

# A Biophysical Approach to the Prevention of Cancer Diseases

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**Abstract:** There has been carried out the analysis of general patterns observed in life activity of microorganisms and cancer cells. Then theoretical and experimental studies have revealed reduction in resistance properties of microorganisms, when using simulated low-intensity solar microwave radiation within microwave range. These findings have allowed to lay the foundation for the hypothesis of using the said radiation in preventing oncological diseases. The device for simulating solar microwave radiation that reaches the surface of the Earth plays the central role in practical implementation of this hypothesis. It makes it possible to simulate various types of microwave radiation that corresponds to undisturbed and disturbed Sun in the frequency range of (4.0-4.3) GHz with a variable intensity not exceeding 100  $\mu\text{W}/\text{cm}^2$ . The use of this device provides a real opportunity to counteract development of cancer diseases.

## 1 INTRODUCTION

Currently, there are no effective technologies for preventing cancer (Bespalov V. G., 2001, Servan-Schreiber D., 2010). Absence of such technologies makes the person unprotected at any stage of his life, since this disease implies a high probability of a lethal outcome. Despite there is vast scientific information about possible causes and mechanisms of formation of malignant tumors, modern medical technologies fail to detect the initial process of its formation (Seitz I.F., Knyazev P.G., 1986). As a rule, they detect an already formed tumor at the stage of progressive disease. This process sometimes lasts for years, which makes it topical to prevent this disease. However, there is still no answer to the question: "What to do and how to take prophylactic measures?" Such vague recommendations as "Lead a healthy lifestyle" in reality do not save from the disease neither children, nor adults, nor the elderly.

In this regard, we can talk about a fundamental scientific problem: the problem of working out the effective measures for preventing cancer. It's challenging to solve this problem. Here we may mention very poor understanding of the main mechanism of cancer development. Moreover there is no clear answer why the human immune system is "blind" to the changes occurring in the body that lead

to appearance of malignant tumors (Napalkov N.P., 1989).

## 2 THE HYPOTHESIS (SEARCHING THE SOLUTION TO THE PROBLEM OF ONCOLOGICAL DISEASES PREVENTION)

When cancer cells are detected in the body, it is not always an indication of cancer as a disease. It is not clear yet what to do in such cases. Application of immunomodulators does not always lead to the results we expect (Antonov V.G., Kozlov V.K., 2004). Eventually, the disease reveals itself only when the tumor is detected. The technology aimed to combat such neoplasms is well developed and its success depends on the stage of the disease. Today scientists can boast of high efficiency of cancer treatment, but only at its initial stages. As a rule, the treatment is based on complex use of radiation, chemical and various surgical methods. However, modern medicine has no countermeasures to help cope with the disease for cases when metastasis of cancer cells spread into various organs and body systems.

High resistance of cancer cells to the human immune system indicates the presence of some kind of bio-formation «membrane», which protects them from it, creates conditions for uncontrolled modification of somatic cells into cancer ones. Such a membrane can form driven by endogenous and exogenous factors, which have a negative effect on intercellular interaction. Hemophoresis anomalies in cellular structures induced by above specified factors result in shifting from aerobic energy exchange into anaerobic one in them. According to two-time Nobel Prize Winner Otto Warburg, lengthy hypoxia in cellular structures is the main cause of modifications of somatic cells in cancer cells (Seitz I.F., Knyazev P.G., 1986). In this context prevention of cancer based solely on activating the human immune system, is a priori ineffective. It is necessary to apply the direct influence on the «membrane» to restore the intercellular interaction and create conditions for aerobic energy exchange for inner cellular structures. When this interaction is restored, it will also ensure that cells of the immune system will have an access there and will be able to perform their protective functions.

Such an impact, which does not destroy other cellular structures, should form the basis of cancer prevention technology. What kind of impact it is going to be – physical, chemical, or a combination of them, and what are its characteristics, is not known yet. However, the main question is how to determine the location of cellular structures, which for various reasons have become "isolated" from the human immune system.

