

Electromagnetic Radiation Health

Fact Sheet



In a time of drastic change it is the learners who inherit the future. The learned usually find themselves equipped to live in a world that no longer exists. – Eric Hoffer

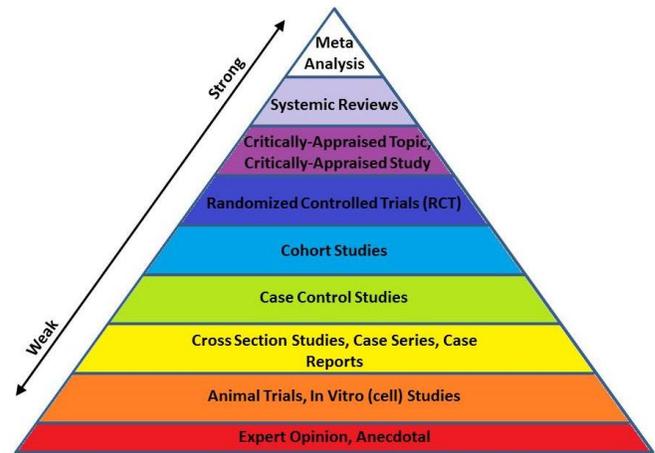


Building Biology Institute
The science of healthy buildings

Electromagnetic Radiation: Health Fact Sheet

This is the second module of the prerequisite and fundamental course on electromagnetic radiation (EMR). This course discusses known biological effects caused by EMR as well as suspected ones. Additionally, official guidelines and exposure limits and how they compare with the ones established by Building Biology are discussed.

Various types of electromagnetic radiation sustain life on earth. In nature the quantity and quality of the many different electromagnetic energies surrounding us and flowing through us follow a very distinct pattern. It all starts with the sun. Though the sun gives off energy throughout the entire electromagnetic spectrum, only certain types penetrate the protective layers of the earth's atmosphere.



Hierarchy of Evidence

We can see with our eyes that visible light enters and we can feel on our skin that heat (infrared radiation) is also allowed in—both frequencies are essential to life. Most ionizing radiation, however, beginning at the upper end of the ultraviolet (UV) radiation, is fortunately absorbed through the ozone layer protecting life on earth from its damaging effects. There is another protective shield, the ionosphere, which absorbs most of the non-ionizing radiation at the lower end of the electromagnetic spectrum. This is a large radio window (wavelengths run from about one centimeter to about eleven-meter waves.), allowing whispers from the farthest corners of our galaxy (pulsars, quasars) to reach us.

Underneath these atmospheric covers, the earth itself also gives off various types of electromagnetic energies. Wrapped in the fold of its own magnetic field, the earth keeps a more or less steady rhythm so essential to the pulse of life.

In the course of evolution, all living organisms have adapted themselves to this very unique radiation climate prevalent on planet Earth. This natural balance is being threatened now because over the last 100 years humans have been very busy adding their own versions of electromagnetic energies without giving due consideration to the biological implications.

“Our exposure to these fields is about 10 to the 10th times (10¹⁰) what we were exposed to in earlier human evolution. A huge increase in exposure—10,000 million times now—keeps going up as new devices get introduced. To do this without any sense of the dangers makes no sense to me.” – Dr. Martin Pall

It is the mission of the Building Biology to educate, encourage and empower interested individuals and organizations in how to create and sustain healthy living and work spaces in harmony with nature. The detailed knowledge of our electromagnetic realities and the conscious awareness of the electromagnetic interactions between cosmos, earth and living organisms will encourage the student to make responsible use of the vast electromagnetic resource for the benefit of all.

This course provides a context for discussing health effects of EMR. It begins by explaining the various sciences involved in research and conclusions found to date. We include how research is rated according to



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the hierarchy of evidence. There is an overview of plausible mechanisms underlying the development of disease; induced current, voltage gated calcium channels (VGCC), melatonin, and DNA damage. Once the

basic context is provided, each category of EMR (direct current and alternating current magnetic and electric fields, high-frequency radiation, radioactivity, and terrestrial radiation) has a section describing specific studies and observations regarding impacts on biology. The course is wrapped up with an overview of guidelines and exposure limits established by various global and national agencies and why they differ from Building Biology standards based on the precautionary principle.