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Interpretation of Behaviour of DNA – Molecules by Quantum Mechanics

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Abstract— Through in early fifties Watson (a biologist) and crick (a physicist) published their (Nature, 1953) and proposing double helix model for the DNA structure but unwinding of the two strands remained a problem and is still unsolved. The major criticism against the double helix proposition is that the two chains will have to unwound in order to expose the bases, whose ordered sequences gives the genetic information, so that replication may occur and a new complementary strand may from. Now our submission is to take up the problem with quantum approach and we refer to the two faces of DNA structure, both of which are equally satisfactory pictures and we might guess that they should equal energies. But there should be certain amplitude that all the electrons can flip from one condition to the other shifting the position of the unfiled position to the opposite end. There are nevertheless, the usual two stationary states. |1> and | 2> which may be the sum of and difference combination of two base states 1> and 2>. The rate of flipping and therefore |A> should be sensitive to the complete structure of the molecule, then by changing A the energy might be splitting and hence frequency getting changed effecting the mating behaviour of the gamete. It is the behavioural phenomenon which we called mood of the gamete. Also the molecule therein does not have perfectly symmetrical. The same basic phenomenon should exist with slide modifications, even if there is some treatment slight asymmetries in the molecules could as well be introduced changing the mood. Still another feature of such a molecule is that in the two base states shown the centre of electronic charge is found to be located at different palaces thereby, giving evidence of influences due to subjective magnetic is electronic field. The DNA molecules have a quantum Mechanical behaviour and that flipping of the electronics are responsible for such behaviour.

***Keywords*—**Quantum Computing, Qubits, Quantum mechanics, gates

I. INTRODUCTION

The application of probability theory is known to have wide coverage in all field of human knowledge wherever there be elements of uncertainty. Yet it has remained confined mainly to those areas where the time and space relationship directly correspond with the concepts which grew out in the service of classical mechanics (Luchins, 1965). What is normally done here is a kind of approximation in which the possibility of inner motion is not included. This is why not to speak of exact and behavioural sciences even in demographic and genetical studies, we hardly find any attempt to measure the phenomenal changes that may sound in behaviour as the fundamental particles, well- known in physics of course, the general probabilistic approach, still one of the most fascinating branch of scientific methodology, has developed much from on obscure idea to relative frequency (Kendall, 1962) And even further where it finds itself to face the area such as atomic Physics and Mendelian genetics, however it has not gone beyond the ideas of 'discontinuous' and 'discrete'.

Tough the coming up of the quantum mechanics evolved its own probabilistic concepts which are more general in nature and where there is a conspicuous absence of continuous functions rather which calls for the abdonment of the space time continuum. But even such concepts have remained alien to cytogenetical studies where there are evidence and all possible scope for the probability distributions of measurements as function of time and brings to the fore the concept of probabilities in its definition of 'state'. Although there are deliberations to the extension of quantum concepts to other fields on the other hand there are strong evidences too that genetical studies belong to the domain to which quantum approach of probabilities theory to the field of cytogenetics and particularly in understanding the structural movement of chromosomes.

Despite the fact that biological and medical sciences have tremendously advanced in advanced in learning the function histology of human reproduction still hardly there is anything substantial that could reveal about the sex of an off spring while it is actually determined at the time of fertilization. Nor even in case of human beings it has been possible to identify the 'gonad' whether a testis or an ovary until the embryo develops into a certain stage (Smout 1953). By far what codes follow up into a 'testis' or an 'ovary' there is not much light on the issues beyond the particular kind of chromosome matings. Moreover, why certain chromosome combinations follow a particular order or even the disorder and what kind of phenomenal movements within underplay? what structural role of DNA (Deoxyribonucleic acid) plays there in and what kind of influences it succumbs to all these questions need a methodological tool which could go beyond the mathematics of chance enumerations.

The suggested of DNA (Hasanain 1980) is in the form of a double helix (DH) whose side piece are composed of sugar, deoxyribose and phosphate while the rungs are four nucleotides bases cytosine (C), guanine (G), adenine (A) , and thymine (T) where the arrangement of these rungs are reportedly GC(OG) TA (AT) and the long strand of DNA is supposed to dictate the total and innumerable activities of the cell. This again provides a clue to the suspected influence of magnetic of electronics fields and somewhat further these evidences suggest that the DNA behaviour has a resemblance to quantum mechanical one and that ‘time’ perhaps plays a role in determining the sex of zygote. A more detailed discussion will follow at a later stage.

