

INVESTIGATION OF THE OPPORTUNITIES FOR IMPROVING THE IMMUNITY OF BIOLOGICAL OBJECTS

A. Smiey

Supervisor – N. Polyanova

Kharkiv Vasylenko National Technical University of Agriculture
(Department of Biomedical Engineering and Theoretical Electrical Engineering,
19, Rizdvyana street, Kharkiv, 61012, tel. (057) 712-42-32)

In modern conditions of environmental pollution and the impact of climate change, the state of the body's immune system is relevant. Partial damage of cell immunity and immune system lead to a large number of diseases, including cancer and AIDS (acquired immune deficiency syndrome). Scientific studies of the world's leading countries are considering the activation of the immune system and its strengthening.

Despite the fact that recently a large number of works are devoted to the problems of EHF (extremely high frequency) reflexotherapy, the mechanisms of the functioning of biological active points (BAP), including the mechanisms of activation of immunity in the EHF-irradiation of BAP, have not been studied enough.

Despite the complexity of the biological structure, BAP has a simple equivalent circuitry containing an internal power source, an oscillating circuit and active elements with negative resistance, which simulate the electrical properties of nerve endings. Due to this, from an electrical point of view, BAP has all the necessary and sufficient conditions for the generation and reception of EHF-emissions, which is confirmed by the conducted research.

Among the various mechanisms of immune defense, the immune response in particular can be caused by the response of mast cells of the biological object. The greatest number of them is in the connective tissues of the skin and in the mucous membranes of the body, and they directly contact with biologically active points. Mast cells are filled with many granules, which they release in case of threat of infection of the body.

When a biological active point, which is considered as a cylindrical resonator, is excited, due to the effect of EHF-radiation in the range 36 ... 70 GHz, acoustic oscillations arise in the piezoelectric layer of collagen. These vibrations activate mast cells and ensure their effective massage. Through the network of neurons, the excitation is transferred through the main channels of acupuncture to the cellular aggregations of lymphocytes, responsible for immunity.

Thus, the effect of EHF-radiation on BAP of living organisms leads to activation of immune defense mechanisms and helps to improve the state of the immune system of the organism.