What is Cancer?

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Abstract

Relational physics, which I founded, is essentially a theoretical system in physics, but it is a theory of everything that can be applied to all other disciplines. In this paper, I attempted to apply the ideas about energy to medicine (cancer mechanisms) in order to establish new methods of treatment and prevention. Based on the numerical values of nerve pulses (electrical energy) generated in the human body, the various other factors that make up these pulses were also quantified, contributing to the derivation of the most rational model for protecting somatic cells from excessive pulse energy. It came to fruition as synaptic therapy. This study is unique in that it identified the root cause of cancer not in somatic cells but in cranial nerve cells, and elucidated its meaning in a holistic and comprehensive manner, intertwining it with cosmic and global organismic theory.

Introduction

Today, medical advances are remarkable. In scientific research, human beings have expanded the scope of analysis to the microscopic world at the cellular and molecular levels, and have come to grasp the causes and cures for a variety of diseases. Cancer treatment is one of them. It has been a long time since modern medicine established the three major therapies for cancer (surgical removal, anticancer drugs, and radiation). However, mankind has yet to conquer cancer. Improvements in testing techniques have made early detection possible, and we have reached the point where we can temporarily restore health through surgical removal, but we have not yet been able to completely prevent recurrence. Only when we can prevent cancer from ever getting worse, and only when we can prevent people from getting cancer in the first place, can we say that we have reached the point of fundamental solution. In order to do so, it is necessary to examine cancer from a fundamental point of view, such as what a human being is, what life is, and what a cell is. In addition, it will be important for cancer treatment and prevention to build new, comprehensive knowledge by actively incorporating ideas not only from the life sciences,

such as medicine, biology, brain science, and neuroscience, but also from other scientific disciplines, such as physics and chemistry, as well as the humanities, such as philosophy and sociology.

Methodology

This world is a clockwork organism. Such organic nature is preserved at every scale: throughout the universe, galaxies, stars, societies, human bodies, cells, molecules, and atoms. In this regard, we human beings, as members of this world, are parts and gears that support the universe and nature. Such gears do not make sense even if they exist in isolation; they have significance only when they intertwine with and influence each other. From here, the philosophy of relational physics was born, which holds that the relationships among members are forces and energy [1]. Such organic principles that operate on the energy between members are common within the human body. Our body is an organism consisting of about 37 trillion cells [2]. The human life activity is operated by their mutual exchange of information in the form of electrical signals [3]. In other words, the human body has an entity as an electrical system (cellular society). Electric energy is truly a natural blessing that sustains our lives. However, if these interactions exceed the appropriate level and continue for an extended period of time, the normal organic nature of the human body may be disrupted, leading to poor physical health and disease. Electricity brings both happiness and suffering to humans. In this section, I will discuss the mechanisms of disease (especially cancer) based on such an electric image and view.

The cellular society that makes up the human body, like the real world, must have a governing structure to discipline its many members. This is because the existence of a supreme decision-making body to set the direction of the organism as an individual makes it possible to operate in an orderly manner as a whole. Just as a nation needs a government or a chief executive, so does the human body need such a command post. It is the brain that is responsible for this. From this, a new mechanistic view is derived that there should be a coordination system between brain cells and body cells to realize the unity of the human body. That is the mechanism I surmised, track down. Track down is triggered by intense brain arousal based on eating, sleeping, sexual activity, etc., which instantly delivers pervasive electrical pulses to body cells throughout the body, which in turn renews the DNA in the cells [4]. In a nutshell, it is a mechanism for writing information using the energy of electric pulses. In doing so, we keep our bodies updated with the latest information that is useful for life, gained through daily experience and learning.

Based on these assumptions, let us take a closer look at how the daily changes in the brain affect the human body. The daily information content, the frequency of information renewal, and the latest order content brought about by the daily information content, formed by the neural network in the brain, vary from individual to individual. It is all manifested by track down. What the track down will look like depends on what the individual's brain order is like. If so, the cause of cancer is likely to be in that area. In other words, what it means to develop cancer is that the brain continues to track down the cancer-prone brain order at a cancer-prone frequency and intensity for an extended period of time. Conversely, if we want to cure or prevent cancer, we need to improve our brain order and track down accordingly. The most important point I wish to make to you in this paper is just that. The latest cancer treatment and prevention methods derived from this will be discussed in detail later.