A similar situation refers to the weakening of sensitivity of pathogenic and opportunistic microorganisms to antibiotics of both endogenous and exogenous origin (Birnbau D., 2003). In this case, we can observe again an inadequate response of the immune system which leads to uncontrolled growth in the quantity of microorganisms. Microbiologists know the reason for increased resistance of microorganisms to antibiotics. It is related to the formation of biofilms that prevent antibiotics from fulfilling their bactericidal function (Davies D., 2003).

An important feature of both cancer cells and microorganisms that cause infectious diseases is the existence of general patterns of their life activity. These include their isolation from other cellular structures, uncontrolled reproductive process, ability to metastasize, etc. (Zyablov E.V., 2016).

In this regard, it is reasonable to assume that the found method of significant reduction of resistance

properties of microorganisms can be also highly effective in preventing cancer.

### **3 THE METHOD TO REDUCE MICROORGANISMS RESISTANCE PROPERTIES AND THE POSSIBILITY OF ITS USE FOR THE PREVENTION OF CANCER**

In recent decades there has noticeably weakened an evolutionally significant role of electromagnetic radiation in nature, the main source of which is the Sun. Electromagnetic pollution of the environment, according to scientists, is the main factor in enhancing the resistance properties of microorganisms (Shishkova Y.S., 2015).

Though there is a great number of research being made on how to weaken resistance of microorganisms, we should admit that currently there are no constructive solutions about how to reduce their persistent potential. The existing biochemical technologies for synthesis of bactericidal and bacteriostatic antibiotics have almost exhausted their potential.

In this connection, it is reasonable to use a method aimed at restoring that significant role the solar microwave radiation reaching the Earth's surface has in nature (Darovskikh S.N., 2008, Chizhevsky A.L., 2015).

To counteract formation of biofilms in microorganisms we suggest using simulated solar microwave radiation of the microwave range, comparable in intensity with background radiation of technogenic origin (not exceeding 10-100  $\mu\text{W}/\text{cm}^2$ ).

To implement this method we developed a device for simulating various types of solar microwave radiation (Fig. 1) in the frequency range (4.0- 4.3) GHz (Vdovina N.V., 2015, Darovskikh S., 2013).

This device allows to simulate bursts of solar microwave radiation with both linear and chaotic polarization. The spectrum of a single burst is very similar to the "dancing" flame of fire. Its structure changes in time in width, in shape and in intensity (Fig. 2).



Figure 1: Device for simulating solar microwave radiation in the frequency range (4.0-4.3) GHz.

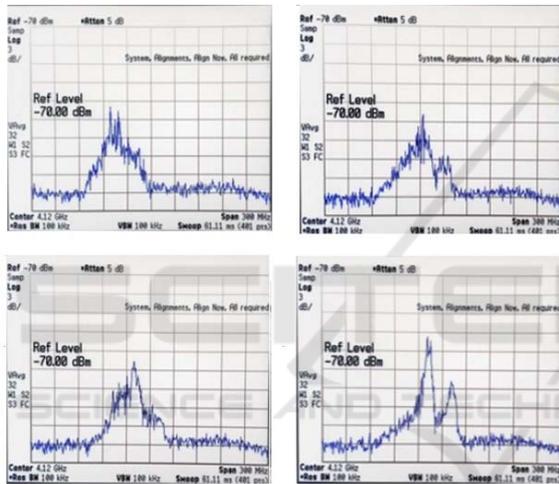


Figure 2: Temporary varieties of the simulated microwave solar radiation burst.

