

CELLULAR COMMUNICATION, SIGNALING AND CONTROL FROM THE DIFFERENT PERSPECTIVES OF BIOLOGY, CHEMISTRY AND FIELD PHYSICS

Konstantin MEYL*

Faculty "Computer and Electrical Engineering", Furtwangen University, Germany
prof@meyl.eu, 1stTZS, Technology Park, Erikaweg 32, D-78048 Villingen-Schwenningen, Germany

ABSTRACT

The DNA generates a longitudinal wave which propagates within the magnetic field vector. Computed frequencies from DNA structure agree with bio photon radiation frequencies as predicted. Optimization of efficiency is done by minimizing the conduction losses which leads to the double helix structure of DNA. The vortex model of the magnetic scalar wave not only covers the many observed structures within the nucleus but also introduces the reader to the hyperboloid channels in the matrix as two cells are then found to communicate with each other. Physical results were revealed in 1990 which form the theoretical basis of the essential component of a potential vortex scalar wave. An extended field theory approach has been known since 2009 following the discovery of magnetic monopoles. For the first time magnetic scalar wave theory best explains the physical basis of life not only from the biological discipline of science understanding only. And for the first time this interdisciplinary theory and provides a new understanding of cellular functions that are explained such theory depicting the complex relationships of nature. The characteristics of the potential vortex are decisive. Now using the concentration effect, my theory provides a cellular miniaturization view down to a few nanometers. This theory for the first time allows a better understanding of the outrageously high information density in the nucleus. Magnetic scalar wave theory explains how the dual base pair-stored information of the genetic code is formed. The process of converting electrical modulation into "piggyback" information that transfers or is send from the cell nucleus to another cell is a revolutionary theory. Information transferred at the receiving end during the reverse process takes place involving a change in the physical and chemical cellular structure. The energy required to power the chemical process, is now understood by the extended field theory to come from the magnetic scalar wave itself.

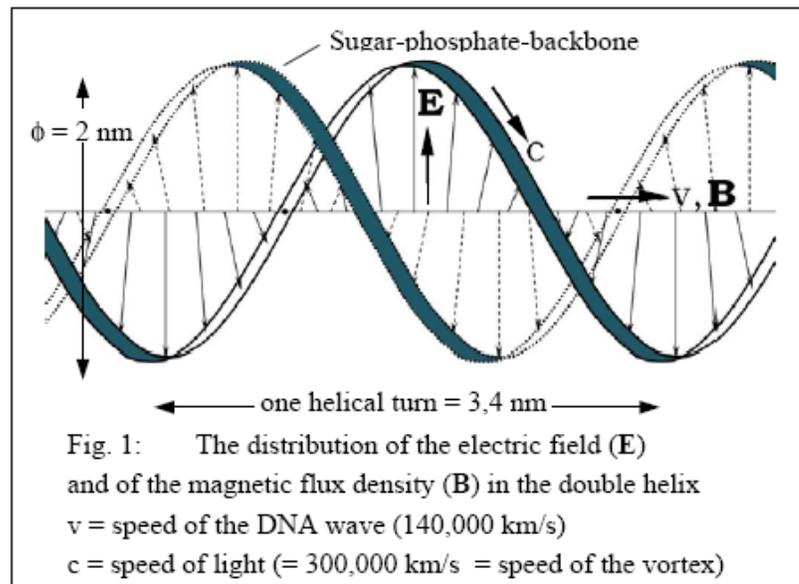
Keywords: Cell Communication, Introns, DNA-wave, Resonance, longitudinal magnetic wave

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1. INTRODUCTION

When two cells communicate with each other, one transmitting the read information and writing it to the other cell, we must ask how the read and write process works, and how genetic information is physically transported from cell to cell from a technical view point? [1,2,3,4]

Hydrogen-bonds hold together through Coulomb forces electrically polarized base pairs in a DNA strand. To gain access to this polarization, the hydrogen-bonds must be separated, requiring radial outward electric field lines or, as I call it, a vortex field. Since the magnetic field vector is perpendicular to the electric vertical field, a resulting axial direction to the DNA strand is a logical consequence. The motion of the vortex field in the direction of the magnetic field results in a longitudinal wave forming a so-called magnetic scalar wave (Fig.1).



“The superbly researched biochemistry of the cell nuclei describes the direction that must be investigated” [5]. “The coding regions in the DNA strand, the genes, make up only a fraction of the total amount of DNA. The stretches that flank the coding regions are called “introns” and consist of non-coding DNA. Introns were looked upon as junk in the early days. Today, biologists and geneticists believe that this non-coding DNA may be essential in order to expose the coding regions and to regulate how the genes are expressed” (taken from [6]). Further research will reveal other important functions pertaining to introns.

