

COMMENT

I am submitting this comment in response to HHS's Request for Information on Electromagnetic Fields, Radio Frequency (RF) Radiation, and Wireless Radiation Exposure.

I am responding from the perspective of a concerned member of the public.

I will be providing a high-level summary of the biological effects of exposure to non-thermal microwave electromagnetic frequencies (EMFs) from 5G/4G microwave towers (or facilities). These radiation effects are also caused by cellphones, WIFI, Bluetooth devices, remote telephones, and SMART meters, which I will not cover here.

Following is a list of biological effects excerpted from a document authored by Dr. Martin L. Pall, PhD, Professor Emeritus of Biochemistry and Basic Medical Sciences at Washington State University. The document is called 5G Risk: The Scientific Perspective and is included as an attachment. Dr. Pall is recognized as a world-renowned expert in the biological effects of low-intensity radiation. I strongly suggest that you read the complete well-researched and referenced document written by Dr. Pall.

The cell phone companies have only provided data regarding thermal effects of cell phone radiation in studies that were designed poorly to placate the FCC and public into believing that these microwave electromagnetic frequencies are safe. However, there is a plethora of "independent" scientific studies that identify eight pathophysiological effects caused by non-thermal microwave EMF exposures. The paper by Dr. Pall includes 12 to 35 study reviews on each specific effect. The cell phone companies and FCC have ignored these independent studies, many times discrediting the scientists and damaging their reputations.

These EMFs:

1. Attack our nervous systems including our brains leading to widespread neurological/neuropsychiatric effects; for example, sleep disturbances/insomnia, fatigue/tiredness, headaches, depression/depressive symptoms, lack of concentration and attention/cognitive dysfunction, dizziness/vertigo, memory changes, and restlessness/tension/anxiety/stress/agitation, and irritability.
2. Attack our endocrine (that is hormonal) systems leading to some abnormal increased and decreased hormone levels.
3. Produce oxidative stress and free radical damage that have central roles in essentially all chronic diseases.

4. Attack the DNA of our cells, producing single strand and double strand breaks in cellular DNA and oxidized bases in our cellular DNA. These in turn produce cancer and also mutations in germ line cells which cause mutations in future generations.
5. Produce elevated levels of apoptosis (programmed cell death), that cause both neurodegenerative diseases and infertility.
6. Lower male and female fertility, sex hormones, and libido, increase spontaneous abortions, and induce attacks on sperm cell DNA.
7. Produce excessive intracellular calcium $[Ca^{2+}]_i$ and calcium signaling. This causes the cells to dysfunction and even die.
8. Attack the cells of our bodies to cause cancer. Such attacks are thought to act via 15 different mechanisms.

There is also a substantial literature showing that electricity-magnetic EMFs also cause other consequences including life threatening cardiac effects. There is also substantial proof suggesting that EMFs trigger very early onset Alzheimer's, digital, and other dementias. Finally, there is evidence that EMF exposures in utero and shortly after birth can cause ADHD and autism in the newborn.

These various biological effects are very concerning. However, they become even more concerning when one considers that several of these effects are both "cumulative" and eventually "irreversible" such as in the areas of the neurological/neuropsychiatric effects, reproduction, mutational DNA outcomes, cardiac changes, some of the hormonal effects, and causation of ADHD and autism.

Because of the known deleterious biological effects of exposure to non-thermal microwave EMFs, I would strongly recommend that HHS take an active role in examining the potential health and environmental effects of wireless radiation. Questions about human health should be addressed by federal agencies with appropriate expertise in medicine, biology, epidemiology, and public health, and the experiences of individuals and families who report being affected should be considered alongside the scientific evidence.

I urge HHS to carefully evaluate these experiences and the scientific evidence, identify gaps in current research, give particular attention to children and other potentially vulnerable populations, and establish appropriate federal research priorities regarding wireless radiation and public health.

Thank you for providing individuals and families with an opportunity to be heard.