Regenerative Medicine Mechanism:

A Quantum Information Biology Approach

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Abstract:

Regenerative medicine, in particular electromagnetic (EM) therapy, has been in trouble during the last half century. Although enormous experimental evidence is gathered to support the claim that EM therapy cures certain diseases, e.g., cancer, leukemia, etc., yet there is no convincing mechanism to agree upon. That is because a fundamental natural law, the driving force which underpins the mechanism, escaped human imagination. It is the maximum action principle which states that a biosystem's rate of action increase, as it traverses a path of maximum action, is proportional to its bioinformation. Hence cellular regenerative control system is the sequential ordering and arrangement of DNA nucleotides along a path of maximum action and maximum bioinformation, that is phi spiral. In consequence DNA becomes a vortex for charge implosion and acceleration. DNA bioinformation template, generated by cellular regenerative control system's charges implosion and acceleration, is a cascade or replica of phase conjugate EM waves. When targeting bioinformation disease by its corresponding healthy bioinformation template, the healthy bioinformation template becomes a bioinformation attractor for self rearranging the distorted or missed nucleotides along a path of maximum action. The DNA bioinformation template mechanism accounts for both Antoine Priore's machine enigma and Luc Montagnier's non-particle view of life.

Keywords:

Bioinformation; Bioinformation attractor; Bioinformation diseases; DNA bioinformation template; EM therapy; maximum action principle.

Introduction:

Regenerative medicine (defined as Medicine that replaces or regenerates human cells, tissue or organs, to restore or establish normal function)[1] is a wide subject that includes stem cell therapy and electromagnetic therapy. Although Quantum Information Biology (QIB) theory can shed some light on stem cell therapy, for the time being, focus is drawn onto Electromagnetic (EM) therapy. QIB is the study of bio-systems as spontaneous self-organizing dynamical systems. It is about unifying physics with biology, and revealing the fundamental laws that describe biotic evolution and development. [2-3,4].

EM therapy itself is a wide subject; it includes almost all frequencies of EM spectrum that are used both for disease diagnosis and therapy. EM high frequencies of gamma, X and some of the ultraviolet waves are ionizing and can be used for blocking cancer growth. Low EM frequencies of radio, micro, infra, and some ultraviolet are used for healing as well as blocking cancer growth. To further limit our considerations focus would be restricted to the healing low frequencies. For example pulsed electromagnetic field (PEMF) therapy has been FDA-approved to fuse bones and reduce swelling and joint pain[5]. PEMF has been used to treat pain and edema in soft tissue for over sixty years [6]. It has been firmly established that tissues such as blood, muscle, ligaments, bone and cartilage respond to biophysical input including electrical and electromagnetic fields.[7] Research shows that certain field strengths and frequencies of PEMF appear to modify certain diseases. For example a 27.12MHz field tuned to tissues specific field strengths has been shown to block tumor growth in cancer patients [8]

These developments have a long and troublesome history. The beginning of the 20th century saw the first medical applications of electromagnetic fields (EMF), notably in the diagnosis and therapy of various diseases such as cancer. The assumption was that external application of electromagnetic energy could correct disease-causing altered electromagnetic frequencies or energy fields within the body[9].

Abrams invented various machines with the goal to cure diseases, notably cancer [10-11] .He claimed that diseases could be cured by transmitting back to the disease the same electronic "vibratory rate" it was transmitting. Between 1923 and 1924, Scientific American magazine set up a committee to investigate Abrams's results[12] and concluded "the claims advanced on behalf of the electronic reactions of Abrams, and electronic practice in general, are not substantiated"[13].
Royal Raymond Rife, based on his Rife Ray Machine, claimed he could diagnose and eliminate diseases like cancer by tuning into electrical impulses given off by diseased tissue. Rife's high voltage gas tube device was designed, with the aid of his unique microscope, by experimentally witnessing the effects on microbes and bacteria, finding what he believed were the particular frequencies that resonated with their destruction. The American Medical Association condemned Rife's experiments. Until recently, virtually all medical devices aimed at treating cancer using low levels of electric and/or magnetic fields were considered quackery because of lack of scientific proof [13].

