

# A Non-Particle View of DNA and Its Implication to Cancer Therapy

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**Abstract.** The various effects of electromagnetic fields to DNA have been reported by Luc Montagnier and his group. It has been shown that genetic information can be transmitted to water through applications of electromagnetic fields, means that DNA has wave character. Here, non-particle view of DNA challenges standard paradigm of DNA and biology. Based on frequency, it can have implications for physics of cancer.

## INTRODUCTION

Over the last 60 years, the development of basic knowledge in biology as well as many medical applications owes much to the discoveries made in DNA. On the other hand, in the same times evidence has been accumulated on the influence of electromagnetic (em) fields on living organisms. The frequencies of involved em fields cover different intervals corresponding to the different scales present in the organisms. For example, in a series of reports by Prof. Luc Montagnier et al. which have caused debates all over the world, they showed that DNA has wave character. Luc Montagnier et al. discuss the appearance of a new property of DNA correlated with the induction of extremely low frequency (ELF) em fields. These fields can be induced by suitable procedures in water dilutions which become able to propagate the information contained in the DNA of the original organisms to other ones. Montagnier et al. considered a very low frequency (ELF) at the order of 7 Hz, which also occurs in nature, and it is known as Schumann resonance. In other paper, Montagnier et al. reported a novel property of DNA, that is the capacity of some sequences to emit electromagnetic waves in resonance after excitation by the ambient electromagnetic background. Owing to the low sensitivity and specificity of their signal capture and analysis, the frequencies emitted are all alike, regardless of the bacterial species involved. But their papers were based on experiments, and although a theoretical framework has been proposed, such experimental works seem to lack theoretical basis. Here, we give a theoretical basis of such a wave character of DNA based on De Broglie's matter-wave hypothesis. We prove that this matter-wave hypothesis can be interpreted such that all matter including DNA can be altered by (electromagnetic) frequencies. Nonetheless, it should be noted that other theoretical model has been proposed to explain Montagnier's experiment with liquid water [12]. In the mean time, there are related findings dating back to the 1920s which had shown the existence of emissions from living substances at the much higher frequency range of ultraviolet light. Such emission was later confirmed by Fritz-Albert Popp, a biophysicist, who named the phenomenon biophotons. Popp and colleagues demonstrated that the light was coherent, somewhat like a laser, that the emitting molecules are coupled by a coherent radiation field; and that the source is the DNA in the cell nucleus. Whole body biophoton detection in Popp's lab showed a correlation with known biological rhythms of diurnal, lunar, and other periodicity, and suggested the existence of a globally organized biophoton field for the organism. And biophotons emitted from DNA have become an established fact. Nowadays, biophotonics is a very active field of research, and it may have medical implications including cancer therapy as well [11]. Significance of this paper: It is known that modern biology including molecular biology has a core assumption, that is corpuscular view of DNA. Such an atomistic model of DNA can be traced to have its root in particle physics. If

the newly interpreted matter-wave hypothesis is true, then it implies that DNA has wave character, i.e. it can be altered and influenced by EM frequencies. It can be expected, that such a non-particle view of DNA can have impacts on all our understanding on physics of biology, including potential implications to cancer therapy too.

## DNA AND DE BROGLIE'S MATTER-WAVE HYPOTHESIS

Experiments carried out by Montagnier group seem to suggest that genetic information can be transmitted to water via electromagnetic waves. This is very interesting since it challenges standard paradigm in biology [2][3]. This is also related to Gariaev's proposal of DNA wave genetic [4][5].

That cell has capability to communicate at a distance may be not surprising, since there are reports indicating that effect. But that electromagnetic field can transmit genetic information to water is interesting result which seems to bring us back to an old debate between corpuscular view and wave view of matter.

Let put aside objections on Einstein's special relativity and follow De Broglie's argument in his thesis:

$$E = \hbar f, \tag{1}$$

and

$$E = mc^2. \tag{2}$$

From equations (1) and (2) we get:

$$m = f \frac{\hbar}{c^2}. \tag{3}$$

In theory, it seems possible that E.M. field not only can transmit genetic information to water, but also E.M. frequency can alter genetic code. Here equations (4) give some hints to explain many phenomena related to Montagnier and Gariaev's experiments and may plausibly open new ways to treat DNA as quantum biocomputer [4].

## PLAUSIBLE APPLICATION OF THE PROPOSED CONCEPT

To test the new concept of "all life comes from life through frequency" (*Omne vivum ex vivo via crebritudo*) which challenges the standard paradigm in biology, we suggest the following:

Let us define  $f$  as yield frequency, which is frequency where matter becomes wave, and a new parameter

$$k = \frac{\hbar}{c^2}. \tag{4}$$

Then equation (3) can be written as a ratio:

$$\frac{m}{f} = k. \tag{5}$$

In words, from the above equation we may predict that the ratio between a small mass  $m$  like photon with its yield frequency  $f$  is always a constant. The small mass here can be extended to neutrino, electron, muon etc.

One plausible application of this proposition is alternative method of cancer treatment using various frequencies. It is known that some frequencies like 444 Hz may kill cancer cell without destroying the normal cells. Such a method seems worthy to be investigated and developed further.

Montagnier and his group also use very low frequency such as 7.83 Hz, which seems to be closely related to the Schumann resonance of 7 Hz. Whether or not such a 7.83 Hz corresponds to ambient frequency of electromagnetic noise in water should be tested with experiments.

## DNA AS PERTURBED SGE SOLITON

One of various models of DNA is using solitary wave [6]. Its use as a model of phyllotaxis systems including DNA has been proposed elsewhere [7][8][9][10]. Now, let consider Perturbed sine-Gordon equation (PSGE) as a model of interaction between soliton and external E.M. field.

Perturbed SGE comes in a variety forms. One common form is a damped and driven SGE [9]:

$$\Psi_{tt} + \Phi\Psi_t - \Psi_{zz} + \sin(\Psi) = F. \quad (6)$$

In addition, the following two versions of the perturbed SGE have been studied in the literature, including directly forced SGE

$$\Psi_{tt} - \Psi_{zz} + \sin(\Psi) = Mf(\omega t) \quad (7)$$

and damped and driven SGE

$$\Psi_{tt} - \Psi_{zz} + \sin(\Psi) = Mf(\omega t) - \alpha\Psi_t + \eta. \quad (8)$$

In the meantime, (2 + 1)D SGE with additional spatial coordinate  $y$  is defined as

$$\Psi_{tt} = \Psi_{xx} + \Psi_{yy} - \sin(\Psi). \quad (9)$$

Here, new insights may be expected in various biological fields.

## CONCLUDING REMARK

In this paper, we prove that DNA has non-particle character in favor of experiments carried out by Luc Montagnier et al. We also propose an extension of the known adage: *Omne vivum ex vivo* to *Omne Vivum ex Vivo via Crebri-tudo*” (Eng.: every life comes from other life through frequency). We also discuss a mathematical model of DNA as solitary wave, which suggests that it is possible to alter its structure through external frequency. However, it should be noted here that theoretical basis for effects of (electromagnetic) frequency to DNA structure is far from clear. Further investigation in the proposed direction can be recommended.

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