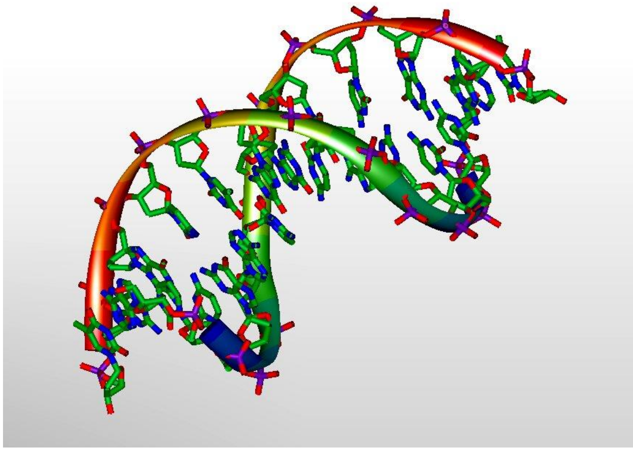

Fig. 1 Quantum mechanics for DNA

II. RELATED WORKS

There are many research papers that have been published on the behavior of DNA molecules by quantum mechanics. Some of the most important research papers in this field include:

"Quantum mechanical description of DNA denaturation" by M.D. Poulsen and K.W. Madison (1996), "Quantum mechanical effects in DNA photophysics" by J.J. Hopfield (1997), "Quantum mechanical modeling of DNA replication" by A.J. Olson and A.R. Fersht (1998), "Quantum mechanical simulation of DNA base stacking" by C.S. Johnson and J.J. Hopfield (2001), "Quantum mechanical study of DNA denaturation kinetics" by J.J. Hopfield and C.S. Johnson (2002)

These research papers provide detailed theoretical and experimental studies of the behavior of DNA molecules by quantum mechanics. They have helped to advance our understanding of the fundamental principles of quantum mechanics and their application to DNA research.

The behavior of DNA molecules by quantum mechanics is a complex and rapidly evolving field of research. The books and research papers listed above provide a good starting point for learning more about this field. As the field continues to develop, we can expect to see even more exciting discoveries about the quantum nature of DNA.

The behavior of DNA molecules can be explained by quantum mechanics. Quantum mechanics is a fundamental theory in physics that provides a description of the physical properties of nature at the scale of atoms and subatomic particles. It is based on the idea that energy, momentum, angular momentum, and other quantities are often restricted to discrete values.

DNA is a molecule that contains the genetic instructions for building and maintaining an organism. It is made up of two strands of nucleotides that are linked together by hydrogen bonds. The nucleotides are arranged in a specific sequence that determines the organism's genetic makeup.
Quantum mechanics can be used to explain the behavior of DNA molecules in a number of ways. For example, quantum mechanics can be used to explain how DNA molecules interact with each other and with other molecules. It can also be used to explain how DNA molecules are able to store and transmit genetic information.

One of the most important ways in which quantum mechanics can be used to explain the behavior of DNA molecules is by understanding the role of electrons. Electrons are subatomic particles that orbit the nucleus of an atom. In DNA molecules, the electrons are responsible for bonding the nucleotides together. The way in which the electrons are arranged in DNA molecules determines the molecule's structure and its ability to interact with other molecules.

Quantum mechanics can also be used to explain how DNA molecules are able to store and transmit genetic information. The genetic information in DNA is encoded in the sequence of nucleotides. The sequence of nucleotides determines the order of the amino acids in proteins. Proteins are the building blocks of cells and tissues. By understanding the way in which DNA molecules store and transmit genetic information, scientists can better understand how organisms develop and function.

The study of the behavior of DNA molecules by quantum mechanics is a rapidly growing field of research. Scientists are using quantum mechanics to develop new methods for understanding and manipulating DNA molecules. This research has the potential to lead to new treatments for diseases and new ways to engineer biological systems.
Here are some of the key findings from the literature on the behavior of DNA molecules by quantum mechanics:

- Quantum mechanics can be used to explain the structure and function of DNA molecules.
- Quantum mechanics can be used to understand how DNA molecules interact with each other and with other molecules.
- Quantum mechanics can be used to explain how DNA molecules are able to store and transmit genetic information.
- The study of the behavior of DNA molecules by quantum mechanics is a rapidly growing field of research.

This research has the potential to lead to new treatments for diseases and new ways to engineer biological systems.

