

The geobiological hypothesis of carcinogenesis: the causes of cancer, the method of its elimination, and the consequences of this elimination

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ABSTRACT: The approach described is based on the author's previously formulated new natural science paradigm of geobiocentrism (GBC) and the geobiological hypothesis of carcinogenesis (GHC) – part of GBC. Organisms do not adapt to their external environment on their own, rather, the external environment adapts them to its conditions by exerting energetic pressure on their genome. “...Where physiological adaptation ceases, genetic adaptation takes effect” (Ervin S. Bauer). *Homo sapiens* exhausted its energy resources for "physiological adaptation" and the environment (the Biosphere) forced it to transition to the stage of "genetic adaptation. Cancer is a manifestation of the human body's "genetic adaptation" to ever-increasing environmental pressure on its genome. The following classification of cancer causes is proposed: primary cause, secondary causes, main cause and direct cause; the mechanisms of action are also considered. The external environmental pressure factors include the composition of the atmosphere and the Earth's electromagnetic field (EEMF) and its component, the Earth's electric field (EEF). Humans are unable to eliminate these pressure factors, as they are driving forces of the evolution of living matter of the Biosphere. The solution to the problem of cancer lies in mitigating the process of “genetic adaptation” by spreading it

from a single cell to the entire organism. method of eliminating cancer and the risk of its occurrence. Examples of “solving the problem of cancer” in nature, based on the same principle, are given. It is assumed that the method needs to be experimentally verified.

Keywords: *natural science paradigm of geobiocentrism, geobiological hypothesis of carcinogenesis, primary cause of cancer, main cause of cancer, direct cause of cancer, solution to the problem of cancer, method of eliminating cancer and the risk of its occurrence.*

1. Introduction

This article is analytical. The study is also based on the author's analytical work, the results of which are reflected in articles (Shchukin, 2010, 2012, 2021), and book (Shchukin, 2018).

The problem of cancer requires no special introduction and can be illustrated by the statistical data presented in Table 1. As shown in Table 1, in the long-term up to 2050, the growth in the annual incidence of cancer (76.5%) and the growth in the number of deaths from cancer in the same year (90.7%) will outpace both the growth of the planet's population (21.3%) and the rate of aging (20.0%), as well as the increase in life expectancy (6.3%). Additional information confirms these pessimistic conclusions: *"Oncological diseases are today one of the most pressing and unresolved medical problems facing humanity. Malignant tumors occur in residents of all continents and countries, in rich and poor populations, and in men and women. Unfortunately, the outlook is still bleak. If the incidence rate continues to rise, then by 2030, the number of people newly diagnosed with cancer will reach 27 million, 17 million ordinary citizens will die from cancer (i.e., the mortality rate will be 63% - V.S.), and 75 million people on the planet will become carriers of this pathology"* (Dumansky & Chekhun, 2022).

Table 1. Cancer Statistics.

Year	World population, billion people.	Average age of Earth's inhabitants, years	Average life expectancy, years	Number of people diagnosed with cancer for the first time in a year, million people	Number of deaths from cancer per year, million people.	Conditional mortality from cancer (p.6: p.5)
1	2	3	4	5	6	7
2022	8,0 ¹	30,1 ⁴	73,6 ³	20,0 ¹	9,7 ²	48,5%
2050	9,7 ¹	36,1 ⁴	78,2 ³	35,3 ²	18,5 ²	52,4%
Increase	21,3%	20,0%	6,3%	76,5%	90,7%	8,0%

¹(Bray et al., 2024); ²(Bizuayehu et al., 2024); ³(Wise, 2024); ⁴(Global Median Age, 2024)

The information presented above leaves little hope that the problem of cancer will be solved in the coming decades by methods of medicine and biology; therefore, the author considered it appropriate to present a new vision of the possibilities for solving this problem from a more general perspective than a medical-biological one, which he referred to as “geobiological.”

2. Cancer from the standpoint of modern oncology

According to current thinking, the main causes of cancer are the following 10 factors, which may be listed in different orders and with slightly different wordings according to different sources but remain fairly consistent overall: age, family history, smoking status, alcohol consumption, sunlight and ionizing radiation, organic and inorganic chemicals, viruses and bacteria, hormone therapy, diet and obesity, and air and water pollution (Parsa, 2012). Thus, the possibility of a single cause of cancer was not considered: *“Since the development of malignancy is a complex multistep process, many factors may affect the likelihood that cancer will develop, and it is overly simplistic to speak of single causes of most cancers”* (Cooper, 2000).

The first question that arises when reviewing the list is *“How can this list of presumed causes of cancer be reconciled with the information that cancer affects not only modern humans but also the pharaohs of ancient Egypt, hominids*

*approximately 1.7 million years ago, dinosaurs approximately 100 million years ago, fish approximately 300 million years ago, and even plants?” (Cancer..., 2025). In other words, “What common factor could cause a disease of approximately the same nature in such different biological objects, and thus far removed from each other in time?” Perhaps Nobel laureate A. Szent-Györgyi was right when he wrote, “Cancer research was retarded by our looking at cancer as a disease which has to be cured, instead of looking at it as **a fascinating natural phenomenon** which has to be understood. To understand, we have to take it, out of the narrow confines of medicine and place it into the wide framework of natural philosophy» (Szent-Gyorgyi,1976). From the perspective of the aforementioned GBC and GHC, such a general “carcinogenic” factor for the listed organisms could be the planet's atmosphere, or more precisely, the ratio of the atmospheric gases O₂/CO₂. This assumption is substantiated below.*

Additionally, according to the author, when reviewing the list of possible causes of cancer, one cannot help but notice the fact that, while recognizing hypoxia as a factor that directly contributes to the progression of malignant tumors increases tumor aggressiveness and hinders modern cancer treatment methods (McKeown, 2014), modern oncology does not consider hypoxia to be the main cause of malignant cell transformation (Cooper, 2000). In the author’s opinion, this confirms the assumption set out below that between hypoxia and its results—the appearance of a malignantly transformed cell (MTC)—there is a certain “intermediary” factor that has not yet come to the attention of researchers, and its hidden existence does not allow us to establish a direct cause-and-effect relationship between local cellular hypoxia (LCH) and the occurrence of malignantly transformed cells (MTCs).

3. Cancer from the perspective of the geobiocentric paradigm

The presented approach is based on the new natural science paradigm of geobiocentrism (GBC) (Shchukin, 2021) and the geobiological hypothesis of carcinogenesis (GHC) (Shchukin, 2018, part 1) – a component of the GBC. According to the GHC, the following classification of cancer causes is proposed: **the primary cause** is the current ratio of the atmospheric gases O₂/CO₂ = 550

(20.9%/0.038%); **secondary causes** are all factors of a mechanical, physical, chemical, or biological nature, which modern oncology classifies as among the main causes of cancer; **the main cause** is local cellular hypoxia (LCH); and **the direct cause** is generated by the main cause—the occurrence **of a negative charge of free electrons**, not accepted by oxygen atoms due to LCH—in the intracellular environment.

