

# Scientific - Analytic Theory Of Life And Death Systems

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## Abstract

Life and death are some usual natural phenomenon known to human beings since long time. Humans cannot control them. Life is complex in nature. Such happenings make us believe about the existence of some super natural power. An effort has been made to understand these happenings on the basis of a new scientific theory based on order and disorder concepts. The roles of time 't' (order parameter 'O') and energy parameter (disorder parameter 'D') towards the actions of life and death systems have been investigated. Interesting results have been observed. The existence of some super natural power, a time dependent entity has been realized. There are openings for life sciences and medical sciences to explore other secrets of nature.

**Key Words:** Order and disorder systems, Life and death phenomenon, Super natural power energy (Cosmic energy) , transformations of different energies, Nature and Universe systems , Heisenberg Uncertainty Principle and its extension, Evolution of universe and evolution of life.

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**1. Introduction:** All living beings on earth possess same physical principles of conservation and transformation of matter and energy. Sun is the main source of energy on earth. Energy in each and every entity of our planet earth directly or indirectly is supplied from sun. All the existing elements on earth and in living beings are in a transformed form from sun radiation. Life is maintained by transformation of energy from the sun. Working of living things is complex in nature. The creation of life like the creation of universe is also based on matter - energy equivalence phenomena ( $E = mc^2$ , where  $m$  is the mass and  $c$  is the velocity of light), which follow random behaviour and occur multiple activities in the form of quantum energy packets inside the life system with different wavelength,  $\lambda$ , which is in turn related to temperature,  $T$  as  $T \rightarrow f(E) \rightarrow f(1/\lambda)$ . 'T' is a disordered parameter.

The existence of earth and living things on earth depend on sun as the well known different constituents (soil, water, energy, space and air) of life have been made up largely from elements carbon, oxygen, hydrogen, nitrogen, sulphur,

phosphorous, calcium, sodium, potassium and iron. Hydrogen is the basic element by which other elements are believed to be formed. These elements make up molecules of living things. Not only this, but our ecosystems are shaped by the non-living environment of land and water-solar radiation, rainfall, mineral concentrations, temperature and topography. The rate of dying and decaying of all organisms is the same as that at which new life is being synthesized. Thus, the total living biomass remains constant. There is a cyclic flow of materials from old to new life, and henceforth there is an irreversible flow of energy from captured sunlight into dissipated heat. The second law of thermodynamics is able to describe the natural tendency towards decay, disorganization and death. In an act of creating something, a certain amount of energy is required such that the disorder energy generated is more than the order created, i.e., some excess energy is left over. There is no space in this universe where energy is created and stored without further disorder occurring. Also the point of destruction and creation is the same—"black hole". This is a belief that some super natural power / cosmic energy is

responsible for the creation and destruction of the universe.

In earlier studies <sup>1, 2</sup> important roles of the quanta of energy (photon) and a protein molecule have been observed in the condensation process occurring during the evolution of universe and evolution of life, respectively. Protein molecules in human body are the basic building block <sup>3</sup> of life. Evolution of universe and then evolution of life provide a unifying principle for understanding the history of the creation of universe and life (flora and fauna). The evolution of life is based on the concept of the relationship among all living things and their life dependence on the physical environment, i.e., species are linked with a multitude in an ecosystem. All living cells of all self-replicating life forms have similar types of complex molecules that are involved in the basic activities of life. A protein molecule along with a DNA molecule and other associated molecules constitute a living cell <sup>4</sup>. A single cell is the originator of other complex cells right from bacteria to elephant species. The cell molecules are composed of atoms of small number of elements as mentioned above. Carbon atom has a tendency for linking up different molecules of anion group due to four valency bonds. The formation of protein molecules and their function depends on its sequence of amino acids. Similarly, the genetic information encoded in DNA molecules provides instructions for assembling protein molecules. The code is same for all life forms. The variation in the pH surrounding the amino acids present at the active site of an enzyme that participates in the reaction affect the H<sup>+</sup> ion concentration and indirectly the biomolecules involved. The variations of temperature and ionic concentrations may bring changes in the activity of DNA molecule, which later brings alterations in protein. Thus, operation of a single cell may be affected by this. In a biochemical reaction a large part of entropy of activation ( $\Delta S$ ) arises

due to hydration. In such reactions <sup>5</sup> (for example the denaturation of proteins and inactivation of enzymes) the Gibbs energy 'G' plays important role, as the rate constant is directly proportional to  $[\exp (-\Delta G / \text{Energy})]$ . Biochemical activities taking place during production of life and death processes reveal the beliefs of the existence of some superpower which control them.

