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DNA and cell communication via magnetic scalar waves, a possible basic principle of the Bioresonance Method?

Prof. Dr.-Ing. Konstantin Meyl, Radolfzell, Germany

DNA generates a longitudinal wave that propagates in the direction of the magnetic field vector. Computed frequencies from the structure of DNA agree with those of biophoton radiation.

The optimisation of efficiency by minimising the conduction losses leads to the double-helix structure of DNA[1].

The vortex model of the magnetic scalar wave not only covers many observed structures within the cell nucleus perfectly, but also explains the hyperboloid channels in the matrix when two cells communicate with each other.

Potential vortices are an essential component of scalar waves[11], as discovered in 1990. The basic approach for an extended field theory was confirmed in 2009 with the discovery of magnetic monopoles[12]. This provides the opportunity to explain the physical basis of life[1].

With this first introduction of the magnetic scalar wave, it becomes clear that such a wave is suitable to use genetic code chemically stored in the base pairs of the genes and electrically modulate them, so as to "piggyback" information from the cell nucleus to another cell. At the receiving end, the reverse process takes place and the transported information is converted back into a chemical structure. The necessary energy required to power the chemical process is provided by the magnetic scalar wave itself.

Cell communication

When two cells communicate with one another, when the information read in one cell is written to another, the question is how does the process of reading and writing and the transfer of genetic information operate from a technical viewpoint.

Hydrogen bonds hold together electrically polarised base pairs in a DNA strand by means of Coulomb force. To achieve this polarisation, these hydrogen bonds must be disconnected and this requires electrical field lines directed radially outwards. I am speaking here of a field vortex.

Since the magnetic field vector lies perpendicular to the electrical, it inevitably points axially towards the DNA strand. So the movement of the field vortex towards the magnetic field results in a longitudinal wave, which we refer to as a magnetic scalar wave (Fig. 1).

52nd International Congress for Bicom Therapists, 28 to 30 April in Fulda, Germany

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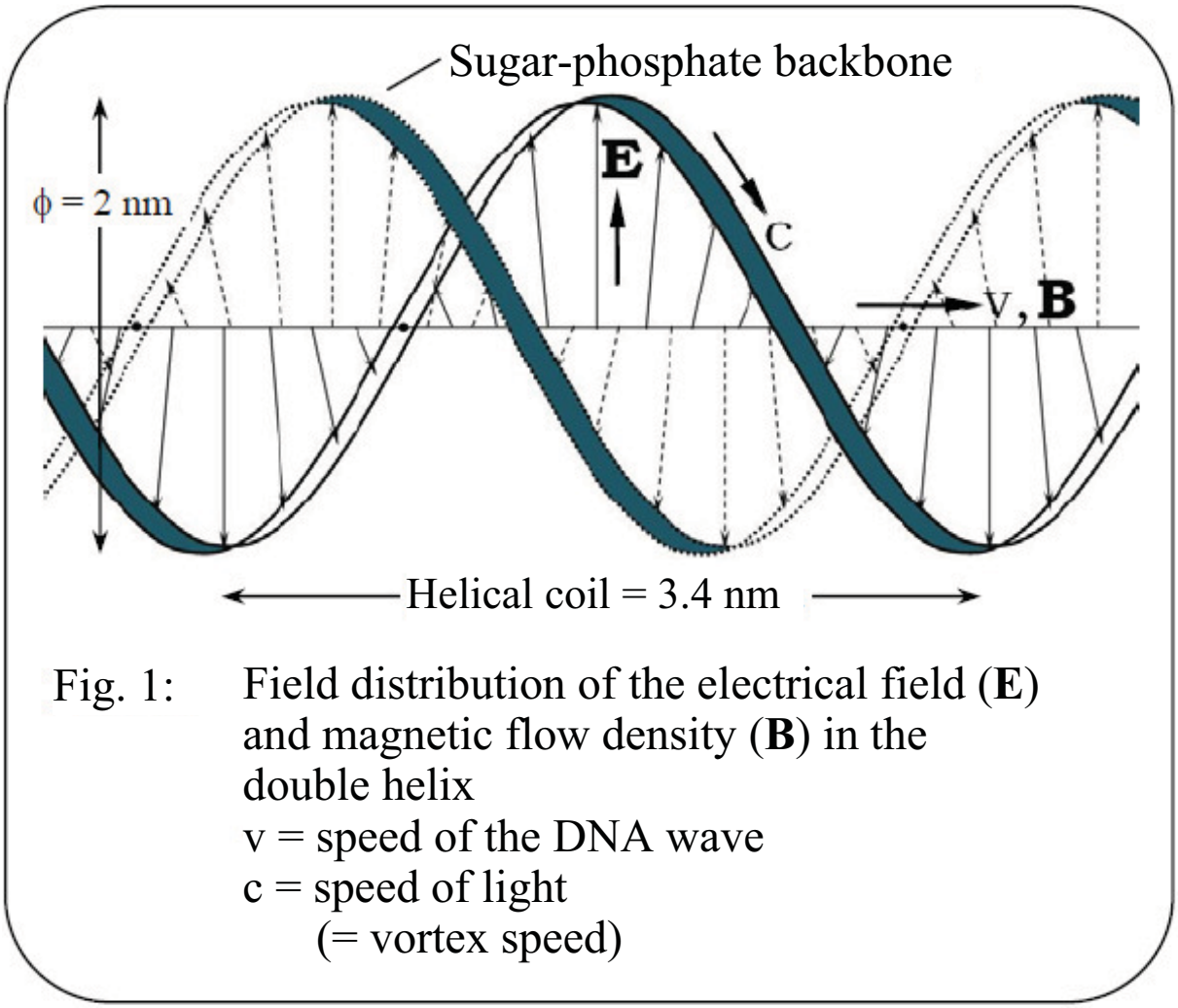

