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Research Article

# A Mathematical Model for Inducing Delays in Transmissions of Information Between Spinors Within the Heart, Hemoglobin Molecules and Cells by Mobile Waves

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**Abstract:** Biological systems like the heart, hemoglobin and cells are built from entangled spinors. Entangled spinors exchange information through two ways: (i) Spinor waves with the velocity of infinity; and (ii) Photons with the limited velocity of the speed of light. If any spin in a pair reverses, then the other spin changes sogn immediately. However, initial exchanged photons do not understand these changes, and retain the memory of the previous stage. Thus, when they reach the spinors, the spinors repel them. With time, the new emitted photons from the spinors obtain the correct information, and absorb other spinors in a pair. This repelling and absorbing causes the oscillation of heart cells and the motions of blood cells including hemoglobin. These molecules transmit information and oxygen and pass them on to cells. A mobile wave could break the entanglement between the spinors of the hemoglobin, and cause a delay in information and oxygen transmission from the heart to some cells, thereby creating non-normal cells like tumor ones. The reason for this is that without information, cells have to act independently of other cells. Also, without oxygen, cells have to use other mechanisms for respiration like the ones which were used by tumor cells in the Warburg proposal. This does not depend on the wavelength because the wavelength only determines the probability of existence of photons at each point and waves with any wavelength (even bigger than cell size) are formed from many photons with smaller size than cells. However, after some time, after establishing electromagnetic towers, the spinor structure of the body could resist these wave-fronts, and the probability for the emergence of tumors decreases. Without this resistance and according to the Warburg proposal, generated tumor cells produce different numbers of spinors which help them to diagnose the motion of T-cells, making them ready to respond. To avoid this event, we may use again some mobile waves which produce some noise around tumor cells.

***Keywords*:** mobile waves, tumors, hemoglobin, heart, spinors

**MSC:** 92C37, 35Q92


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# 1. Introduction

Recent investigations have shown that mobile waves have very dangerous effects on biological cells. For example, some investigators have described that radiofrequency radiation (RFR) emitted from mobile phones has a potential to produce DNA damage in follicle cells of the hair in the ear canal [1]. Some other authors have argued that 5G mobile networking technology will affect not only the skin and eyes, but will have adverse systemic effects as well [2]. Another study has investigated the non-thermal effects of Wi-Fi radiofrequency radiation of 2.4 GHz on global gene expression in Escherichia coli K-12 DH5α. According to those results, the exposure of *E. coli* DH5α to Wi-Fi radiofrequency radiation for 5 h influenced several bacterial cellular and metabolic processes [3]. Another paper has proposed some evidence for a connection between coronavirus disease-19 and exposure to radiofrequency radiation from wireless communications including 5G [4]. Another research has indicated that 900-, 1,800-, and 2,100-MHz waves emitted from mobile phones may cause oxidative damage, induce increase in lipid peroxidation, and increase oxidative DNA damage formation in the frontal lobe of rat brain tissues. Furthermore, 2,100-MHz RFR may cause the formation of DNA single-strand breaks [5]. Another article has evaluated 18 studies that included 4,280 samples and showed that mobile phone usage is harmful to sperm quality [6]. Another work has considered the effects of RF exposure from mobile phones on human brain waves, which can provide information about the mental state of the individual [7]. Another investigation has discussed that scrotal hyperthermia and increased oxidative stress may be the key mechanisms through which electromagnetic waves affect male fertility. However, these negative effects appear to be associated with the duration of mobile phone use [8]. Motivated by these researchers, we propose a model which shows how mobile waves could break the entanglement between biological spinors of hemoglobin, heart and cells and cause a decrease in information transmissions from the heart to normal cells. This information loss may cause the emergence of some diseases like cancers.

Up to now, some mathematical models for biological systems have been proposed. For example, in one article, a qualitative analysis of the mathematical model of novel corona virus named COVID-19 under nonsingular derivative of fractional order was considered [9]. Another study analyzed the fractional order co-infection disease epidemic model endowed with Caputo fractional derivative [10]. Another study investigated the impact of global infection rates on social media posts during the COVID-19 pandemic [11, 12]. There are many other parallel researches which make use of mathematical models in biological systems. In this present work, we focus on the physical aspects of biological systems and consider the effects of waves on them. We discuss how mobile waves act like noises and reduce entanglement between spinors on hemoglobin molecules, cells and the heart. This causes that the transformation of information between cells confronts some problems, and some diseases appear.

The outline of paper is as follows: In Section 2, we describe the model and consider the effects of mobile waves on biological spinors within the hemoglobin and the heart. In Section 3, we propose the mathematical results. The last sections are devoted to the discussion and conclusion.