**2. Theory:** In general, no phenomenon, whether short-term or long-term, is wholly determinate or wholly indeterminate. The Dual Nature-Action characteristics of matter and radiation in corpuscle form and in wave form is an example of it. The cyclic order of an action <sup>6</sup> or the stability of natural order develops through regularity or continuity of action, i.e., periodicity. An Action occurrence arises from the union of energy and time, whose product has the dimension of Planck's constant 'h' ( $h = 6.55 \times 10^{-27}$  erg.sec), which for a photon (quanta of energy,  $\epsilon_q = h \nu = h / t$ ) denotes an elementary quantum, a responsible quantity for discrete individuality and dual characteristics.

A new scientific theory <sup>7, 8</sup> based on order - disorder concept has described in integral form the Heisenberg Uncertainty relation as

$$\iint f(E,t) \Delta E. \Delta t = (1/2 \pi) = \iint f(D,O) \Delta D. \Delta O, \quad (1)$$

which agrees with the Heisenberg result:

$$\Delta \nu . \Delta t = (1 / 2 \pi) \quad (2)$$

$\nu$  is frequency and  $t$  is time. Here 'O' is a symmetrical and periodic quantity (for order of Nature) and 'D' is an unsymmetrical quantity (for disorder or randomness or entropy). Here the author introduced the concept of a probability distribution function  $f(E, t)$  in the Heisenberg Uncertainty Principle ( $\Delta E. \Delta t \rightarrow \geq h / 2 \pi$ , where  $h$  is Planck's constant) of atomic systems. This was in order to bring the integral space for all the existing systems of Nature and the Universe in line with the Order- Disorder Scientific theory. The validity of eq. (1) has been observed earlier <sup>1, 2, 6, 9</sup> in interpreting the evolution of universe and life and in the various

analytical considerations of scientists as Planck, Heisenberg, De Broglie, Bohr and Einstein.

Human body is composed of such elements, which already exist in sun's atmosphere and on earth. Their atomic vibration for Order-Disorder Transformation (ODT) is followed by quantized energy:

$$E_q = E_q(T, t) = (k_B / c) (\lambda T / t) = (k_B / v) (T / t) = (\epsilon_T / t), \quad (3)$$

The quantized particle of ODT energy is pronounced here as lifton, which possess order and disorder characteristics both.  $\epsilon_T$  [ $\epsilon_T = (\lambda / c) (k_B \cdot T)$ ] is pronounced as SYA constant and  $\epsilon_c$  [ $\epsilon_c = (\lambda / c t) \cdot k_B$ ] as equivalent thermal capacity constant. The dimensions of 'h' and  $\epsilon_T$  are same. Similarly the dimensions of 'k<sub>B</sub>' (k<sub>B</sub>: Boltzmann constant) and 'ε<sub>c</sub>' are same.

**3. Methodology and Results:** Here, an effort has been made through this study to investigate the action occurrences (energy x time) in the life and death activities of human physical body systems. Life develops in a disordered state. Its union with super natural power energy provided order and disorder characteristics both to a life system. The state of death of a life system is an ordered state. For life systems, the distribution function  $f(E, t)$  is given by

$$f(E, t) = \exp(E / \epsilon_E) \exp(-\epsilon_W / \epsilon_E), \quad (4)$$

here  $\epsilon_E = mc^2$  and  $\epsilon_W = \epsilon_q + E_q + \Delta G$ . Here G is Gibb's energy function, which for protein molecule  $\Delta G = \Delta H - \Delta S$ . H is Helmholtz energy function and S is entropy. During the fertilization of egg the Gibb's energy  $\Delta G$  (employed due to evolution of life<sup>2</sup> characteristic) and Lifton energy  $E_q$  (employed due to ODT) work as a resource energy in zygote development. Lifton works for the activities like beating of the heart etc in the embryo development. There is a particular period of time when energy  $\epsilon_q$  (employed due to evolution of universe<sup>1</sup> characteristic) in form of

super natural power generates basic activities in life systems like a catalyst in a biochemical reaction. In a biochemical reaction, a large part of the entropy of activation ( $\Delta S$ ) arises due to hydration, while for dry substances like dry plant or dead body  $\Delta S = 0$ . For a life system its value lies between 0 and 1. By substituting the corresponding values of  $\epsilon_E$  and  $\epsilon_W$  in eq. (4) and using the obtained value of the distribution function  $f(E, t)$  in eq. (1) of Order- Disorder scientific theory, we obtain an equation of the form

$$\int \exp(E / mc^2) \exp\{- (h / t) - (\lambda k_B T / c t) - \Delta G\} / mc^2 \Delta E \cdot \Delta t = (1 / 2 \pi) \quad (5)$$

