TIME #7: THE PHOTOELECTRIC EFFECT

Blog take home: ***A cell is a quantum measuring device for light's frequency to make elegance from the chaos light frequencies brings from our environment.***

Proteins in solution absorb ultraviolet light with absorbance maxima at 280 and 200 nm. Amino acids with aromatic rings are the primary reason for the absorbance peak at 280 nm. Peptide bonds are primarily responsible for the peak at 200 nm and since this frequency of light cannot penetrate the ozone layer it fortifies strong carbon-nitrogen bonding in sunlight. This is what makes proteins our source of a magnetic memory in nucleic acids in water. Water provides the stage that allows massive changes to incoming light frequencies. Secondary, tertiary, and quaternary protein folding and structure all affect absorbance of specific frequencies of light, therefore factors such as pH, ionic strength, etc. can alter the absorbance spectrum of the proteins to affect the water around the proteins to change its density. It also seems that water is capable of changing the absorbance of proteins making it the ideal molecular mirror for light interactions optically. *This is a part of the photo-electric effect completely ignored by modern biology. This is how quantum spin links to information transfer.*

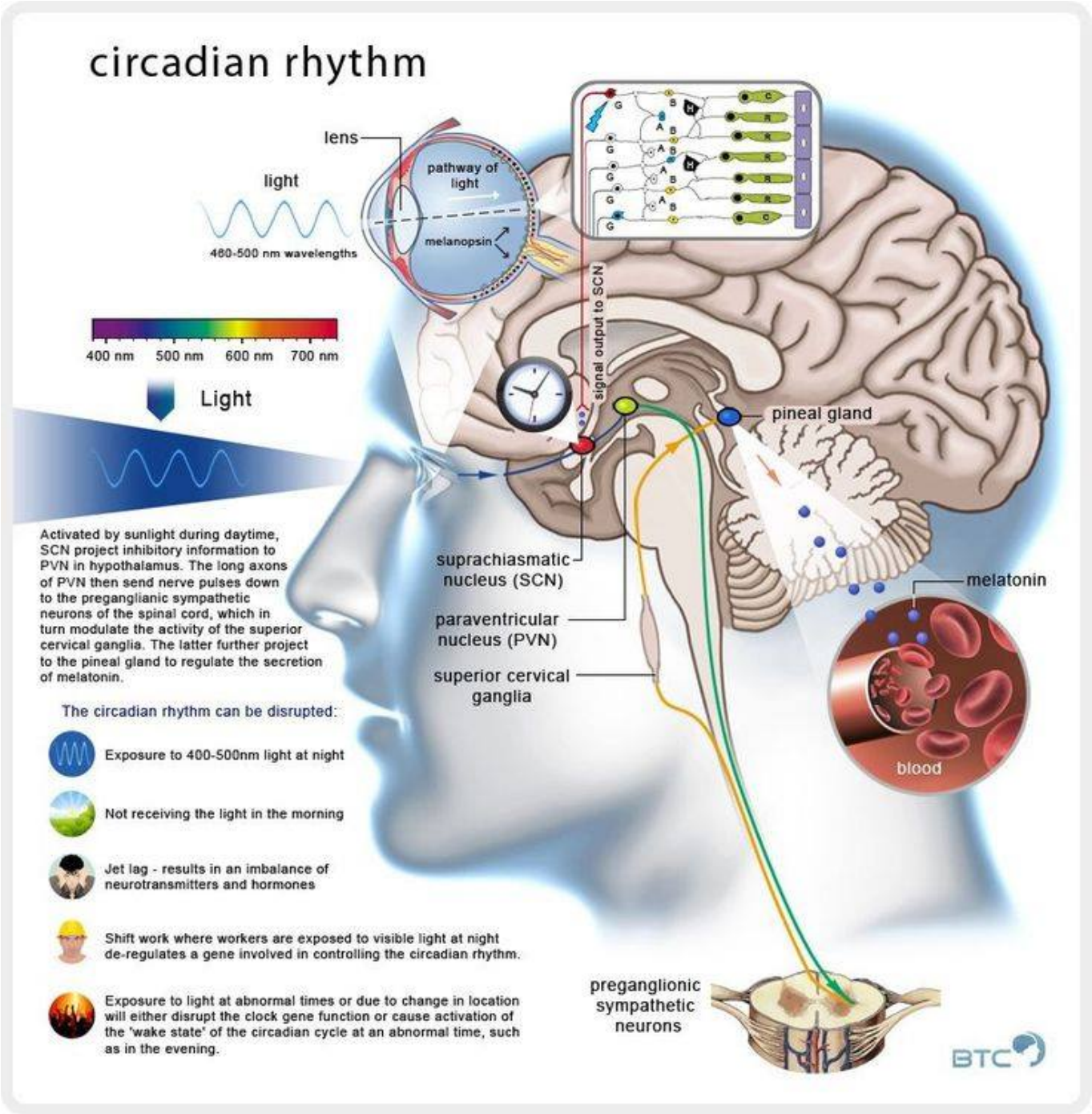
Another focus of cells is how they operate with water and light to create magnetic islands in different molecular networks in water to create simplicity, complexity, regularity, and randomness. Using optics and photonics, this simplifies electric and magnetic circuitry in cells to the low power state. Life at the cell level uses the lowest possible state. Why is this important photoelectrically? As things shrink in QED the effects of photons on electrons and protons becomes even stronger than one would expect. This natural