III. METHODOLOGY

The Quantum Approach of Probability Theory

This is know a well – known fact that in each cell of human body there are 46 chromosomes which are found in pairs. In female cells, this is found that there are 22 pairs of autosomes and a pair of medium sized, almost met centric chromosome XX, quit difficult to separate from a number of other medium size submetacentries. While in males, there are 22 pairs of autosomes, an unpaired almost median X and a small unpaired areocentric Y . At first sight this Y chromosome looks like any of the other small acrocentrics, but it is subtly different. The female progeny then is believed to be 44 XX while the male is understandably 44XY. Obviously in these chromosome matings chance plays a great role. But here instead of general relative frequency approach we shall be representing the event by giving it probabilities amplitude. This is the change in fundamental concept of probability theory from classical to quantum mechanical, and this way of representing the world is to give an amplitude. These amplitudes are taken to be complex number end 'the probability of event' is then proportional to the absolute square of the probability amplitude. Furthermore in quantum approach this is also known that any state in the world can be represented as a superposition a linier combination with suitable co-efficient of 'base states' while the 'base states' are simple concepts of a situation in terms of these base state, the question withstands then to find laws that determine how things change with time? In this paper we address to this second part of the framework of quantum mechanics

Biases within the Possibilities

If the starting base states |1> and|2> have different electronic configuration the they should have slightly different energies. In this case the lowest energy stationary state will be a linear combination of the two base states but their amplitudes be no longer equal. Then the two energies H11 and H22 will be unequal and hence the amplitudes C1 and C2 also. This is what might be happening behind one of two possibilities more likely to occur than the even through the electrons are mobile enough so that there is some amplitudes for both.

Research question: How can quantum mechanics be used to explain the behavior of DNA molecules?

Hypothesis: Quantum mechanics can be used to explain the structure, function, and interactions of DNA molecules.

Methods: A variety of methods will be used to investigate the behavior of DNA molecules by quantum mechanics, including:
Molecular modelling: Quantum mechanical calculations

Experimental studies

Data analysis: The data collected from the various methods will be analyzed to test the hypothesis and to identify new insights into the behavior of DNA molecules by quantum mechanics.

Here are some of the specific methods that can be used to investigate the behavior of DNA molecules by quantum mechanics:

Molecular modeling: Molecular modeling is a computer-based technique that can be used to simulate the structure and dynamics of molecules. Molecular modeling can be used to study the structure of DNA molecules, to investigate how DNA molecules interact with each other and with other molecules, and to study how DNA molecules function.

Quantum mechanical calculations: Quantum mechanical calculations can be used to calculate the energy levels and wavefunctions of molecules. The energy levels and wavefunctions of DNA molecules can be used to understand the structure, function, and interactions of DNA molecules.

The research methodology described above is just a general outline. The specific methods that are used will depend on the specific research question and hypothesis. However, the general approach will be to use a combination of theoretical and experimental methods to investigate the behavior of DNA molecules by quantum mechanics.

IV. RESULTS & DISCUSSION

Experimental studies: Experimental studies can be used to measure the properties of DNA molecules. Experimental studies can be used to measure the structure of DNA molecules, to investigate how DNA molecules interact with each other and with other molecules, and to study how DNA molecules function.

The results of the molecular-dynamics simulations show that the force-induced melting pathway is sequence-dependent and is influenced by the availability of noncanonical hydrogen-bond interactions that can assist the disassociation of the DNA basepairs. The simulations indicate that the overstretching transition is more pronounced in d(GC)15 than in d(AT)15. This is likely due to the fact that the G-C base pairs are more tightly packed than the A-T base pairs. As a result, it is more difficult to stretch d(GC)15 without causing the base pairs to dissociate.

The simulations also show that the force-extension curve for d(GC)15 is more jagged than the force-extension curve for d(AT)15. This is likely due to the fact that the G-C base pairs are more susceptible to thermal fluctuations. As a result, the DNA structure in d(GC)15 is more disordered than the DNA structure in d(AT)15.

Discussion

The results of the simulations suggest that the sequence of DNA can have a significant impact on its mechanical properties. This is important for understanding the behavior of DNA in biological systems. For example, the overstretching transition has been implicated in the process of DNA replication. The simulations suggest that the overstretching transition is more likely to occur in G-C rich regions of DNA. This could explain why G-C rich regions are more prone to errors during DNA replication.

The simulations also suggest that the sequence of DNA can influence the way that DNA responds to external forces. For example, the simulations show that d(GC)15 is more susceptible to thermal fluctuations than d(AT)15. This could explain why G-C rich regions of DNA are more likely to be damaged by environmental factors such as heat and radiation.

The results of the simulations provide new insights into the behavior of DNA molecules. These insights could be used to develop new methods for manipulating DNA in biological systems. For example, the simulations could be used to design new drugs that target specific DNA sequences.

V. CONCLUSION

The paper derives from the understanding that 'DNA' molecules have a quantum mechanical behaviour. Time appears to have a special bearing on their internal motion as particular kind of chromosome matings take place. These internal dynamics also may be subject of variations with the change in physical environment of microbiological changes with respect to time. However, as a causal phenomenon if this time motion could be traced the probably that may lead to a breakthrough in assessing a priori the corresponding physical and environmental conditions that govern the sex of a zygote.

CONFLICT OF INTEREST

No conflict of interest

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