Finally we obtain

$$t [ mc^2 - (\epsilon_T / t) \log t - (h / t) \log t ] \exp[(E - \Delta H + \Delta S) / mc^2] = (1 / 2 \pi) \quad (6)$$

Both form of the energies  $S_E$  [ $S_E = (h / t) \log t$ ] and  $L_E$  [ $L_E = (\epsilon_T / t) \log t$ ] show logarithmic behaviour. Both follow infinite and zero values at  $t = 0$  and  $t = 1$ , respectively.  $S_E$  is depending on order parameter 't' only while  $L_E$  on order parameter 't' and disorder parameter 'T'. It is noticeable that in eq. (6), when the sum of logarithmic quantities  $S_E$  and  $L_E$  equals to  $mc^2$  or in exponential term the numerator  $(E - \Delta H + \Delta S)$  equals to  $mc^2$  the equilibrium of life system disturbed. Consideration of the condition  $(E - \Delta H + \Delta S) = 0$  or  $E - \Delta G = 0$  is against evolution principle. For the sustainability of life,  $E - \Delta G > 0$ , which is evolution disordered characteristic.  $S_E$  corresponds to nature, an ordered characteristic of evolution of universe.  $L_E$  corresponds to order and disorder characteristics both. Universe<sup>7, 8</sup> is the creation of nature and it forms a disordered system with existing matter and energy as disordered entities. The laws of nature can't exist without time. The existence of nature (an ordered entity) is itself a manifestation of time. It can be believed that something exist beyond time, which has transformed itself periodically leading to the apparent creation and destruction.

This is very similar to Einstein's mass- energy conversion of universe (a disordered entity) and Descartes theory of rationalism.

Until the quantities of left hand side of eq. (6) balance the right hand side quantity  $1 / 2 \pi$ , the possibility of existing life is there. As body temperature goes on decreasing and  $T \rightarrow 0$ ,  $\Delta S \rightarrow 0$ ,  $L_E \rightarrow 0$ , the eq. (6) indicates the tendency for the occurrence of death. At these conditions eq. (6) provides

$$t [mc^2 - (h / t) \log t] \exp \{ (E - \Delta H) / mc^2 \} = (1 / 2 \pi) \quad (7)$$

How different energies vary according to time 't', it is very interesting to see. The behaviour of time factor with respect to energy factor describes an exponential decay, which reveals that for  $t \rightarrow 0$ , energy contribution in action process moves to  $\infty$  value while at very large span to zero. It reveals the fact of decaying process of energy as life span increases. At the moment of failure of life the system follows:

$$S_E = (h / t) \log t = mc^2 \quad (8)$$

$$\text{And } E - \Delta H = mc^2 \quad (9)$$

When lastly  $\Delta H = 0$ , there is lost of internal energy and body attains the complete death state. Simultaneously the ordered form of energy  $S_E$  also leaves out. At this point there occurs

$$E = mc^2 \quad (10)$$

It shows that there is complete conversion of mass into energy.

**4. Conclusion:** A complete ordered state of matter (an ideal state) is attended at zero mass, zero temperature and zero energy position being atoms at stationary state (silence). The displacement of time brings about agitation in atoms and thermal vibration develops, which enhance the temperature, energy and mass in matter. Ultimately randomness (disturbance) in behaviour of matter and radiation develops, i.e.,

order - disorder transformations are responsible for producing particle and wave characteristics (dual nature) in matter and radiation both, which is supported by third law of thermodynamics. It can be concluded that the failure of life and tendency for the occurrence of death situation arises due to disorders decaying situation, which indicates that firstly  $L_E \rightarrow 0$ , then  $\Delta H = 0$  and lastly  $S_E$  in form of some super natural power energy goes out.  $S_E$  worked as catalyst indirectly quanta of energy in activating  $L_E$  and  $\Delta H$ , a reality of evolution process. Time and temperature both play important roles in the attainment of life (disordered state) and death (ordered state). Also we observe that after death there is complete conversion of mass into energy, the reality of Einstein's mass- energy equivalence principle. More openings are still there to learn about the secrets of life and death systems for the researchers of life sciences and medical sciences. Not only this but in future we hope that the scientists would understand clearly many secrets of Nature and Universe.