3.1. On the main cause of cancer from the perspective of GBC

Not all researchers share the position of modern oncology regarding the role of hypoxia in carcinogenesis: *“Moreover, despite 50 years of intensive cancer research... no single unifying cause for cancer has been established. ...Over 70 years ago, Warburg showed that cells could always be made cancerous by subjecting them to periods of hypoxia. Moreover, he demonstrated that once cells had converted to a cancerous state, reversion could not occur. ... It is our hypothesis that long-term hypoxia of cells in the body, measured in years, is the primary trigger for cancer. We believe that hypoxia, which must meet the nutritional requirement of a critical 35% reduction in intracellular oxygen levels to initiate cancer, is linked to the incorporation of adulterated, no oxygenating, or inappropriate polyunsaturated fatty acids (PUFAs) into the phospholipids of cells and mitochondrial membranes. ...The exact mechanisms by which a prolonged period of mild to moderate hypoxia could trigger the typical metabolism of cancer cells are not known...”* (Peskin & Carter, 2008).

According to the author, the “obscurity” of “*the exact mechanisms*” triggering “*the typical metabolism of cancer cells*” (Peskin & Carter, 2008) are the reason why evidence-based medicine does not point to LCH as the main cause of cancer. Thus, in the author’s opinion, which completely coincides with this position (Peskin & Carter, 2008), the mechanism triggering cancer is LCH - long-term, measured in years, periodic, mild or moderate hypoxia, which, in the author’s opinion, can occur in almost any person during life. From the described character of hypoxia, it is logically justified to assume that **hypoxia must generate some factor that**, unlike oxygen, HIF factors, and other biochemical compounds associated with the process of carcinogenesis, changes in the concentrations of which are detected by modern

biochemical methods, **is capable of accumulating in the cell for years and at the same time not being detected by biochemical control methods during the period of its accumulation.** Obviously, this factor must be no biochemical in nature and presumably electro physical. This same factor may constitute an “unknown mechanism” that can trigger the typical metabolism of cancer cells (Peskin & Carter, 2008).

3.2. On the direct cause of cancer from the perspective of GBC and GHC

According to GBC, this factor may be **the electric field of free electrons**, which are normally accepted by oxygen, but in the absence of oxygen, i.e., in hypoxia (LCH), they become an independent source of energy with all the characteristics of an “unknown mechanism” generated by hypoxia. The following facts support this assumption.

3.2.1. All types of electrical conductivity, including electronic conductivity, are established for living matter in the human body. *“There has been repeated mention of complex, multifaceted resistance, requiring consideration of all types of electrical conductivity in inanimate nature and many specific types of electrical conductivity that are unique to living organisms”* (Manoilov, 1991, p.170). *“...There is reason to believe that many organisms have different electrical conductivities. **Apparently, the most complex structures and important significant systems in organisms possess electronic and electron–hole conductivities**”* (Manoilov, 1975, p.44).

3.2.2. The presence of free electrons in biological structures of the body has been established: *“The thermal energy absorbed by polymers with symmetrical bonds leads to an increase in **the number of electrons detached from the atom and wandering around the molecule.** This causes an increase in the overall conductivity of the polymers. A similar phenomenon of electron conductivity has been discovered, for example, in naphthalene. **This destroys the old ideas about the absence of electron conductivity in organic substances.** A number of organic biopolymers, particularly substances in nervous tissue (including the brain), can be classified as biopolymers with symmetrical bonds, i.e., substances that apparently possess, in addition to **ionic conductivity and electron conductivity.** ... At the same time, it is*

hardly permissible to deny the presence of electron–hole conductivity in living tissue, since it is precisely this that can explain the intercellular migration of energy" (Manoilov, 1991, p.196).

3.2.3. The electrical conductivity of living tissues can vary widely, depending on the strength of the electric field in the tissues, reaching the conductivity of metals. *"Some complex organic compounds have a conductivity close to that of metals. The activation energy, i.e., the energy required to initiate the movement of energy carriers, is very small. Beginning with certain voltage values, characterized by an electric field strength of 10^3 - 10^5 V/cm (10^5 - 10^7 V/m), the current depends on the voltage, which is close to Ohm's law"* (Manoilov, 1975, p.22).

3.2.4. By accepting electrons, oxygen reduces the electrical conductivity of cells and tissues. An increase in its concentration in the air (or an increase in atmospheric pressure) reduces the number of electrical charge carriers—free electrons—which manifests itself in a decrease in the body's sensitivity to electric current. CO₂ acts in the opposite direction. *"An increase in the partial oxygen content in the air reduces the body's sensitivity to electric current, and vice versa; a decrease in the partial oxygen content increases this sensitivity. ... With an increase in CO₂ content, sensitivity to current increases..."* (Manoilov, 1991, p.264).

3.2.5. The ability to restructure the work of the genetic apparatus of a cell, up to obtaining a cell of a different type, by exposing the cell to an electric current (field). *"An interesting phenomenon was discovered by I. E. Mikhaltsev: by changing the frequency of the applied voltage, its amplitude, or phase shift, it is possible to transform neurons of one type into neurons of another type with different electrical characteristics and a different response to electric current"* (Manoilov, 1991, p.270).

3.2.6. "...Life is controlled precisely by electrons, i.e., by the energy that these electrons give up in individual portions during their descent from the high level to which they were raised by photons. However, an electron moving along a closed path is a weak electrical current. **Consequently, life is driven by small electrical currents supported by sunlight.** All the complex processes of intermediate metabolism are only layers on the basic fact." (Szent-Gyorgyi, 1964, p.30).

With the increase in the number of free electrons in the intracellular environment during LCH, the amount of energy contained in the combined electric field increases. Humans are not yet able to control changes in the electrical potential of a specific cell's intracellular environment in vivo, so the accumulation of negative electric field energy there goes unnoticed. Only the results of this hidden accumulation became noticeable—biochemical changes in the cell's cytoplasmic or mitochondrial membranes, as noted in previous work (Peskin & Carter, 2008).

Thus, it seems logical to hypothesize that the **long duration, periodicity, and presence of low- or moderate-intensity hypoxia** (Peskin & Carter, 2008), taken together with the **irreversibility of the process of malignant cell transformation** established by Warburg (Peskin & Carter, 2008), indicate **the existence and operation of a positive feedback mechanism within the cell. Such a mechanism does not allow the electrical potential, once generated, to decrease toward the specified norm but acts only toward its increase "cumulatively."** This means that the number of new free electrons in the intracellular environment can increase even as a result of periodic hypoxia (Peskin & Carter, 2008), i.e., hypoxia that disappears after a certain time, increasing the probability of the appearance of the next free electron there. Moreover, as the total negative electric field of these electrons intensifies, the entry of the next oxygen atoms through the inner membrane of the mitochondria should be increasingly blocked (where the process of electron acceptance by oxygen occurs).

Electrons that are not accepted by oxygen increase the electrical conductivity of biological structures and reduce the transmembrane potential of cells, which is a characteristic feature of MTC (Di Gregorio, et al., 2022), and a likely cause of *“the incorporation of adulterated, no oxygenating, or unsuitable polyunsaturated fatty acids (PUFAs) into the phospholipids of cell and mitochondrial membranes»* (Peskin & Carter, 2008).

