Anatomic Characterization of Acupuncture System and Ultra-weak Photon Emission
International Institute of Biophysics (IIB)

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This article brings together acupuncture meridians, connective tissue, liquid crystalline state of extracellular collagen and biophoton emission properties.
215 end notes

Notes:

According to Chinese theory, acupuncture meridians are “channels” with “meridian qi” flowing through them. Kaptchuk, TJ. [The *web that has no weaver. Understanding Chinese medicine* Contemporary Publishing Group Inc. Chicage 2000]

The stated goal of this paper is to link traditional Chinese acupuncture with Western bioregulatory concepts. The western concept of a bioregulatory system based in the connective tissue of the human body developed in the 19th century, in parallel with the cell pathology model dominating medicine today. Several studies have been done positively correlating acupuncuture points and meridians with connective tissue. It also has been confirmed that most acupoints correspond to high electrical conductance points in the body. Since the 1970s, instruments have been developed that measure skin resistance when stimulated with either ac or dc electrical current. Differing electrical properties are often found to correlate with states of health and disease.

The extracellular matrix is composed of a variety of proteins and polysaccharides and assembled into an organized meshwork in close association with the cells that produce them. This matrix was once thought to be merely an inert scaffold to stabilize the tissue structures. However, it is now clear that this matrix is important in cell regulation. This matrix can become calcified, forming rock hard structures like bone and teeth. P. 7

The interaction of the extracellular matrix and cytoskeleton (cellular matrix) is reciprocal; resulting in the ability of the extracellular matrix to propagate large scale ordered structures. P. 11

Bonghan Kim, a surgeon, claimed to have discovered anatomically distinctive corpuscle like tissues at the acupoints, and threadlike ducts at the meridians of human skin. He traced the ducts, now called Bonghan ducts, and found they formed a circulatory network throughout the body. Until recently, these results cold not be reproduced, mostly because the formula for the staining dye, needed to identify the ducts, was kept secret. The Japanese anatomist Fujiwara was also said to have confirmed this discovery. More recently, these ducts have been identified inside the blood vessels and in the organs of rabbits and rats, without use of the secret dye.

The Bonghan corpuscle and duct system is gaining more credibility with independent research findings, providing an anatomical basis for the acupoint and meridian system. Bonghan ducts appear to supply the channels in the connective tissue with DNA granules inside, connecting acupoints in the skin to internal organs. As the narrow channels form a network of tubes with light sources, they can become an optical (fiber optic) channel which can produce a coherent photon state.

This is a scientific interpretation of acupuncture therapy

More research on Bonghan ducts is underway. The distinguishing feature of these ducts is the distribution of rod shaped nuclei within them and their cribriform structure; their diameter varies from 10 micron to submicron. Analysis of the biochemical components of the duct contents is underway. Probably the most important component in the liquid is a spherically shaped microcell. P. 13 f

The role of water in biological tissue is complex, and important in cellular organization. P. 20

In biological tissue, water is structured, meaning that it has the ability to form three-dimensional mutually bonded networks of molecules. This is important in biological process such as metabolism, where the resulting coherence of large numbers of molecules allows for a maximum energy efficiency. P. 20

It is widely recognized that living tissue is similar to liquid crystal. P. 21

Liquid crystals are states or phases of matter between solid crystals and liquids, so they are called mesophases.

The paper notes, among other things, that biological liquid crystals typically undergo rapid changes in orientation (called phase transitions) when exposed to electric and magnetic fields.

They respond to changes in temperature, hydration, shear forces and pressure.

A liquid crystal has orientational order and some translational order, but is flexible. All major constituents of living organisms may be liquid crystal, including DNA cytoskeltal and muscle proteins, and collagens.

Biological liquid crystals carry static electrical charges and are therefore influenced by pH, salt concentration, and the dielectric constant. Thus the cell is understood to be mechanically and electrically connected in “solid state” or “tensegrity system”, and can therefore be refered to as liquid crystal.

The collagenous liquid cystallin mesophases in connective tissue combined with the associated structured water constitutes a semi-conducting highly responsive network that extends through out the organism. This network is directly linked to the intracellular matrices of individual cells, forming an excitable electric continuum for rapid intercommunication throughout the organism. Both the DC electrodynamic field and acupuncture system have a common anatomical basis. Both support rapid semiconduction of protons. Liquid crystal facilitates coherent excitations. P. 21-22 f

Evidence supporting the hypothesis that organisms are essentially liquid crystal come from nuclear MRI studies of living human muscles, as well as the imaging of live organisms using an interference color technique that amplifies weak birefringence typical of biological LC.