Now, by the way, the most obvious phenomenon that causes changes in the brain is the decrease in cranial nerve cells (neurons). It is believed to be dying at a rate of about 100000 per day [5]. We can say that we live by changing the order in our brains every day as we eat and sleep. That

is what it means to grow old. In this regard, aging is considered a normal physiological phenomenon, a balancing act that takes place to ensure a balance between the self and the surrounding environment. Since cell death is also triggered by the operation of the program of apotosis [6], aging itself need not be the subject of treatment.

5 The symptoms of cancer, on the other hand, are an obvious anomaly: the endless proliferation of cells. A normal cell will always be designed to divide only a limited number of times in order to maintain its function as a gear in the cellular society (Hayflick's limit) [7]. This is an essential property that should naturally be required as a member of an organic body. Cancer cells, however, shake off such restrictions and multiply without limit. This means precisely the

10 destruction of the social and organic nature of the organism in vivo. Why would such an anti-organic, pathological phenomenon arise? To put it simply, the answer to this question is that the ruthless law of "the greater good is better than the lesser good" exists in the natural world.

Let us examine this in detail, with specific calculations. The nerve pulses exchanged in the human body are produced from the potential difference (about -70 [mV] in the resting state)

15 between potassium and sodium ions that are distributed inside and outside the nerve cells covered by the cell membrane [8]. The electrical energy per ion in this case can be thought of as an individual nerve pulse generated locally. Although this is only a simplified model, in general, the equation for nerve pulse energy in the human body is given in the following form.

20 $$E = QV \quad —①$$

E represents the energy of the electrical pulse, Q represents the amount of charge per ion (= electroelement [9]), and V represents the potential difference between inside and outside the neuronal membrane. Substitute each value into the above equation to calculate the nerve pulse

25 energy in the human body generated locally. The following process is used to give values.

$$E = QV$$
$$= 1.6021766 \times 10^{-19}[\text{C}] \times 0.0694461522[\text{V}]$$
$$= 1.11265 \times 10^{-20}[\text{J}]$$

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This is the energy value at the local level of a typical nerve pulse in the human body (please note that it can vary from time to time and from individual to individual). Compared to the ultraviolet energy of the sun (about 1.11265×10^{-17} [J]), it is only about 1/1000th of the weak energy, but if it is accumulated for 1000 times, the cells on the receiving end of the pulse would have been

35 damaged as much as by exposure to ultraviolet radiation. Skin cells are believed to respond to sunburn in a few to 24 hours once they begin to be exposed to the sun's ultraviolet radiation [10]. Since ultraviolet rays are absorbed by melanin pigments, the human body tans by emitting them to protect the skin [11]. This is also a kind of self-preservation by the organism to maintain its own organic nature. Why do so? Because the organism wants to avoid cancer. It would be a

40 noble way to live. That is what it means to live.

Now, let us calculate the pulse interval values of nerve pulses in the human body. The equation that can do so is completed by combining the energy equation in relational physics with the equation for the rotation law, also in relational physics (the specific derivation process will be discussed in detail at another time). The formula is as follows.

45

$$t = \sqrt{\frac{4En_c^2\pi^2l^3}{k_a L}} \quad -②$$

In relational physics, the rotational motion (rotation and revolution) of an object and a pulse are considered equivalent. The above equation is a mathematical expression of this. t represents the pulse interval, E represents energy, n_c represents the number of rotations (pulses), l represents the distance between objects (here set to 1.269×10^{-9}[m]), L represents the energy foundation range (here set to 1.269×10^{-9}[m]), and k_a represents the electromagnetic force constant (value is 1, unit is [kg·m^4·s^{-4}]).