force in nature thereby lowers the potential for interference patterns that are possible with waveforms from the environment. This provides a platform for cells that lowers complexity of field interaction, while creating a systemically regular flow of energy to the entire organism because the basic cost to perform physiologic work is lowered when optics is used over electronic measures. The use of non linear optics allows us to shrink circuits, become more complex, while using far less power, allowing us to make sense out of the chaos in the environment. All of these factors increase the QED effects, and thereby strengthen the photoelectric interactions between the sun and our atomic lattice.

WHY DENSITY MATTERS

Light is a sensitive and specific communicator within the eye. It enables us to see with an eye camera, tell time with the eye clock, and has a luminosity function to regenerate the 3 types of photoreceptors in the retina. Light communicates time using the "gears within the eye clock" mechanism. DHA allows light to interact with our lipid/protein lattices in cell membranes *as a particle.* Light has a duality = particle and wave functions. The water exclusion zone allows us to interact with light's wave qualities by changing its refractive index when it is bound to lipid rafts in a cell. It does this by excluding protons. Refraction is the bending of a wave when it enters a medium where its speed becomes different than it was at it traversed space or the ionosphere. The refraction of light when it passes through a fast medium (air) to a slow medium (water) bends the light ray toward the normal to the boundary between the two media. The amount of bending depends on the indices of refraction of the two media and is described quantitatively by Snell's Law. Why is this big for the eye clock mechanism and the skin? Refraction is responsible for image formation by lenses and the eye. As the speed of light is reduced by refraction by the matter in the cornea and lens, the slower or more dense medium is, the more

the wavelength is shortened proportionately, *but the frequency is unchanged*; it is a characteristic of the source of the light and remains unaffected by medium changes. **In this way, light is powered down to become useful to a specific part of the cell at a specific time of the day when the light is absent from our eye or gut.**



This is how biology uses light's duality to sculpt life. ***It***

uses gravitational lensing, general and special relativity, the photoelectric effect, in unison, at low energy levels, to create biologic time. The photoelectric effect is used in our mitochondria by using light to add and subtract mass by altering the momentum of light's frequencies and using light to change water's density. Light can be trapped in cells or organelles if electrons or protons are present in our lipid rafts and this alters the wavelength of the trapped light for later use. Exclusion zone (EZ) water has another key factor that few people link to light. The EZ excludes just about everything we try to add to it experimentally. This is quite important because it preserves the EZ optical abilities. Those abilities are quantized to the frequencies that interact with cell water at our surfaces. Water is most dense at 4 degrees C and as the temperature falls its density decreases. This is why ice floats on liquid water. **Density and optics change the duality of light.** Density of cell water = EZ = more electrons = excluded protons = UV light nonlinear interactions photoelectrically on e^- = particle aspects of light = excluded protons are separated by spin = protons moved by red light.