Furthermore, according to established facts, the free electrons generated by LCH are capable of breaking the strongest molecular bonds between biochemical compounds and molecules present in the environment and corresponding to the corresponding norms (i.e., in the absence of LCH), including CO and CO₂ molecules, within its

point electric field. Such breaks in existing bonds, which are not provided for by the norm, initiate the flow of new biochemical reactions that are not provided for by the norm and the formation of new biochemical compounds that are also not provided for by the norm. «Using CO and CO₂ molecules as examples, the patterns of change in chemical bond energy depending on the distance to the Coulomb center and the charge value were studied. In particular, **as the charge approaches, the bond energy (or degree of bond stability) decreases, and at a certain distance from the charge, the bond breaks; at a constant distance, the probability of bond breaking increases with increasing charge.** In interpreting the behavior of the bonds of various molecules, we refer to the nature and characteristics of the behavior of the CO molecule in a charge field mainly for the following reasons: **the bond energy of the CO molecule is one of the strongest, and if any changes occur, then under the same conditions, similar changes are more likely to occur with any other molecules.** Consequently, the interpretation of the behavior of carbon monoxide in a charge field may be entirely correct with regard to carbon dioxide as well” (Sobolev, 2010, p.p.88-89). Notably, this work, which is unrelated to carcinogenesis processes, examined the effect of the electric field of **valence electrons**, which are part of ions, on chemical bonds. "In the calculations, point charges are represented by ions of different valence. The electric field strength of a monovalent ion at room temperature at a distance of one nanometer is approximately $1.5 \cdot 10^9$ V/m" (Sobolev, 2010, p.89). However, according to the author, this fact does not change the physics of the effect of the electric field of **a free electron** on the molecular bonds of biochemical compounds in the intracellular environment.

Thus, according to the proposed model, which confirms the authors' hypothesis (Peskin & Carter, 2008), hypoxia of any intensity, when exposed to a cell for a long time, generates an excess electrical potential in the intracellular environment in the form of a charge of free electrons, which can accumulate there over time and not be detected by biochemical control methods. The accumulation of this electrical potential is ensured by a positive feedback mechanism, whereby each preceding stage reinforces the subsequent stage and prevents a return to the previous, normal energy state of the cell. The "hypoxic" electrical potential, which increases over time, "dissolves" by small 'portions that are not detected by external control mechanisms

into the intracellular environment, increasing its electrical conductivity (Laufer et al., 2010), altering the energy of molecular bonds of biochemical compounds present in this environment, and reducing transmembrane potentials, thereby promoting malignant progression (Yang & Brackenbury, 2013). *“From an energy point of view, life is, generally speaking, a process that takes place under very mild conditions. However, even a small amount of energy appears to undergo transformation into even smaller portions”* (Szent-Gyorgyi, 1964, p.35). As it accumulates, the “hypoxic” potential acts on the genetic apparatus of the cell through the intracellular environment with increasing electrical conductivity (see above, paragraph 5.5) and ensures the “transition” of this apparatus from “physiological adaptation” to “genetic adaptation”: *“where “physiological adaptation ceases, genetic adaptation takes effect”* (Bauer, 1935, p.196).

According to Warburg's research (Peskin & Carter, 2008), the “energy trigger” for such a transition should be a negative electrical potential equivalent to the total charge of all free electrons that remain unaccepted in the intracellular environment owing to a 35% reduction in oxygen (hypoxia) from normal levels. The fact that the tumor acquires an overall excess negative potential is confirmed, in particular, by information about the possibility of destroying tumor tissues by applying a positive electric field (Zandi et al., 2023).

According to one of the provisions of GBC, MTC acquires an energy advantage over normal cells in its environment due to the additional 'hypoxic' electrical potential accumulated in the intracellular environment. This gradually transforms into changes in the cell's electrical properties and the formation of biochemical compounds not provided for by the norm — first in the cell's membranes and then in the intracellular environment. These compounds are markers of malignant transformation.

The claim of “energy superiority” of MTC has been confirmed, in particular, by the fact that MTC are capable of “extracting” mitochondria from neurons that penetrate tumor tissue, which significantly improves tumor energy (Hoover, et al. 2025). In addition, as practice shows, it is much more difficult to destroy hypoxic MTCs than normal cells, and this poses a serious problem in cancer treatment. *“In conclusion,*

unless an effective method of eradicating hypoxic tumour cells is found, complete control of many solid tumours is unlikely to be achieved.” (McKeown, 2014, p.8).

The assertion of the energetic superiority of MTC over normal cells also corresponds to the provisions of the GBC and GHC that carcinogenesis is part of the evolutionary changes in the mass of living matter in the biosphere aimed at increasing the energy potential of living cells, which means increasing the amount of energy that cells can use to sustain their vital functions (Shchukin, 2021, thesis 11.2). Evolution cannot reverse itself; therefore, despite the efforts of medicine, MTC cannot “descend” to the energy level of a normal cell, which makes carcinogenesis irreversible under normal conditions, as noted by Warburg (Peskin & Carter, 2008).

4. Mechanisms of cancer induction by carcinogens of various origins

Above, we considered a model of spontaneous carcinogenesis, which can occur in the apparent absence of additional carcinogenic factors. Cancer induced by mutagenic factors of various origins—mechanical, physical, chemical, or biological—differs from spontaneous cancer only in the way excess energy is generated, which is the direct cause of cancer according to the proposed classification. For this reason, these effects could be attributed to the **main cause of cancer**, which is on par with LCH. However, since the actions of these factors are mainly short-term and irregular, they were classified as “**secondary causes of cancer**”.

4.1. Mechanical carcinogenesis.

This can occur, for example, in the case of mechanical tissue trauma, at the site where a malignant tumor may develop over time. In this case, excess energy potential in the intracellular environment may arise **as a result of the piezoelectric effect**—when a cell in damaged tissue is mechanically deformed on its stretched side (i.e., inside the cell), an excess negative electric charge (charges) arises, followed by spontaneous carcinogenesis. *“It has been established that nucleic acids have piezoelectric and thermoelectric properties. These properties are largely due to the presence of water. By changing the amount of water, the piezoelectric properties can also be changed”* (Manoilov, 1975, p.33). Notably, according to GBC, this same effect may underlie the physiological phenomenon of **contact inhibition of cell**

growth under normal conditions, which is disrupted during malignant cell transformation when the amount of excess electric charge exceeds physiological levels.

There are known cases of lung cancer in people who work with asbestos. In this case, the following mechanism of carcinogenesis seems likely. The tiniest asbestos fibers are “*earth objects*” (Shchukin, 2018, thesis 3.2.2.), and represent **an energy receiving and transmitting antenna** that absorbs resonant flows of free (i.e., capable of performing work) energy, corresponding to their size and wavelength of electromagnetic radiation (EMR), which continuously penetrate the mass of living matter in the body. The absorbed energy is transformed—due to the polarization of the dielectric asbestos—into an excess electrical charge that accumulates at the ends of individual fibers (the tip effect). Once inside the cell, the fiber transfers the acquired electrical charge to the surrounding cellular structures. In addition, after transferring their charge to the cell, these fibers continue to act as receiving and transmitting antennas, increasing the excess energy potential of the surrounding intracellular molecular structures. What follows is similar to spontaneous cancer.

4.2. Physical carcinogenesis.

It is caused mainly by hard, ionizing radiation, such as X-rays, which breaks molecular bonds in living tissue and ionizes tissue; i.e., it causes the appearance of excess electrical charges, including negative charges in the form of free electrons. Soft, non ionizing radiation can serve as a source of “physiological” energy, i.e., be beneficial to the body.

4.3. Chemical carcinogenesis.

These diseases are typically caused by complex high-molecular-weight chemical compounds, including those of anthropogenic origin. The large number of atoms in such compounds, united into a single whole by elastic molecular bonds, enables a wide range of conformational changes in the molecules, which indicates the ability of these compounds, under certain conditions, to accumulate (like a torsion bar—an elastic rod twisted along its longitudinal axis) a significant amount of the **structural energy of living matter** (SELM) (Shchukin, 2021: defin. 4), in the form of elastic deformation energy (torsion) of the polarized molecular structures that make up these

compounds. Upon entering the cytoplasmic membrane or intracellular environment, these carcinogens transfer the SELMs they contain to cellular molecular structures, creating local excess energy potential, as in spontaneous cancer. It is also possible that these high-molecular-weight compounds also carry an excess electrical charge on their molecular structures, which, once inside the intracellular environment, triggers spontaneous carcinogenesis.