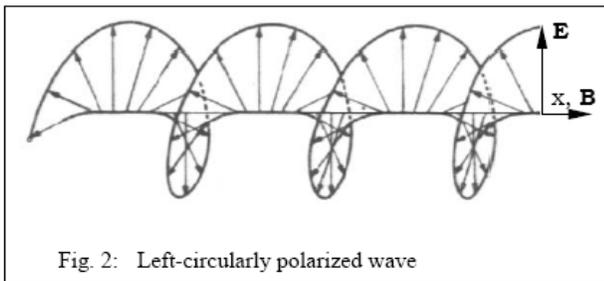
2. THE ELECTRIC FIELD OF THE FOUR BASES

As we know, the DNA is wound into a double helix with a right-handed rotation (type A or B). The two polynucleotide strands are of opposite polarity. Between the bases hydrogen-bonds are formed, whereas adenine always pairs with thymine and guanine always pairs with cytosine [7]. These represent the code or character set of the genetic information. A chemist distinguishes the four bases on the basis of their structure; however, a physicist on the basis of different charges. Although the electric charges are very low, the electric field strengths, measured in volts per meter, may be very high at such small distances.

While inactive the hydrogen-bonds follow the field strength and neutralize the electric charges of the base pairs. The DNA behaves outwardly neutral and conversely is not interfered with by external electric fields. Only during the writing process are the hydrogen-bonds temporarily removed and the base pairs separated, allowing the sequence of exposed charges to be read. This process requires a higher electric field strength. The magnetic scalar wave (Fig. 1) can, for example, provide the required voltage. Incidentally, this is the only type of wave in which the field vector of the electric field points radially outward as a prerequisite for interaction with the electric charge of the bases. As a result, a modulation occurs, which is carried by the wave.

3. CIRCULARLY POLARIZED DOUBLE HELIX

The referenced longitudinal wave propagate in the direction of the magnetic field vector. Magnetic forces are formed between the field vortices and are responsible for the emergence of wave nodes and also are responsible for the propagation of the wave. Because of the helical structure of the vortex field, the field lines are open and not closed. They wind the screw forward compared to a circularly polarized wave (Fig.2).



The vortex velocity, which is at the speed of light c , screws along the outer line in a forward direction. Because the resulting path is more than twice as long, the propagation of this field formation in the x-axis direction and results in a longitudinal wave propagating at 140,000 km/s. This is a result of the geometric dimensions (Karp,G, [7] p.503 and [8]) on the one hand and the diameter of the helix of 2 nm on the other as well as the path length of 3.4 nm measured in x-axis direction over a full helical turn (Fig. 1).

4. THE WAVELENGTH OF THE DNA-WAVE

The next step is to determine the frequency and wavelength in the current direction of the magnetic field vectors and with it the modulated wave. Valuable information can be observed by the tendency of the helix to form a coil with two turns of globular proteins called histones.

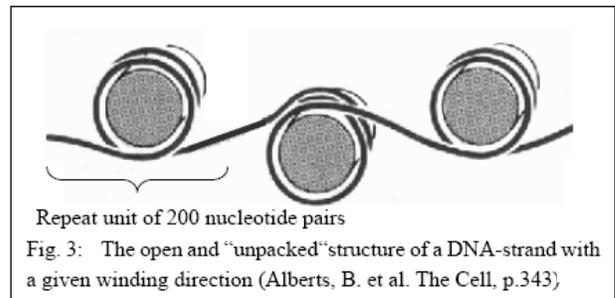
It becomes obvious that this corresponds to two turns of a half-period. Thus, the transition from one histone to the next always occurs in a wave node, corresponding to half of the wavelength. If a coil produces the positive half-wave, then the neighboring coil is responsible for the negative half-wave and vice versa. The **alternating winding direction** from one coil to the next confirms the correctness of this assumption.

The length of the DNA strand of both windings can be determined in two ways. For the nucleosome core particle, consisting of the coil body (histones) and the wrapped around DNA molecule, an average coil diameter of 10 nm is established [7]. The molecular length of one turn in the middle of the DNA strand is therefore $(\pi \cdot 10)$ nm and the wavelength at 4 turns distributed to 2 histones is:

$$\lambda_{\text{DNA}} = 126 \text{ nm.}$$

Quoted values in literature differ sometimes, which is explained by the relevant condensation degree of the molecule. An error analysis would help narrow down the possible fluctuation range. Using published data and observations using x-ray structure analysis valuable information (Genes IV [9], p.421) can be obtained to estimate the range of the tolerance band. In the second calculation method the base pairs are simply counted.

