Retraction Notice

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Editor guiding this retraction: Prof. Bu Sik Par and Prof. Iver Hakon Brevik (Editorial members of JEMAA)

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Scientific Research

Biophysics and Cancer: The Electromagnetic Fields Produced by the Mitochondria and Its Effect on the Cell's Metabolic Regulation

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Abstract

We studied the interactions between electromagnetic fields (EMF), the Hydrogen isotope (H_1) and the biophysical process that precedes the biochemical expression of the cell's energetic mechanisms. The hydrogen isotope, being the simplest atom, its manipulation is more technically feasible. In addition of its importance in metabolic energy driving reactions due to its reductive power, the hydrogen atom seems to be a necessary cofactor and driving force to induce, foster and/or restore oxidative phosphorylation in the cancer cell. Normal cells require a higher level of energy to attain and sustain the order, communication and direction necessary for the maintenance of the differentiated state. When cellular aerobic energy mechanisms are damaged, the energy is not enough to sustain the complexity and specificity of differentiation and therefore it can only either die or transform to a simpler state (less differentiated) that requires less energy in order to survive. This is the genesis of the malignant state. The interaction of the H1 with the EMF produces a change in the permitivity of the mitochondrial membrane that favors the release of energy allowing for the oxidative phosphorylation to proceed. We propose that this interaction of the EMF and the H1 can be manipulated in such a way that it would be capable of clearing interferences of fields that may favor transformation to the malignant state.

Keywords

Biophysics and Cancer: EMF'S and Cell's Metabolic Regulation

1. Introduction

Based on the EMFs produced by the surrounding molecules found in the micro environment of the mitochondria

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and the electromagnetic field print they leave, we can state:

In the physical world, permittivity and permeability of the mitochondrial membrane potential has demonstrated to be similar to the behavior of the EMF of the Hydrogen isotope H_1 (PROTIO), in the aerobic process of the Krebs cycle and the electron transport chain. This is possible only when the EMF emanated by the surrounding microenvironment are week, valued nearly |1|, permitting the normal exchange of the electron charge.

In the process of cell differentiation and ATP production, the electrical permittivity allows the manifestation of the properties of the H_1 such as paramagnetism, diamagnetism and anti-ferrimagnetism. This induces membrane interstitial space of the mitochondria's surrounding environment to be electrically charged or extra charged. This determines whether or not the permittivity of O_2 cofactor (induced by H_1's electron spin behavior) through the membrane potential and the consecutive expel of the hydrogen molecule to the outside, will favor oxidative phosphorylation. This activity can be modified by the surrounding EMF produced by the molecules found in the cell's micro environment such as one's produced by acidic or alkaline environment that we provide the cell to live in, and other EMF produced by the body's systems such as brain waves and the heartbeat. This process of absence of the O_2 cofactor in the cell's microenvironment, according to Warburg, Szent-Gyorgyi and Kremer, is the cause of almost all degenerative diseases, especially cancer and believed to be irreversible.

Thanks to the unique EMF print of each molecule, we are developing a novel anticancer therapy, using a new formula derived from Coulomb's Law, Faraday's molecular behavior and the concepts of permeability and permittivity. This new approach allows us to "clear" the surrounding interference fields created by the EM "aggressive" fields; and permits us to reignite the electron transport chain and restore the cofactor O_2 into the cell's energy mechanism, without using any Hertz in the device (bio-energetic) or in the frequencies applied. We protect cancer patients avoiding the use of electricity that can stimulate cancer cell growth.

This therapy (still in Experimental phase and research since 2010) can be used to help control degenerative diseases especially cancer, and helping improve patient's immune system significantly, in a short period of time.

2. The Biophysical Bases of the Bioenergetic's Theory of Carcinogenesis

At the beginning of time on earth, life was basically Uni-cellular. The organism was very primitive and obtained its chemical energy from a process called Glycolysis, which is the first step in the break-down of glucose resulting in the creation of 2 ATP'S. This process that has been present for many millions of years, does not require the presence of Oxygen. Since Oxygen was very limited, this became a natural unicellular subsistence process. But with the advent of the presence of Oxygen, Glycolysis was relegated as the primary process to obtain energy to a secondary role. With the apparition of oxygen and the formation of the atmosphere, the cell changes its primitive and inefficient energy production process to a more complex and efficient pathway. By introducing the oxygen molecule, the by-products of the Glycolysis continue to break down until reaching the formation of Carbon dioxide (CO_2) and water (H_2O). This process known as Aerobic Respiration, resulting in the creation of 32 additional molecules of ATP, making at the end of the process a total of 38 ATP'S. This more efficient energy production process allows the evolution of life forms from the primitive Uni-cellular organism to a more complex Multicellular life form.