Fig. 1: Field distribution of the electrical field (**E**) and magnetic flow density (**B**) in the double helix
v = speed of the DNA wave
c = speed of light
(= vortex speed)

The biochemistry of the cell nucleus, the subject of outstanding research, prescribes in practical terms what we need to look for[1].

"The coding areas in a DNA strand, the so-called genes, make up at most 10% of the total DNA ("exons"). The remaining DNA (90%), known as "introns", consists of uncoded DNA. Introns were initially regarded as meaningless rubbish. Today biologists and geneticists believe that the role of this uncoded DNA lies in exposing the coded areas and regulating how genes express themselves"[2].

Yet introns could also have a completely different function which we will examine in more detail in part 2.

The electrical field of the 4 bases

As we know, DNA is coiled into a double helix with a clockwise sense of rotation (type A or B). The two polynucleotide strands have opposing polarity. Hydrogen bonds form between the bases whereby adenine always forms a base pair with thymine and guanine forms a base pair with cytosine[3]. They make up the character set for genetic information.

Chemists distinguish between the four bases by means of their structure while engineers, on the other hand, would differentiate on the basis of the different charges. The electrical charges are very low yet the distances are too, with the result that extremely high electrical field strengths can occur, measured in volts per meter.

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When at rest the hydrogen bonds follow the field strength and neutralise the difference in electrical charge between the base pairs. DNA behaves outwardly in a neutral manner and , conversely, remains unaffected by external electrical fields.

Only during the selection process are the hydrogen bonds briefly suspended and the base pair separated slightly allowing the sequence of the open charges to be read. This requires a higher electrical field strength. The magnetic scalar wave (Fig. 1) is, for example, capable of providing the required voltage. Moreover, this is the only type of wave where the field vectors of the electrical field point radially outwards as a prerequisite for interaction with the electrical charge of the bases. The result is a modulation which is transferred on by the wave.

The circularly polarised double helix

The longitudinal wave used here is propagated in the direction of the magnetic field vector. Consequently magnetic forces develop between the vortex fields and these are responsible for the creation of wave nodes as well as for the wave advancing.