# 2. The model: Considering interactions between biological spinors and mobile waves

Recently, some scientists have announced that mobile waves could have harmful effects on biological cells and even cause hard diseases like cancer. However, factories respond that wavelengths of mobile waves are bigger than the size of cells and have no effect on them. There is a mistake in understanding the quantum concept of wavelengths and waves. A wave is formed from many photons whose sizes are very smaller than the sizes of cells. A wavelength is a quantity which determines the probability for the existence of a photon at one point. For example, when the peak of a wavelength is at one point, there is more probability of finding a photon there, while at other points of the wavelength, this probability is smaller. Thus, even radio waves with large wavelengths are built of photons with small sizes which could pass cell membranes and reach the DNA. However, the number of photons in unit time that collide with biological cells increases with the reductions of wavelengths. The reason for this is that by reducing the wavelength, the separation between the peaks decreases, and if one supposes that each peak includes a photon, the number of photons increases. Thus, a wave is formed from many photons. Photons are elementary particles that could join each other and form planes of waves (See Figure 1).

Now, the question that arises is how the photons of mobile waves interact with biological cells. To respond to this question, we should remember that biological structures like the hearts, hemoglobin molecules and cells are built from spinors like electrons and atoms. These spinors could interact with any external wave-like mobile waves. To describe these interactions, we should firstly consider the process of information transmission from the heart spinors to hemoglobin spinors and cells. These spinors are entangled and exchange information through two ways: (i) Spinor waves which move with infinite velocity. This means that in an entangled system, when a spin changes, all spins change immediately. (ii) Photons which move with limited velocity like the velocity of light. Thus, spinors exchange photons for communication, because most of them have electrical charges and these charges exchange photons which form the structure of waves. Also, spinors have another ability to diagnose any change in other spinors and respond. This ability comes from the Pauli exclusion principle. Any change in one spinor could cause changes in other spinors (See Figure 2).

To clear the role of these waves in blood circulatory systems, we consider two spinors in a pair. These spinors emit photons which move from one spin to the other. If a spin in this pair reverses, the other spin would reverse immediately. However, exchanged photons have the memory of the initial state and when they come close to any other spinor, they repel it. With time, new photons are emitted by the spinors which have the correct information. When these photons come close to any spinor in this pair, they attract it. This repelling and attraction causes an oscillation of the spinors. The same event occurs within the heart. A difference between the time of information transmission by spinor waves and photons causes the oscillation of the heart cells and the motion of blood cells. This is because photons have the velocity of light whereas spinor waves act immediately and thus the velocity of the photons is less than the velocity of the spinor waves (See Figure 3). Red blood cells include hemoglobin molecules which contain iron atoms and many spinors. Iron atoms could play the role of antennae, take information from the heart or brain cells, and store them. Then they move within vessels, and give this information to biological cells. The spinors of the heart, hemoglobin molecules and cells are entangled. Any change in the spinors around a cell could be diagnosed by other cells immediately (See Figure 4). However, this entanglement may be decreased by external waves. For example, mobile waves could divide into photons. These photons break the entanglement between the spinors of hemoglobin molecules and produce new entanglements between these spinors and spinors on towers or mobile antennae. In fact, hemoglobin molecules exchange information with each other and the heart and brain. However, any external magnetic field acts like noise, and prevents the transformation of information (See Figure 5). By decreasing the entanglement between biological spinors, information could not be transformed between cells, and some cells lose information. Maybe, these cells carry out their activities without knowing the states of other cells and independently of them. Also, possibly some hemoglobin molecules cannot provide the oxygen needed for these cells. Consequently, without information and oxygen, these cells use respirational methods which are using by tumor cells in the Warburg proposal [13, 14]. This may cause cancer (See Figure 6). According to the Warburg idea [13, 14], products of cancer cells are different from normal ones. For example, normal cells take oxygen and glucose and give out water, carbon dioxide, ATP and spinors, while tumor cells take glucose and give lactate and different numbers of spinors with respect to normal cells (See Figure 7). This change in the number of spinors causes a change in the entangled biological system, and can be diagnosed by T-cells. These cells move and their motion changes the spins of the system. These new changes in the spinors could be understood by tumor cells and they become ready to respond to any attack of T-cells by producing harmful connections like PD1/PD-L1 ones [15, 16]. To avoid these connections, we can use mobile waves and induce some extra photons around tumor cells. These photons act like the noise and cause information loss. Consequently, tumor cells could not understand the existence of T-cells and these cells have the opportunity to kill tumor cells (See Figure 8).