Antoine Priore: Into a tube containing a plasma of mercury and neon gas, a pulsed 9.4 GHz wave modulated upon a 17 MHz carrier frequency was introduced. Complete remission of terminal tumors and infectious diseases in hundreds of laboratory animals of the treated diseases was obtained. "In the mid-70's Priore's work was suppressed, because of hostility of the oncology community, change of the French Government, loss of further funding, and complete inability of the physicists and biological scientists to even hypothesize a mechanism for the curative results."[14]

Robert Becker: developed a very effective PEMF generator to stimulate bone fracture healing that was approved by the FDA with an 80% success rate.[15]

Searching for a mechanism in order to account for EM therapy, Bearden T assumed that there is a specific, constant electromagnetic "delta" that differentiates the parasitic cancerous "organism" from the normal -human cellular organism.[16] This "delta" can be considered a sort of constant, complex-structured charge existing in the body's atomic nuclei. If a phase conjugate replica of a cancer's cell's specific "delta" frequencies is fed into the body having that cancer, the deviation of the cancer cell's master cellular control system will be "time reversed." The cancerous cell will be immediately destroyed, or reverted back to a normal cell of the animal.[17]

Bearden clarifies two important components concerning regenerative medicine mechanism that are phase conjugation and longitudinal waves.[16] Phase conjugation is important because coherence is necessary for energy waves to be effective. Longitudinal waves have the property of operating along the time domain in conformity with biosystems' fundamental dynamics which takes place along the time domain.[4] However, since the healing frequencies replica based on experimental evidence are not property of a cancerous cell, it becomes urgent to look for an alternative. Bearden proposes (without offering any operational definition) that the cellular regenerative control system, as a source of scalar waves, resides in the atomic nuclei of cells. In this perspective scalar waves, due to its negentropy and time reversal, structure and organize DNA. It is evident for DNA to selforganize and function it has to have energy (e.g.,scalar), but this does not necessarily mean that the negentropy is the cause of selforganization or selfregegeration. For example as an organism grows it takes in negenetropy, however after maturity it goes on taking in negentropy but without further growth and development. In other words what characterizes the dynamical essence of a biosystem is its bioinformation rather than its electric charge. Therefore, the EM waves that can do healing and regeneration must be carrier of bioinformation and not negentropy. Yes, there is a difference between negentropy and bioinformation. While negentropy is passive information a measure of static order or complexity in terms of bytes, bioinformation is active information a measure of developmental functional complexity, and for this sake has the dimensions of energy and information, with units (cal x bytes)[2-3,4].

DNA self-organizing capacity is due to the fact that it possesses the only geometry, its helical and golden ratio based dodecahedron fractal geometry[18] that embodies the maximum action principle[3-4], according to which a bio-system's rate of action increase is proportional to its bio-information (developmental functional complexity). Thus the cellular regenerative control system is the sequential ordering and arrangement of

nucleotides along a path of maximum action and maximum bio-information, i.e., it is not (complex-structured charge existing in the body's atomic nuclei)[17]. The cellular regenerative control system is the basis for generating DNA bio-information template which is replica of EM waves that can be used for healing. To investigate further how the DNA bioinformation template arises and how it can function as a mechanism for regenerative medicine the principles of QIB must be involved.

Methods

Quantum Information Fractal Field Hypothesis (QIFFH):

Elsheikh[2-3,4] proposes the hypothesis of QIB. QIB is the study of biosystems as spontaneous selforganizing dynamical systems. QIB bridges the gap between physics and biology and proposes a unified theory of life according to which both phylogeny and ontogeny can be studied on the basis of QIFF equations. To accomplish this goal Elsheikh proposes broadening the concepts and principles of information, quantum field and least action principle.

Bioinformation

He distinguishes between genome physical information which is a measure of genome static physical complexity in bytes[3-4], and genome's bio-information a measure of genome's bio-complexity which is developmental and functional, and has the dimensions of energy and information. In this new perspective the genome's bio-information (v(t)) is about the phenotype, since the genome's bio-information is meaningless without producing a phenotype. The bio-information increases before adulthood, has a maximum when the organism is fully grown, decreases afterward, and becomes zero when the organism dies. For example, considering a unicellular organism that divides for successive generations, the bio-information becomes a periodic function of time. Thus it represents the bio-information oscillations generated by the genome through successive generations.