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# Lifton, A New Biomaterial Of Life And Death Systems

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## Abstract:

Tissues are biomaterials, which play important role in complex and intricate system of human body. The two ways by which generally death can be confirmed are (i) when cardiac (heart) Beat stops and tissue stops function (cardiac death) and (ii) when brain tissue stops its Function (brain death). Blood pressure and body temperature play vital role to sustain Life and death. The dynamics of living biomaterials is complex in nature. All living beings on Earth possess some physical principles of conservation and transformation of matter and Energy. Life is maintained by transformation of energy from the sun.

The heart beating and vibrations generated in the brain may be expressed through the wave Function of vibrating motion of simple harmonic type. The Order- Disorder Transformations (ODT) of the form  $\int \int E_q(T, t) \Delta T \Delta t \approx (1/2\pi)$  occurring in the life and death systems of Human's body is controlled by quantized energy  $E_q(T, t)$ . The quantized energy particle called Lifton, a bio-catalytic material is responsible for the sustainability of life system and the occurrence of death system, which possess order and disorder characteristics both. There is some natural power energy (time dependent only) that controls all the events and ends in the last after decay of Lifton biomaterial on the basis of Einstein's mass energy equivalence. Time and temperature both plays important roles in the attainment of life (Disordered state) and death (Ordered state). The behavior of time with respect to temperature of quantized particle, Lifton describes an exponential decay,  $t = \exp [c / (\pi \lambda k_B T^2)]$ . It reveals the fact of decaying process of temperature as life span increases.

**Key Words:** Biomaterial, Bio-catalyst, Tissues, Lifton, Life and Death Systems, Order and Disorder states, Order- Disorder Transformations, Quantized energy particle

**1. Introduction:** The human body is an incredibly complex and intricate system. Tissues are biomaterials, which play important roles in human body. There are of four main types of tissues: (i) muscle tissue (ii) skeletal muscle (iii) cardiac and (iv) smooth muscle. All tissues develop from the three primary germ cell layers that are formed in an embryo. Cardiac Tissue is a special tissue of first variety, which is found only in the

walls of the heart and shows the characteristics of smooth muscle and some of skeletal muscle tissue. It plays an important role in the contraction of the atria and ventricles of the heart, which causes the rhythmical beating of the heart, circulating the blood and its contents throughout the body as a consequence. Brain is

another sensitive organ, which controls some of the body's vital functions, like blood pressure, heart rate, coughing, swallowing, control of body temperature and breathing etc. After cardiac tissue, the brain tissue is another important tissue. The brain is made of nerves and ganglion. It is made up of inter connecting neurons, which transmit and store information. An effort has been made to develop the complex human brain tissue in a 3D - culture system as reported recently in Nature publication<sup>1</sup>. The effort was to generate neuro-ectoderm, a basic cell layer of nervous system from which mini brains of maximum size were obtained but they could not survive even for a year in the spinning bioreactor. No further growth was observed due to the lack of a circulation system associated to genetic disorder and other neuronal disorders.

The brain tissue can't be donated after the death of a person while heart tissue can be. The heart valve tissue can be stored for up to ten years. Actually tissues don't require a constant blood supply and don't need to be transplanted as quickly as organs. Tissue transplantation may not be life-saving but, it dramatically improves and enhances the quality of lives. The brain death occurs when the brain is unable to receive blood and oxygen because of a severe injury or some developed disorders but the heart is still beating because the person has been medically cared for on mechanical ventilation. The brain continues to function when someone is unconscious or in coma because it can still be supplied with blood and oxygen. The cardiac death occurs when the heart stops beating. When this occurs then there is no longer a pump to circulate blood and oxygen to the brain and other organs of the body hence the person dies. There are two ways by which death can be confirmed (i) when cardiac tissue stops function, there is cardiac death and (ii) when brain tissue stops function, and then there is brain death.

Blood pressure and body temperature play vital role in sustaining life and death. Their irregular functions can cause various diseases. Highest point of expressed blood pressure of a human body is the pressure at the time of the cardiac cycle when the heart contracts, forcing blood out and the lowest point of blood pressure is the pressure in the cardiac cycle when the pressure is at its lowest, while the heart is refilling with blood. Body temperature depends on the heat energy produced minus the heat lost. The survival of living beings greatly depends on their capability to maintain a stable body temperature irrespective of surrounding environment temperature. Human body temperature varies through thermoregulation process. The balance of heat produced and heat lost maintains a constant body temperature. Due to cellular aging the elderly can't maintain body temperature. Ageing is generally characterized

by the declining ability to respond to stress, increasing homeostatic imbalance and increased risk of disease. Because of this, death is the ultimate consequence of Ageing.