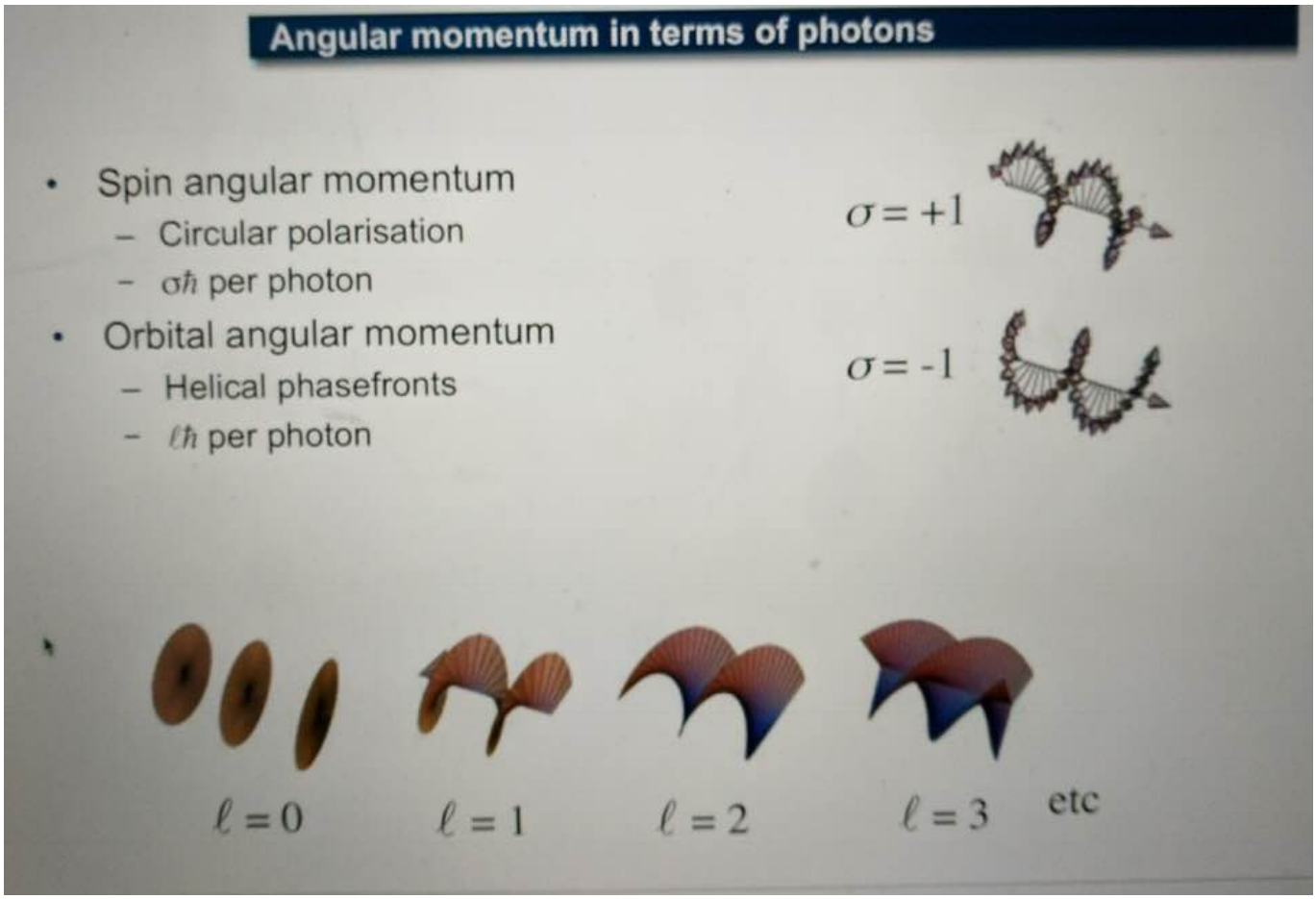
When I talk light to people that know nothing about the photoelectric effect or electromagnetic interactions, I use the analogy of a kiss. We all have been kissed many many times. When you get kissed think about the surface interactions a kiss can give you. A kiss can just be a touch of your lips without any effect. It could even make you cringe if kissed by the wrong person or in a way that you did not want it to happen. But some kisses just blow you away with their stimulus, and you feel tingling in every cell down to your toes. At times like this, we experience time as relative. Time appears to stands still to our senses while all sorts of magic happen to happen to us! This is how light from one person can affect the oxytocin release in another person. Our cells release light that has this momentum. That is precisely how light works in a nutshell. Light can be bullet-like

(particle) or it can be a soft wave of interaction without protein and lipid rafts to cause alterations of many chemicals in us. Most of us believe biochemical change has to be chemical in nature. It turns out the biggest changes in biochemistry are brought about photochemically because of how the photoelectric effect changes the media in cells with the way it kisses our electrons and protons. That kiss excites them to animate life.

PHOTOELECTRIC FACTS:

What's the photoelectric effect? It's been determined experimentally that when light shines on a metal surface, the surface emits electrons. For example, you can start an instantaneous DC current in a circuit just by shining a light on a metal plate or some of the proteins or lipids in us. Light of specific and sensitive power that hits anything with loose electrons called de-localized electrons is capable of this effect. All semiconductors that are non-metals use this effect in technology. It turns out most of the lipids and proteins in our cells also use this effect. This also has been experimentally proven by Robert O. Becker in human bone tissue in the *1960's*. It has been proven operational in many other tissues as well because of transcranial and transcardiac magnetic stimulation

Historically, light has sometimes been viewed as a particle rather than a wave; Newton, for example, thought of light as a particle. The "particle only view" was pretty much discredited with Young's double slit experiment, which made things look as though a light had to be a wave. In 1909, we found out light had an angular momentum. The double slit experiment has proved this true many times. Moreover, early 20th century, some physicists, Einstein for one, began to examine the particle view of light again. Einstein noted that careful experiments involving the photoelectric effect could show whether light consists of particles or waves.