Life Fractal Nature:

Dan Winter - a pioneer on golden ratio in physics- asserts that golden ratio fractality is a condition of recursive constructive interference. In his view DNA golden ratio based dodecahedron fractal geometry is the only geometry that allows wave patterns to add and multiply recursively constructively, thus produces optimum charge distribution and coherence. He coined the term quantum fractal field to designate the state of perfected charge distribution and coherence characteristic of the DNA.[18]

Least Action Principle:

In physics, the principle of least action, or more accurately the principle of stationary action is a variation principle when applied to the action of a mechanical system, can be used to obtain the equation of motion for that system. According to the least action principle a particle moves along the path for which the action is minimum; this means the spontaneous motion of the particle is to minimize action. Now is it possible to extend the action principle to incorporate the case of maximum action? [19]. In general, a maximum or

most action principle must allow a system to follow spontaneously a path of maximum action. Thus spontaneous self-organization becomes possible, e.g., embryogenesis and morphogenesis, because under such circumstances the maximum action principle maximizes the rate of change of action, whereas under the least action principle the rate of change of action is less or equals zero.

Quantum Field:

A field whether classical or quantum is defined as a function over space and time. This definition is not sufficient to contain the dynamical essence of biosystems. Because a biosystem dynamics or functionality depend on its bio-information or bio-complexity rather than on the space coordinates it occupies. So he defines the genome quantum information fractal field (QIFF) as a function over bio-information and time, L(v,t). QIFF is the union of DNA golden ratio based fractal geometry and the maximum action principle. Such field generates, in addition to weak EM waves, self-sustained bio-information oscillations for successive generations. This means the DNA or genome is the material substrate of a quantum information fractal field.

Definition 1:

A genome or genome pool is a quantum information fractal field, QIFF.

Postulates:

(i)- The QIFF (genome) generates, in addition to weak EM waves, self-sustained bio-information oscillations through successive generations

(ii)- The bio-information oscillations contain the dynamical essence of the living system.

(iii)- The bio-information sustains the living state.

Based on these postulates Elsheikh[3,4] defined genome's bioinformation (developmental functional complexity) in terms of vitality,v(t), function:

$$v(t) = bE(t)\,\ell^{a} \qquad (1)$$

where b is genome's physical information measured in bytes, E(t) organism's total energy metabolized, ℓ = A- t is the organism life expectancy, A lifespan or cell cycle time, a is an exponent which depends on species.

Vitality satisfies the following property:

It increases before adulthood, reaches a maximum at adulthood, decreases afterwards and becomes zero when the organism dies, i.e., v(A) = 0.

The vitality model may be usefully employed to discuss vitality for successive generations. We shall essentially be concerned with unicellular

organisms, particularly those which reproduce by binary fission. For such systems, we suggest the following equation:

$$v_g = v(t + mA) = v(t) \qquad (2)$$

where m = 1, 2, 3 ,.. , is the number of cell divisions or generations. Equation (2) defines vitality as a periodic function of time, i.e. it represents vitality oscillations, or equally acceptable, the bio-information oscillations generated by the genome as self-replicating quantum information fractal field. Consequently, the genome's bio-information measured in calories x bits, oscillates in the time-vitality (t-v) space, also called bio-information space, during successive generations. This model is equally applicable to multi-cellular organisms which reveal an overlap of generations, i.e., overlap of bio-information oscillations.

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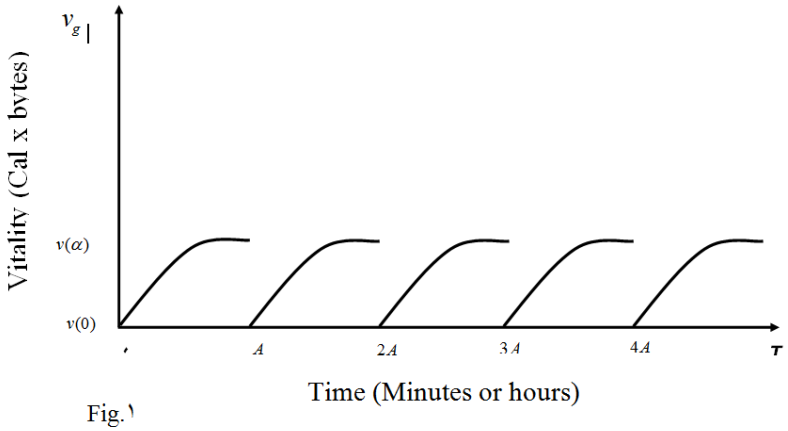

Fig.1: Hypothetical representation of bio-information oscillations of a unicellular organism for successive generations. A the lifespan is the period of oscillations.[2]

The Bioinformation Attractor

Based on the first and second postulates of QIFFH, the life state of an organism, L, called the bioinformation attractor (or the life-organizing principle) [20-21] being an attribute of QIFF, must satisfy the following conditions:

i- L = L(v, t)

ii- L is a generalized Schrödinger's type of system.

iii- L is a periodic functional attractor.

