

Water: The New Science Behind the Universal Conduit

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ABSTRACT

This presentation will be a review of current literature that will illuminate the essential role water plays in many of the modalities we use in our practices. In essence this literature review has taken me down a path less travelled in order to find an explanation to the daily miracles we observe using homeopathic remedies, responses to Low Level Laser Therapy (LLLT) and Micro-current electric stimulation modality. The evidence will challenge the theory that water plays a secondary role as a diluent suspending proteins, DNA etc. and that water is absolutely essential for everything the cell does. It will also demonstrate that water in the cells is not like water in a glass it is ordered. The Universe in which we find ourselves and from which we cannot be separate is a place of Law and Order. It is not an accident, nor chaos. It is organized and maintained by an electro-dynamic field capable of determining the position and movement of all charged particles. All living things from men to mice, from trees to seeds- are molded and controlled by 'electrodynamic fields', which can be measured and mapped with standard modern volt-meters (1). Therefore, the Human (or Animal) organism is mainly an Electro-magnetic (EM) System. For this reason EM therapies that use devices such as lasers (of appropriate wavelength & power density) can have a remarkable impact on regulation of living processes.

INTRODUCTION

My original quest was finding an explanation for why a 635 nm 5mW laser with treatment times of three minutes or less resulted in therapeutic responses for conditions that Class IV laser manufacturers and users claim was impossible. The popular theory being that there is not enough power using only 5mW to deliver a therapeutic dose to the to the depth of the area of involvement

Scientific research has become extremely specialized and as a result extremely fragmented. Hence, the search for my explanation took me in a number of different directions. My focus became searching under the parameters I felt were involved in the LLLT, which included the animal or human body as a whole unit, along with wavelength, photons and frequency, connective tissue (Extracellular Matrix – ECM), and water. There is a major emphasis on properties of water.

LITERATURE REVIEW

We will begin by reviewing all the players involved in the response to LLLT.

- Human or Animal body as a whole (The Organism)
- Wavelength
- Photons and Frequency
- Connective Tissue (Extracellular Matrix – ECM)
- Water

THE ORGANISM

Physicists distinguish between four interactions in nature: gravitational, strong force, weak force, and EM interactions. EM interactions are responsible for the structure and behavior of atoms, molecules, macromolecules (e.g., many proteins), and cells. Each interaction between molecules, macromolecules, or living cells is basically EM energy; governed by photons (2). Physical EM interactions are fundamental to biology and medicine. Therefore, the human organism is mainly an EM system (1,3). For this reason, EM therapies that use devices such as lasers (of appropriate wavelength and power density) can have a remarkable impact on regulation of living processes.

WAVELENGTH

Wavelengths below 400nm (like x-rays) have so much energy that they eject electrons away from atoms. This is called ionization and it damages tissue. This was first established in experiments by Albert Einstein.

Wavelengths between 400nm to 660nm have less energy, they do not eject electrons, they do not cause ionization, and do not damage tissue. However, wavelengths between 400nm to 660nm have sufficient energy to displace electrons in atoms to a higher energy state (level). This is desirable because the higher energy level electron is now more available for donation, expediting the efficiency of all human physiological processes. The electrons influenced by the laser will in turn influence adjacent electrons, creating the cascade of systemic influence that has been documented in laser physiology. This is known as the London Dispersion Effect.

Longer wavelengths (above 660nm) penetrate deeper, but at a cost of reduced electron volt ability to displace electrons to a higher energy state. Just because there is deeper penetration does not mean that it excites electrons to a higher energy level better. Therefore longer wavelengths have a reduced ability to biomodulate physiological processes because of their reduced ability to excite electrons to a higher energy state. To compensate, longer wavelength lasers require more milliwatts / watts to achieve an acceptable physiological response. Unfortunately, more milliwatts / watts is associated with heating of the tissues and its associated deleterious effects

PHOTONS AND FREQUENCY

Photons switch on the body's processes like a conductor launching each individual instrument into the collective sound. At different frequencies they perform different functions.