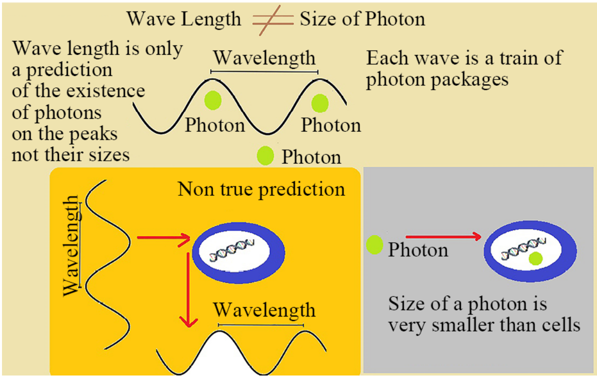


**Figure 1.** Differences between quantum concepts of wavelengths and the size of photons. A wave is formed from many photons. Photons are elementary particles that could join each other and form planes of waves

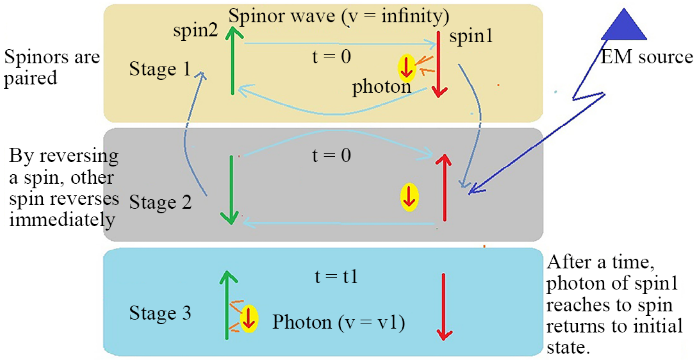


**Figure 2.** Exchanged spinor waves and photons between spinors. Spinors exchange photons for communication because most of them have electrical charges and these charges exchange photons which form the structure of waves. Also, spinors have another ability to diagnose any change in other spinors and respond

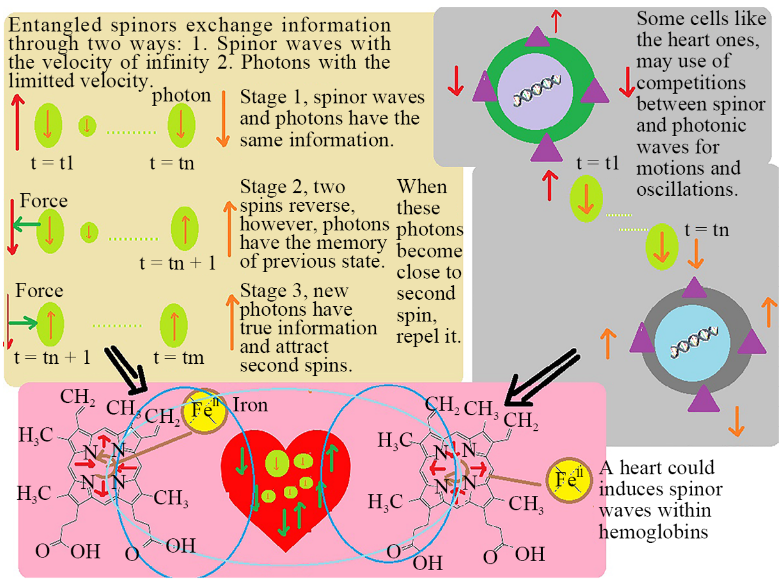


**Figure 3.** A difference between time of information transmission by spinor waves and photons causes the oscillation of heart cells and motions of blood cells. Photons have the velocity of light and spinor waves act immediately and thus the velocity of photons is less than the velocity of spinor waves

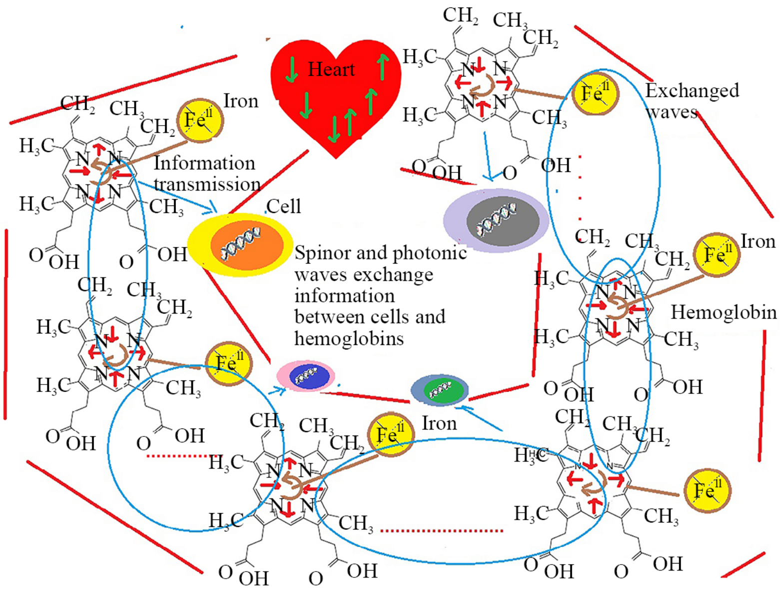


**Figure 4.** Hemoglobin molecules which are located on red cells take information from the heart and some cells, move along vessels and give them to other cells. This is because iron atoms within hemoglobin and spinors store information