We shall therefore assume the simple following form:

$$L = L_0 e^{i\Phi/G} \qquad (3)$$

where L_o is the amplitude, G is a constant to be found and has the dimension of Planck's constant. To satisfy the above mentioned conditions, we limit our considerations to the concrete example in which Φ is given by:

$$\Phi(t) = \int_0^t E(1-\frac{x}{A})^a \, dx \qquad (4)$$

$$\Phi(t) = \frac{V(t)}{bA^a} = \frac{1}{bA^a}\int_0^t v(x)dx \qquad (5)$$

From (3), (4) and (5) we get:

$$\therefore \quad \ddot{L} - \frac{\dot{v}}{v}\dot{L} + \frac{v^2}{k^2}L = 0 \qquad (6)$$

Where $k = b A^a G$

Elsheikh shows that equation (6) represents a non-linear, non-conservative and irreversible system, which describes self-sustained oscillations[2-3,4]. Furthermore, it has been proved that equation (6), being a generalized Lienard's system, admits limit cycle. Stable limit cycle solutions usually characterize structural stability or dynamic equilibrium, a property of high significance to bio-systems [22-23,24]. A limit cycle is also called an attractor, i.e. a set of states of a dynamic physical system toward which that system tends to evolve, regardless of the initial conditions of the system. We call the bioinformation attractor that describes muticellular organism dynamics a major attractor, while that which describes cellular dynamics a minor attractor. A cell type is an example of a minor attractor which belongs to the basin of a major attractor.

Field Equations:

In addition to the periodic bioinformation attractor:

$$\ddot{L} - \frac{\dot{v}}{v}\dot{L} + \frac{v^2}{k^2}L = 0$$

We can derive the following laws[3-4]:

First Law of Self-Organization

To account for the spontaneous growth, development and functional activity of living systems, the living system must maintain a path of maximum action. Under such circumstances the genome capacity to generate developmental functional complexity (vitality) must be correlated to the rate of change of action to match the path. Thus we try

to demonstrate that the phase of the genome's bio-information oscillations, which has action units, is the path of maximum action we are looking for:

$$\therefore\ \dot{\Phi}(t) = K\,v(t) \qquad (7)$$

Equation (7) establishes the equivalence of energy and material bioinformation, which means, under certain conditions, energy waves could carry bioinformation, i.e., some sort of bioinformation spectroscopy.

Second Law of Self-Organization

$$\mathrm{V(A)} = \frac{n\pi bG}{f^{a}} \qquad (8)$$

Where V(A) is total vitality, given by:

$$\mathrm{V(A)} = \int_{0}^{A} v(t)dt \qquad (9)$$

Note the lifespan, A, is at the same time the period of oscillations. Equation (8) is the second law of self-organization; it is a quantum information fractal law of evolution and development. It is a power law, a Pareto [25] type of law, which indicates that total vitality varies directly with Fibonacci numbers and genome physical information and inversely with the frequency of bio-information oscillations [3]. It is interesting that Bak and Paczuski [26] have also proposed a power law to account for punctuated equilibrium [27]. However, based on (8) the motif of bifurcations occurs in accordance with Fibonacci numbers, n. In consequence, (8) generates tree-like structures ontogenetically as well as phylogenetically. Such result can be empirically underpinned by development ontology tree [28] and the tree of life [29].

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Law of Conservation of Total Bio-Information

$$\mathrm{T} = \mathrm{U(t)} + \mathrm{Z(N(\,t))} = \text{constant} \qquad (10)$$

U(t) is the population mean total vitality at time t during successive generations, and Z(N(t)) is total natality density function at time t during successive generations. Elsheikh [3,4] shows that equation (10) can be employed to derive logistic equations for the growth and development of organisms and populations:

$$\therefore\ \frac{dp}{dt} = p\left(c - \int_{0}^{t} \frac{\dot{U}\,dx}{Z'_{N}}\right) \qquad (11)$$

Moreover to substantiate the notion of QIFF Elsheikh[4] demonstrated that cell type, tissue, organ, organ-system, and organism represent a nested hierarchy of bioinformation attractors, i.e., nested hierarchy of quantum information stationary functional states.