4.4. Biological carcinogenesis.

It is caused by various biological organisms, including protozoa, bacteria, and viruses. In this type of carcinogenesis, the carriers of excess energy potential in the form of SELMs are the living organisms themselves or their parts, in particular, nucleic acids (Gershenzon et al., 1999). In the case of viruses, the integration of the viral genome with the recipient cell genome occurs, which is a necessary condition for malignant transformation (Zilber et al., 1975). Having united with the cell genome, **the viral genome gives the latter an increased ability to absorb external energy** from its flows, constantly permeating the mass of living matter. The increase in the amount of energy absorbed by the DNA molecule occurs due to its physical enlargement (cell DNA + viral DNA), similar to a receiving and transmitting antenna. As a result, the frequency-energy range of free energy flows absorbed by the expanded genome expands, and the amount of energy absorbed per unit of time also increases. The frequencies of electromagnetic radiation emitted by the altered DNA molecule also change. These changed frequencies are resonantly absorbed by biochemical structures of the cell, whose existence is not provided for by the norm. This ensures the functioning of these biochemical structures, which are not provided for by the norm. Excess energy potential, compared to normal potential, is emitted by transformed DNA in the form of electromagnetic and acoustic radiation and flows into chromatin and then through the nuclear membrane into the cytoplasm, where it accumulates. *"These (basic structural-energetic) systems include the genetic apparatus—the source of genetic information and, in the author's opinion, also the source of living energy... Back in 1966, the author proposed a hypothesis according to which the nucleus of a cell, actively functioning at a "biological" temperature, was considered not only as a receptacle for genes but also as a complex oscillator, a generator of electromagnetic and acoustic vibrations in a wide range of*

*frequencies. It is these biological systems, nuclear genomes, in the author's opinion, that are the primary oscillators on whose functions the electrical polarization of cell nuclei and **rhythmic oscillatory processes at higher systemic levels depend**"* (Shakhbazov, 2004, p.15). Furthermore, as in spontaneous cancer. We also note that, according to the laws of electrodynamics, with an increase in the electrical conductivity of the intracellular environment due to the accumulation of electrical potential during LCH, this environment increasingly poorly transmits high-frequency electromagnetic radiation emanating from the nucleus, which can lead to a misalignment of "***rhythmic oscillatory processes at higher systemic levels***" (Shakhbazov,2004, p.15) of the body and result in a loss of control of the body over its individual parts affected by carcinogenesis.

On the other hand, according to GBC, the EEF, which is localized in the upper layers of the Earth's crust, exerts its energetic influence on the human body in the extremely low frequency range from 0 to approximately 4 Hz (Podoltsev, 2016). **These frequencies must correspond to the electric field created in the intracellular environment by free electrons.** The energy of such an extremely low-frequency field easily propagates in an environment whose electrical conductivity increases as hypoxia increases, and ultimately, this energy reaches the cell nucleus and reorganizes the work of its genetic apparatus (see section 3.2.5 above). **The EEF is a crucial factor in the evolution of living matter in the biosphere** (Shchukin, 2010), and, according to the proposed model, is **a factor in the energy pressure of the external environment on the human genome.** "*The evolution of organisms is nomogenesis, i.e., development based on regularities. However, the nature of these laws is obviously not statistical but dynamic, **similar to the laws governing reversible processes, such as gravity, electrical and mechanical oscillations, and acoustic and electromagnetic waves**" (Berg, 1977, p. 310).*

5. The proposed method for eliminating cancer and the natural options for "cancer solutions"

According to the GBC and GBC, cancer manifests itself as a life-threatening disease because the inevitable process of "genetic adaptation" to new environmental conditions does not affect the entire human body simultaneously but rather affects

individual cells that undergo malignant transformation. As a result of carcinogenesis, the MTC acquires an energetic advantage over normal cells, preventing the body from controlling the MTC. The lack of such control renders the process of "genetic adaptation" uncontrollable, leading to the death of the organism.

Therefore, the main goal of the proposed method **for eliminating cancer and the risk of its occurrence** is to deprive the MTC of its energetic advantage over normal cells, which will allow the body to restore control over the MTC since, according to the GHC, such control over each cell is exercised through its environment. Since, according to the GBC, the MTC is at a higher level of evolutionary development than normal cells are, humans are powerless to change the direction of evolution and "lower" the MTC to the "energy level" of a normal cell. Therefore, they must "raise" all the normal cells of the body (i.e., the entire body) to the same level of "energy supply" at which the MTC already exists. According to the GBC and GHC theories, this goal can be achieved by applying **a method for eliminating cancer and the risk of its occurrence** in the human body affected by carcinogenesis, which consists of the following steps.

The human body affected by carcinogenesis at any stage must be subjected to simultaneous, gradually increasing intensity, continuous, and prolonged exposure to two purposefully modified environmental factors, namely:- a respiratory atmosphere with altered gas composition (oxygen content 13-15%, CO₂ content approximately 6-8%, other components unchanged);- controlled exposure to the Earth's electric field by earthing the body. All parameters of the active factors and the duration of their exposure to the patient's body were selected depending on the patient's condition.

The proposed method consists of two parts, which we conventionally designate the "respiratory" and "earthing" parts.

5.1. Effects of the "respiratory" part of the proposed method for eliminating cancer and the risk of its occurrence.

The **main cause of cancer, LCH**, is supposed to be eliminated by eliminating its **primary cause—the current O₂/CO₂ ratio** of atmospheric gases. This should result

in saturation of the entire human body with additional oxygen. This goal can be achieved by gradually and continuously reducing the ratio of O₂ and CO₂ in the breathing mixture to O₂/CO₂ = 1.6-2.5, which corresponds to concentrations of O₂ ≈ 13-15% and CO₂ ≈ 6-8%, respectively, with the remaining components remaining at current levels. The following arguments support the effectiveness of this method.

Direct evidence for the claim that reducing the O₂/CO₂ ratio in the breathing atmosphere to the level indicated above can lead to an increase in oxygen consumption by the body and thus eliminate LCH was provided by the results of experiments conducted by different researchers in different countries between 1935 and 1980 (Agadzhanyan & Elfimov, 1986, tab.42). These results are presented in Table 2. These experiments were not related to oncological treatment and aimed to determine the effect of a constant gradual increase in the hypoxic-hypercapnic composition of the respiratory atmosphere on the body. The subjects were placed in an airtight chamber where they breathed only the air contained in the chamber for a long period of time—up to 100 hours. As a result of breathing, both the composition of the air contained in the chamber and the ratio of O₂ to CO₂ dissolved in the subjects' blood gradually change.

It was established that, **starting from a CO₂ content in the air of ≈ 4.9%, the oxygen consumption of the subjects increased**, which is the goal of the proposed method. A description of one of the experiments reflected in the table is provided.