The dynamics of living biomaterials is complex in nature. The molecules of protein form the basis building block of life as well as play important role in the evolution of life<sup>2</sup> as evident on the basis of Order- Disorder Scientific Theory<sup>3,4</sup>. The laws of nature can't exist without time as observed recently<sup>5</sup> in the dynamics of life and death systems. During the fertilization of egg, the Lifton, a new quantized bio-catalytic material particle of Order- Disorder Transformation energy  $E_q = E_q(T, t)$  [ T: temperature, a disordered parameter; t: time, an ordered parameter] function in controlling and generating the activities of heart beating and vibrations in brain.

**2. Methodology And Results:** All living beings on earth possess some physical principles of conservation and transformation of matter and energy. Energy in each and every entity of our planet earth directly or indirectly is supplied from sun, the main source of energy. All the existing elements on earth and in living beings are in a transformed form from sun radiation. Life is maintained by transformation of energy from the Sun. The creation of life is based on matter- energy equivalence phenomena, which follow random behavior and occur multiple activities in the form of quantum energy packets inside the life system with different wavelength  $\lambda$ , which is in turn related to temperature, T as  $T \rightarrow f(E) \rightarrow f(1/\lambda)$ . The existence of earth and living things on earth depend on sun as the well known different constituents (soil, water, energy, space and air) of life have been made up largely from elements oxygen, hydrogen, sulphur, phosphorus, calcium, sodium, potassium, and iron. Hydrogen is the basic element by which other elements are believed to be formed. These elements make up molecules of living biomaterials.

The important tissues of heart and brain lose their functions during death. The heart beating and the vibrations generated in the brain may be expressed through the wave function of vibrating motion of simple harmonic type [ $\Psi = \sin \{(2\pi/\lambda) vt\}$ ]. The dominance of Temperature  $T$  exists in whole space of human body such that the wave function transforms to

$$\Psi = \sin [(2\pi E_q(T, t)), \quad (1)$$

which, for satisfying the quantum parity condition

$$\int \Psi \Psi^* d\tau = 1, \quad (2)$$

leads to Order-Disorder Transformations (ODT, referred here after) of the form

$$\int \int E_q(T, t) \Delta T \Delta t \approx (1/2\pi) \quad (3)$$

This agrees with the Heisenberg result:

$$\Delta \nu \Delta t \approx (1/2\pi) \quad (4)$$

where  $\nu$  is the frequency. Here  $E_q$  is the quantized energy of the form

$$E_q = E_q(T, t) = (k_B / c) (\lambda T / t) = (k_B / \nu) (T / t) = (\epsilon_T / t), \quad (5)$$

The quantized particle of ODT energy is pronounced here as Lifton, which possess order and disorder characteristics both.  $\epsilon_T' [ \epsilon_T = (\lambda / c) (k_B \cdot T) ]$  is pronounced as SYA constant and  $\epsilon_c' [ \epsilon_c = (\lambda / c t) \cdot k_B ]$  as equivalent thermal capacity constant. The dimensions of 'h' (Planck's constant) and SYA constant  $\epsilon_T$  are same. Similarly the dimensions of 'k<sub>B</sub>' ( Boltzmann constant) and equivalent thermal capacity constant  $\epsilon_c'$  are same. The physical meaning<sup>6</sup> of 'h' ( $6.55 \times 10^{-27}$  erg.sec) and its dimension is same as that of Energy x Time. It denotes an elementary quantum, a responsible quantity for discrete individuality and dual characteristics.

The validity of eq. (5) establishes when we introduce the concept of a probability distribution function  $f(E, t)$  in the Heisenberg

Uncertainty Principle ( $\Delta E \Delta t \rightarrow \geq h/2\pi$ ) of atomic systems. This was in order to bring the integral space for all the existing systems of nature and the universe in line with the Order - Disorder Scientific Philosophy<sup>3,4</sup> as in:

$$\int \int f(E, t) \Delta E \Delta t \approx (1/2\pi) \approx \int \int f(D, O) \Delta D \Delta O, \quad (6)$$

which agrees with eq. (4). Here 'O' is a symmetrical and periodic quantity (for order of nature) and 'D' is an unsymmetrical quantity (for disorder or randomness or entropy). Both depend on the probability of distribution concept. Here, the distribution function is given by

$$f(E, t) = \exp(E / \epsilon_E) \cdot \exp\{(-\epsilon_T / t) / \epsilon_E\} \quad (7)$$

where  $\epsilon_E$  is the energy of evolution. We find finally from eq. (6)

$$E = \epsilon_T / t = (k_B / c) (\lambda T / t) \quad (8)$$

which is the form of quantized energy as mentioned in eq. (5).