A nucleosome has 146 bp (base pairs) and takes slightly less than 1.8 turns, while one full turn has 83 bp, and two turns have 166 bp. Even more base pairs are required for the transition from a "bobbin" to the next, but sadly there is no reliable data. The high packing density within a condensed chromatin makes it difficult to count the fibers (Fig. 3). In an open and uncondensed fiber 200 bp's are counted (The Cell [10], p. 343).



The ascent of the helix along its central axis is 0.332 nm per base pair [11]. Multiplied by the number of base pairs, which depend on the degree of condensation a maximum and minimum wavelength is obtained:

$$\lambda_{\text{DNA}}(\text{max}) = 200 \text{ bp} \cdot 0.332 = 132.8 \text{ nm}$$

$$\lambda_{\text{DNA}}(\text{min}) = 180 \text{ bp} \cdot 0.332 = 119.5 \text{ nm}$$

or referencing as a range:

$$\lambda_{\text{DNA}} = 126 \text{ nm} \pm 6 \text{ nm}$$

Propagation speed v_{DNA} and wavelength λ_{DNA} in turn determines the frequency of the DNA-wave:

$$\begin{aligned} f_{\text{DNA}} &= v_{\text{DNA}}/\lambda_{\text{DNA}} = 140 \cdot 10^6 / 126 \cdot 10^{-9} \\ f_{\text{DNA}} &= (1.11 \pm 0.06) \cdot 10^{15} \text{ Hz } (= \text{UV-radiation}) \\ \text{at } c/2.14 &= 140 \cdot 10^6 \text{ m/s} \\ &\text{as the average speed of the DNA-wave} \end{aligned}$$

5. EVALUATION

The values determined here are primarily for the B-DNA. An especially important result in accordance with the metrological experience is shown in the table above. It describes the DNA-wave at frequencies around 10^{15} Hz of UV radiation as is therefore a UV radiation.

Prof. Popp speaks of bio-photons and demonstrates, using highly sensitive photo-multiplier tubes that cells do emit measurable extremely weak UV light [12,13,14].

Prof. Heine has measured tunnel structures inside the basic substance of the extracellular matrix and his results correlate with the above-calculated wavelength [15].

Both scientists' similar results are in agreement but are argued differently. Popp has moved the cell radiation at 126 nm into the area of the speed of light, while Heine is showing that propagation velocity is equal to the sound wave. The latter view is probably closer to reality, and is in the nature of the magnetic scalar wave. Longitudinal waves know no fixed propagation speed and consequently no fixed frequency. To characterize them we must also incorporate their wavelength. This wavelength does not change when the wave is slowed down to lower speeds [16,17]. The propagation speed depends on the properties of the medium that carries the longitudinal wave.

6. THE TASK OF THE INTRONS

In contrast to technical devices biological systems are using an "auto-focus" function; or in other words, in the presence of scalar waves cells show a tendency to go into resonance with each other. In this way, they draw energy and information from other cells and from the environment. Synchronization with external or internal biological stimulators occurs. It has not escaped my attention that this model can also help to explain observations of epigenetics. In physics and engineering the phenomenon of resonance is known in the art of vibratory systems. If we excite such a system and label it as a transmitter, then a different system acting as a recipient of the oscillation becomes the receiver when

- (i) the *same frequency*,
- (ii) the opposite algebraic sign or the *reversed phasing* and
- (iii) the same waveform, i.e. *identical modulations* are present.

If transmitter and receiver are in resonance as a coupled

vibration system, the receiver and transmitter stations are no longer distinguishable, as both are free to change their places and tasks. At the end energy and information are balanced [18].

Another very important property is present, derivable from physical laws. During the oscillation between two cells there is an attraction in the form of magnetic or electric interaction! This partially answers the question as to what force drives the DNA wave, provided that the three resonance conditions are satisfied. In the case that the third condition (iii) is not fulfilled, because the information of the genome radiated from the transmitting cell does not find a receiving cell to go into resonance with, it could be reasoned that the receiving cell has the wrong, or no information. Writing of the DNA code would not be possible. To prevent this from happening neutral resonators are required on both sides which are not encrypted and do not have to transport information.

These include the so-called "introns", which are in far superior numbers in the DNA strand compared to the information bearing "exons". The uncoded sections possibly provide the resonance condition, that is to say between two identical sections of two cells a standing wave can be formed.

