

**INFLUENCE OF ELECTROMAGNETIC FIELDS (EMF) ON CELLS
AND HUMAN ORGANS AND METHODS OF PROTECTION AGAINST
THEIR HARMFUL EFFECTS**

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***Annotation:** Nature has presented mankind with clean, transparent air, reservoirs and a natural electromagnetic background emitted by both planets, stars, and flora and fauna.*

***Keywords:** nature, transparent, planets, atmospheric.*

Introduction. The use of electromagnetic energy in a wide variety of areas of human activity has led to the addition of artificial electric and magnetic fields to the existing electric and magnetic fields of the Earth, atmospheric electricity and radio emissions from the Sun and the Galaxy. Currently, more and more attention is paid to the problems of the negative impact of electromagnetic fields and radio emissions on humans. Electric and magnetic fields are a special form of the existence of matter, characterized by a combination of electrical and magnetic properties. Electromagnetic fields surround us everywhere, but we cannot feel them and generally notice them, therefore we do not see the radiation of the police radar and the fields induced by the antenna of the television tower or power lines, they use of electromagnetic energy in a wide variety of areas of human activity has led to the fact that the existing electric and magnetic fields of the Earth, atmospheric electricity and radio emissions from the Sun and the Galaxy were supplemented by electric and magnetic fields of artificial origin. However, with the development of civilization, the natural electromagnetic background was enhanced by man-made impacts. With the help of electrical, radio-technical and radio-electronic devices, man has created an invisible electromagnetic web, in which we all find ourselves. Powerful high and ultra-high voltage power lines, generators of electromagnetic radiation, cellular

communications, ambulance radios, air traffic and police, numerous radio and TV transmitting stations, satellite communication space stations and others cause electromagnetic pollution of the human environment. Exposure to EMF occurs at home, at work, and even during outdoor recreation. Household appliances designed to make our life easier, the walls of houses and apartments, pierced with electric wires, spread EMFs that are not harmless to human health (1, 2).

The Biological Effect of EMF. The data of both domestic and foreign researchers indicate a high biological activity of EMF in all frequency ranges. High frequency EMFs lead to heating of body tissues. Numerous studies in the field of the biological effect of EMF have identified the most sensitive systems of the body: nervous, immune, endocrine and reproductive.

The biological effect of EMF under conditions of long-term exposure accumulates, as a result of which the development of long-term consequences of degenerative processes in the central nervous system, neoplasms, and hormonal diseases is possible. Children, pregnant women, people with disorders in the cardiovascular, hormonal, nervous and immune systems are especially sensitive to electromagnetic fields. a) Influence on the nervous system -the transmission of nerve impulses is disrupted. As a result, autonomic dysfunctions appear (neurasthenic and asthenic syndrome), complaints of weakness, irritability, rapid fatigue, sleep disturbance, disturbed higher nervous activity -weakening of memory, a tendency to develop stress reactions. b) Influence on the cardiovascular system -disturbances in the activity of this system are manifested, as a rule, by lability of the pulse and blood pressure, a tendency to hypotension, pain in the region of the heart. In the blood, there is a moderate decrease in the number of leukocytes and erythrocytes. c) Influence on the immune and endocrine systems -it was found that when exposed to EMF, immunogenesis is impaired, more often in the direction of oppression. In animal organisms irradiated with EMF, the course of the infectious process is aggravated. The influence of high-intensity electromagnetic fields is manifested in a depressing effect on the T-system of cellular

immunity. Under the influence of EMF, the production of adrenaline increases, blood clotting is activated, and the activity of the pituitary gland decreases. d) Influence on the reproductive system-many scientists attribute electromagnetic fields to teratogenic factors. The most vulnerable periods are usually the early stages of embryo development. The presence of a woman's contact with electromagnetic radiation can lead to premature birth, affect the development of the fetus and, finally, increase the risk of congenital malformations.

The Main Sources of EMF and Methods of Protection Against Their Impact Sources of electromagnetic fields are atmospheric electricity, geomagnetic fields, industrial installations, radar, radio navigation, television and radio broadcasting, household appliances, and internal electrical networks in homes. The field emitted by them differs depending on specific models -the higher the power of the device, the greater the electromagnetic field it creates. The issue of cellular biological safety is quite relevant. Scientists have not yet given an unambiguous answer to it. Only one thing can be noted: for the entire existence of cellular communication, not a single person has received obvious damage to health due to its use. Based on the technological requirements for building a cellular communication system, the main radiation energy (more than 90%) is concentrated in a rather narrow beam, which is always directed towards and above the adjacent buildings. In talk mode, the radiation of a cell phone is much higher than in standby mode. The field that appears around his antenna is amplified in the subway, during a conversation in the car, and the metal frame of the glasses amplifies its effect. Personal computers (PCs) have long become one of the most important things in the home of the average resident of any of the developed countries of the world. Very often you have to use a computer at work. According to statistics, about 30% of the population spend most of their working time at a computer, in addition, a significant part of users has contact with a PC at home. In this regard, many people have a question about the harmful factors affecting a person when working on a computer and how to protect against them. It is believed that the most dangerous is radiation from a monitor, which is a source of

electromagnetic, X-ray, infrared and visible ultraviolet radiation. However, only fairly old monitors released 5-7 years ago can be dangerous in this regard. They are very low frequency EMP sources, but no more than other electrical appliances. The X-ray radiation level of the monitor is much lower than the natural background radiation. And the levels of infrared and ultraviolet radiation from a monitor are negligible compared to electric lamps. Even so, you can purchase a screen protector separately. Modern liquid crystal (flat) screens and laptop computers do not emit at all -they have a different principle of operation. To exclude or reduce the levels of exposure to EMF on the human body, it is important to follow a number of simple recommendations:-exclusion of a long stay in places with an increased level of the electromagnetic field of industrial frequency-competent arrangement of furniture for rest, providing a distance of 2-3 meters to electrical distribution boards, power cables and electrical appliances-when purchasing household appliances, pay attention to the information on the compliance of the device with the requirements of sanitary standards-use of devices of lower power-do not use a cell phone unnecessarily, do not talk continuously for more than 3-4 minutes-use a hands-free kit in the car, placing its antenna in the geometric center of the roof. People can no longer give up power plants, railways, airplanes, cars, and other conquests of civilization, even when it comes to their own health. The task is to minimize harmful technogenic impacts on the environment and to familiarize society with specific environmental hazards and develop a protection mechanism.