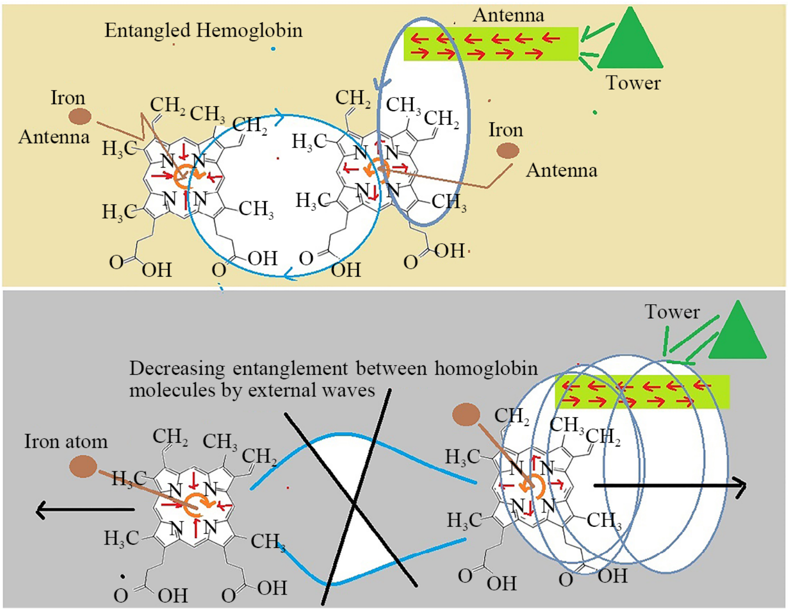


**Figure 5.** A decrease in quantum entanglements between spinors of hemoglobin molecules by electromagnetic waves. Hemoglobin molecules exchange information with each other and the heart and brain. However, any external magnetic field acts like the noise and prevents the transformation of information

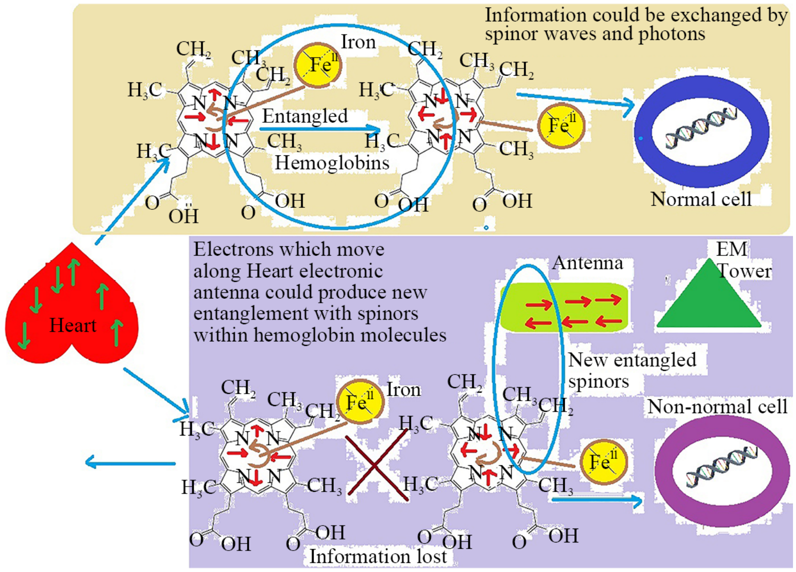


**Figure 6.** Extra electromagnetic waves like mobile ones decrease entanglement between biological spins and cause the loss of information around cells. Biological spinors which are located on hemoglobin iron atoms and also on the cells of the heart and brain exchange information. Any external field acts like noise and reduces the exchange of information