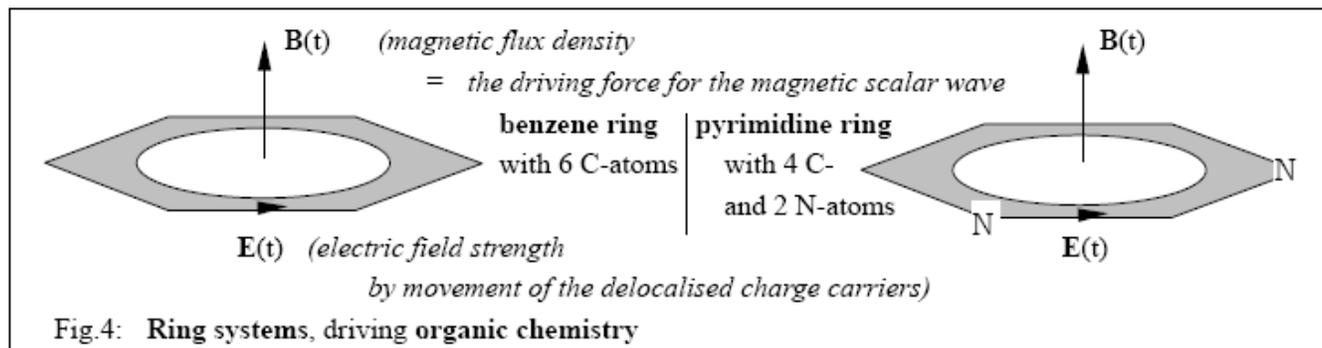
On the one hand this leads to a balanced energy state on both sides. Conversely if the information was initially different the genetic code as a whole will also be pulled from the sender to the receiver, which would have interfered with the build up of a resonance. Because of the resonance of the introns at the end identical information is present on both sides. This clearly demonstrates that no evolution could have happened without introns [19].

Metabolism controlled by the genes is only possible if both energy and information are introduced. From a technical view, a scalar wave is actually capable to do just that because in contrast to the electro magnetic wave it transports also energy in addition to the information. A DNA wave travelling through the twisted helix must be supplied with sufficient energy to not only advance through the helix, facilitating transport over a certain distance, but will also ensure the desired production of proteins at the site of the recipient. So where lies the motor pushing the DNA-wave?

7. BENZENE RINGS

Scalar waves propagating in the direction of the magnetic field vector are clearly driven by magnetic fields, and are formed, for example by rotating electrical charges. Such field vortexes must be searched for; as such a motor would be capable to drive the biological processes and chemical reactions.

To construct such a motor a ring structure with enclosed freely movable and non-localized electrons are required. The most prominent chemical structure possessing these properties is the benzene ring [20,21]. The current orbital model depicts six carbon atoms forming a ring, allowing an electron cloud to move freely. A known fact, for example is that magnetic fields in a nuclear spin resonance spectrometer induce ring currents.



The four bases of the double helix also use such a ring structure, except that two carbon atoms are replaced with nitrogen atoms. One of these nitrogen atoms forms the hydrogen-bond to his partner on the other side of the helix (Fig.4).

These pyrimidine building blocks of nucleic acid consist of a six-membered ring with free-moving electrons, which are not localized in the ring structure. Due to the correlation of the vertical magnetic field vector emanating from the ring and the magnetic field propagating as the DNA-wave an interaction is the likely consequence. The magnetic scalar wave is thus either drawn or pushed through the DNA strand resembling the exact mechanism I was looking for.

8. THE DNA-WAVE GENERATOR

If the carbon-containing ring structures play an important role in energy technology, we no longer need to wonder about the vast variety of ring systems, which dominate over all living organisms and organic chemistry.

The physical process can be described as follows: If electrons move inside the ring in one direction a magnetic field perpendicular to the ring plane is created, and if the direction changes an alternating magnetic field is created, with the result of emitting a magnetic scalar wave.

Reversely if an oscillating field vortex of a scalar wave impacts a ring perpendicular to its plane then it acts as a generator to put the electrons in motion. If no external force is present the electrons will remain in its direction. The ring thus assumes the duties of the energy source, the energy sink, and the storage of field energy. These are precisely the prerequisites required for the wireless reading, writing and storing of genetic information, as well as supplying the energy for the biochemical processes.

It did not escape my attention that the ring plane of the bases of a DNA helix are approximately at right angles to the longitudinal axis of the molecule and are stacked on top of each other, resulting in the magnetic-field pointer always propagating in the direction of the DNA-wave and therefore fully available as the driving force.