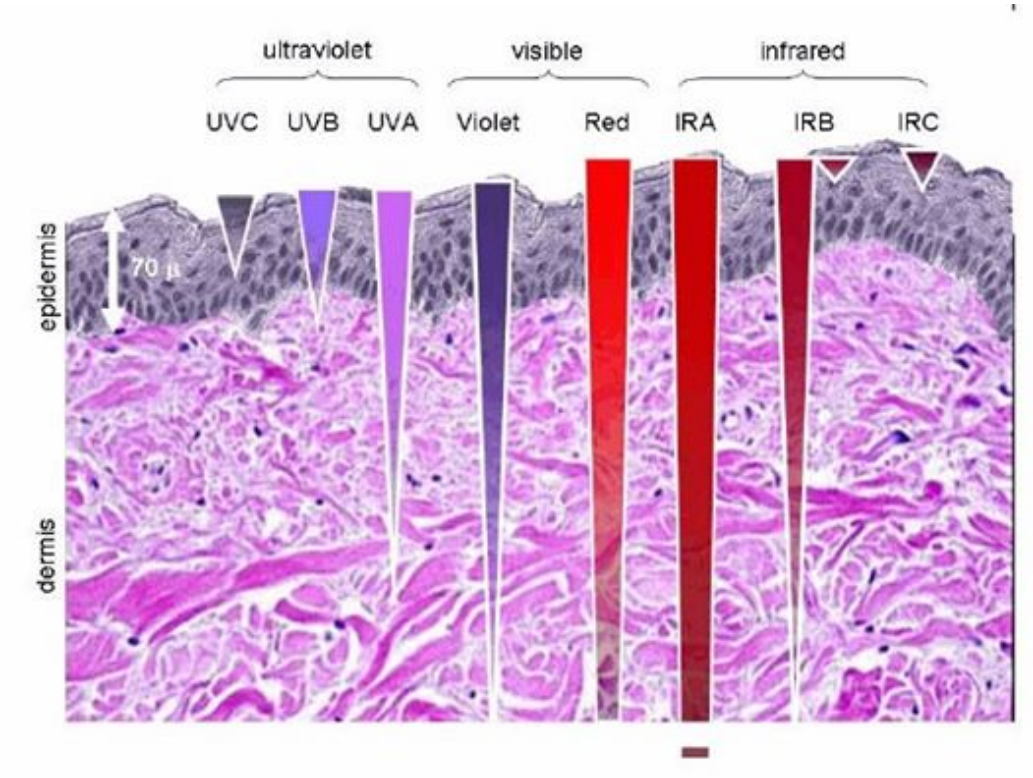


The photoelectric effect (PE) can act as a bullet causing considerable disruption of the surfaces of the material. This bullet effect between light and electrons is special because it occurs instantaneously and the hit electron ejects energy during the collision in the form of a light wave emission. there is an indirect effect on protons in the skin This allowed scientists to deduce that the collision was a "one on one encounter". There is **no time delay** in this encounter which makes it a critical gear in the eye clock mechanism. The other critical gear is based on the fact that light of different frequencies contains different power, and therefore each frequency has its own specific momentum to impart to things it hits. This was measured and proven by the Compton effect. As a photon hits an electron, the two go off at different angles. Because of this, we can apply the laws of conservation of energy and momentum to calculate the angles and energies just as we do on a pool table as balls collide.