Now, let us substitute each value into equation ② and calculate. The pulse interval value is given by the following process.

$$t = \sqrt{\frac{4En_c^2\pi^2l^3}{k_a L}}$$

$$= \sqrt{\frac{4 \times (1.11265 \times 10^{-20}) \times 1^2 \times 3.14^2 \times (1.269 \times 10^{-9})^3}{1 \times (1.269 \times 10^{-9})} \frac{[\text{kg} \cdot \text{m}^2 \cdot \text{s}^{-2} \cdot \text{m}^3]}{[\text{kg} \cdot \text{m}^4 \cdot \text{s}^{-4} \cdot \text{m}]}}$$

$$= \sqrt{7.06644 \times 10^{-37} [\text{s}^2]}$$

$$= 8.406217 \times 10^{-19} [\text{s}]$$

This is the pulse interval value of the electrical signal energy generated locally in the nerve. However, it is difficult to tell from this alone whether it is within the normal range or not. Therefore, I would like to reveal the real picture through relative quantification in combination with other factors. Let us now establish an equation relating temperature to. The target equation to relate is the Stefan-Boltzmann law [12]. The formula is as follows.

$$E = \sigma T^4 \times 4\pi l^2 [\text{W}] \quad -③$$

Since this is an equation for radiation intensity, let us transform it into an equation that deals with energy. It takes the following form.

$$E = \frac{\sigma T^4 \times 4\pi l^2}{v} [\text{J}] \quad -④$$

Let us incorporate a variant of the rotation law equation in relational physics ($v = n_c 2\pi l/nt$ [m·s^{-1}]) into equation④. The following process completes the equation.

$$E = \frac{\sigma T^4 \times 4\pi l^2}{\left(\frac{n_c 2\pi l}{nt}\right)} \frac{[\text{W} \cdot \text{m}^{-2} \cdot \text{K}^{-4} \cdot \text{K}^4 \cdot \text{m}^2]}{[\text{m} \cdot \text{s}^{-1}]}$$

$$= \frac{\sigma T^4 \times 4\pi l^2 \times nt}{\left(\frac{n_c 2\pi l}{nt}\right) \times nt} \frac{[\text{W} \cdot \text{m}^{-2} \cdot \text{K}^{-4} \cdot \text{K}^4 \cdot \text{m}^2 \cdot \text{s}]}{[\text{m} \cdot \text{s}^{-1} \cdot \text{s}]}$$

$$= \frac{2\sigma T^4 nlt}{n_c} \ [\text{J}] \quad —⑤$$

This is the formula for the relationship between the Stefan-Boltzmann law and the rotation (pulse) law. Let us transform this into an equation for dealing with the number of parties (n). It takes the following form.

$$n = \frac{En_c}{2\sigma T^4 lt} \quad —⑥$$

n represents the number of parties, E represents the electrical pulse energy (thermal energy), σ represents the Stefan-Boltzmann constant ($5.67 \times 10^{-8}[\text{W·m}^{-2}\text{·K}^{-4}]$), T represents the absolute temperature, l represents the distance, and t represents the pulse interval value. Now, let us calculate the value of n by substituting each value into formula ⑥. For the value of T, I would like to use 309.68568[K], which is the human body temperature (common temperature for both local and whole human body levels). The following process is used to give calculated values.

$$n = \frac{En_c}{2\sigma T^4 lt}$$

$$= \frac{(1.11265 \times 10^{-20}) \times 1}{2 \times (5.67 \times 10^{-8}) \times (309.68568)^4 \times (1.269 \times 10^{-9}) \times (8.406217 \times 10^{-19})} \frac{[\text{kg·m}^2 \text{·s}^{-2}]}{[\text{W·m}^{-2} \text{·K}^{-4} \text{·K}^4 \text{·m·s}]}$$

$$= 10000$$

The above values were obtained. What does this mean? Let us look at it in more detail in the next section.

Discussion

Equation ⑥ represents the number of parties (n) that make up the local level electrical energy of nerve pulses generated in the human body. The value calculated based on this was $n = 10000$. Would this number be the number of ions? Or is it the number of ion channels?

Let us look at equation ⑥. We find that the number of parties (n) stands inversely proportional to the temperature (T). Focusing on that point brings up an important truth here. That is, the large number of n's allows temperature to escape (disperse) and reduces the risk of heat exposure to somatic cells. In other words, in equation ⑥, n can be thought of as a variable related to risk diversification ability. In this regard, ion channels are entry/exit points for creating potential differences between the inside and outside of neurons, not channels for heat dissipation. Hence, it can be seen that n does not represent the number of ion channels. Also, the aforementioned value of 10000 is too small to be considered as the number of ions themselves. Hence, we also know that n does not represent the number of ions.

