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Self-Field Theory: A Mathematics for Bioelectromagnetics

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0.1. Objective. To present some bielectromagnetic applications of SFT

0.2. Biological Applications. Although cell dynamics is extremely complex and involves layers of interaction, recent experiments and computations have begun to piece together how chromosomes and cells move and change shape during the cell cycle. The mathematics of SFT can be of assistance in understanding these processes since it identifies actual motions. Charge in biology has many forms such as dipolar proteins that diffuse within the plasma membrane forming lattices, cytoplasmic microtubules that link together to overcome Debye screening and chromosomes that morph or diffuse within the cytoplasm. Cells themselves can assume positions relative to each other. There are biophysical fields that either translate or rotate as SFT spinors.

Gaglioli has found that despite Debye screening, nanoscale electrostatics plays a major role in cell spindle assembly and motion as well as the generation of forces at kinetochores and chromosome arms during mitosis. At various stages, chromosome movement is dependent on kinetochore microtubule dynamics; a chromosome can move towards a pole when its kinetochore is connected to microtubules emanating from that pole.

Popp et al observed low levels of photon emission from various biosystems, including a strand of DNA. The photons originate from a coherent field within living organisms with the function of intracellular and intercellular regulation and communication. These non-classical findings require a theory to support them. SFT does predict energy states associated with the DNA spine of hydration. As the hydrated protein changes energy, photons of specific energy can be emitted and received in a two-way exchange by other hydrated ionic messengers within the cytoplasm. Since the internal field of a water molecule is exposed to other external fields, they can interact to assume field states according to the particular photon chemistry. This forms a theoretical mechanism by which cell-cell communications occur. Photon chemistry also provides a theoretical basis by which DNA stores data such as photons and phonons within its nuclei.

Bauer et al have used sound frequencies in the audible range to test the effectiveness of an acoustic device on core tendon lesions of the thoroughbred race horse. Electromagnetic SFT shows how the photon and the phonon have a similar sub-structure but an orthogonal orientation to each other. Hence sound, as well as EM exposure can interact to cause cellular effects within the cell-cycle such as replication or apoptosis. The therapeutic method involved the application of an acoustic device (Cyma 1000), which delivered specific frequencies, within the audible sound range, to acupuncture points and meridians as well as the areas of injury. These audible frequencies ranged from 100 to 1600 Hz.

0.3. Conclusion. Prior to SFT, no single mathematics has been found to treat both the very large and the very small scale dynamics often demanded by biology. In addition the range of phenomena goes beyond the mathematical capabilities of general relativity and quantum field theory. SFT sees beyond the fog of quantum inaccuracy, the uncertainty principle. The SFT is able to see "inside the photon" and thus a number of physical and biophysical processes become clearer.

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