With this transformation done, all the basic life principles were given, enabling us to witness the different evolutionary processes that are recorded in the code that exists since the beginning of life on earth and that at the same time, manages our cellular memory known as the Genetic Code. In our organism, as well as in all multicellular organisms, this process is evident within the development of embryonic cells forming after conception, giving the appearance of being unicellular and of rapid, undifferentiated growth until they reach a point where the cells turn on the mitochondria and meet with oxygen, unleashing a more efficient and natural capability of degrading the glucose molecule that will provide the necessary energy to sustain the process of cellular differentiation.

Considering these observations and inferences, the majority of theories and studies in Medicine about cellular genesis, growth and development, have all been based in the entrance of oxygen to the cellular biochemical scenery, as the most important protagonist new role in the production of cellular energy, dedicating more than a hundred years of medical discoveries to the presence of oxygen in the cell as the only important molecule; thus leaving the full protagonism to the molecule of Oxygen.

In spite of all, Oxygen is not replaceable within his role cellular respiration, and its molecular capabilities, but because it's a molecule with a very complicated numerical molecular mass (with an absolute value between 1

and 2) and with very complex biophysical characteristics to mold and manage; Oxygen requires very costly medical machinery with top of the line technology for its use, manipulation and application.

Our study focuses on a different path, away from the attention that up to this moment has been directed solely to the restitution of the cellular respiration through the oxygen molecule, thus changing our attention to the basic molecular composition that existed since the beginning of life on earth, even before the appearance of Oxygen bringing us to the Hydrogen molecule.

Hydrogen (H_1 isotope) as well as Oxygen, is present in 99.98% of the Universal mass and its necessary to uphold within the cellular respiration, the electron transport chain activity function and production of ATP'S, thanks to the gradient of hydrogen ions and ATP Synthetase which recovers the hydrogen ions and pumps them inside the Mitochondrial matrix and reestablishing ATP production.

If we refer to the Electron transport chain, we can observe that, in order for it to take place, we must rely on various transports that will permit the hydrogen ion to form the necessary gradient that makes the ATP Synthetase work and helps it to produce ATP. This production must always be active and it occurs in two ways: the first one is an inefficient one (Glycolysis) that takes place in the cytoplasm of the cell, outside the mitochondria, producing only 2.2% of the total energy that can be produced by each molecule of glucose in the Anaerobic phase in which there is no presence of oxygen, producing only 2 ATP'S per molecule of glucose (38.8% into energy reserve in Pyruvic and the NADH to proceed to the next phase, 2.2% into ATP or survival energy and 59% is lost in the liberation of heat). It requires less investment of energy but it complies with the principle of cellular subsistence, in other words, is the basic principle to stay alive with as little energy requirements as possible and in any case, the hydrogen ions that give up its electrons, are re-transported in the form of NADH to the gradient in the space of the inter membrane of the mitochondria where they will be needed in the subsequent phases of the electron transport chain.

The second part, known as the Aerobic phase, is a more efficient process and produces 38 ATP'S thanks to an extra step due to the presence of oxygen within the process. This phase can take place only when the oxygen enters the process and helps to elevate the amount of production of ATP with the same amount of molecules of glucose.

This process takes place in the best available environment conditions in the matrix of the mitochondria, in which the mitochondria ensures itself to have in its reach all the necessary nutrients and co-factors to optimize its functions. It's necessary to mention that in this phase, each Hydrogen molecule releases its only electron which is transported through the internal membrane of the mitochondria towards the exterior of the mitochondria matrix in the form of energy reserve thanks to the transport of $NADH + H^+$.

For each electron, there is a Hydrogen ion pumped out ready to go out to the gradient of Hydrogen ions in the interior space of the mitochondria membrane. There, it will be re-used in the electron transport chain in the third phase of cellular respiration and becomes an extremely important part of the cellular respiration process; since it's here that it utilizes 70 Hydrogen ions in total; in other words: two H^+ for each molecule of ATP created by the ATP Synthetase and two utilized for the water molecule that transports outwards the molecule of Oxygen. Let's imagine what would happen if all this Hydrogen ions accumulate in the inter membrane space if the third phase of cellular respiration doesn't take place: we will have an extra charge electron cloud that can produce strong EMF'S that acidify the extra cellular environment, producing an interference field between the outside and the inside of the mitochondria environment. This can eventually happen, and we are about to see how.