Bioinformation Attractors' Interaction Hypothesis (BAIH)

Let B be a sub attractor of an upper bioinformation attractor A. If A and B interact, then A vitalizes B; in consequence B = A.

To clarify this hypothesis let us consider the following examples:

In set theory:

$$If \quad B \subset A \Rightarrow A \bigcup B = A \tag{12}$$

Here B as subset of A remains intact within A.

River stream interaction.

Suppose a river is flowing from south to north. At a certain position suppose there is a terrain such that a stream is flowing from north to south. Suppose the stream meets the river at a certain point. What should we expect? Obviously the stream would change direction and follow the river. In this case although the stream changes direction, it remains somehow distributed as a sub structure within the river.

These two examples differ from bioinformation attractors' interaction which is a creation operation, the logic of operation goes like this: A creation B equals A as a result or implies that B = A:

Let $B \subset A$

$$\therefore \text{A Cr B} = \text{A} \Rightarrow B = A \tag{13}$$

Of course this cannot happen unless A and B are selforganizing, order generating systems, subject to the maximum action principle, and unless there is energy bioinformation equivalence.

Results: Regenerative Medicine Mechanism

To reveal regenerative medicine mechanism we employ QIB principles, in order to establish DNA as sub QIFF. Accordingly the cellular regenerative control system emerges as an attribute of the QIFF. The cellular regenerative control system generates DNA bio-information template which is a cascade of LEM waves. The bioinformation

template represents an upper or lower bioinformation attractor according to whether the system is healthy or dysfunctional.

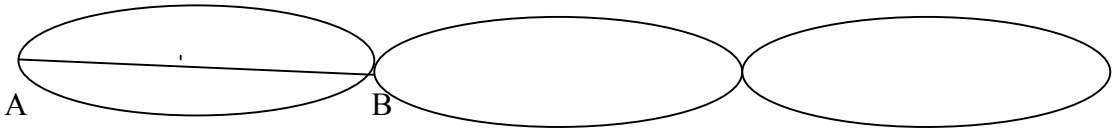
DNA Helical Structure

From a physical point of view for life to emerge two conditions must be satisfied:

i- Existence of maximum action principle that allows a system to traverse a path of maximum action and maximum bioinformation, that accounts for biotic development and evolution, (first law of selforganiation).
ii- Existence of the geometry that complies with the maximum action principle.

Fortunately DNA geometry, its helical and golden ratio based fractal structure, embodies the maximum action principle, hence DNA becomes a sub QIFF. This can be shown as follows:

DNA helical structure satisfies the maximum action principle:



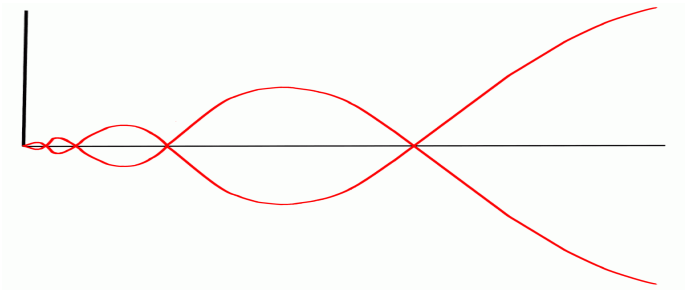
The secret of life resides on DNA geometry both helical and golden ratio based dodeca fractal geometry[18]. DNA has four nucleotides adenine, cytosine, guanine and thymine, for simplicity suppose each nucleotide measures one unit of bioinformation. If these nucleotides are arranged side by side along the straight line AB, so that AB becomes 2r bioinformation units, then since the straight line is the minimum distance between AB, the nucleotides are arranged along a path of minimum action in conformity with the principle of least action. The amazing fact the DNA, being helical, does not follow this path, rather it arranges its nucleotides along the path of maximum action and maximum bioinformation which is curve AB. In case curve AB half circumference it possesses 3.14 r bioinformation units, we call any path greater than 2r path of maximum action.