*"In this study, despite a continuous increase in PCO₂ in the inhaled air, the elimination of endogenous CO₂ through the lungs (VCO₂) remained virtually unchanged and even tended to increase to 372±50 ml STPD/min at PCO₂> 38 mm (4.9%). An increase in CO₂ elimination occurred against the background of a continuous increase in its level in alveolar air and capillary blood, **as well as an increase in O₂ consumption by the body**. The increase in O₂ consumption manifested itself gradually as the concentration of CO₂ increased, and despite the decrease in O₂ in the atmosphere of the pressure chamber, it was maximal (347-461±18 ml STPD/min) at the end of exposure to hypoxia and hypercapnia when PO₂ decreased by 41-49% relative to the normal atmosphere (i.e., to a level of 12.4-10.7% -V.S.) (Agadzhanyan & Elfimov, 1986, p.89).*

Table 2. O₂/CO₂ and O₂+CO₂ ratios in the human body in a sealed facility

Authors	Estimated volume of the sealed object, m ³ /person	Speed, mmHg/hour		Gas composition of the atmosphere of the sealed object at the end of exposure						Time spent in the atmosphere of the hermetic facility, hours.
		In-crease in PCO ₂	De-crease in PO ₂	PCO ₂ ,		PO ₂ ,		O ₂ /C O ₂	(O ₂ + CO ₂) %	
				mmHg	%	mmHg	%			
1	2	3	4	5	6	7	8	9	10	11
A.G. Averyanov et al. (1935)	3,1	5,26	6,04	42,3	5,6	110,7	14,8	2,6	20,4	8
W.Consolazio et al. (1947) ⁵	14,0	0,95	1,09	49,7	6,5	102,2	13,4	2,1	20,0	52
N.A. Agadzhanian et al., (1972, 1976); V.P. Zagryadsky, Z.K. Sulimo-Samuilo (1975) ⁶	4,0	3,0	3,6	54,5	7,2	95	12,5	1,7	19,7	16-18
N.A. Agadzhanian et al., (1977-1980)	1,4	8,3	9	41,6	5,5	114	15,0	2,7	20,5	5
	0,5	30,4	40	60,4	7,9	81	10,7	1,3	18,6	2,1
	0,95	15,2	20	52,6	6,9	90,2	11,9	1,7	18,8	3,7
	1,8	7,6	10	50,7	6,7	93,4	12,3	1,8	19,0	6,9
	3,4	3,8	5	50,5	6,6	94,4	12,4	1,9	19,1	13,1
	6,5	1,9	2,5	50,9	6,7	92,2	12,1	1,8	18,8	26,6
	12,3	0,95	1,25	48,5	6,4	96,9	12,8	2,0	19,1	50,2
	23,3	0,47	0,62	48,6	6,4	98,3	12,9	2,0	19,3	100,6

Note to Table 2. In addition, columns 6 and 8-10 were added by the author of this article.

⁵(Consolazio et al., 1947); ⁶(Zagryadskiy & Sulimo-Samuylo, 1975).

As described above, **with an increase in CO₂ concentration and a decrease in O₂ concentration in the atmosphere of the sealed object (and with a decrease in the O₂/CO₂ ratio), the body's oxygen consumption increased**, which began when the CO₂ concentration in the air reached a PCO₂ > 38 mm (4.9%).

At the same PCO₂, CO₂ elimination from the body reached its maximum level (372±50 ml STPD/min). **The maximum level of oxygen consumption by the body was recorded when the oxygen content in the atmosphere of the sealed object**

was **10.7-12.4% (average value 11.6%)**. According to Table 2 (column 10), based on the results of 11 experiments, the sum (O_2+CO_2) % at the end of all the experiments ranged from 18.6% to 20.5% (weighted average value 19.4% considering the duration of the experiments); it seems logical to state that **the maximum level of oxygen consumption by the organism established by this study was achieved with the following approximate composition of air in the sealed object: $O_2 = 11.6\%$; $CO_2 = 7.8\%$ ($19.4\%-11.6\%$), i.e., $O_2/CO_2 = 1.5$** , with oxygen consumption increasing from the moment when the CO_2 concentration in the atmosphere of the airlock reached $\sim 4.9\%$ and $O_2/CO_2 \approx (19.4-4.9)/4.9 = 3.0$.

The current O_2/CO_2 ratio can cause LCH and contribute to carcinogenesis by disrupting the body's acid–base balance (ABB) via the following mechanism.

In their work (Mintser & Shchukin, 2023) the authors substantiated the assertion that the existing $O_2/CO_2 \approx 1$ in the internal environment of the human body should be considered a constant of the body's homeostasis. Consequently, according to the law of homeostasis of the body, formulated by C. Bernard in 1878, the body has regulatory systems that monitor its maintenance, and if this ratio is disrupted, measures should be taken to restore it.

The authors previously showed that the “*optimal ratio of atmospheric gases for both photosynthetic plants, which make up 99.2% of the total mass of living matter in the biosphere (Bazilevich et al., 1971, p.46), and humans is $O_2/CO_2 \approx 1\div 4$* ” (Shchukin, 2021; thesis 17). at the same time, in the planet's atmosphere—the single breathing environment for the vast majority of living organisms in the biosphere—the ratio of atmospheric gases O_2/CO_2 is approximately 550 (20.9%/0.038%).

In this regard, according to the author, it is surprising that neither doctors nor biologists pay attention to the enormous (2.5 orders of magnitude!) differences between the O_2/CO_2 ratio in the external and internal environments of the human body. Even if they do pay attention to this, this fact apparently does not raise any questions. This is likely because the following answer seems obvious: “*Humans have adapted perfectly to such an atmosphere and have existed in it for hundreds of thousands of years, and there's nothing unusual about this that warrants attention.*”

Undoubtedly, the human body has adapted to such an unfavorable breathing atmosphere, but the following question remains: what is the price of such adaptation? Let us try to find an answer.

Let us consider the composition of the air inhaled and exhaled by humans (Table 3) and the O₂ and CO₂ contents in their internal environment.

Table 3. O₂ and CO₂ content during inhalation, exhalation and in the internal environment of the human body

Gas	Inhale		Exhale		Internal environment
	%	mm Hg	%	mm Hg	mm Hg
1	2	3	4	5	6
O ₂	20,96 ⁷	159,3	16,03 ⁷	121,8	40 ⁸
CO ₂	0,036 ⁷	0,27	4,38 ⁷	33,3	40 ⁹
N ₂	79,00 ⁷	600,4	79,59 ⁷	604,9	
Water vapor	30-40 rel.% ⁷		80-100 rel.% ⁷		

⁷(Berezovsky, 2012); ⁸(Bigatello & Pesenti, 2019). ⁹(Mintser & Shchukin, 2023).

First, let us consider oxygen. As shown in Table 3, a person normally inhales a mixture of gases containing 20.96% O₂ (159.3 mmHg), and the exhaled mixture contains 16.03% oxygen (121.8 mmHg). Thus, under normal conditions, humans consume only 4.93% (37.5 mmHg) of oxygen (20.96-16.03%) from the atmosphere, returning the rest to the atmosphere. It should also be noted that the oxygen taken from the atmosphere by the human body is partially returned to it in the form of exhaled CO₂, in which oxygen accounts for 3.16% (24.0 mmHg) of the total oxygen intake (4.38%-0.036%)*(32/44).

Thus, the body uses only 1.77% (4.93-3.16%), or 13.5 mmHg, of the 20.96% of the atmosphere for its own needs. However, the pO₂ in the internal environment remained at 40 mmHg (Table 3, column 6). Simple arithmetic shows that **the oxygen a person takes from the atmosphere during respiration (13.5 mmHg) is insufficient to ensure a pO₂ of 40 mmHg in the body's internal environment.**

Thus, the conclusion that the oxygen needed to maintain pO₂ = 40 mmHg in the internal environment enters the body from internal sources seems logically justified.