Then what the heck does that represent the number of parties? The answer to this question will be discussed in detail later.

Let us now consider the difference between pathological phenomena and self-defensive balancing. All living organisms, including the human body, invariably take definite measures of self-preservation to protect their own organic nature in the event of some excessive pleasurable

behavior. It is an alternative measure of some, remarkable balancing act between excessive behavior. An example is sunburn caused by excessive sun exposure. Ultraviolet radiation is a high-energy form of radiation that shreds the bonds between amino acids in cells, so the organism takes the countermeasure of sunburn to protect itself. So is aging. The somatic changes woven by an excessively reduced number of brain neurons are being expressed in order to achieve a balance between the shifting surrounding environment. So is obesity. Overproduction of intense cerebral excitation increases the frequency and energy of track down and causes significant damage to body cells. Hence, the organism actively divides and proliferates fat cells to increase the amount of subcutaneous and visceral fat, thereby dispersing damage. So is thinning hair. To prevent the excess track down energy from causing serious damage to body cells, the organism attempts to cool down the body cells by dissipating heat in exchange for the death of papilla cells. In extreme cases, even the response of drug addicts to protect their organism from the track down stimuli of overexcitation by destroying their own dopamine intake in the brain is similar.

They all have one thing in common: they are all self-protective balancing acts (at the level of the individual organism) performed by the individual organism to protect its own organic nature. The organism does not want to get cancer, so it is trying to achieve such balancing as a desperate measure.

However, it is hard to believe that the pathological phenomenon of cancer was brought about by such self-preservation purposes. In fact, it is even the opposite. All pathologies and self-protective balancing ultimately occur in somatic cells. When something goes wrong, somatic cells, as somatic cells, have no choice but to take the best self-defense measures that somatic cells can take. The only way to walk away from the risk, at least, is to do some kind of balancing that can be done at the somatic cellular level. That is within normal limits.

Cancer, on the other hand, is a symptom that occurs in somatic cells as dividing cells (non-dividing cells do not become cancerous in the first place [13]), but its root cause is found in brain neurons (track down). In other words, somatic cells become cancerous even though it is not the fault of the somatic cells. Moreover, there is no sense of any self-defense purpose in it. What on earth does this mean?

This is a measure of self-preservation and a balancing act to protect the organic nature of the universe and the earth, beyond the level of individual organisms, including somatic and brain cells (the principle of the "big is better than the small"). The natural world sometimes sacrifices the balance of a small organism, the individual organism, in order to preserve the balance of the larger organism, the universe or the earth. Cancer is just the manifestation of this. Even if we humans, in our daily lives, sometimes binge drinking and eating, causing track down excesses, the natural mechanisms initially try to protect the organic balance of the individual and make changes for this purpose (to give us a chance for rehabilitation, so to speak). However, if the individual is unwilling to change such anti-organic behavior for any length of time, nature will switch strategies and give up the approach of protecting the individual and move to one of protecting the entire universe. The infinite proliferative capacity of cancer cells is exactly what they are designed to do.

If this is the case, then various therapies that target the cancer cells themselves, while effective in the early stages, will become less and less effective the closer one gets to the terminal stages of cancer.

So how on earth can we solve the problem of cancer from a fundamental level? It is also problematic in relation to the meaning of n in equation ⑥. From the track down mechanism, we know that the nerve pulse is the track down itself. Track down is a phenomenon in which

electrical pulse energy generated in cranial nerve cells (neurons) is transmitted simultaneously to all body cells throughout the body. The electrical energy is converted into a chemical signal in the space separating neurons, but is converted back into electrical energy within neighboring neurons and transmitted [14]. From the brain, it passes through the spinal cord and eventually
5   reaches the body cells throughout the body. The human body temperature is about 310 [K] (37 [℃]) because the countless number of individual heat areas of 310 [K] generated locally converge to the normal temperature at the whole human body level by adjoining each other vertically and horizontally (the principle of thermal equilibrium [15]).