What we have left behind is the fact that for every energetic change to take place, various factors must be taken into account and this reflects two important fields in which the results will be seen. In other words, that for each chemical process occurring in our biological system, it requires a biophysical propellant, to promote the processes involved in the energetic forces either by induction or by applied field of different orders. Orders such as:

The physical processes at the molecular level (to propitiate the angular momentum of the electron in the hydrogen ion, like a motor that needs gasoline energy to produce movement).

An adequate micro environment to produce the changes and the ionic presence of electric charges that assured that the changes will be sealed in such a way, to re-utilize in the continuous motion of electrons.

At the physical level, for each molecule interchange of energy, it requires another energetic investment, and this energy comes from Hydrogen (H_1) and its facility of comparative manipulation with respect to the Oxygen is as follows:

At the Atom level, the hydrogen molecule that ignites this process is the Hydrogen isotope (H_1) form or

PROTIO. This Protio present the following characteristics:

- It possesses one electron and one proton.
- It has for molecular mass an absolute value of 1.
- Its permeability is similar to the Void. In other words, its constant value of permeability is close to one (see **Figure 1**).
- Its permittivity or di-electric constant is 1.
- It's present in 99.98% of the Universal matter.
- Its main characteristic, given its electric permeability and permittivity with an absolute value close to 1, must be Paramagnetic. In other words, its magnetic momentum or its angular momentum of its electron becomes parallel to the magnetic field at which it submits, in a normal environment temperature and in a weak induction environment (a weak magnetic field with weak electrical charges in order to avoid any interference with its natural process).

In physics, we call magnetic permeability the capacity of one substance or environment to attract and allowed to pass through it, magnetic fields which are given by the relation between the existing magnetic induction and the magnetic field intensity that appears in the interior of said material. Therefore:

- In the Diamagnetic materials, the magnetic flow diminishes (hydrogen in its form H_2 and H_3 or with accumulated charges or extra charged) and produces repulsion or negative moments.
- In the Paramagnetic materials, the magnetic flow increases (hydrogen in its Protio Isotope form: H_1) and produces parallel unions or positive moments enticing the molecular union by the cession of electric charges (electron spin).

Diamagnetism and Paramagnetism influences the behavior of the union of materials or the acceptance of other materials with similar properties. This is called Magnetic Permeability of the Materials [1].

- The magnitude is defined like this: the magnetization level of a material in response to a magnetic field is called absolute permeability and is represented by the symbol μ. At the same time is defined by the magnetic induction quotient (also called density of the magnetic flow) in the material and by the intensity of its magnetic field. The permeability of the Void, known also as magnetic constant, is represented by the symbol μ_O and in units SI*.

We define it as:

$$\mu_o = 4\pi \times 10^{-7}\ \mathrm{Tm \cdot A^{-1}} \quad [2]$$

to compare with each other the materials. We understand the absolute magnetic permeability (*U*) as the product between the relative magnetic permeability (*Ur*) and the Void's magnetic permeability (μ_o):

$$\mu = \mu r \cdot \mu_o \quad (\textbf{Figure 1})$$

The electric permittivity (ionic charge of elements)—appears in the Coulomb's law[(2)]—and the magnetic constant of the void are related by the already known formula ($E_0\mu_0 = 1/C^2$) where we have made an adjustment from the original form in order to be able to apply it to the study of metabolic energy:

$$\text{“ } E_0\mu_0 = 1/C^C \text{ ”} \quad [3]$$

where C will not represent the velocity of the light in the void but "the dielectric constant of the angular moment of the hydrogen's electron, elevated to its own dielectric constant in biological systems (without resistance: 0 field or void's permeability)" [3]. This has permitted us to create a special EMF and control the macro environment, in order to study the molecular behavior at the mitochondria level and to create some changes on it at the molecular level.

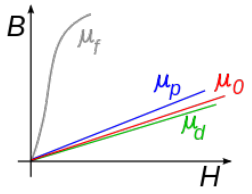

Figure 1. Comparison of permeabilities for: ferromagnets (μ_f), paramagnets (μ_p), diamagnets (μ_d) and the void (μ_0).