Finally from eqs. (3) and (5), we obtain

$$(\epsilon_T / t) \log t = [1 / (\pi T t)] \quad (9)$$

$$\text{Or} \quad t = \exp [ c / (\pi \lambda k_B T^2) ] \quad (10)$$

Time and temperature both play important roles in the attainment of life (disordered state) and death (ordered state). The behavior of time with respect to temperature of quantized particle, Lifton describes an exponential decay. It reveals the fact of decaying process of temperature as life span increases.

**3. Conclusions:** The displacement of time brings about agitations in atoms and thermal vibration develops. This enhance the temperature, energy and mass in matter and ultimately randomness in behavior of matter and radiation develop., i.e., Order- Disorder Transformations are responsible for producing particle and wave characteristics (dual nature) in matter and radiation both, which is supported by Third Law of Thermodynamics. Disorders



decaying situation develops the failure of life and tendency for the occurrence of death.

The quantized energy  $E_q(T, t)$  particle called Lifton, a biocatalyst is responsible for the sustainability of life and the occurrence of death. There is some natural power that controls all the events and ends in the last after decay of Lifton biomaterial of human body system on the basis of Einstein's mass energy equivalence.

Lifton time plays dominant role during decaying process of temperature as life span increases.

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# Theory of Bio-Radiation: Lifton

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**Abstract-** A biomolecule present in living beings and a molecule present in non-living material differ in respect of having growth and consciousness. This paper presents the theory of quantization of Lifton, a biomaterial particle. The quantized particle Lifton is the content of bio-radiation. In earlier studies the importance of the biomaterial particle has been observed as a biocatalyst and in the activities of human life and death systems. The dynamics of bio-radiation quantized particle has been found different than the ordinary radiation quantized particle, photon. The difference lies in their energy values and methodology followed. The photon energy  $h\nu$  ( $\nu = 1/t$ ) differs from the Lifton energy  $\epsilon_T \nu$ . However, the dimensions of Planck's constant 'h' and SYA constant  $\epsilon_T$  is same (Energy x time), i.e. the dimension of action. Any action of Nature and Universe may be described on the basis of Order-Disorder Transformation (ODT) theory of the author (SKS) as observed earlier [<http://it.science.cmu.ac.th/ejournal>] of Order- Disorder Scientific Philosophy.

The dynamics of SYA radiation formula of Bio-radiation (having Lifton quantized particle),  $E_\lambda = [ ( 8 \pi / \lambda^4 ) \{ ( Q_F \cdot k_B T ) / ( \exp Q_F - 1 ) \} ]$  and its limiting value in shorter wavelength region ( $\lambda T \ll 1$ ) obtained here differ from ordinary radiation (having quantized particle photon) formulae. It is noticeable that the product of quantity  $Q_F$ , the quantization factor and the average energy for each vibrational degree of freedom,  $k_B T$  is the quantized energy  $E_q$  of biomaterial Lifton, i.e. Lifton is the quantized particle of bio-radiation.

**Key Words:** Bio-Radiation, Lifton, Quantized energy particle, Order and Disorder states, Order- Disorder Transformations, Conservation and Transformation of matter and radiation, Human Body System, Life and Death Systems.

## 1. INTRODUCTION

A bio-molecule (of Flora and Fauna) differs from a molecule of non-living material in respect of having growth and consciousness activities. They also differ in the effects of external radiations. Internal bio-radiations as well as tissues and organs of human body system play a prominent role in the internal activities as well as with the interaction of external radiations. Order- Disorder Transformations<sup>1,2</sup> with respect to nature, universe and super natural power have revealed their prominent role in human life and death systems<sup>3,4</sup>. In all the activities of nature and universe the existence of the role of action (Energy x time) through matter and radiation has been involved all around<sup>5-8</sup>. The role of Planck's constant 'h' ( $6.55 \times 10^{-27}$  erg.sec) in atomic system and of SYA constant  $\epsilon_T$  in bio-molecular system have presented the differences in the behaviours of non-living and living materials. The dimension of 'h' and ' $\epsilon_T$ ' are same as that of action (Energy x time).

All living beings on earth possess some physical principles of conservation and transformation of matter and radiation. Sun is the main source for the transformations of energy and matter to the earth and flora and fauna living systems. In such transformations of energy the quantized particle, photon plays important role. All the existing elements on earth and in living beings are in a transformed form obtained from sun energy.

The purpose of present study is to explore the happenings of the transmission of energy and their effects inside the human body systems. Regarding it we consider that the transmission of bio-radiation takes place in human body system in form of a special type of bio-resonator 'lifton' developed through Order - disorder transformations. On the basis of quantum aspects, a bio-radiation formula for the studies of bio-molecules in human body system has been developed.