## 4 RESULTS

Theoretical and experimental studies have revealed (Darovskikh S.N., 2015, Darovskikh S.N., 2015, Shishkova Yu.S., 2015), that the "radio vibration" mechanism is the key point for the positive effect of microorganisms interaction, when subjected to simulated solar microwave radiation of the microwave range (Shishkova Yu.S. 2014). The main point of this mechanism is that when some substance absorbs electromagnetic radiation, not all its energy is converted into thermal energy. Some part of it is converted into mechanical energy, which is the source of low-intensity elastic (acoustic) vibrations, which provide a vibrational effect on cellular structures of the body. These vibrations activate in

microorganisms such metabolic processes that prevent formation of biofilm (Darovskikh S.N., 2014, Darovskikh S.N., 2017).

Similar processes can define the prevention of cancer. Their distinctive features from the "community" of microorganisms are as follows:

- under the influence of the above-mentioned vibrations in an isolated tissue structure in the state of hypoxia, a branched blood microcirculation system is formed. This leads to the "puncture" of the so-called "film" preventing the restoration of aerobic energy exchange in this structure;

- restoration of aerobic energy exchange in somatic cells is the key to the prevention of their modification into cancer ones. And those cells that have already modified into cancer ones will be "neutralized" by the immune system, the activity of which is directly related to the parameters of the formed blood microcirculation system.

Such an assumption can be made on the basis of the experimental study results with the use of the above device (Fig. 2) with a dosed shank extension in dogs (Darovskikh S.N., 2006, Filimonova G.N. 2012).

The application of the simulated microwave solar radiation to the regenerate during the distraction of the shanks of dogs at 1 mm per day with a 4-fold fraction results in its positive effect on parosseous muscles. In the experiment based on the stereological analysis there was revealed almost a 3-fold decrease in the degree of muscles sclerotization; the growth of myocytes number; intensive regeneration of the muscle tissue. And in the opinion of the researchers these results are connected with the significant (1.6 times) increase in the number of microvessels.

The results of the above experiment, caused by the formation of a branched blood microcirculation system in the area of the regenerate, should be considered as an antipode to those that will occur when the above radiation is applied to cancer structures. The appearance of a ramified microcirculation system in them and, as a consequence, the restoration of the control functions of the immune system are the main conditions for weakening the development of tumor formations.

## 5 DISCUSSION

There should be mentioned the opposite point of view as well (Servan-Schreiber D. 2010). Some scientists referring to their experimental data believe that the formation of the circulatory system on the surface of the tumor tissue and partly inside it only stimulates

the multiplication of cancer cells. So on the basis of these data, they provide recommendations to use the medications that inhibit the formation of blood vessels. However, these conclusions, as shown by practice, are erroneous. Reproduction of cancer cells in the presence of a circulatory system on the surface of the tumor and inside it indicates that it is insufficient to replace anaerobic energy metabolism by aerobic one, which is "pernicious" for cancer cells. The "attempt" of the body to restore by itself the aerobic energy metabolism in the already formed tumor proves to be in most cases unsuccessful. Under these conditions it is necessary to use stimulators for the formation of high density of blood microvessels, evenly distributed both on the surface of the tumor and especially inside it. The above mentioned studies prove that the determining role in the formation of a branched blood microcirculation system in the carcinoma is associated with the use of the device for simulating solar microwave radiation.

## 6 CONCLUSION

The prospects justification of the abovementioned hypothesis aimed to prevent cancer in humans and treatment of their initial stages, of course, requires experimental verification. Since it is difficult to organize such an experiment, due to its complexity and collect reliable data, it can last many decades. At the same time, the use of ecofriendly technology based on the use of simulated solar microwave radiation is justified right now. It has no contraindications. For more than twenty years when this technology has undergone approbation, evidence has been gathered that it is not only absolutely safe (this has been shown by numerous medical and biological studies (Darovskikh S.N., 2005, Darovskikh S.N., 1999) etc., but also that it is advisable to apply it in treating various diseases in children and adults (Uzunova A.N., 2006, 1997, 2004) et al.. These results account for the use of analogues of electromagnetic radiation of natural origin. Currently there does not exist any other alternative to prevent a wide range of diseases, including oncological ones, in the context of irreversible changes in the properties of environment and its electromagnetic pollution in particular.

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