Thus, excessive track down could eventually lead to abnormal heat exposure to somatic cells. If
10   DNA is damaged in the process, it increases the likelihood of including genetic information copying errors that later accompany cell division. Thus, cells that should have been normal become cancerous.

If this is the case, then the most rational strategy to alleviate or prevent cancer is to release the heat successfully.
15   In connection with this, if we consider the meaning of n in equation ⑥, we can see the real picture. In other words, it is the number of n that holds the fate of whether heat is concentrated locally or dispersed over a wide area.

In this light, the value of n represents the number of synapses. It is estimated that there are about 10000 synapses per neuron [16]. It is consistent with the value of n calculated in the previous
20   section using equation ⑥. On the surface of the cell membrane, many thorns (dendrites) extend like kompeito sugar, and placed at the tips of these thorns are synapses. Electrical pulses generated within neurons always pass through synapses before reaching somatic cells. In other words, it is a pathway for electricity.

Thus, ultimately, the number of synapses (n) equals the number of electrical pathways. Therefore,
25   depending on how much of it is present on a neuron, it makes a difference whether the terminal somatic cell receives the electrical stimulation (heat) all at once or shares it with other somatic cells. This leads to the difference between being prone to cancer and not. In short, the synapses are exclusively responsible for the risk-dispersing function of mitigating somatic heat exposure.

As mentioned earlier, approximately 100000 neurons are extinguished per day. It is a non-
30   dividing cell, so once it breaks down, it never regenerates. And a decrease in the number of neurons means an associated decrease in the number of synapses. The risk of developing cancer increases with age because the total number of synapses with the ability to disperse risk decreases with neurons. If no action is taken, it will only diminish and reduce energy efficiency. In an attempt to compensate for this, we modern people tend to resort to shortcuts that stimulate
35   and elevate us (overeating, smoking, drinking, etc.). However, this increases the risk of lifestyle-related diseases such as cancer, heart disease, and stroke.

If this is so, then the best that humans can do to treat and prevent cancer is to increase the number of synapses through practice. Once neurons are reduced, they can no longer be increased, but fortunately, synapses can be increased with practice [17]. We can continue to increase our
40   synapse count at any age by actively using and training our brains. Besides, it has no side effects like drugs. There is no physical or psychological burden on the patients. Enhancing synapse number is truly the ideal way to treat and prevent cancer. I named it "synaptic therapy". Formula ⑥ and its calculations led me to it.

45   **Results**

Cancer is caused in brain neurons, but the results occur in somatic cells, which complicates the situation and makes it difficult to see the real solution. To solve this mystery, I attempted to establish a new model of the relationship between nerve pulses and somatic heat exposure by combining my own theory of energy (relational physics) and my own track down theory (autonomous organism theory). In the process, I reinforced my own model by incorporating the Stefan-Boltzmann law. As a result, I had newly discovered the risk-dispersing function (heat-dissipating ability) of synapses. I also succeeded in deriving a new method of treatment and prevention of cancer (synaptic therapy) from it.

Conclusion

Cancer cells were originally normal cells in the body. Since normal cells have simply transformed into cancer cells at some point, it is prudent to avoid, if possible, the type of therapies that target them. Of course, they can be used in conjunction with synaptic therapy. However, since the root cause of cancer lies in the brain neurons (track down), it would be better if measures could be taken at the brain cell level without harming body cells to avoid "friendly fire".

The essence of the phenomenon of cancer is based on the principle of "the greater good is better than the lesser good", which is manifested in the "change of course" that the natural world has steered toward "elimination" of dangerous molecules that continue to adopt an anti-organic attitude. The natural world has changed its policy to erase the small organic nature of individual organisms in order to protect the large organic nature of the universe as a whole. That is what it means for a cell to become cancerous.

If this is the case, it is meaningless to try to restore organicity at the "small" level, and we, as members of an organic body, should take measures to restore organicity at the "large" level. In other words, the most important way to restore our health is to improve our lifestyle itself. If synaptic therapy can help with that, I am happy.

I wish all cancer patients a speedy recovery.

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