## II THEORY

Let us assume that the radiation inside human body is produced by some kind of resonators. If we consider the displacement  $x$  of a bio- resonator in simple harmonic form

$$x = A \sin [ ( 2 \pi E_q (T, t) ) ] \quad (1)$$

where  $A$  is the amplitude,  $T$  is temperature and  $t$  is time.  $E_q(T, t)$  is given by

$$E_q = E_q(T, t) = \epsilon_T v = \epsilon_T / t = Q_F \cdot k_B T, \quad (2)$$

where ' $\epsilon_T$ ' is called SYA constant and  $Q_F$  ( $Q_F = \lambda / c t$ , say) is the quantization factor. The dimension of ' $\epsilon_T$ ' is that of energy  $\times$  time. The kinetic energy,  $E_{kinetic}$  at the equilibrium position of the bio-resonator at the instant ' $t$ ' is given by

$$E_{kinetic} = \frac{1}{2} m [ ( dx / dt )_{max} ]^2 = 2 \pi^2 A^2 m (\epsilon_T)^2 / t^4 \quad (3)$$

According to quantum theory

$$n \epsilon_T v = E_{kinetic} = 2 \pi^2 A^2 m (\epsilon_T)^2 / t^4 ; n : \text{integer} \quad (4)$$

$$\text{Or } n v = 2 \pi^2 A^2 m \epsilon_T / t^4 \quad (5)$$

Also momentum  $p_x$  of bio - resonator is given by

$$p_x = ( 2 \pi A m \epsilon_T / t^2 ) \cos [ ( 2 \pi E_q (T, t) ) ] \\ = B \cdot \cos [ ( 2 \pi E_q (T, t) ) ] \quad (6)$$

where  $B = ( 2 \pi A m \epsilon_T / t^2 )$ . From eqs. (1) and (6) we obtain

$$(x^2 / A^2) + (p_x^2 / B^2) = 1, \quad (7)$$

which is the equation of an ellipse. The area of the ellipse ( $\pi A \cdot B$ ) formed by above equation may be described by the "phase integral" ( $\int_{\text{phase}} p_x \cdot dx$ )

$$\int_{\text{phase}} p_x \cdot dx = \pi A \cdot B = 2 \pi^2 A^2 m \epsilon_T / t^2 = n v t^2 ; . \\ = n \cdot t \quad (8)$$

The form of above equation in angular motion may be represented by

$$\int_{\text{phase}} p_\Phi \cdot d\Phi = n \cdot t ; \quad (9)$$

where  $p_\Phi = I \omega = mr^2 \omega$ .  $I$  is the moment of inertia of the system and  $\omega$  ( $\omega = 2 \pi / t$ ). Finally eq. (8) and eq. (9) give

$$p_\Phi = mr^2 \omega^2 = n = \text{total energy}, \quad (10)$$

which on the basis of the law of equipartition of energy allows us to associate total energy  $k_B T$  of a bio-vibrator with each degree of freedom and the Lifton energy  $E_q$  to be considered as quantized energy.

Now we assume that the energy distribution of the resonators obey the law of Maxwell and Boltzmann. The radiation spectrum arise in human body system in terms of emission and absorption of quantum radiation in discrete quanta, each of which contains amount of energy  $E_q$  [ $E_q = E_q(T, t)$ ] of Lifton, whose radiation wave length  $\lambda$  is related by

$$\lambda = \epsilon_T / p = \lambda k_B T / c p \quad (11)$$

$$\text{Or } c p = k_B T \quad (12)$$

Eqs. (10) and (12) emphasis about the quantization aspect. It is considerable that the radiation in biomaterials exchange energy with their surrounding not continuously but in discrete units in the form

$$(E_q)_n = n \epsilon_T v \quad (13)$$

The available states are only those for which energy is  $0, \epsilon_T v, 2 \epsilon_T v, 3 \epsilon_T v, \dots$  etc, where  $v$  is a characteristic frequency of  $N$  oscillators. The number  $N_n$  in a state of energy  $(E_q)_n$  according to Boltzmann distribution law becomes

$$N_n = N_0 \exp [ - (E_q)_n / k_B T ] = N_0 \exp [ - n \epsilon_T v / k_B T ] \quad (14)$$

where  $N_0$  is the number of oscillators in lowest energy state. Then the total number  $N$  of the oscillators is the sum of all  $\sum_n N_n$  ( from  $n = 0$  to  $n = \infty$  ).