Considering that the body has virtually no reserves of free oxygen and that humans continue to breathe even in the absence of food intake, it seems logical to conclude that the oxygen needed to maintain the required pO_2 of 40 mmHg in the body's internal environment arises from the breakdown of biochemical compounds within the body. This conclusion is also supported by the slight excess (0.59%) of nitrogen in exhaled air compared to inhaled air, indicating the partial breakdown of nitrogen-containing compounds, such as proteins or amino acids.

Based on the above, we formulate conclusion 1.

Conclusion 1.

The O_2 and CO_2 gases present in the atmosphere do not allow the human body to breathe normally without drawing gaseous oxygen and carbon from its own internal resources. Since the composition of the planet's atmosphere is the same for all living things and because the volume of oxygen resources that can be utilized for each organism to ensure the breathing process (see above) is strictly individual and depends on the physiological characteristics of each organism, constitution, lifestyle, etc., it seems very likely that at a certain point in time, in a certain organism, at a certain stage of its life cycle and in a certain physical state, in a certain cell of such an organism, **the internal oxygen resources may not be sufficient to maintain normal cellular respiration**; subsequently, LCH occurs—mild, moderate, periodic and/or long-term—which, however, as shown in the work (Peskin & Carter, 2008), **is sufficient for the onset of carcinogenesis processes**. The additional influx of oxygen into the body, which can eliminate LCH, is impeded by the presence of a homeostatic constant of $O_2/CO_2 \approx 1$ in the body's internal environment (Mintser & Shchukin, 2023), and by the action of its regulatory systems to maintain it. If the body lacks CO_2 (for the reasons outlined below), these systems will not allow the oxygen necessary to eliminate LCH into the body's internal environment. The existence of one of these "limiters" is confirmed by the Verigo–Bohr law, according to which *"without CO_2 , oxygen cannot be released from its bond with hemoglobin, which leads to cellular oxygen starvation even at high O_2 concentrations in the blood"* (Drogovoz et al., 2016, p.112).

However, the potential carcinogenic effect of an existing gaseous atmosphere on the human body is not limited to its ability to induce LCH. Let us consider the "relationship" between the human body and the planet's gaseous atmosphere with respect to CO₂.

In the body, CO₂ reserves are mainly concentrated in the body's bicarbonate buffer system (BBS), whose main purpose is to maintain the body's acid–base balance (ABB) within the range of pH = 7.35 ÷ 7.45 (Guideline..., 2025). However, some established facts give reason to believe that the BBS has another natural function that has not been noted by physiological science, which in terms of its significance may be equal to or even exceed the importance of maintaining the ABB. Let us consider this virtual function of the human body's BBS.

A person exhales 4.38% of the CO₂, although they inhale only 0.036% (Table 3). Where does the CO₂ for exhalation come from? The most reasonable answer is from the body's bicarbonate buffer system since the atmosphere does not contain CO₂ in the same quantities as it is found in exhaled air. *"The body obtains CO₂ not from the atmosphere, but from the oxidation of fats during metabolism"* (Drogovoz et al., 2016, p.112). CO₂ can only enter BBS from food and is subsequently transformed into fat since there is no other way for carbon to enter the human body. **Consequently, carbon is partially returned to the atmosphere as CO₂, after biochemical transformation from food occurs in the digestive system, BBS and the body's respiratory system.**

Thus, under normal conditions, the body's BBC constantly releases another portion of CO₂ into the atmosphere through the lungs after each exhalation, and the body's internal reserves are continuously replenished with carbon dioxide. Given the obvious consistency and continuity of the processes of CO₂ expenditure and replenishment, it seems logical to assume that under normal conditions, the rate of CO₂ replenishment in the BBS is approximately equal to the rate of CO₂ expenditure during exhalation. If these rates were not equal, this inequality would be reflected in the variability of the CO₂ concentration in exhaled air (naturally, with a constant level of physical activity), which would fluctuate depending on which of the two rates is greater and which is less. However, human physiology does not support this

fact. In other words, under normal conditions, the BBS is in a state of dynamic equilibrium in terms of CO₂ expenditure and replenishment. From the assumed equality of these rates of expenditure and replenishment of CO₂ reserves under normal conditions, the following conclusion 2 logically follows.

Conclusion 2.

The bicarbonate buffer system (BBS) of the human body is, to a large extent, not a buffer for storing CO₂ reserves and for the possibility of its rapid consumption in case of need but an *airlock*, the main purpose of which is to reduce the significant gradient of partial CO₂ pressures in the external and internal environments of the body, equal to 148 (40:0.27; Table 3), thereby preventing the external atmosphere from “pulling” CO₂ out of the body, which needs to meet its internal needs, particularly to maintain the body's acid–base balance. *“The main factor in the movement of gases through the liquid environments of the body is the pressure gradient of these gases, which depends on their diffusion abilities”* (Sverchkova, 1988, p.84). *The diffusion capacity (alveolar-capillary) of carbon dioxide is 25-30 times greater than that of oxygen”* (Drogovoz et al., 2016, p.112).

Thus, the size of the body's available (*airlock*) reserve of CO₂ is determined primarily not by the body's internal needs for CO₂, which periodically change in magnitude but by the constantly acting and very significant gradient of partial pressures of CO₂ in the external and internal environment of the body and by the need for the body to counteract the attempts of the external atmosphere to "pull" vital CO₂ from it, associated with the existence of such a gradient. *“Carbon dioxide is no less necessary for the body than oxygen ...”* (Kban, 2010). *“Only in pairs do CO₂ and oxygen function effectively in our body... Excessive removal of carbon dioxide from the body causes the occurrence of approximately 150 diseases (“diseases of civilization”) (Moiseev V.S. (2013)”* (Drogovoz et al., 2016, p.113). The effectiveness of such a counteraction is determined by the individual ability of the organism to replenish its BBS with food decomposition products.

Conclusion 3 logically follows from conclusion 2.

Conclusion 3.

The “airlock” nature of the body's BBS indicates that the BBS functions at the limit of its physiological capabilities to maintain the body's acid–base balance since it has no “physiological” reserves for CO₂. The available reserves are largely “technical” in nature since their purpose is to prevent CO₂ from escaping into the atmosphere as much as possible rather than to maintain the optimal physiological level of CO₂ for the functioning of the body, for which the body lacks the necessary resources, both material and energetic. Proof of the validity of the latter statement is the existence of long-lived animals that practically do not develop cancer (see below), in which, unlike humans, the “O₂/CO₂ problem” has been solved.

To confirm conclusion 3, let us analyze the above information contained in the description of one of the experiments concerning changes in the composition of air inhaled and exhaled by humans in a sealed environment (Agadzhanyan & Elfimov, 1986, p.189).

As the concentration of CO₂ in the atmosphere increased, its elimination from the body did not change to a certain limit (PCO₂ = 38 mmHg, or 4.9%). The concentrations of CO₂ in the alveolar air and capillary blood also did not change and then began to increase together (*“against the background”*) with an increase in the volume of exhaled CO₂.

The body's CO₂ saturation occurred in the following order. As the concentration of CO₂ in the atmosphere increased, the body's bicarbonate buffer system was the first to become saturated with carbon dioxide. Complete saturation of the buffer occurred at PCO₂ = 38 mmHg or 4.9%. Then, after the buffer was saturated, the alveolar air and capillary blood in the body began to become saturated with carbon dioxide, which led to a simultaneous increase in the volume of excess CO₂ removed from the body.