There is a specific issue with photons and electrons not

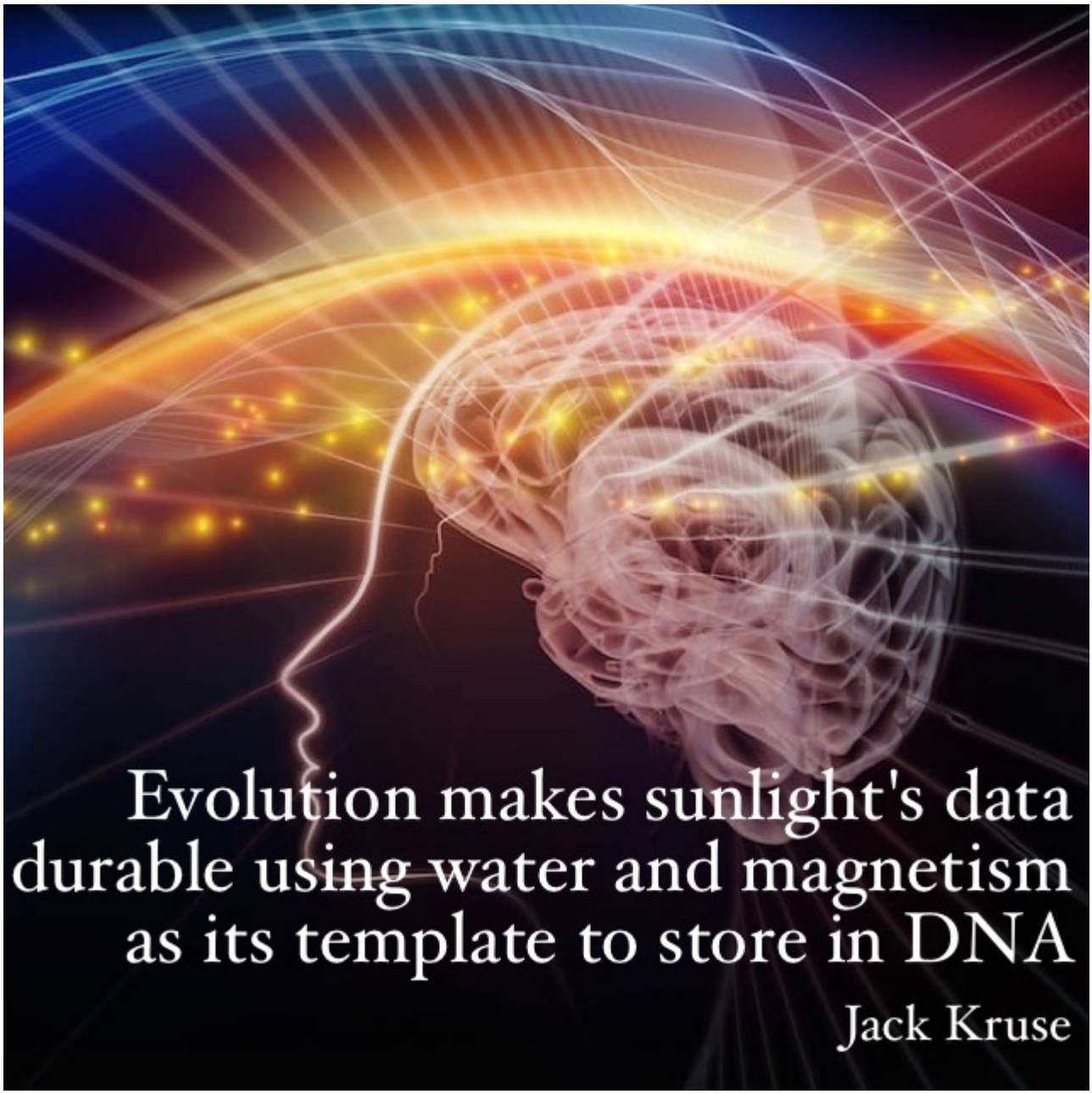
shared by pool balls, however. When pool balls collide the striking ball slows, but in the photoelectric effect the light photon NEVER slows down because it always travels at the speed of light if it is in a vacuum. **This is not true outside a vacuum or in a cell.** The density of a medium alters how light travels by Fermat's principal or by Snell's law. The key point here is that the "*photon speed*" can be slowed by the medium it travels in. In this case, as speed slows post-collision, the light frequency must change precisely to match the collisions effect. This is what quantized means in QED. As this aspect of light changes so does the power or energy in the light; So too does its angular momentum change. Momentum gives light the ability to do work by giving it a kinetic energy. This implies that in cells, filled with cell water and proteins, light captured in the EZ, allows for frequency decreases in incident light by altering its wavelength. Its wavelength increases as a result. **A cell becomes a quantum measuring device in this way for incident light.**

Feynman taught us that as light loses its frequency and momentum it acts more like a wave and less like a particle. In fact, when you see the moon reflecting in the sea at night, only 2% of the light we see is reflected. *Light's power is only a function of its frequency.* As the frequency of light increases as light power increases. In visible light, this describes the ultraviolet part of the visible spectrum. *Higher powered UV light acts more like a particle and less like a wave by the laws of physics.* ***The red and infrared frequencies act more wavelike, so they move things with mass. Humans take huge advantage of this in the eye and skin.*** UV light cannot penetrate our skin. But its waves impart a huge momentum on the surface of our skin that pushes down with a force that is linked to the power in UV light. This has a massive effect on protons in the blood.



Note the depth of penetration of UV.

So UV light often is absorbed by our lipids and proteins to phase shift to different color light and diminish momentum. This is why UVB light changes cholesterol to sulfated cholesterol and more sunlight changes sulfated cholesterol to Vitamin D3 in our skin. This can be activated deep in the liver and kidney by further modification under the control of red light. This affects the power of light to do work in different tissues, cells, and atoms. **In this way, single atoms, electron, or protons become "programmable quantum nanomachines" for light photons.** The work that can be done is linked to their frequency of interaction with electrons in our cells.