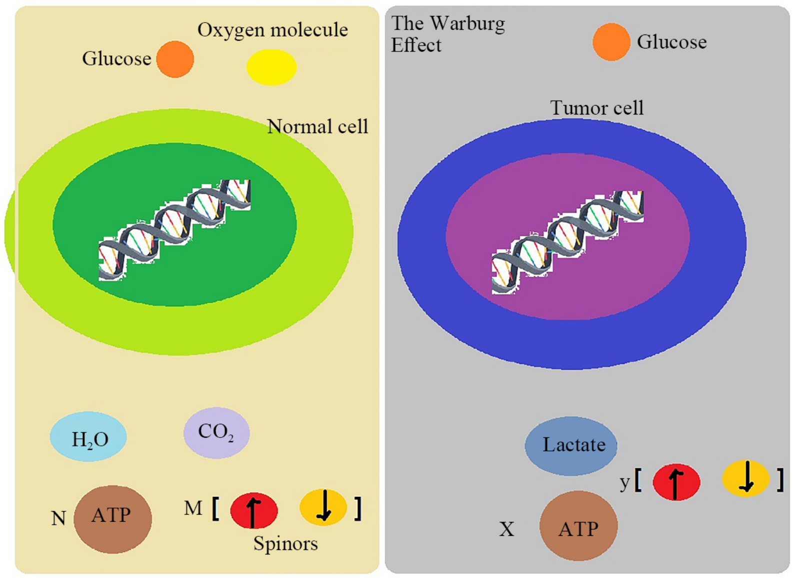


**Figure 7.** The Warburg effect. Differences between products of normal and tumor cells. According to the Warburg idea, tumor cells have a different mechanism of respiration and products with respect to normal ones. Thus, the number of spinors around these cells are different

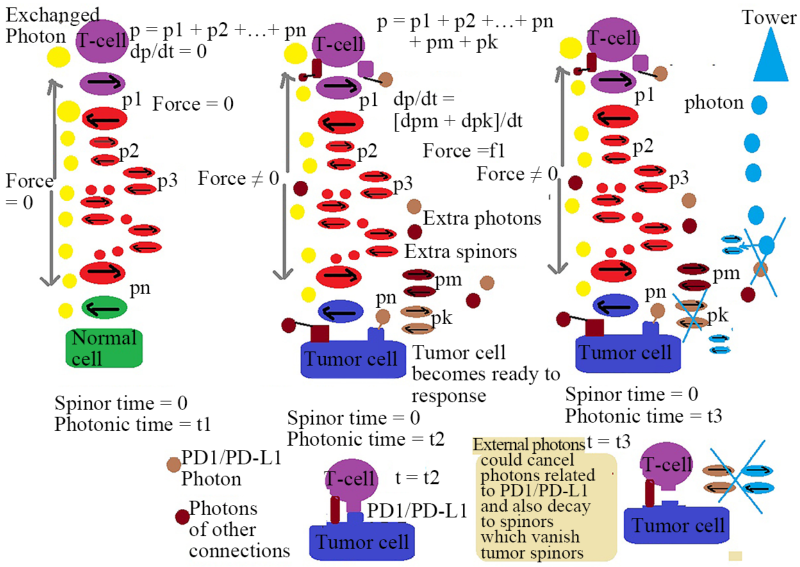


**Figure 8.** Inducing noises around tumor cells by using mobile waves. Mobile waves prevent transformation of information from tumor cells to other cells. Also, mobile noises cause tumor cells to fail to diagnose the presence of T cells and consequently T-cells have the opportunity to kill them

## 3. Mathematical results

In this section, we will calculate the time needed for the transformation of information between biological spinors. It is known that within an entangled system of two spinors, the states could be:

$$|\uparrow\downarrow\rangle\, or\, |\downarrow\uparrow\rangle \tag{1}$$

When the arrow of one spin changes, the arrow of the other spinor changes immediately. This is because spinor waves move with infinite velocity. In fact, we can write a general wave function as below:

$$|ES,\ 2\rangle = \cos(\alpha_{T,\ EM})\,|\uparrow\downarrow\rangle + \sin(\alpha_{T,\ EM})\,|\downarrow\uparrow\rangle \tag{2}$$

where $|ES\rangle$ is the function of the entangled spinors, $T$ is the temperature of the medium at that point and $EM$ is the index related to the electromagnetic waves. The probability for each state can be obtained from the equations below:

$$P_{|\uparrow\downarrow\rangle} = cos^2(\alpha_{T,\ EM}) \tag{3}$$

$$P_{|\downarrow\uparrow\rangle} = sin^2(\alpha_{T,\ EM})$$

The above probabilities depend on the temperature of the medium and the external electromagnetic waves. Summing over all probabilities should be equal to one:

$$P_{|\uparrow\downarrow\rangle} + P_{|\downarrow\uparrow\rangle} = 1 \tag{4}$$

We can rewrite Equation (2) as follows:

$$|ES,\ 2\rangle = \sum\nolimits_{i,\ j=0,\ 1} \sqrt{P_{ij}}\, |ij\rangle \tag{5}$$

$$P_{ii} \ = \ P_{jj} \ = 0$$

where $i,\ j = 0$ corresponds to spin ($\uparrow$) and $i,\ j = 1$ corresponds to spin ($\downarrow$).

In a biological system, each of spinors may be entangled by more spinors. For example, for four entangled spinors, we have:

$$|ES,\ 4\rangle = \sum \sqrt{P_{ijkl}}\, |ij \otimes kl\rangle \tag{6}$$

$$P_{iiii} \ = \ P_{jjjj} \ = P_{kkkk} \ = \ P_{llll} \ = 0$$

And for $N$ spinors, we have:

$$|ES,\ N\rangle = \prod\nolimits_{n=1}^{N} \sum\nolimits_{i_1 \ldots . i_n} \sqrt{P_{i_1 \ldots . i_n}}\, |i_1 i_2 \otimes \ldots . \quad \ldots . \otimes i_{n-1} i_n\rangle \tag{7}$$

$$P_{\ldots \ldots i_1 i_1 \ldots \ldots .} \ = \ 0$$

The probability for similar spinors which are near each other is zero.