Therefore, according to the information (Agadzhanyan & Elfimov, 1986, p.189), **saturation (restoration to normal) of the body's bicarbonate buffer system occurred at a CO₂ concentration in the inhaled air of ≈ 4.9%.**

The following information also supports the assertion that the modern bicarbonate buffer system of the human body has no physiological “safety margin” and immediately uses CO₂ “reserves” from internal resources (fat oxidation coming, see above) to ensure the breathing process. «*V_{CO2} (producing CO₂ by cellular metabolism) may also change abruptly under nonsteady-state conditions due to changes in body carbon dioxide stores (bicarbonate and carbonic acid) or exogenous infusion. For example, the rapid administration of sodium bicarbonate with the aim of neutralizing metabolic acidaemia (i.e., converting bicarbonate to carbon dioxide and water) results **in a stoichiometric increase** in carbon dioxide production: 100 mEq of sodium bicarbonate for more than 20 min may cause up to a 50% increase in V_{CO2} of the same duration (5 mEq/min)*» (Bigatello & Pesenti, 2019, p.1070). Let us analyze the information contained in the above excerpt.

If the body's bicarbonate buffer system had at least some reserve of CO₂ that was not used by the body when this non-stationary event occurred, then at least some of the introduced sodium bicarbonate would have replenished this reserve, and the other part of it, after filling the buffer system, would have been transformed into CO₂ and water. However, as follows from the above quote, this did not happen, and all the administered bicarbonate was immediately and completely utilized by the body, enhancing metabolism and ensuring a **“stoichiometric increase in CO₂ production,”** that is, the release of **all possible CO₂ that could be obtained from a given amount of sodium bicarbonate**, without preserving any reserve for the BBS, which turned out to be completely emptied, both at the onset of this non-stationary case and after the introduction of additional sodium bicarbonate.

Thus, in the author's opinion, based on the presented scientific facts, conclusion 4 appears logically justified.

Conclusion 4.

Another vital function of the BBS in the human body, along with its "buffer" function for maintaining the acid-base balance within a pH range of 7.35–7.45, is its "airlock" function, which reduces the partial pressure gradient of CO₂ between the external and internal environments of the body and thus reduces

the force of CO₂ "extraction" from the body. This ‘airlock’ function essentially protects the body from internal destruction, which inevitably occurs if CO₂ is allowed to leave the body unimpeded.

Additionally, a somewhat unexpected finding related to the topic of carcinogenesis was reached (Conclusion 5).

Conclusion 5.

By changing the O₂/CO₂ ratio, humans can save food since, instead of consuming their own body fat (Drogovoz et al., 2016, p.112), **they can use atmospheric CO₂ for breathing.** This result can be seen as one of the steps in solving humanity's food problem. In addition, changing the composition of the atmosphere could help combat obesity, for example.

Thus, the answer to the initial question about the cost of adapting the human body to the planet's unfavorable breathing atmosphere can be formulated as follows (Conclusion 6):

Conclusion 6.

In the current atmosphere of the planet, there is a catastrophic shortage of CO₂ and approximately double the excess oxygen O₂. An excessively high O₂/CO₂ ratio leads to a profound decrease in the physiological reserves of one of the main homeostasis systems of the human body—the bicarbonate buffer system—which maintains the body's acid–base balance. The consequence of such depletion is the high vulnerability of the *Homo sapiens* organism to adverse external and internal effects that entail a change in this balance, including the processes of carcinogenesis. In addition, as shown above, the human body's use of food products instead of atmospheric gases for respiration contributes to the worsening of humanity's food problems. **Such is the “price of adaptation.”**

5.2. Natural options for "cancer solutions"

There are cases in nature where mammals permanently live in conditions virtually identical to those proposed for cancer patients by the proposed **method for**

eliminating cancer and the risk of its occurrence. Of particular interest in this regard are the naked mole rat (NMR) (*Heterocephalus glaber*) and the bowhead whale (*Balaena mysticetus*). Let us first consider the living conditions of the naked mole rat.

The NMR, which lives in northeast Africa, is the most characteristic (basal) representative of African mole rats (Kim et al., 2011). **African mole rats (order Bathyergidae) are long-lived, strictly subterranean rodents** that feed on underground roots and tubers. They are able to thrive in habitats that are low in oxygen and rich in carbon dioxide and ammonia, conditions that are lethal to mice and rats (Bennett & Faulkes, 2000). *The naked mole-rat (Heterocephalus glaber) is the longest-lived rodent, with a maximal reported lifespan of 37 years. In addition to their long lifespan, which is much greater than predicted based on their small body size (longevity quotient of ~4.2), naked mole-rats are also remarkably healthy well into old age. This is reflected in a striking resistance to tumorigenesis and minimal declines in cardiovascular, neurological and reproductive function in older animals*” (Narayan et al., 2021). **“Cancer Resistance. Studies of the NMR** (Liang et al., 2010; Manov, et al., 2013; Seluanov, et al., 2008; Seluanov, et al., 2009) *and the distantly (~ 70 million years) related blind mole rat* (Gorbunova, et al., 2012; Nasser, et al., 2012; Manov, et al., 2013) *suggest that many species of long-lived mole rats are resistant to cancer, and even if they do develop pathology, they will present a milder phenotype in comparison with short-lived rodents (e.g., mouse)* (Azpuruua & Seluanov, 2012; de Magalhães, 2013)» (Fang, et al., 2014). *«The air in naked mole rat burrows is usually low in O₂ (approximately 8%) and high in CO₂ (approximately 10%)»* (Zhao et al., 2014), **i.e. O₂/CO₂≈0,8.**

The second species, similar to the NMR, which is also an African blind mole rat, is the Damaraland mole rat (DMR) (*Fukomys damarensis*), found in the arid regions of southwestern Africa. Unlike NMR, which weighs 35 g and has no wool covering its skin, DMR weighs 160 g and is covered with wool, which is a dielectric. Both animals lead the same strictly underground lifestyle and breathe the same atmosphere, but the DMR lives 10 years less (Fang et al., 2014). From the perspective of GBC, NMRs do not have electrical insulation in the form of a wool

coat, as does DMRs; for this reason, NMRs experience a direct and therefore more intense effect of the Earth's electric field (EEF) on the body, which can explain the 10-year difference.

Let us look at information about the bowhead whale.

*“It is remarkable that a warm-blooded species such as the bowhead whale (*Balaena mysticetus*) has not only been estimated to live over 200 years (estimated age of one specimen 211 SE 35 years), suggesting that it is the longest-lived mammal but also exhibits very low disease incidence until an advanced age compared to humans (George et al., 1999; Philo et al., 1993)”* (Keane et al., 2015). Throughout its life, the Greenland whale has been in constant contact with the Earth's electric field (EEF), whose energy flows are localized in the waters of the World Ocean. Given the high electrical conductivity of seawater, it seems obvious that the distribution of EEF energy in the mass of the World Ocean is much more uniform than that in the upper layers of the lithosphere, where areas with both normal and abnormally high or low conductivity can be found. From the point of view of GBC, the limited distributions of NMR and DMR in northeast and southwest Africa, respectively, may indicate that the upper soil layers in these regions have high electrical conductivity characteristics that facilitate the penetration of EEF energy into animal organisms, to a greater extent in NMR and to a lesser extent in DMR, due to the presence of a dielectric wool coat.

