

ELECTROMAGNETIC FIELDS, MICROBIAL BIOELECTROMAGNETICS & HUMAN HEALTH

Public comment to the U.S. Department of Health and Human Services | Docket HHS-OASH-2026-0397 | October 2026

Subject: Microbial responses to electromagnetic exposure, fungal physiology, host-microbiome interactions & environmental health

Executive statement

I submit this comment to draw attention to a scientifically documented but insufficiently integrated dimension of electromagnetic-field health assessment: electromagnetic exposures can modify measurable microbial functions under defined experimental conditions. Human health assessment must account for the possibility that environmental fields interact not only with host tissues but also with microbial communities and fungal organisms in the environment and in association with humans.

The relevant question is not confined to whether electromagnetic radiation directly injures human cells. It includes whether field-dependent changes in microbial growth, gene regulation, calcium signaling, enzyme secretion, and ecological interactions influence host exposure and biological responses. These processes are experimentally testable and deserve a distinct place in federal evidence review.

Published experimental evidence

A 2022 experimental study in *Journal of Fungi* reported that exposure of *Aspergillus oryzae* to a 2 GHz radiofrequency field under specified laboratory conditions increased extracellular alpha-amylase activity and total secreted protein, with reported changes in gene expression and intracellular calcium. The study demonstrates a measurable fungal physiological response under its tested conditions; it does not establish that ordinary wireless exposure increases pathogenicity or mycotoxin production in humans. [1]

A systematic review published in *Bioelectromagnetics* evaluated experiments on *Escherichia coli* and identified reported changes in growth, morphology and gene expression under some extremely low-frequency and radiofrequency exposures. Its authors also highlighted limitations in study number and comparability, especially for RF exposures. These findings support treating microorganisms as a specific research target rather than presuming uniform effects across exposure settings. [2]

A 2023 review in *Current Opinion in Food Science* examined electromagnetic radiation, filamentous fungi and mycotoxins in food decontamination research. It documents the relevance of electromagnetic modalities to fungal systems while emphasizing dependence on radiation type, intensity, organism and experimental context. Ionizing, ultraviolet, microwave and RF findings must not be treated as interchangeable. [3]

Host-microbe implications

Microorganisms participate in host metabolism, immune regulation, barrier function and biochemical signaling. Consequently, microbial responses to environmental exposures warrant evaluation alongside

direct host-cell endpoints. A coherent research model would examine field exposure, microbial functional changes, metabolite profiles, host inflammatory responses and clinical outcomes in sequence. Evidence for an individual step does not alone establish the entire causal pathway.

Environmental and firsthand observations

My independent investigation has involved documented indoor fungal contamination, sustained environmental observations and personal symptom patterns during changes in environmental conditions. I request that firsthand observations be considered as observational evidence that can guide controlled investigation, rather than being excluded because they were not generated within an institutional laboratory. Exposure settings, dates, instruments, methods, symptom timelines and alternative environmental factors should be reported in a supporting appendix when available.

Requested federal research priorities

1. Conduct replicated, temperature-controlled studies of RF and low-frequency field effects on bacteria and medically relevant fungi, reporting frequency, modulation, field strength, exposure geometry and dosimetry.
2. Quantify fungal enzyme secretion, calcium signaling, growth, sporulation, biofilm properties and secondary metabolites, including specific mycotoxins, using validated analytical methods.
3. Investigate interactions between water-damaged indoor environments, fungal exposures, microbial ecology and realistic electromagnetic exposure conditions without conflating their independent effects.
4. Study host-microbe co-culture systems and longitudinal human cohorts with objective exposure characterization, microbiome profiling, inflammatory markers and clinical endpoints.
5. Publish both positive and null findings and explicitly distinguish laboratory responses from demonstrated health effects at everyday exposure levels.

Conclusion

Electromagnetic-field health research should explicitly incorporate microbial bioelectromagnetics and mycology. The scientific record already contains experimental demonstrations that electromagnetic exposures can alter specific microbial functions under particular conditions. Federal review should assess these findings directly, identify their exposure boundaries and test whether any observed microbial changes translate into meaningful human-health outcomes.

Selected references

- [1] "Enhancement of Fungal Enzyme Production by Radio-Frequency Electromagnetic Fields." *Journal of Fungi* 8(11), 1187 (2022). DOI: 10.3390/jof8111187. <https://pubmed.ncbi.nlm.nih.gov/36354954/>
- [2] Askaripour K, Zak A. "A systematic review on cellular responses of *Escherichia coli* to nonthermal electromagnetic irradiation." *Bioelectromagnetics* 45(1):16-29 (2024). DOI: 10.1002/bem.22484. <https://pubmed.ncbi.nlm.nih.gov/37807247/>

[3] "Electromagnetic radiations and their effect on filamentous fungi and mycotoxins: recent advances and perspectives." *Current Opinion in Food Science* 52, 101073 (2023). DOI: 10.1016/j.cofs.2023.101073. <https://doi.org/10.1016/j.cofs.2023.101073>

[4] U.S. Department of Health and Human Services. Request for Information on Electromagnetic Fields (EMFs), Radiofrequency (RF) Radiation, and Wireless Radiation Exposure. *Federal Register* 91 FR 59792 (September 21, 2026). Docket HHS-OASH-2026-0397.

Note: This document is a research-grounded public comment. Detailed firsthand exposure logs, measurements and the additional physician-authored study discussed previously can be incorporated as supplemental evidence once their exact records are confirmed.

A handwritten signature in black ink, appearing to read "Shy Or". The signature is fluid and cursive, with the first part resembling "Shy" and the second part resembling "Or".