These spinors exchange two types of waves:

1. Spinor waves for which their velocities are infinite. For example, when a spin in this entangled spinor changes, all spinors change immediately. We can write:

$$t_{spinor-wave} = 0 \tag{8}$$

2. Photonic waves for which their velocities are limited. In a flat space-time, the velocity of photons is :

$$V_{photon-flat} = c = \ 3 \times 10^{8} \tag{9}$$

However, spinors produce some magnetic fields. These magnetic fields act on the particles and cause their accelerations. According to the Unruh effect, this acceleration changes the space-time and the velocity of photons [17, 18]. First, we can obtain the magnetic field of this system

$$B_{TOT} \to S_{TOT} \tag{10}$$

where $B$ is the magnetic field and $S$ is the spin. The above equation shows that the magnetic field of a system has a direct relation with its spin. For biological entangled spinors, we can write:

$$B_{TOT} \to S_{TOT} \ \to \prod_{n=1}^{N} \sum_{i_1 \dots i_n} \sqrt{P_{i_1 \dots i_n}} [S_{i_1 \dots i_n}] \tag{11}$$

$$S_{i_1 \dots i_n} = \ S_{i_1} + \dots + \ S_{i_n}$$

This magnetic field could produce the energy density. For $n$ spinors between two red blood cells and their hemoglobin molecules, we can write:

$$U_{i_1 \dots i_n} = \frac{[B_{i_1 \dots i_n}]^2}{2\mu_0} = \frac{\mathscr{N}_{i_1 \dots i_n} [S_{i_1} + \dots + \ S_{i_n} \ ]^2}{2\mu_0} \tag{12}$$

where $\mathscr{N}_{i_1 \dots i_n}$ is a parameter which relates the magnetic field to the spin. Suppose that the spinors on two blood cells oscillate. We can write:

$$E_{i_1 \dots i_n} = \ U_{i_1 \dots i_n} \ \pi \ (R_{cell} + x)^2 l_n \tag{13}$$

where $R_{cell}$ is the radius of the cell, $x$ is the oscillation parameter and $l_n$ is the distance between two cells. Taking derivatives in the above equation gives:

$$F_{i_1 \dots i_n} = \frac{d \ E_{i_1 \dots i_n}}{dx} = \ 2U_{\ i_1 \dots i_n} \ \pi \ (R_{cell} + x) l_n \tag{14}$$

To calculate the acceleration, we can ignore the oscillation parameter and write:

$$a_{i_1 \dots i_n} = \frac{F_{i_1 \dots i_n}}{n \ m_{electron}} = \frac{2U_{\ i_1 \dots i_n} \ \pi \ (R_{cell}) l_n}{n \ m_{electron}} \tag{15}$$

where $a_{i_1 \dots i_n}$ is the acceleration of the spinors and $m_{electron}$ is the electron mass. This acceleration produces a Unruh temperature [14]:

$$T_{i_1 \dots i_n} = \frac{a_{i_1 \dots i_n}}{2\pi} \tag{16}$$

where $T_{i_1 \dots i_n}$ is the Unruh temperature at this point. At this temperature, some photons are produced such that their states could be obtained from the equation below:

$$\left|photon,\ T_{i_1....i_n},\ E_{Photon,\ i_1....i_n}\right\rangle = \frac{1}{\cosh r_{T_{i_1....i_n}}} \sum_m^M \tan h^m r_{T_{i_1....i_n}}\ \left|m \uparrow\uparrow,\ I\right\rangle \left|m \downarrow\downarrow,\ II\right\rangle \tag{17}$$

where $\left|photon,\ T_{i_1....i_n}\right\rangle$ is the photonic wave function, $m$ is the number of exchanged photons, $I$ denotes the region $I$ and $II$ denotes the region $II$ of the curved space-time.

