as the ‘cellular stress response’... It is essential to better investigate the interactions among the different parameters of EMF exposure, such as frequency, intensity, exposure duration, and modulation, to prevent harmful effects...

For decades, the argument that “there is no known mechanism” has been used to paralyze changes in public health policy by denying any reported biological effects of EMF below certain thresholds...practically speaking, funding to replicate experiments is generally not available. (Replication experiments, in fact, are rare in scientific research, and in EMF research most replication experiments are industry-funded{opposition research}.)

Logically, perfect understanding of mechanisms is not required to accept the reality of observed effects....”

The paper by Dr. Lai & Levitt presents much knowledge gained over many decades that Human-made EMF can disturb Homeostasis in Humans: Henry Lai* and B. Blake Levitt, Cellular and molecular effects of non-ionizing electromagnetic fields, Environ Health 2023; 39(3): 519–529 { <https://doi.org/10.1515/reveh-2023-0023> } .

13] technologies ? 13 a, b, f, j] cellphones & wearable/medical devices can present intense EMF fields to organ structures.

14] scientific evidence of EMF harm? see: Henry Lai* and B. Blake Levitt, Cellular and molecular effects of non-ionizing electromagnetic fields, Environ Health 2023; 39(3): 519–529 { <https://doi.org/10.1515/reveh-2023-0023> } .

reference publications

15] types of scientific evidence- a{proximity},b{cumulative},c{ant. density},

15b) antenna density - Near-field emitted radiation of electronic devices {i.e. Cellphones} must be considered on different sized Human organs {i.e. Cochlea, Eyes, Hippocampus, etc.} for the organs are sized to 1/2 & 1/4 wavelengths of emitted frequencies.

Research Priorities

16] highest priority research gaps? Cause of Cancers, Neurodegenerative disease, hypothalamic-pituitary-adrenal stress, etc.

17] agencies coordination- FDA, NIH, CDC, NIST, DoW should be involved

Additional Information

18] additional scientific evidence? see: Henry Lai* and B. Blake Levitt, Cellular and molecular effects of non-ionizing electromagnetic fields, Environ Health 2023; 39(3): 519–529 { <https://doi.org/10.1515/reveh-2023-0023> } .

This completes my submission of RFI Docket HHS–OASH– 2026–0397.