Popp found with experimentation that molecules in the cells would respond to certain frequencies and that a range of vibrations from the photons would cause a variety of frequencies in other molecules of the body. Light waves also answered the question of how the body could manage complicated feats with different body parts instantaneously or do two or more things at once. These 'biophoton emissions', as Popp was beginning to call them, could provide a perfect communication system, to transfer information to many cells across the organism. (4)

Most of the earlier research had largely been ignored, mostly because there was no equipment sensitive enough to measure these tiny particles of light before the invention of Popp's machine. Furthermore, any notions of the use of radiation in cellular communication were utterly swept aside in the middle of the twentieth century with the discovery of hormones and the birth of biochemistry,

which proposed that everything could be explained by hormones or chemical reactions (5). By the time that Popp had his light machine, he was more or less on his own with regard to a radiation theory of DNA. Nevertheless, he doggedly pressed on with his experiments, learning more about the properties of this mysterious light. The more he tested, the more he discovered that all living things— from the most basic of plants or animals, to human beings in all their sophisticated complexity— emitted a permanent current of photons, from only a few to hundreds. The number of photons emitted seemed to be linked to an organism's position on the evolutionary scale: the more complex the organism, the fewer photons being emitted. Rudimentary animals or plants tended to emit 100 photons per square centimeter per second, at a wavelength of 200 to 800 nanometers, corresponding to a very high frequency of electromagnetic wave, well within the visible light range, whereas humans would emit only ten photons in the same area, time and frequency.

He also discovered something else curious. When light was shone on living cells, the cells would take this light and after a certain delay, shine intensely— a process called 'delayed luminescence'. It occurred to Popp that this could be a corrective device. The living system had to maintain a delicate equilibrium of light. In this instance, when it was being bombarded with too much light, it would reject the excess. (6)

CONNECTIVE TISSUE (EXTRACELLULAR MATRIX – ECM)

Fascia is a structure of connective tissue that surrounds muscles, groups of muscles, blood vessels, and nerves, binding some structures together, while permitting others to slide smoothly over each other (7) various kinds of fascia may be distinguished. They are classified according to their distinct layers, their functions and their anatomical location: superficial fascia, deep (or muscle) fascia, and visceral (or parietal) fascia.

Like ligaments, aponeuroses, and tendons, fasciae are *dense regular* connective tissues, containing closely packed bundles of collagen fibers oriented in a wavy pattern parallel to the direction of pull. Fasciae are consequently flexible structures able to resist great unidirectional tension forces until the wave pattern of fibers straiten out by the pulling force. These collagen fibers are produced by the fibroblasts located within the fascia. (7)

Fasciae are similar to ligaments and tendons as they are all made of collagen except that ligaments join one bone to another bone, tendons join muscle to bone and fasciae surround muscles or other structures.

Photoreceptors on phospholipid cell membrane called "Integrins" which have two main functions:

- Attachment of the cell to the extracellular matrix (ECM)
- Signal transduction from the ECM to the cell.

Integrins signal from "outside-in & inside-out" and they link the cellular matrix with the ECM and all of the connective tissue throughout the entire body. In fact, it is widely recognized that under a variety of conditions, the speed of communication in our body is much faster than can be accounted for by the known speed of nerve conduction (8), and nerves simply do not reach all parts of our body.

Ho proposed that both the DC electro dynamical field and the acupuncture system have a common anatomical basis. *It is the aligned, collagen liquid crystalline continuum in the connective tissues of the body with its layers of structured water molecules supporting rapid semi-conduction of protons.* This enables all parts of the body to intercommunicate readily, so the organism can function as a

coherent whole. This liquid crystalline continuum may mediate hyper reactivity to allergens and the body's responsiveness to different forms of subtle energy medicine. Furthermore, it constitutes a "body consciousness" that is functionally interconnected with the "brain consciousness" of the nervous system (8). The organism is a liquid crystalline continuum

Less known in the US, Pischinger's work shows the matrix to be vital to all bodily functions, acting as a body wide support and communication system that regulates metabolic cellular processes. James Oschman in his introduction states "the matrix components are actually semiconducting liquid crystals, materials known to have a variety of remarkable properties for the transmission, storage, and processing of information involved in regulations". Heine's recent work shows that the regulation and construction of the ECM have relationships to cybernetic non-linear systems and phase transitions (9)