Due to the helical structure of the field vortex the field lines are not self-contained, however. They advance in a spiralling motion, similar to a circularly polarised wave (Fig. 2).

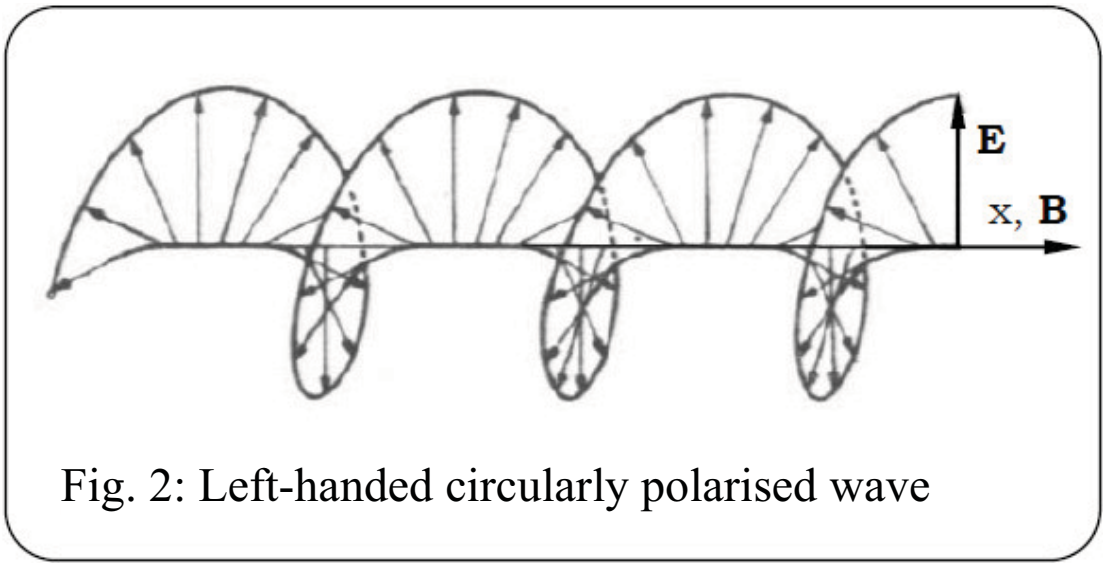

Fig. 2: Left-handed circularly polarised wave

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The vortex speed (speed of light c) spirals on along the external line. Since the path is more than twice the length as a result, propagating this field information in direction x produces a longitudinal wave travelling at 140,000 km/s. This is derived from the geometrical dimensions[4], firstly, of the diameter of the helix (2 nm) and, secondly, of the distance in direction x (3.4 nm) measured through one full helical turn (Fig. 1).

The wavelength of the DNA wave

The next question is to determine the frequency and wavelength of the modulated wave running in the direction of the magnetic field vector. The observed tendency for the helix to wrap itself like a coil with two twists around spherical proteins, known as histones, provides valuable information here.

It is obvious that the two twists correspond to half the period. Consequently the transfer from one histone to the next always occurs in a wave node and therefore corresponds to half the wavelength. If one coil carries the positive half wave, then the neighbouring coil is responsible for the negative and vice versa. The **alternating direction of twist** from one coil to the next confirms that this assumption is correct!

The length of the DNA strand of both twists can be determined in two ways.

An average coil diameter of 10 nm is assumed for the nucleosome core particles consisting of the coil body (histone) and the DNA molecule wrapped around it[3]. The molecular length of a twist in the centre of the DNA thread is therefore ($\pi \cdot 10$) nm and the wavelength with 4 twists distributed over 2 histones:

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

The values cited in the technical literature differ in some cases, as a result of the degree of concentration of the molecule. Error analysis would help to limit the possible range of fluctuation.

Published data observed with the help of X-ray structural analysis provide valuable information for enabling the tolerance band to be estimated[5]. For the second computation we must count the base pairs.