If the pyrimidine rings of the bases play such a central role, why are they not recognized in UV spectroscopy? The DNA-wavelength is measured along the centre line of the double helix, while the rings of the bases are located on the outside and therefore approximately 2.14 times longer distance needs to be considered. So 2.14 times the

DNA-wavelength $\lambda_{\text{DNA}} = 126 \pm 5 \text{ nm}$
 allowing for the extended Path results in an extended wavelength of $\lambda_{\text{bases}} = 260 \text{ nm to } 280 \text{ nm}.$

For the rings of the bases to work synchronously with the DNA wave, an increased velocity (approximately at the speed of light) and a wavelength increased by the same factor have to be able to go in resonance. This is achieved at the highest level of condensation (with maximum purity?) at 260 nm and increases up to 280 nm, in accordance with the chosen spread, which is minimally restricted.

In fact, the result is congruent with the measured absorption spectrum of the four DNA nucleotides (Karp, G. [7], p. 508). Meaning that the absorption at 260 nm is commonly used to determine DNA concentrations, whereas in "impurities" the maximum shifts towards 280 nm. This conformity is remarkable. Furthermore measurements of the DNA molecule as a total show a maximum absorption at 260 nm. Obviously a resonance is present.

9. NUCLEAR SPIN OR MAGNETIC RESONANCE?

All *results of the evolution* in the biosphere that have arisen between the "capacitor plates" of the earth itself and its ionosphere can be regarded as *structured capacitor losses*, which also apply to humans. Since they are dielectric losses of electric fields, it becomes obvious that even low electrical voltages or currents can be fatal to humans. Magnetic fields are quite different. In a MRI scanner patients are exposed to a magnetic field 30,000 times stronger than the earth's natural field, without leading to an immediate death. This does not destroy the magnetic scalar waves in the body, but an additional and perhaps even desirable energy input from the outside.

In this imaging method, a strong field of a super-conducting magnets initially align the cell nuclei and ring molecules. Then a high frequency alternating field is superimposed and the resulting emanating response to the magnetic scalar waves is measured, allowing the creation of the three-dimensional image of the body.

The achievable signal strength when tipping a spinning proton should be vanishingly small and irrelevant compared to the magnetic resonance of DNA. Radiologists who credit the charged and turning core particles, responsible for the resulting measured voltage induced in the coils as means for explanation, are ignoring

physical reality. MRI scanners are only capable of imaging organic compounds but not of inorganic matter.

10. CONSEQUENCES OF THE RESEARCH

At a close look at the DNA wave shows a mixture of wave and radiation. The mixing ratio is not constant and is determined by technical requirements. The basis is that a resonance must build up first, which is not possible without a field. Therefore, any exchange of information between cells begins with the emission of a scatter field. The source of the scatter field can be both the transmitter and the receiver, as means of requesting information. The scatter fields of each living organism manifests as an "aura"-appearance. The sum of all effects and frequencies are measured as a noise field. Similar to the near field of an antenna, the field strength is decreasing rapidly with the distance from the source.

Naturopath speak of a "reaction distance", allowing to draw conclusions about vitality and health status of a person. A cell needs energy to radiate scatter signals. Therefore field strength and range are a useful measure for the available energy to the cells. If another cell picks up the scatter field and goes into resonance, then the field characteristics change dramatically. Between the transmitter and receiver exists now an exclusive coupling in the form of a closed resonant circuit. "Closed" in this context means that no measurable scatter fields occur, no transmission losses occur, and that the transmitter and receiver exchange energy and information among each other until an equilibrium is reached.

We should distinguish between a forced resonance and a free resonance. In the former case the range is coupled to that of the scatter signal, whereas in free resonance the range is theoretically unlimited. This answers many open questions of telepathy. Since effective scalar waves in resonance not only transmit information but also energy, even a suitable model for the phenomenon of telekinesis is found. Just as the DNA-wave is radiating from a nucleus, a cell assembly, or even from a human body, suitable waves can radiate in, i.e. a person can absorb energy and information of people in whose aura he is, or by thinking of someone, capable of working even over long distances [22, 23].

From a technical standpoint it is a process in which the receiver generates and radiates a very similar structured field vortex, patterned after the desire. This is done by utilizing a magnetic scalar wave. The direction of the magnetic field lines emanating while in resonance from the transmitter to the receiver and the resulting interactions create an attractive force between the two. This provides every person and every cell energy and information from our environment, utilizing the numerous existing noise vortices. Resonance excludes all technical measurability, since all field lines are closed and none are available that could be attached to measuring equipment. For this reason, the most prominent interpersonal resonance will never be measurable:

Love!

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