

7 August, 2007

Message from William Bruno to the National Academy of Sciences  
Committee on Identification of Research Needs Relating to Potential Biological or Adverse Health  
Effects of Wireless Communications Devices.

Personal background:

William J. Bruno received his Ph.D. in physics from U.C. Berkeley. He has worked in theoretical biology & biophysics at Los Alamos National Laboratory since 1990. His research has resulted in scientific papers on enzyme dynamics, ion channel kinetics, experimental design, molecular evolution, and genome analysis.

He has found that removing sources of electromagnetic fields from his environment has greatly helped improve his neurological symptoms, which have included catastrophic tinnitus, severe insomnia, fatigue and headaches. He reports that some stimuli, including cell phone base stations and in some cases dimmer switches, result in nearly immediate tinnitus, while other stimuli, such as electric pumps, result in symptoms that appear several hours later. He notes that in the sound of the tinnitus often correlates with the nature of the exposure.

Personal Comment addressed to NAS Panel for Project: NRSB-O-06-02-A:

As a theoretical biophysicist, of course I am in favor of further research on the interactions of living things with electromagnetic fields.

Indeed, there should have been a call for more research back in 1962, when Allan Frey showed that weak pulsed radar signals could cause the phenomenon of "microwave hearing" in humans.

Another good time for more research would have been after the 1977 Senate hearings on the adequacy of U.S. safety standards for microwaves and radiowaves, at which research showing effects of extremely low-power microwaves on human EEG were presented.

Likewise in 1987, when Ross Adey showed that weak 60 Hz electric fields could affect mammalian cell cultures, there should have been a huge increase in research.

Research in the U.S. was instead, for the most part, scaled back. Chilling research findings are cropping up from around the world, notably in Germany, Austria, Sweden and Spain. Russia did its research decades ago and has exposure limits 1000 times stricter than here.

I was at a community gathering recently where an elderly woman stood up to say that since the installation of a Wi-Fi network throughout her city, her life has become "a living hell". A year ago I would have thought she was exaggerating, but now that I have begun to suffer from electrical sensitivity myself, I know exactly what she meant. Being exhausted but unable to sleep. An incessant, metallic ringing blaring inside the head, loud enough to be heard over the sound of normal conversation. Those are just the most obvious symptoms.

It simply breaks my heart now when I see teenagers with their cell phone against their head. When I see kids playing and families setting up picnics just a couple hundred feet from a cell tower (often a disguised "stealth" tower). When I see houses with upper story windows directly in the beam of four roof-mounted microwave transmitters. I know that over time these people will get much more radiation than what it took to sensitize me and nearly incapacitate me. I dread that many of them will get the diseases Dr. Carlo mentioned, and never know why.

The time at which calling for more research would have been sufficient has long past. The science has been in the literature for decades, and much of it has been reproduced in multiple laboratories.

Obviously there are many scientists, especially in the military and in industry, whose jobs are at risk if microwave exposure limits to humans are drastically cut back. These people sometimes write review articles dismissing negative research without any scientific basis for doing so. This "paycheck bias" is very powerful and has been documented [Huss et al, 2007]. I am hopeful that these scientists will all find work in infrared communications.

There have been many public health disasters that have taken away many innocent lives: lead exposure, non-medical X-ray exposure, asbestos exposure, cigarette smoke exposure, trans-fat exposure. It seems quite plausible that microwave exposure will dwarf all of these in its consequences both for public health and economic damage. In the face of that, what we need is not action five years from now, but a strong public warning now, with immediate guidance on reducing exposure.

I am told by Cindy Sage of the BioInitiative group that their science based recommendations for exposure limits will be published by the end of this month. Their extensive study of the literature should be considered very seriously for endorsement by the National Academy.

Having said that more research is less important than actual remediation of existing widespread exposures, I will also list some possible research priorities. One priority should be replacement technologies, such as infrared communication, which is already anticipated to replace Wi-Fi. Another should be establishment of a background EMF refuges, for both humans and wildlife, that can be used as controls for experiments. This would help in experiments on electrical sensitivity, which has been difficult to nail down in a laboratory setting. There are many open questions in terms of mechanism that should be investigated, but the time horizon before such information can be used to help find solutions is a problem. The main exception I see here is any research that might give insight into the relative biological effects of different wireless protocols (i.e, higher burst frequencies, as well as higher carrier frequencies, or analog versus digital), because changing protocols is a lot simpler than switching to infrared.

I hope you are able to make the country and the world understand the gravity of our current situation, and the urgency with which action must be taken.

Sincerely,

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