Being the hydrogen ion permeability equal to 1, we can conclude that its absolute permeability substitutes the Void, manifesting then the following characteristics:

- Benefits of the Hydrogen over the Oxygen as a molecule to promote energy production of easy manipulation in the metabolic systems: its molecular mass, its di-electric constant and its atomic composition has an absolute value similar to the one of the Void, in other words 1, that makes it easier to manipulate, to study and in fact, to handle inside complex organisms, such as human beings. These Biophysical characteristics of the molecule makes them more convenient inside the molecular configuration, as to say, that by a simple weak magnetic field applied around it and without elevating it's environment temperature, she proceeds to align herself parallel to the applied field (in other words, it finds easily its angular moment and gives up its electron) and proceeds to its chemical reduction of various organic components of simple composition. These applied weak fields come from the ones generated by the electron spin of the molecules running in the environment, combined with magnetic induction fields, emanated by: the sounds that we listen, the light at which we are submitted, the ones emanated by the environment that surrounds the hydrogen ion molecule in its micro and macro environment, such as the brain waves; all of this in addition to the induction field emanated by the normal heart's activity which will be the ideal to obtain the angular moment of the electron in a natural way to create the necessary eutropia for differentiation. The heart is the electromagnetic center of our body, so is the one that manages the rhythm of our organism, obtaining the angular moment of the spin of the electron that is given by the hydrogen ion in the electron transport chain.

Now let's see the following process up close:

- At normal temperature and with a weak constant magnetic field, it can only create water (H_2O). When it creates water, the PROTIO (hydrogen isotope with 1 electron or H_1) becomes Deuterium, in other words, it stores an extra neutron and when it substitutes the Void, it becomes Diamagnetic, storing additional charges and creating in itself a repulsion force, separating itself from the rest of the Diamagnetic molecules behaving like the molecular oxygen (O_2) of negative charge. This means that at a higher magnetic field and a higher electric induction, the higher the energy reserve that it will have at a molecular level, thus, increasing more each time its electron spin and storing 3 or more electrons, and becoming absolutely auto-sufficient of electric charges and generating strong magnetic fields that propitiate that the rest of the hydrogen ions that are in the gradient and that still are paramagnetic, aligned to them now that they are fully charged of electrons and becoming anti-Ferrimagnetic or of a higher electron spin, making very complicated the angular moment of the electron. This propitiates that the un-couple electron from the paramagnetic hydrogen ions create an anti-Ferrimagnetic electron barrier and stops them from giving easily the electron contained in its spin, stopping little by little the electron transport chain process and becoming a barrier almost Impermeable to cross.

This propitiates the accumulation of Hydrogen ions in the inter membrane space of the mitochondria like a cloud of impenetrable electrons inflaming the space and making the surroundings Acidic (due to the no-permittivity of oxygen and the excess hydrogen that accumulates creating alliances with heavier molecules than the oxygen such as the Nitrogen and Carbon molecules) and alkaline in the inside (because of the accumulation of water in its inside and the impermeability of the internal membrane created by the cloud of hydrogen ion electrons in its Tritium form, prevents them from exiting to the gradient of electrons). When this behavior is produced by a constant repetitive magnetic induction, an anaerobic cellular micro environment of protection is developed by the mitochondria that at the instant of repeatedly and intermittently not receiving oxygen in it aerobic phase, activates a RESPONSE GENE, that is recorded in its cellular memory of embryonic mitosis and becomes independent in its ATP production (increased anaerobic glucose fermentation to lactate in the presence of oxygen (aerobic glycolysis) and mitochondria independent ATP generation is a hallmark of aggressive cancer growth) in anaerobic form; this was proven in laboratory tests by Otto Warburg-Nobel prize in medicine-1938. He left in-vitro proof of intermittent cells without oxygen, proving that its metabolism became anaerobic) increasing its glucose necessity for its survival because of the lack of efficient production of ATP.

Electron Transport Chain: Bases of the Organism's Energy as a Source of Universal Life

Based on the former information, lets situate ourselves inside the micro environment of the mitochondria and let's see up close what is happening in the inter membrane space which is where the Protio (H_1) clouds are stored waiting to release its charge in the last phase of cellular respiration.

1) The easiness to give up its electron is given by its molecular weight of its atom or its atomic mass, by hav-

ing only one proton and one electron, making it easy to obtained its electron angular moment and this is achieved at normal temperature in applied weak fields (" $E_0\mu_0 = 1/C^C$ " [3]). These applied weak fields come from the ones generated by the electrical charges of the surrounding ions, summed up to the fields emitted by the heart and modulated by the fields emitted by the brain waves. When this paramagnetic Protio substitutes the void, assimilates added charges and becomes Diamagnetic, appearing in its deuterium ion (H_2) form which makes it negative in its charge and thus more difficult to give up its electron, complicating the angular moment- that looks modified by the magnetic field generated with respect to its nucleus. This means that it increases its spin, its magnetic field changes from being circular to elliptic with a series of complications for its fusion. Here is where it starts to fail the electron transport chain and starts to accumulate the Deuterium hydrogen ions in the interstitial space of the mitochondrial membrane.