A nucleosome core particle has 146 bp (base pairs), enough for slightly less than 1.8 twists while a full twist consists of 83 bp, the two together therefore making up 166 bp. Additional base pairs are required for the transfer from one "coil body" to the next. Unfortunately no reliable data are available on this. The high packing density makes it difficult to count within the condensed chromatin fibre (Fig. 3). In an open, uncondensed fibre the count is 200 bp[6].

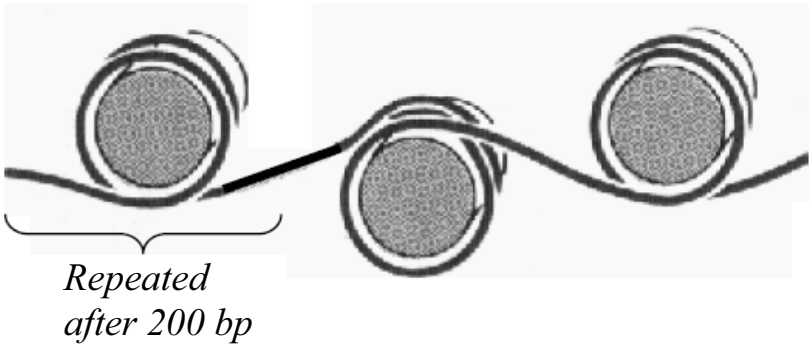

Fig. 3: The open "decompressed" structure of a DNA strand indicating the direction of twist [7].

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The helix progresses along its central axis by 0.332 nm per base pair[6]. Multiplied by the number of base pairs, the maximum and minimum wavelength, depending on the degree of concentration, is therefore:

$\lambda_{DNA}(max) = 200\ bp \cdot 2 \cdot 0.332 = 132.8\ nm$

$\lambda_{DNA}(min) = 180\ bp \cdot 2 \cdot 0.332 = 119.5\ nm$

or, assuming a spread:

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

Speed of propagation v_{DNA} and wavelength λ_{DNA} determine, in turn, the frequency of the DNA wave:

$f_{DNA} = v_{DNA}/\lambda_{DNA} = 140 \cdot 10^6/126 \cdot 10^{-9}$

$f_{DNA} = (1.11 \pm 0.06) \cdot 10^{15}$ Hz
(= UV radiation)

where $c/2.14 = 140 \cdot 10^6$ *m/s*

as average speed of the DNA wave

Evaluation

The values determined here apply primarily to B-DNA.

The important result that, at frequencies around 10^{15} Hz, the DNA wave consists of UV radiation accords with experience from previous measurements.

Prof. Popp speaks in terms of biophotons and demonstrates that the extremely weak UV light transmitted by cells can be detected using highly sensitive photomultipliers[9].

In his research Prof. Heine surveyed tunnel structures of the ground substance of the extracellular matrix and the values he determined match the wavelength calculated here[10].

Once again we see two scientists investigating the same topic of cell communication without incorporating the other's results in their own research, despite overwhelming agreement in their results.

The reason could be that Popp places cell radiation at 126 nm in the range of the speed of light whereas Heine works on the basis of structure-borne sound as the speed of propagation. The latter view is probably closer to reality yet there must be an explanation and it lies in the nature of magnetic scalar waves.

Longitudinal waves have no fixed speed of propagation and consequently no fixed frequency, but instead produce the abovementioned noise[11]. If we wish to characterise them, we have to use the wavelength for this. This does not change even if the wave is slowed down to lower speeds[1]. The speed of propagation is in turn dependent on the properties of the medium carrying the longitudinal wave.

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This scientific paper was first presented under the title "DNA and Cell Radio, double helix structure and cell communications explained by field physics" on 26 April 2011 in Dalian, China. The author was also admitted as a member of the programme committee at the second World DNA Congress, attended by 10 Nobel prize winners amongst others. Prof. Meyl was also Chair of Track 2.7 and was appointed to the scientific advisory body of the World Congress, an indication of the scientific community's official recognition at the highest level of his research into scalar waves.