DNA Dodecahedron Fractal Geometry

The fundamental problem a DNA has to resolve is how to gather or suck electric charge waves without destructive interference. So how does the DNA solve the problem? Whilst destructive interference is the norm in wave interference, the only exception in nature is when the waves interfere with golden ratio wavelengths[18]. So, when waves of electrical charge are arranged in self-similar or fractal geometry optimized by golden ratio they recursively and constructively interfere (heterodyne). The recursive constructive interference turns compression in to acceleration, because golden ratio allows the wave velocities as well as the wave lengths to recursive add and multiply." We have been teaching for years that the only perfectly fractal 3 dimensional electric field is the Golden Mean stellated dodecahedron. The beautiful thing is that in this structure the best possible

combination of wave interference occurs for a constructive output. This is because- as you well know- only the Golden Mean ratio - allows constructive interference of both wave addition, and wave multiplication"[18]

Therefore, DNA by selecting golden ratio based fractal dodecahedron geometry, it selects fractal field phase conjugation of maximum coherence and optimum distribution of charge, and in consequence it selects the path of maximum action.



Path of Maximum Action

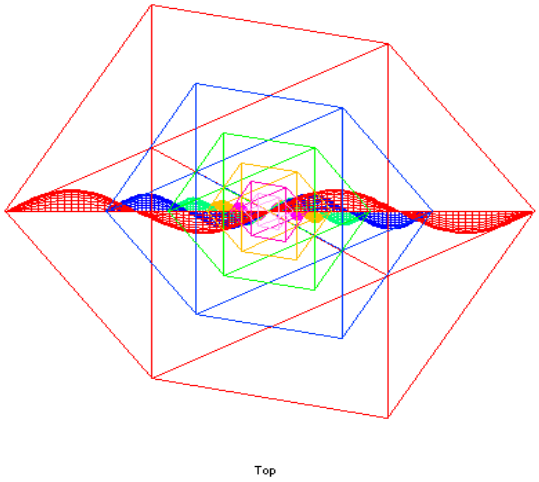
When pure sine waves with wavelengths of $1/\Phi$, 1, Φ, Φ^2, Φ^3 etc. are added together, they will form a perfect Phi spiral. It is clear these waves lengths add and multiply in accordance with phi series property of both adding and multiplying:

Note Φ=1.618, then:

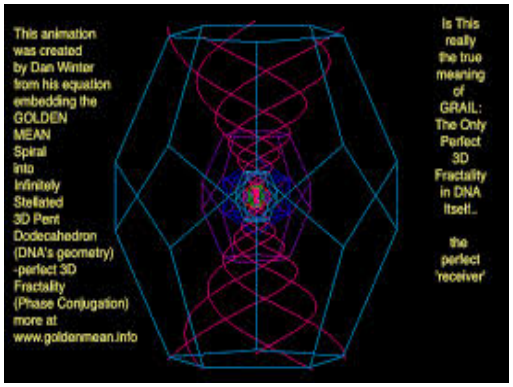
$\varphi^{n-1} + \varphi^n = \varphi^{n+1}$, *also* $\varphi.\varphi^n = \varphi^{n+1}$ *consider*:

0.618, 1, 1.618, 2.618,....

satisfies both adding and multiplying.



Phase conjugation: maximum coherence.



Phase conjugation: nested hierarchy of phi spirals.

Courtesy of Dan Winter [18]

DNA phi based dodeca fractal geometry generates recursive constructive charge-wave interference (waves conjugation). Now since Dan Winter's quantum fractal field represents DNA as a vortex of hierarchically nesting phi spirals, i.e., nested hierarchy of paths of maximum action, such field is actually a sub field of QIFF as nested bioinformation attractors. This claim is supported by the fact that, as shown above, nucleotides are arranged along a path of maximum action and maximum bioinformation.

DNA Bio-information Template

Cellular regenerative control system is the sequential ordering and arrangement of nucleotides along a path of maximum action and maximum bio-information. Accelerated charges (due to charge implosion) along a path of maximum action emit LEM waves which encode the signature of phi spirals, and the associated quantum information stationary functional state. In consequence DNA bioinformation template, which represents DNA bioinformation attractor, is the emitted phase conjugate cascade of LEM waves. Usually the frequency pattern of these vibrations is measured by frequency synthesizers. Also it can be found out theoretically by solving Schrodinger equation for a particle tracing a loop.(30)The bioinformation template creates a path of maximum action for nucleotides rearrangement, it is path reconstruction or restructuring without Bearden's proposed time reversal.[16] In fact here comes the difference between Bearden's envisaged phase conjugation according to which scalar waves carry negentropy. And Winter's envisaged phase conjugation according to which charge implosion and acceleration along paths of maximum action (phi spirals) generate EM waves that carry bioinformation. Note the ability of EM waves to represent bioinformation or bioinformation attractors is established by the first law of selforganization (equation (7)).