$$\text{Thus, } N = \sum_n N_n = N_0 \sum_{n=0}^{n=\infty} \exp [ - n \epsilon_T \nu / k_B T ] \quad (15)$$

The total energy  $U$  is the sum of  $N_n ( E_q )_n$  :

$$U = N_0 \sum_{n=0}^{n=\infty} n \epsilon_T \nu \cdot \exp [ - n \epsilon_T \nu / k_B T ] \quad (16)$$

Thus for the average energy  $\bar{E}$  of an Oscillator

$$\bar{E} = U / N = \epsilon_T \nu / [ \exp \{ (\epsilon_T \nu / k_B T) \} ] = \{ Q_F \cdot k_B T \} / \{ \exp Q_F - 1 \} \quad (17)$$

$$\text{Or } \bar{E} = E_q / \{ \exp Q_F - 1 \} \quad (18)$$

The number of modes of vibration or degrees of freedom per unit volume in the wave length region  $\lambda$  to  $\lambda + d \lambda$  is given by

$$E_\lambda \cdot d \lambda = [ \{ ( 8 \pi / \lambda^4 ) \{ Q_F \cdot k_B T \} \} / \{ \exp Q_F - 1 \} ] d \lambda \quad (19)$$

$$\text{Or } E_\lambda = [ ( 8 \pi / \lambda^4 ) \{ Q_F \cdot k_B T \} / \{ \exp Q_F - 1 \} ] \quad (20)$$

where  $8 \pi / \lambda^4$  is the number of degrees of freedom per unit volume. We call above equation as SYA Formula of Bio- radiation.

Case - I : When  $\lambda T \gg 1$  (Longer wave length limit)

$$E_\lambda = ( 8 \pi / \lambda^4 ) k_B T \quad (21)$$

Case- II : When  $\lambda T \ll 1$  ( Shorter wave length limit)

$$E_\lambda = ( 8 \pi / \lambda^4 ) \cdot ( k_B T \cdot Q_F ) \exp Q_F \quad (22)$$

In eqs. (20) and (22) there exist a quantity  $Q_F$  the quantization factor. Also in above three eqs. (20), (21) and (22),  $E_\lambda \propto k_B T$ . Here  $k_B T$  is the average energy for each vibrational degree of freedom for vibrator, which from eq. (12) equal to  $c p$ . If we remove the

quantity,  $8 \pi / \lambda^4$ , the number of degrees of freedom per unit volume from eqs. (20), (21) and (22) we find the quantities of energy values  $[ Q_F / \{ \exp Q_F - 1 \} ] k_B T$ ,  $k_B T$  and  $( k_B T \cdot Q_F ) \cdot \exp Q_F$ , respectively for these equations. The values of eqs. (20) and (22) are in closer as compared to the value of eq. (22). It is noticeable that the product of quantity  $Q_F$ , the quantization factor and the average energy for each vibrational degree of freedom,  $k_B T$  is the quantized energy  $E_q$  of biomaterial Lifton quantized particle.

### III RESULTS

Lifton is the quantized energy particle of Bio-radiation as Photon is quantized energy particle of Sun radiation or ordinary radiation. SYA Bio-radiation formula described here follows different values in longer wave length limit and shorter wave length limit.

### IV CONCLUSIONS

It is concluded that the radiations inside human body are produced by some kind of resonators. The quantization of energy  $k_B T$  of a bio-vibrator with each degree of freedom provides the Lifton energy  $E_q [ E_q = E_q (T, t) = \epsilon_T \nu = \epsilon_T / t = Q_F \cdot k_B T ]$ , i.e, Lifton is the quantized particle of bio-radiation.

It is noticeable that the dimension of SYA constant and of Planck's constant 'h' is same as that of Action (Energy x time). The dynamics of SYA radiation formula of Bio-radiation (having Lifton quantized particle),  $E_\lambda = [ ( 8 \pi / \lambda^4 ) \{ Q_F \cdot k_B T \} / \{ \exp Q_F - 1 \} ]$  and its limiting value in shorter wavelength region ( $\lambda T \ll 1$ ) obtained here differ with ordinary radiation (having quantized particle photon) formulae. There is closer agreement in the forms of SYA radiation formula and its form in shorter wavelength region while deviation exists in its forms as compared to longer wave length ( $\lambda T \gg 1$ ) region. It is noticeable that the product of quantity  $Q_F$ , the quantization factor and the average energy for each vibrational degree of freedom,  $k_B T$  is the quantized energy  $E_q$  of biomaterial lifton, which is the quantized particle of bio-radiation.

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