Also, we have:

$$\tanh r_{T_{i_1....i_n}} = exp\left(-\frac{E_{Photon,\ i_1....i_n}}{T_{i_1....i_n}}\right) \tag{18}$$

where $E_{Photon,\ i_1....i_n}$ is the photonic energy. The probability for producing m photons can be obtained from the equation below:

$$P_m = \left[\frac{\tan h^m r_{T_{i_1....i_n}}}{\cosh r_{T_{i_1....i_n}}}\right]^2 \tag{19}$$

This probability is not complete and we should consider the probability of entangled spinors also:

$$P_{m,\ \left|photon,\ T_{i_1....i_n}\right\rangle} = \prod_{n=1}^N \sum_{i_1....i_n} \sqrt{P_{i_1....i_n}}[P_m] = \prod_{n=1}^N \sum_{i_1....i_n} \sqrt{P_{i_1....i_n}} \left[\left[\frac{\tan h^m r_{T_{i_1....i_n}}}{\cosh r_{T_{i_1....i_n}}}\right]^2\right] \tag{20}$$

The total energy of the photons at this point, can be obtained by multiplying the probability of Equation (20) and the photonic energies:

$$\begin{aligned}\widehat{E}_{\text{Photon },\ i_1...i_n} &= \sum_{m=1}^M \frac{E_{\text{Photon },\ i_1...i_n}}{m} P_{m,\ \left|\ \text{photon },\ T_{i_1...i_n}\right\rangle} \\ &= \sum_{m=1}^M \frac{E_{\text{Photon},\ i_1...i_n}}{m} \prod_{n=1}^N \sum_{i_1...i_n} \sqrt{P_{i_1...i_n}}\,[P_m] \\ &= \sum_{m=1}^M \frac{E_{\text{Photon},\ i_1...i_n}}{m} \prod_{n=1}^N \sum_{i_1...i_n} \sqrt{P_{i_1...i_n}} \left[\left[\frac{\tan h^m r_{T_{i_1...i_n}}}{\cosh r_{T_{i_1...i_n}}}\right]^2\right]\end{aligned} \tag{21}$$

The above photonic energy could help us to obtain the period:

$$\widehat{E}_{Photon,\ i_1....i_n} = h\nu_{Photon,\ i_1....i_n} \rightarrow \nu_{Photon,\ i_1....i_n} = \frac{\widehat{E}_{Photon,\ i_1....i_n}}{h}$$

$$t_{Photon,\ i_1....i_n} = \frac{1}{\nu_{Photon,\ i_1....i_n}} \rightarrow t_{Photon,\ i_1....i_n} = \frac{h}{\widehat{E}_{Photon,\ i_1....i_n}} \tag{22}$$

$$\rightarrow t_{Photon,\ i_1....i_n} = h\ \left[\sum_{m=1}^{M}\frac{E_{Photon,\ i_1....i_n}}{m}\prod_{n=1}^{N}\sum_{i_1....i_n}\sqrt{P_{i_1....i_n}}\left[\left[\frac{\tan h^m r_{T_{i_1....i_n}}}{\cosh r_{T_{i_1....i_n}}}\right]^2\right]\right]^{-1}$$

where $\nu_{Photon,\ i_1....i_n}$ is the frequency, $h$ is the plank constant and $t_{Photon,\ i_1....i_n}$ is the period of the photons. This time depends on the spinor structures of the system, the number of spinors at that point, magnetic fields, the separation between molecules and the accelerations. The total time which is needed for transformation of information from spin 1 (for example a point on the heart) to spin $N$ (for example a point on a cell) could be obtained by summing over all times:

$$t_{Photon,\ information,\ N} = \sum_{n=1}^{N} t_{Photon,\ i_1....i_n} = \sum_{n=1}^{N} h\ \left[\sum_{m=1}^{M}\frac{E_{Photon,\ i_1....i_n}}{m}\prod_{n=1}^{N}\sum_{i_1....i_n}\sqrt{P_{i_1....i_n}}\left[\left[\frac{\tan h^m r_{T_{i_1....i_n}}}{\cosh r_{T_{i_1....i_n}}}\right]^2\right]\right]^{-1} \tag{23}$$

The above equation shows that the time needed for photonic waves to transmit information from a heart cell or any other controller cell to hemoglobin, and then to cells, depends on the number of spinors, Unruh temperature, the distance between cells and acceleration of molecules.

When one uses a mobile, its waves divide into smaller photons. Each photon interacts with spinors and causes a delay in transmission of information. We can write:

$$B_{mobile\ wave} = \sum_{x=1}^{X} B_{mobile,\ photon,\ x}$$

$$U_{i_1....i_n} = \frac{\left[B_{i_1....i_n} + B_{mobile,\ photon,\ x}\right]^2}{2\mu_0} = \frac{\lambda_{i_1....i_n}\left[S_{i_1} + \ldots.. + S_{i_n} + B_{mobile,\ photon,\ x}\right]^2}{2\mu_0} \tag{24}$$

where $B_{mobile\ wave}$ is the magnetic field which is produced by mobile waves and $B_{mobile,\ photon,\ x}$ is the magnetic field of mobile photons. Using the above equation, we can repeat our calculations in Equations (12)-(23) and obtain the new time:

$$lt_{bio-Photon,\ information,\ N+Mobile\ waves} = \sum_{x=1}^{X}\sum_{n=1}^{N} t_{bio-Photon+mobile\ photons,\ x,\ i_1....i_n}$$