PARTICLE PORTION OF LIGHT:

In our world, is a car wash or sandblaster more damaging to a car's surface? A sandblaster would take the paint and dirt from the car! A car wash gives a smooth bombardment of water from a hose to the surface. Sandblasting may deliver the same total energy concentrated in individual grains of sand to give a series of localize sharp shocks the surface of the car. It would strip the paint off quickly and damage it. If you then changed from sand and used steel pellets and concentrate

this stream on a focused area you would create severe local damage, but the remainder of the surface would remain unaffected. Light is capable of all these effects on our tissue surfaces to change how biochemistry can occur below that surface. This is why only UVB light can create Vitamin D3 and no other frequency. It is also why sunlight on the skin has direct impacts to RBC's in our circulatory systems. *Porphyrins and hemoglobin are ideal non optical proteins because of how they interact with light in a non linear fashion with high intensity UV light.* It begins to make sense why nitric oxide is in our skin, why hemoglobin absorbs light in the UV and IR range, and why porphyrins are the second most common protein in RBC's. They absorb all frequencies of UV light that lead to a phase transition optically in cells to the sun's light.

The PE was discovered by accident by Hertz in 1887. He was working to produce radio waves using electric spark discharge between two metal spheres. He noticed that when he illuminated the spheres with UV light, the sparks were bigger and brighter. He had no idea that UV light has the most power in visible light to cause the PE to form in metals. His work was confirmed by Hallwachs a year later in many other metals.

Physicists immediately realize that the PE effect is strong evidence that light acts like a particle sandblaster to electrons. The shocker for most, is that light of low intensity, as in a few microvolts per square meter produces an immediate detectable PE current. This is why cells release ELF-UV in small amounts at low energy levels. ***QED dynamic theory posits as energy levels shrink, QED gets even stronger than one would naturally expect***. **This means that even that low-intensity light is capable of generating a PE effect for signaling.** The current the PE generates is instantaneous and can be used to do work in a cell.

CHANCE OR LUCK?

How does light select the electrons it will collide with? It is 100% chance or probability. That single electron receives a whole quantum of energy from light while its neighbors remain undisturbed. The minimum energy required to pull an electron out of a surface is *around 3 electron volts.* 1 eV = 1.6×10^{-19} Joules. When light is hitting a surface over a larger area many electrons are released in unison to this bombardment. Some of the liberated ones are attracted back to the surface while more can escape. The escapees create an electron cloud above the surface of the material undergoing the PE effect. In this cloud, the electrons also move randomly.

EINSTEIN CHIMES IN

In 1905 Einstein theorized that light could transfer its entire energy to an electron and this energy allowed the escape. He also said any energy that was "left over" would appear as kinetic energy (KE) of the freed electrons. He derived an equation:

$$hf = W + (KE)_{max}$$

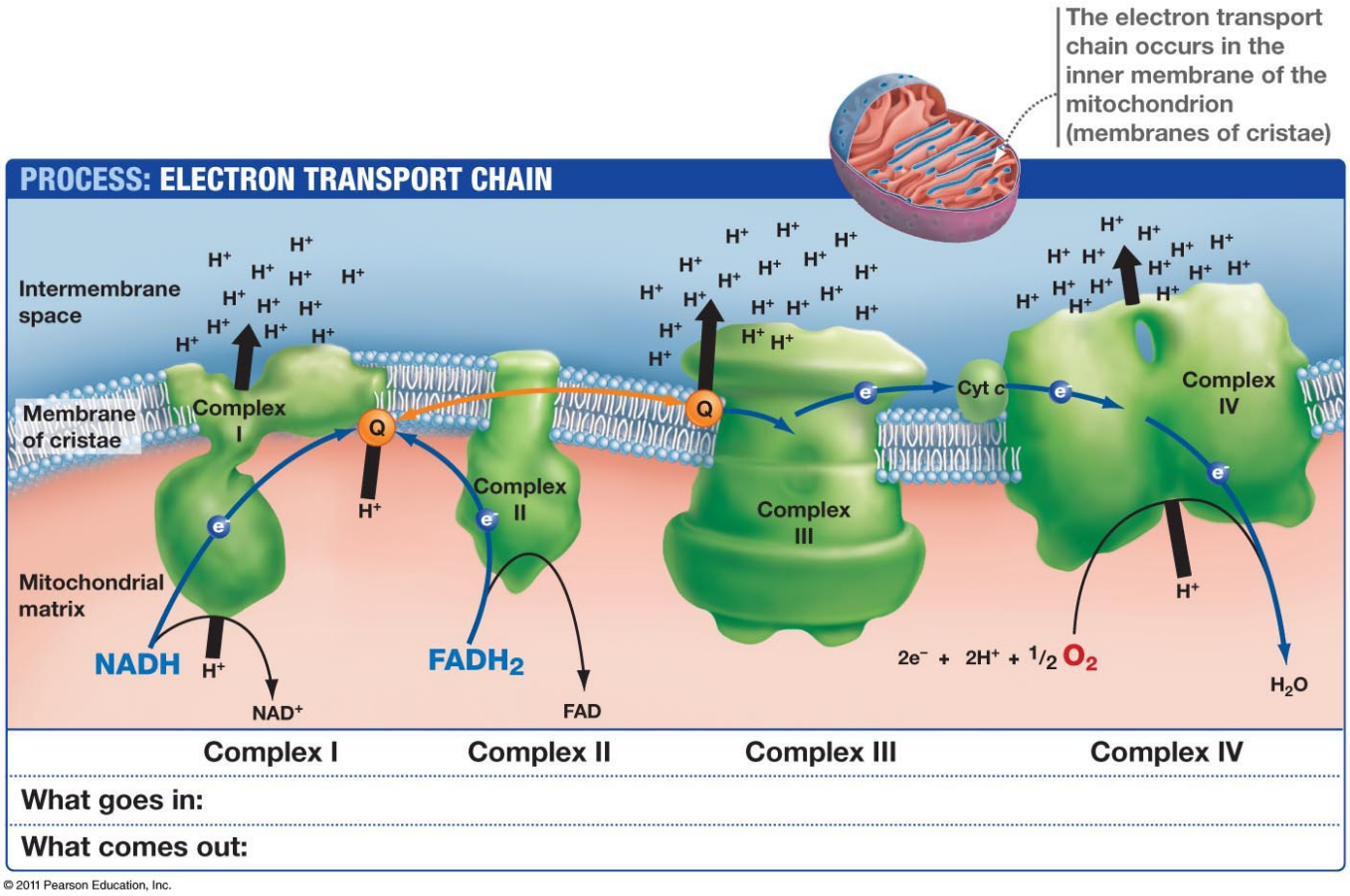
h = Planck's constant, *f* = frequency of light, and *W* is the amount of work capacity. Einstein never did experiments to prove his theories. Most of his ideas were placed in math equations for others to prove or disprove. Millikan proved Einstein instinct correct with regards to the photoelectric effect. Einstein won his only Nobel for this thought experiment. In Millikan's experiments, he found when the light hit a surface it liberated electrons so he wanted to control those electrons using an electric current. This continually swept away the liberated electrons. He found that the electric field accelerated the electrons away from the surface emitter in the tubes he was using and around the circuit he created. For each frequency of light, he found something more interesting. As the accelerating voltage was