Bio-information diseases

Bio-information disease is reduction in the system's bio-information (vitality) due to distortion in the system's regenerative control system reflected on its cascade of phi spirals, i.e., bio-information template. This is why for such diseases drugs and immune system are helpless. Cancer, organ dysfunction and aging are examples of bio-information diseases. A bioinformation disease can be targeted by a healthy bio-information template or attractor that creates a path of maximum action and rearranges the distorted nucleotides.

Cancer Treatment

Based on the bioinformation attractor's interaction hypothesis cancer treatment necessitates identifying the sub bioinformation attractor and the upper attractor, i.e., the attractor that can vitalize or create. In case of a cancer cell we compare its bioinformation attractor with that of its mother differentiated cell or tissue. The BIA of either of them is specified by its associated total vitality (V(A)), i.e., in accordance with the second law of selforganization:

$$\mathrm{V(A)} = \frac{n\pi bG}{f^{a}}$$

Designating the cancerous cell BIA by V_c and the differentiated cell by $V_{D,}$ we get:

$$V_D \propto \frac{1}{f_D{}^{a}}\ ,\ V_C \propto \frac{1}{f_C{}^{a}}\ ,$$

$$Since\ f_D = \frac{1}{A_D}\ ,\ f_C = \frac{1}{A_C}$$

$$A_D > A_C \Rightarrow V_D > V_C \qquad (14)$$

$$\therefore\ V_D\, Cr\, V_C = V_D \Rightarrow V_C = V_D$$

Note: A_D and A_C are the differentiated and cancerous cell's cycle time respectively. It follows A_D is greater than A_C , because A_C represents greater proliferation rate.
∴ The differentiated cell bioinformation attractor vitalizes the cancerous cell subattractor. In other words the differentiated cell's bioinformation template cures or heals the cancerous cell.

$$\therefore\ V_D\, Cr\, V_C = V_D \Rightarrow V_C = V_D \qquad (15)$$

It deserves attention that, in addition to the need to empirical verification, the bioinformation attractors' interaction hypothesis needs mathematical proof. Currently I have no idea of how to produce such proof; probably a development parallel to the quantum theory of creation operators may produce useful results. Particularly, if a relationship between the frequency of bioinformation oscillations and the harmonic frequencies of differentiated and cancerous cells are established.

Montagnier's Revolutionary Discovery

Luc Antoine Montagnier is a French virologist and joint recipient with Françoise Barré-Sinoussi and Harald zur Hausen of the 2008 Nobel Prize in Physiology or Medicine for his discovery of the human immunodeficiency virus (HIV). Furthermore, Montagnier[31-32] has brought forth remarkable evidence for a non-particle view of life. He claims that DNA can send electromagnetic imprints of itself into distant cells and fluids which can then be used by enzymes to create copies of the original DNA. The basic set-up of his experiments was that two adjacent but physically separate test tubes were placed within a copper coil and subjected to a very weak extremely low frequency electromagnetic field of 7 hertz. The apparatus was isolated from Earth's natural magnetic field to stop it interfering with the experiment. One tube thoroughly filtered from a fragment of DNA around 100 bases long; the second tube contained pure water. After 16 to 18 hours, both samples were independently subjected to the polymerase chain reaction (PCR). The gene fragment was apparently recovered from both tubes, even though one had contained just water. Thus it would be possible, according to Montaigner's results, to duplicate viral and bacterial DNA in the absence of the physical template of the DNA itself. Coding information would be transmitted by electromagnetic waves generating from water molecules.[31]

Many scientists greeted Montagnier's claims with scorn and harsh criticism. One of the criticisms of the work was that there is no known mechanism by which bacteria can generate radio waves. Thus to account for Montagnier revolutionary discovery, based on QIB, the EM signals actually represent the DNA bioinformation template that reassemble and organize water molecules in sequence of golden ratio optimized fractal dodecas. Do water molecules have the property of being organized to form fractal dodecas? The answer is yes, not only that but also it is established that the dodeca is relatively stable and common motif in water clusters, Loboda[33]. Now the induced bio-information template transforms water molecules into self similar bio-information template, then given the essential ingredients the template can reassemble the whole DNA sequence.