$$= \sum_{x=1}^{X} \widehat{[1+P_x]} \sum_{n=1}^{N} h \left[\sum_{m=1}^{M} \frac{E_{bio-Photon+mobile\ photons,\ x,\ i_1....i_n}}{m} \otimes \right. \tag{25}$$

$$\left. \prod_{n=1}^{N} \sum_{i_1....i_n} \sqrt{\widehat{P}_{i_1....i_n,\ x}} \left[\left[\frac{\tan h^m r_{T_{i_1....i_n,\ x}}}{\cosh r_{T_{i_1....i_n,\ x}}}\right]^2\right]^{-1}\right.$$

where $\widehat{P}_x$ is the probability for the interaction of photon $x$ of the mobile wave with the biological spinors. The above equation shows that mobile waves divide into $x$ smaller photons all of which interact with spinors and photons within the biological system. These interactions cause a delay in the transmission of information from a spinor on the hemoglobin or heart cells to other spinors on the normal cells. This delay causes that a cell acts independently of other cells and some types of diseases like tumors emerge.

## 4. Discussions

Biological spinors within the body form an entangled system which transmits information from the heart to hemoglobin and cells. These spinors emit two types of waves including (i) Spinor waves and (ii) Photons for which their differences in the time needed for transformation of information causes the oscillation of heart cells and the motion of blood cells including hemoglobin. A mobile wave with any wavelength includes some photons with smaller size than the cells, which break the entanglement between the biological spinors and causes a delay in the transmission of information and oxygen to the cells. Without information and oxygen, cells have to carry out their functions independently of the biological system and the use of respirational methods like the Warburg mechanism for tumor cells. Consequently, some tumor cells may emerge which changes the spinor structure to diagnose the place of T-cells and become ready to kill them. To prevent this event by using mobile waves, one can induce some noise around the tumor cells which causes the loss of information. Consequently, T-cells have the opportunity to kill the tumor cells. On the other hand, eventually biological systems become resistant to mobile waves, and the probability for the production of tumor cells and other diseases decreases.

## 5. Conclusions

To date, it is believed that a large fraction of mobile waves could not have any effect on cells. The reason for this is that their wavelengths are much larger than the size of cells. However, the wavelength is a quantum quantity which determines the probability for the existence of a photon at each point. The size of a photon itself is much smaller than the size of cells. Although by reducing the wavelength, the probability for the existence of a photon at each point increases, even for radio waves with large wavelength, this probability is not zero. In this work, we have shown that mobile waves break entanglements between spinors in a biological system like the circulation of blood and produce new entanglements between them and the electrons on mobile or tower antennas. Heart and hemoglobin molecules within blood cells are built from spinors which exchange information and are entangled. These spinors send or receive two types of waves. (i) Spinor waves which have infinite velocity. This means that any change in the spin of one spinor in a pair, changes the other spin immediately. (ii) Photons which have finite velocities and could transform information after a period of time.

For example, suppose one of the spinors in a pair sends some photons towards another spinor. Before the photons reach the second spinor, if the spin of the first spinor reverses, the other spin changes immediately. However, photons have the memory of the initial state and repel the second spinor. With time, new photons emerge which have the true information. These photons reach the second spinor and attract it. These repulsions and attractions cause the oscillation of heart cells and the motion of blood cells within vessels. These spinors transmit information and pass it on to cells. If a mobile wave reaches the heart and blood cells, it divides into photons and each photon can break the entanglements between the spinors of the heart and hemoglobin molecules, and produces new entanglements between these spinors and those moving in the mobile antenna. This causes information loss around cells. Some of the cells could not obtain the information needed, and act separately. Also, some hemoglobin molecules could not transmit oxygen to cells adequately. Consequently, cells have to use respirational methods which do not need oxygen like those which are using tumor cells in the Warburg proposal. This may cause cancer. According to the Warburg effect, tumor cells which are produced this way produce different numbers of spinors with respect to normal cells. These spinors break some entanglements and could be diagnosed by T-cells. On the other hand, the motion of the T-cells causes a change in the spinors which could be diagnosed by the tumor cells. These cells become ready to respond by producing PD1/PD-L1 connections. To avoid these connections, we can use mobile waves to inject photons and new spinor states around tumor cells. These new photons and spinors play the role of noises around tumor cells. Consequently, tumor cells could not diagnose the existence of T-cells and these cells have the opportunity to kill them. Maybe, one could ask whether mobile waves could cause the cancer, and why this could not be observed within present human communities. To respond, we should acknowledge that with time, biological spinors within the biological system could be reprogramed to accept the existence of extra waves. However, if the intensity or wavelength change, again entangled spinors could not carry out their functions, and information transmission and new diseases are emerge.

## Conflict of interest

The authors declare no competing financial interest.

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