WATER

Water is among the most mysterious of substances, because it is a compound formed from two gases, yet it is liquid at normal temperatures and pressures. In their studies, Del Giudice and Preparata have demonstrated mathematically that when closely packed together, atoms and molecules exhibit a collective behavior, forming what they have termed 'coherent domains'. They are particularly interested in this phenomenon as it occurs in water

In a paper published in Physical Review Letters, Preparata and Del Giudice demonstrated that water molecules create coherent domains, much as a laser does. Light is normally composed of photons of many wavelengths, like colors in a rainbow, but photons in a laser have a high degree of coherence, a situation akin to a single coherent wave, like one intense color. (10) These single wavelengths of water molecules appear to become 'informed' in the presence of other molecules— that is, they tend to polarize around any charged molecule— storing and carrying its frequency so that it may be read at a distance. This would mean that water is like a tape recorder, imprinting and carrying information whether the original molecule is still there or not. The shaking of the containers, as is done in homeopathy, appears to act as a method of speeding up this process. (11) So vital is water to the transmission of energy and information that Benveniste's own studies actually demonstrate that molecular signals cannot be transmitted in the body unless you do so in the medium of water. (12) In Japan, a physicist called Kunio Yasue of the Research Institute for Information and Science, Notre Dame Seishin University in Okayama, also found that water molecules have some role to play in organizing discordant energy into coherent photons— a process called 'superradiance'. (13)

This suggests that water, as the natural medium of all cells, acts as the essential conductor of a molecule's signature frequency in all biological processes and that water molecules organize themselves to form a pattern on which can be imprinted wave information. If Benveniste is right, water not only sends the signal but also amplifies it. (6)

In the 1960s, biologist Dr. Bernard Grad of McGill University in Montreal, one of the earliest pioneers in the field, was interested in determining whether psychic healers actually transmit energy to patients. Rather than using live human patients, Grad had used plants that he'd planned to make 'ill' by soaking their seeds in salty water, which retards growth. Before he soaked the seeds, however, he had a healer lay hands on one container of salt water, which was to be used for one batch of seeds. The other container of salt water, which had not been exposed to the healer, would

hold the remainder of seeds. After the seeds were soaked in the two containers of salt water, the batch exposed to the water treated by the healer grew taller than the other batch.

Grad then hypothesized that the reverse might also happen— negative feelings might have a negative effect on the growth of plants. In a follow-up study, Grad had several psychiatric patients hold containers of ordinary water, which were to be used again to sprout seeds. One patient, a man being treated for psychotic depression, was noticeably more depressed than the others. Later, when Grad tried to sprout seeds using water of the patients, the water that had been held by the depressed man suppressed growth. (14).

In later experiments, Grad chemically analyzed the water by infrared spectroscopy and discovered that the water treated by the healer had minor shifts in its molecular structure and decreased hydrogen bonding between the molecules, similar to what happens when water is exposed to magnets. A number of other scientists confirmed Grad's findings. (15)

Gerald Pollack in his recently published book “The Fourth Phase of Water Beyond Solid, Liquid, Vapor”(16) takes us on a fantastic voyage through water, showing us a hidden universe teeming with physical activity that provides answers so simple that any curious person can understand. He navigates the perils of water science by conducting dozens of simple, carefully controlled experiments and piecing together the first coherent account of water's three dimensional structure and behavior. He challenges the theory that water plays a secondary role as a diluent suspending proteins, DNA, etc. and demonstrates that water is absolutely essential for everything the cell does. Water in the cells is not like water in a glass it is ordered.

Pollack provides evidence that there is an unexpected large zone of water that forms next to or around submersed materials. This zone was called the “exclusion zone” (EZ) and got its name because it excludes practically everything. The EZ contains a lot of charge, and its character differs from that of bulk water.