2) When the Protio becomes diamagnetic, it accumulates and substitutes the void, then the emanated field by its electron spin becomes bigger and much higher than the one emitted by the molecular oxygen, then it tends to accumulate more extra electron charges then becomes a hydrogen ion in its Tritium (H_3) form, which complicates even more it situation, generating repulsion fields in other diamagnetic, such as oxygen, provoking its intermitted non permittivity and propitiating UNIONS only with positively charged molecules and of superior mass; in other words, the possibility stays open only to the remainder molecules that are in the environment propitiating the accumulation in the form of clouds of hydrogen ion electrons (in its H_3 form) in the inter membrane space of the mitochondria and acidifying its external environment, which ends by not allowing the ATP production process. This, by the intermittence of the presence of the oxygen, ends the aerobic phase of the cellular respiration by the impermeability of the oxygen inside the ATP production process, in intermittent phases (just as it was proven by Otto Warburg, Nobel prize in medicine-1934), until it converts the environment into a diamagnetic environment; LIKE SAYING of the negative magnetic fields with relative permeability well below the permeability of the void, that stops the paramagnetism necessary for the hydrogen ions, making it impossible to give up its electron and to continue with its cellular respiration process in its aerobic phase. This create a re-activation of its more inefficient cell respiration, being the most need it, in its high energetic consumption but resulting being less effective in the production of ATP (it produces only 2.2% of the available energy in each glucose molecule metabolized or consumed). We can say that this phase results from the activation process of anaerobic subsistence that is recorded in the genetic information of the primitive cell, explaining then the activation of its RESPONSE GENES before situations of continuous exposure to magnetic fields emanated by electrical charges of different magnitudes (this visualizes Cancer as a cellular mechanism of survival making it sacrifice the differentiation process and the cellular communication: resulting in Entropy.

3) Only the fields accepted by the mitochondria as normal (the weak ones that propitiates the paramagnetism of the hydrogen ions H_2) can activate the cessation of electrons, the consequent liberation of hydrogen ions and the subsequent acceptance of oxygen to try to achieve efficiently the production of 38 ATP'S per glucose molecule consumed. This process of Oxidative phosphorylation will be modified by the electromagnetic fields that surround the micro environment of the internal membrane of the mitochondria, like the ones produced by acidic o alkaline environment that we provide the cell to live in; as well as the other fields produced by the organism systems such as brain waves and heart beats. This process in the absence of oxygen at the mitochondria micro environment, as stated by Otto Warburg, Szent-Gyorgyi and Kremer, is the cause of mostly all of the degenerative illnesses and believe that cannot be reversed.

All said, this process takes place in an environment surrounded by oxygen, followed by carbon molecular masses and lastly by a nitrogen molecular mass. These molecules will practically take in a first place all the electrons present in the cloud formed by diamagnetic (H_2 and H_3) isotopes, and will give the last chance to oxygen to form any oxidation until the production of ATP will be reduced at 2.2% of the normal process of ATP production.

Thanks to the unique EMF print of each molecule, we could develop a novel therapy, using the new modified formula (3) and all the data, derived from Coulomb's Law, Faraday's molecular behavior and the concepts of permeability and permittivity. This new approach allows us to "clear" the surrounding interference fields created by the EM "aggressive" fields; and permits us to reignite the electron transport chain and restore the cofactor O_2 into the cell's energy mechanism, without using any Hertz in the device (bio-energetic) or in the frequencies applied to help us maintain temperature control in the mitochondria microenvironment. These, at an extra mitochondrial membrane level, will happen in a natural form, slowly, more like an "election process" of basic or embryonic cellular formations (at a Neoplastic level), to proceed to its rapid multiplication (in its anaerobic

phase in which it requires very little investment of energy and a high consumption of glucose molecules for its subsistence) and propitiating new formations that, with the apparition of molecular oxygen by natural call, will proceed to oxygenate, diversify and form new complex lives inside the multicellular beings such as in the human beings. The only magnetic camp that needs to be applied to the molecular movement is the one emitted by the heart, with its own unique rhythm, his own unique sounds and his own unique light and form spectrums that are distributed by nature to the propensity of molecular union and des-union of each living being and this is what determines the electromagnetic field print of each molecule in the Universe.

We protect cancer patients avoiding the use of electricity that can stimulate cancer cell growth and we reignite in a short period of time the normal ATP production process in the last phase of cellular respiration.

This therapy (still in Experimental phase since 2010) can be used to help control degenerative diseases especially cancer, and helping improve patient's immune system significantly, in a short period of time.

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