The ordered network of water in collagen also supports rapid jump conduction of protons, P.23 which is a form of semiconduction in condensed matter, and is much faster than conduction of electric signals by nerves. This “ground substance” may form a much better intercommunication system than the nerves.

Non- electrical aucupuncture is thought to work by the mechanical motion of the needle creating a strain, which is transduced into an electrical current due to the piezoelectric properties of the connective tissue. The electrons generated travel thru the body along “channels” possessing

semiconductor properties. When the stimulus reaches a specified organ, the electric current is again transduced into the chemical or mechanical energy necessary to restore functioning on both a molecular and cellular level.

A major factor contributing to the efficiency of intercommunication in connective tissues is the structured, oriented nature of collagen liquid crystal mesophases.

Immediate injury currents, away from the injury, are positive, suggestive of proton currents. Only later, after the regenerating blastema is formed, do the currents reverse to negative.

The human body is mostly fascia. If all other tissue were removed, the remaining fascia would be enough to provide a normal body contour. Connective tissue both generates and conducts energy.

Usually the visible portion of the spectrum is called light. The term photon is applied to the radiation from the whole EM spectrum. (does this mean photons are associated with radio waves?) How is light generated? Every moving charge in a heterogeneous EM field emits EM radiation. Certain quantum processes generate and absorb photons. The electrons in atom and molecules can absorb photons of distinct wavelength, and as a result are transferred to an excited level. If the delivered energy exceeds the ionization barrier, a free radical is generated. The living organism is an open system that exchanges energy and information with the environment. The exchange of information is by charged particles and photons. Ultra weak photon emission (UPE) can provide information about the statistical properties of the system's state and can be used as a non-invasive tool for inspection of "meridian qi" energy.

Traditionally, photon emission in biological tissue has been thought to be a byproduct of chemical reactions, such as oxidation, and the reorganization of hydrogen bonds and Van der Waals complexs. However, the energy released in such processes is too low to excite electronic energy levels corresponding to the observed spectral range of UPE, from 440 to 850 nm.

Based on research it has been concluded that collagen structures conduct and modify photon pulses coming from biological sources.

Popp et al's biophysical model for inter and extra cellular communication postulates that the photon is trapped and emitted by cellular physical resonance devise, presumably DNA, resulting in a high degree of coherence. DNA may be an exciplex in which photons are stored. Non-coding DNA may act as a photon store and coherent radiator, because of its enormous polymer size and ability to form exciplexes. The resulting long range EM waves and fields can be seen as a basis of self organization. Bonghan ducts supply the channels in the connective tissue with DNA granules inside, connecting acupoints in the skin to internal organs. As the narrow channels form a network of tubes with light sources, they can become an optical channel (fiber optics) which can produce a coherent photon state. This is a scientific interpretation of acupuncture therapy. The organ surface Bonghan Corpuscles (acupoint) in rats was found to be relatively transparent. More research is needed.

A "common" anatomic human male body emission pattern of biophotons was discovered which was consistent between CCD cameras and PMT. Photon emission was highest at neck, cheeks and forhead and hands. Highly structured anatomic locations appear to emit more photons.

Inaba et al compared the intensity of biophoton emission at acupoints with non-acupoints. They suggested that the emission intensity was in general higher than the emission intensity of non-

acupuncture points. However, recent photon images from the hands made with advanced CCD techniques showed that acupoints cannot be distinguished from their surrounding emission.

Photon emissions between meditators and nonmeditators were compared. It was found that the anatomical pattern was very similar, but the meditators had a 35% reduction in emission. Before meditation, human UPE had fractal properties; photons tended to cluster. Meditation results in less clustering.

More study will be required to determine to what extent this structure corresponds to connective tissue and acupuncture structures.

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Mae Wan Ho, PhD makes similar observations:

The Acupuncture System and The Liquid Crystalline Collagen Fibres of the Connective Tissues

Liquid Crystalline Meridians

We propose that the acupuncture system and the DC body field detected by Western scientists both inhere in the continuum of liquid crystalline collagen fibres that make up the bulk of the connective tissues. Bound water layers on the collagen fibres provide proton conduction pathways for rapid intercommunication throughout the body, enabling the organism to function as a coherent whole. This liquid crystalline continuum mediates hyperreactivity to allergens and the body's responsiveness to different forms of subtle energy medicine. It constitutes a "body consciousness" working in tandem with the "brain consciousness" of the nervous system. We review supporting evidence from biochemistry, cell biology, biophysics and neurophysiology, and suggest experiments to test our hypothesis.

http://www.i-sis.org.uk/lcm.php

The Liquid Crystalline Organism and Biological Water
http://www.springerlink.com/content/pl0065321n155652/