increased, the current increases until it reached a saturation current. At this point, all the electrons were swept into the discharge tube as they were freed and liberated from the parent atomic lattice. ***It turns out the current of electrons created (DC electric current) depends upon the frequency of incident light. This is why the DC electric current shows up in a cell during the day. Becker made this observation and then several Russian researchers noted that ELF-UV light release in cells only occurs when the optic disc is sensitive to light. The human retina is very sensitive to light. THis is why any light at night is toxic. It liberates too much ELF-UVduring a time of the day that stimulates mitosis.***

The PE also was shown in experiments to allow currents to flow uphill. This is the equivalent of spring water flowing uphill against gravity to do work. When the external voltage was turned to zero, a current *still remained*. Even when the electric or magnetic polarity was reversed some current still remained. The energy of some of the liberated electrons is high enough to overcome the retarding potential to reach the collector plate in the experiments. These experiments won two Noble Prizes, one for each for Einstein and Millikan.

When Einstein derived mass equivalence equation in his mind in 1905, he could not have imagined that in *1959* it would become possible to build machines capable of turning pure light energy into matter at the precise rate of exchange which **$E=mc^2$ predicted**. Today, the Large Hadron Collider is the latest generation of these machines. *I think he had no idea what this "light effect" meant for biology either.* It is clear that light sculpts life by knocking off electrons and moving protonsto and from lipids and proteins in cells. The mechanism is the same but the mechanics in how it is accomplished is the difference. I came to understand what it meant to biology around 2005 myself. It became further refined when I understood how QED and QCD interacted in mitochondria. When I realized it became possible to create

matter at particle accelerators, a window opened in my mind about what might be missing from my neurosurgery perspective. My world fundamentally shifted. I realized in a moment, that I finally understood what mitochondria were really capable of doing at the smallest scales of life.



Physicists used $E=mc^2$ to build the CERN collider and many other particle accelerators to understand the nuclear reactions in quantum physics. They built machines capable of aiming high energy protons into a target. This alone is capable of creating matter out of the energy they put into the machine in a controlled fashion. The matter they created were particles that they used to construct the theory called the Standard Model of physics. Every particle known to date in the Standard Model theory has been found using this detection system. The identity of these particles also required a lot of complicated math. *That math has added a lot of doubt in my*

own mind whether what they found was fundamental in nature or mathematical renormalization with a story of discovery around it. That is a story for another day. But the idea of what they were doing made me immediately think about mitochondria.