Evidence that exclusion-zone (EZ) water is physically different from bulk water (17, 18, 19, 20)

- EZ water is more constrained (NMR)
- EZ water is more stable (infrared radiation)
- EZ water has a negative charge (electric potential)
- EZ water absorbs at 270 nm (light absorption spectrum)
- EZ water is more viscous (falling ball viscometry)
- EZ water molecules are aligned (polarizing microscopy)
- EZ molecular structure different (IR absorption)
- EZ optical properties are different (refractive index)

Electrons and protons are the elementary units of charge. They attract one another because one is positive and the other negative. Electrons and protons play central roles in water's behavior. The water molecule is neutral. Oxygen has a charge of minus two, while each of the hydrogen atoms has a plus one charge. Protons latch onto water molecules to form hydronium ions (H_3O). Pollack continues to explain how these form hexagonal units, which in turn form honeycomb sheets made of oxygen and hydrogen forming a liquid crystal (Similar to ice).

Water emits radiant energy and most of the energy comes from bulk water. However, EZ emits some energy as well. The wavelengths emitted from the EZ depend on its structure. EZs build from structures with unique charge distributions and those unique distributions will necessarily create variants of the generic EZ structure. Hence the energy radiated from the EZ could contain surface-specific information. If so, then EZ water may radiate information in the same way that TV station antennas radiate information. The radiated energy may be more than generic.

What happens when water absorbs the radiated energy? If radiated energy contains information, then we might expect that the information would become blurred or lost. However, if some of the energy's vibratory modes induced new EZ structural variants, then some information could be retained. Any such retention would amount to nothing less than electromagnetically communicated structural information – a kind of “water-based email”

While any such communication might seem farfetched at best. Montagnier created an aqueous suspension of sample DNA. He placed the suspension in a sealed flask next to second sealed flask of water. The flasks stood next to each other for an extended period, while he exposed both to a source of ordinary electromagnetic energy. The newly “informed” water in the second flask was then combined with the raw materials required for DNA synthesis (nucleotides). This procedure created new DNA sequence identical to the DNA in the first flask (21). Two labs claim they could confirm Montagnier's findings

CONCLUSION

“An Important scientific innovation rarely makes its way by gradually winning over and converting its opponents. It rarely happens that Saul becomes Paul. What does happen is that its opponents gradually die out and that the growing generation is familiarized with the idea from the beginning.”
--Max Planck

The current popular theory is that in order to deliver a therapeutic dose to subcutaneous, and especially deep muscle or joint ailments at a distance inside the body it is necessary to start off with high power density since all contributing factors lead to severe attenuation of the beam. If you wish to achieve any analgesic or biostimulatory effects, these lower power lasers simply cannot deliver sufficient dose at depths in the body in reasonable treatment times.

The supporting evidence provided is derived from a measured 3-D dosimetric beam profile of a 12W laser in a water phantom. For instance, a point that is 6.1 cm deep in water and 0.5 cm from the central beam axis will be exposed to radiation whose intensity is 29% of the full intensity at the surface of the skin. In addition other measurements were taken using legs from dog cadavers

Based on the above information an example calculation would be if the biostimulatory dose required at the area of involvement is $6\text{J}/\text{cm}^2$ and the area to be treated was 150 cm^2 at a depth of 6 cm and the percent intensity received at this depth is only 29% then the energy needed at the surface 3240J. The required surface dose of 3240J can be delivered by a 12W (12,000mW) laser in 4.5 mns. however, if you have 200mW laser it would take 4.5 hours.

The evidence cited in the literature review from above calls in to question this theory. First the measurements in water in this model were done in bulk water and the work of Pollack and others clearly shows that the cellular and extracellular water is definitely not the same as bulk water; it is liquid crystal in nature and as such has conductive properties. Secondly, the human organism is mainly an EM system and work by Popp and others has demonstrated that the body is naturally communicating via biophoton emissions. In addition, if we consider the role of the ECM with the aligned, collagen liquid crystalline continuum and its layers of structured water molecules supporting rapid semi-conduction of protons enabling all parts of the body to intercommunicate readily, so the organism can function as a coherent whole.

The information in this paper along with the positive results reported by many veterinarians using LLLT on thousands of animals should be enough to convince you that LLLT does work and has sufficient power to affect the tissues deep in the body using treatment times of minutes not hours. That is not to say Class IV lasers do not work however based on the work of Popp we have to ask if we really need all that energy. Popp discovered when light was shone on living cells; the cells would take this light and after a certain delay, shine intensely– a process called ‘delayed luminescence’. It occurred to Popp that this could be a corrective device. The living system had to maintain a delicate equilibrium of light. In this instance, when it was being bombarded with too much light, it would reject the excess. (6)

Finally, I submit that the information on the properties of water provides the link as to how the body communicates and processes information whether it is LLLT, micro-electric current, homeopathic remedies and other energy modalities such as Reiki. Water is the universal conduit see Fig 1.