Discussion:

Probably some physicists may worry about the fate of the least action principle. I urge them to be comfortable because the maximum action principle does not violate the least action principle. The situation is similar to the relationship between relativity or quantum mechanics and classical mechanics, relativity does not violate classical mechanics rather

it covers a domain which is beyond the domain of validity of classical mechanics. And since the new domain of relativity is more general, it contains the laws of classical mechanics as special case. It is same with the maximum action principle which operates beyond the domain of the least action principle, and contains the least action principle as special case. Consider the first law of selforganization (equation (7)) when $t = A$, i.e., an organism is dead, the rate of change of action becomes zero which means the inanimate system becomes in stationary state, moreover the second time derivative is also zero which indicates that the system's total energy is conserved. More important we, as scientists, must stick to empirical evidence as it is clear a biosysten, ontogenetically as well as phylogenetically, traces a path of maximum action.

In fact one wonders what hidden assumption averts scientists from hypothesizing the ability of differentiated (mother) cell's frequency harmonics to carry the remedy for its cancerous daughter. Probably the hidden assumption is that: if the differentiated cell (mother) truly carries the remedy, then why the daughter goes wild while hugged in the mother's arms? It seems as if the mother's regenerative control system is not caring.
Few heuristic calculations show that the cellular regenerative system does care which substantiate the claim that the mother does carry the remedy. Suppose the world human population size is 6 billion (actual size 7.06 billion in 2012)[34], suppose the annual cancer death toll is 15 million (greater than estimated size 14 million in 2012)[35]. Based on these assumptions individual percentage to contract cancer is:
$(15x10^6 / 6x10^9) \times 100 = 0.25\%$
This means the cellular regenerative control system is 99.75% efficient in preventing the disease, this raises the probability that the mother cell vibrations carry the secret remedy.
The proposed regenerative medicine mechanism resolves both Priore's machine enigma and Montagnier's non-particle view of life. It seems by experience (and trial and error) Priore was able to pick up the appropriate differentiated cell's bioinformation template. Moreover the same mechanism can be applied if cancer is due to maturation arrest, because a cancerous cell's bioinformation attractor is always a lower attractor.

Conclusion

Studying biosystems as spontaneous selforganizing dynamical systems has been problematic on the basis of ordinary physics, because two fundamental attributes of biosystems have been missed. These are existence of a maximum action principle according to which a biosystem traverses a path of maximum action and maximum bioinformation during biotic development and evolution. And second, existence of a geometry that embodies or actualizes the maximum action principle. DNA helical and golden ratio based dodecahedron fractal geometry embodies the maximum action principle. Hence the DNA becomes a quantum information fractal field, i.e., a nested hierarchy of paths of maximum action and maximum bioinformation, we call nested bioinformation attractors QIFF. If nature did not have the maximum action principle, there would be no life, no biotic evolution and development, and no intelligence. Without the maximum action principle physics will remain forever blind to comprehend life phenomenon.

A QIFF generates in addition to weak EM vibrations selfsustained bioinformation oscillations. While the bioinformation oscillations contain the dynamical essence of biosystems, the emitted EM waves carry a signature or spectro-bioinformation that designates a DNA bioinformation template. Different bioinformation attractors which represent different quantum information stationary functional states are represented by different bioinformation templates. Healing takes place when an upper bioinformation attractor vitalizes a lower bioinformation attractor. Without Winter's ingenious discovery of DNA charge implosion and phase conjugation we need to endow scalar waves, as Bearden proposed, with miraculous properties such as time reversal. In fact DNA is what to be considered to have miraculous properties: QIFF, cellular regenerative control system, bioinformation attractor, and bioinformation template.

This theory seems to be consistent, however, it needs experimental support, i.e., to verify the healing power of a differentiated cell's bioinformation attractor, or template, when targeting a cancerous cell. Having no sponsor, equipment, or finance, and given the importance of the theory subject matter, I appreciate any contribution from any university, equipped scientist, or group of scientists to further develop and verify the theory.

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