In addition to the effects of the Earth's electric field, the body of the bowhead whale is also constantly exposed to the same hypoxic-hypercapnic respiratory mixture factor as NMR and DMR. *“Thus, in long-lived cetaceans and freshwater turtles, in the process of phylogenetic development, the organism has adapted to prolonged stays underwater accompanied by respiratory arrest, in which a state of oxygen deficiency and carbon dioxide excess is formed in the body (Yépez et al., 2024, p.4).»* (Tregub et al., 2024).

Thus, according to the GBC and the facts presented above, **both the naked mole rat and the bowhead whale owe their phenomenal longevity and resistance to**

cancer to precisely those environmental conditions that are modeled by the proposed method for eliminating cancer and risk of its occurrence.

5.3. Effects of the "earthing" component of the proposed method for eliminating cancer and the risk of its occurrence.

When identifying the reasons for the longevity and cancer resistance of, in particular, the naked mole rat and the bowhead whale, the following circumstance, important for solving the cancer problem, should be noted. None of the studies devoted to the phenomena of these animals have addressed the fact that both of these organisms are in constant contact with the energy flows of the Earth's electric field (EEF) throughout their lives, a fact that deserves more detailed consideration.

According to the author, modern natural science, particularly medicine and biology, critically underestimates the importance of the Earth's electromagnetic field (EEMF) and its main component, the Earth's electric field (EEF), as a crucial factor not only in the origin of life on Earth but also as a factor in the ongoing evolution of living matter in all organisms, including humans (all long-lived organisms, both animals and plants, obviously exist in constant electrical contact with the EEF). Therefore, the literature contains virtually no scientific data regarding the effects of specific frequency-energy parameters on the human body on EEF energy flows when earthed. At the same time, there are a significant number of publications in popular and scientific medical literature in English concerning the positive effect of the very fact of earthing the body on both physiological and pathological processes (Ober et al., 2012; Chevalier, 2014; Chevalier & Mori, 2007; Chevalier et al., 2012; Oschman, 2008; Oschman, 2007), including attempts to use earthing as an adjunct in the fight against COVID-19 (Ober & Oschman, 2020). In all of the above works, earthing is considered a secondary factor that can have some, usually positive, effect on the human body but not an evolutionary factor whose application can rebuild the body at the genetic level in the direction in which the entire evolution of living matter in the biosphere is progressing. This underestimation can be explained simply as follows.

The Oparin (1924) - Haldane (1929) theory about the origin of life on the planet in the primordial ocean continues to invisibly dominate modern biological science. It is

obvious that this theory does not take into account either the Earth's electromagnetic or gravitational fields as important factors in the origin and evolution of life on Earth.

However, numerous facts, as well as the opinions of authoritative scientists in this field (Soviet academician L.S. Berg, British biochemist and crystallographer D. Bernal), refute this theory and indicate that life on Earth originated on land, in river floodplains or estuaries, on the periodically moistened border with sea or continental water bodies, and then spread, on the one hand, deep into continents and, on the other hand, into the depths of the world ocean and continental water bodies. According to established facts, life on Earth arose in the form of thin films condensed on primary clay, first non-living inorganic, then non-living organic, and finally living organic matter (Shchukin, 2010, p.35-41). Modern biology does not define the concept of “living matter”; such a definition is given in GBC (Shchukin, 2021, defin.3,4).

Thus, according to the GBC, living matter is the product of the interaction of nonliving matter condensed on clay **with the energy flows of solar radiation and the Earth's gravitational and electromagnetic fields (EEMFs)**, part of which is its quasi-static ultralow-frequency electric field (EEF) (Podoltsev, 2016). **Consequently, the EEMF is an important factor in the evolution of living matter in the biosphere.** *“The evolution of organisms is nomogenesis, i.e., development based on regularities. However, the nature of these regularities is obviously not statistical but dynamic, like the laws governing reversible processes, such as gravity, electrical and mechanical oscillations, and acoustic and electromagnetic waves”*(Berg, 1977, p. 310). By using a modified Earth's electric field factor, in combination with the effect of a hypoxic-hypercapnic breathing mixture on one's body, within the framework of the proposed method for eliminating cancer and the risk of its occurrence, a person is able to solve, in particular, both the problem of cancer and the problem of extending one's own life beyond its current species limit (Shchukin, 2021).

Earthing the body has an effect on it that is, to a certain extent, similar to the effect that a cell undergoes during its malignant transformation. Thus, as a result of earthing the body, the electrical conductivity of all of its tissues increases, including brain tissue, which abruptly transitions from a dielectric state to a conductive state;

(Shchukin, 2010, p.120; Oro et al., 2008, p.397) additionally, its resonance frequencies decrease by approximately 1.6 times (Kudryashov, 2008, p.76); Khvan, 1980); and the need for oxygen decreases: “*Running in bare feet reduces oxygen consumption by a few percent*” (Warburton, 2001). By ensuring the regulation of geoelectric energy flows entering the human body when it is earthed, as well as a gradual change in the composition of the respiratory mixture in the proposed direction, people will be able to rid their body of carcinogenesis processes and extend their life beyond their current species limit, as evidenced by the existence of the naked mole rat and the Greenland whale.

6. Conclusion

From the perspective of GBC, cancer is a generalizing marker of aging in *Homo sapiens* species. This organism has exhausted its energy potential for “physiological adaptation” to the constant growth of energy pressure from the external environment—the Biosphere—on its own genome and has entered the stage of “genetic adaptation,” manifested in the form of cancer. Thus, cancer is a manifestation of the process through which *Homo sapiens* organism transitions to the next stage of evolutionary development. “...***Homo sapiens is not a finished creation; it does not possess a perfect thinking apparatus. It serves as an intermediate link in a long chain of creatures that have a past and will undoubtedly have a future. Its ancestors had a less perfect thinking apparatus, and its descendants will have a more perfect one than it has***” (Academician Vernadsky V.I.).

Therefore, the primary significance of cancer for humans, according to GBC (Shchukin, 2018), is that it serves as an indicator of the direction in which further evolution of both *H. sapiens* and the entire biosphere will proceed. By moving in the direction “indicated by cancer,” humans will not only eliminate themselves from the cancer problem itself but also solve other vital problems—the problem of extending their own lifespan beyond its current species limit—while simultaneously eliminating many diseases currently considered incurable, the problem of nutrition on a human scale, and the problem of controlling the global climate, including global warming (Shchukin, 2021). In this case, the “**Archimedean fulcrum**”, on which a human being will be able to transform both himself and the entire biosphere, is

the ratio of atmospheric gases O₂/CO₂, which must be reduced from the current ≈ 550 to the optimal values for all living matter in the biosphere, equal to 1÷4, which corresponds to an oxygen content of O₂ ≈ 13-15%, and carbon dioxide CO₂ ≈ 6-8%, with the remaining components remaining unchanged.

This scientific prediction can be confirmed (or refuted) only by the expected positive results of the above-described evidence-based biomedical experiment to test the effectiveness of the method for eliminating cancer and the risk of its occurrence. The author is willing to cooperate with any interested party in setting up such an experiment.

"If the possibility arises (and it undoubtedly will) of externally influencing and controlling the electrical conductivity of cells and the living organism as a whole, truly inexhaustible avenues will open up in the fight against human diseases and the prolongation of life" (Manoilov, 1975, p.44). According to the author, the proposed method for eliminating cancer and the risk of its occurrence offers such an opportunity.

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