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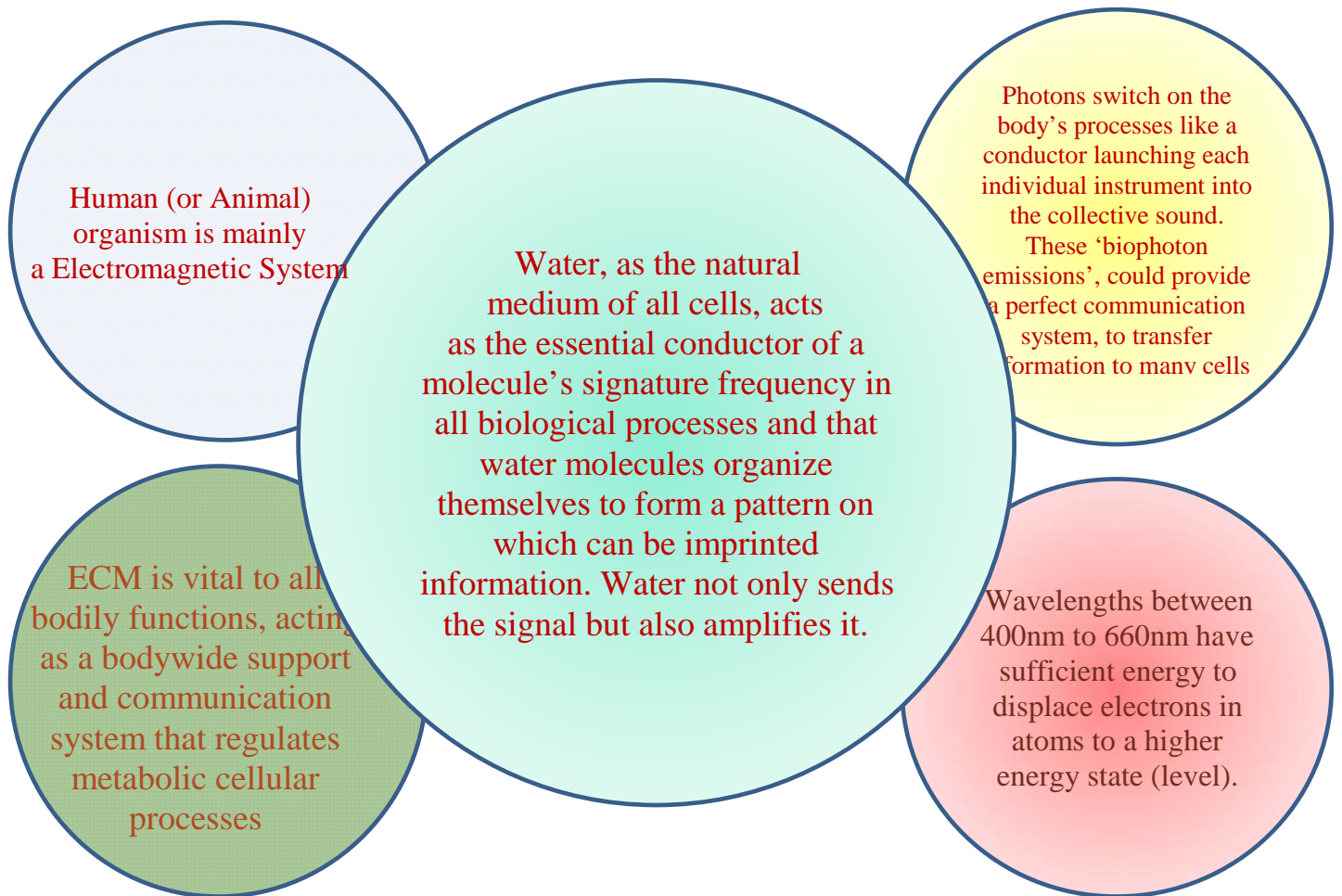


Fig. 1