I realized immediately that this ability is built into our own mitochondria by nature. Its matrix is filled with protons and it feeds them through the ATPase and it shoots them out of a cytochrome mouth into an atomic target of iron and sulfur. Simultaneously an equivalent mass charge (30 million volts) of current is generated by electron chain transporters that surrounds these cytochromes. That target is the iron-sulfur complexes in the cytochrome proteins. When protons are aimed at target matter can be created out of energy in a controlled fashion. That is something no biology book has ever really thought about. I know because I have read most of them in my training as a neurosurgeon.

So how does life make matter out of energy?

It uses the photoelectric effect to do it. **The mass equivalence equation, $E= mc^2$, gives us the rate of exchange when matter is converted into energy**. This is the equation that particle physicists use to probe nuclear explosions and experiments at CERN to find particles that make up nature. **Light is fully capable of making subatomic particle and atoms in matter fully programmable.** Energy and collisions give birth to particles in physics. It is so well known, that when such a conversion occurs today, the lay public calls it nuclear energy. ***What is far less well understood about Einstein's equation is that the opposite conversion can also happen in nature, but few people realize it in biology***. In fact, this conversion is key to the quantum yield of all things living on Earth. You might want to write that one down.

This is how a tree makes wood fibers from thin air using sunlight and water. *If enough energy is concentrated at any one point, matter can be created out of this light energy.* The first step in photosynthesis uses incident light to charge separate water. This is precisely what happens when sunlight hits our surfaces as well. This is when the exclusion zone of water is created. As it is created the density of water is shifted. As it shifts and grows, the amount of UV light we can assimilate rises. This means that plants and animals use light in very similar ways. In practice, this type of energy conversion is well known in particle smashers. There, it can only occur at nuclear and subnuclear levels. When I say this many people think this means a place like CERN until I explain to them how a mitochondrion works. It turns out that mitochondria also work at a subnuclear level with respect to sunlight and food. All food is broken down into electrons that are fed into ECT in mitochondria. Mitochondria deal in electrons and protons exclusively, surrounded by an equivalent charge of 30 million volts. This means mitochondria and the Hadron collider both deal with subnuclear physics. CERN operates at the high end of the energy spectrum and mitochondria operate at the lower end of the energy spectrum. This is why I don't focus on macronutrients, as most physicians, and food guru's do. Mitochondria can do what CERN's collider can do, but it occurs at much lower energies and speeds because of the size of the collisions and the size and shape of mitochondria and its use of light to control atoms. **The world acts differently at small scales than it does at large scales to do things that we cannot fathom because we only perceive the world at larger scales of observation.**

Consider this example: A proton of high energy collides with another proton, neutron, or electron in particle accelerators at high speeds. Most of you think about collisions as a destructive event, like when two cars come to crash into one another. When subatomic particles collide ***they cannot be***

distorted or broken into fragments. Energy and information, however, is liberated from the mass of particles. They are already fundamental parts of matter. So this begs the question I raised in EMF 2 long ago, what happens when we reverse $E=mc^2$ in a cell? Where does all this energy and information go? It turns out when energy is focused on one point in our mitochondria, a cell becomes capable of making matter from light energy and information. This is why light energy is used to drive protons into iron and sulfur targets. That light energy to drive the process is found by collecting the energy in electrons from foods. This charge is 30 million volts because the mitochondrial membranes are so thin. This raises the charge potential tremendously. Charge strength can be elevated in this way because of the sheer amount of highly powered electrons fed into ECT is simultaneously present on a razor-thin inner mitochondrial membrane of 4-6 nanometers. What these electrons do is coupled with how protons can or cannot act in the matrix. This is the same power found in a solar plasma around Earth or from a bolt of lightning.

When you stop and think about this, **the most stunning fact is that the sum of the reverse of mass equivalence provides nature a way to create any matter a cell might need. Moreover, it would appear that it can appear out of nothing on a larger scale that biology does its experiments. To see this creation live would require atomic camera's which do not exist.** At first is sound shocking until you realize how a tree makes its own wood from the thin air, using sunlight and some electrons from water. That "nothing" is the energy contained in electrons and protons that are colliding in the inner mitochondria membrane and the cytochrome targets. No one has been able to figure out why these targets exist. I told some people on my recent member cruise, that in papers published in the early 20th century, it was shown that B_{12} deficiency could be cured with the addition of UV light alone to a persons blood plasma. UV light delivers even more DC

electric current to eukaryotic membranes to further increase the charge present and it does some exotic things to the matrix of the mitochondria where H^+ resides. They looked at me stunned when I said it because they could not believe it, as I smiled. They asked me how this was possible. I told them when I got to this blog series they would have their answer.

Light, when focused on a point (think water, atoms, proteins), when it acts as a particle does, can make the matter a cell requires or is deficient in by harnessing the power buried in the mass of a proton. **Mass and energy are one and the same thing in Einstein's mass equivalence equation.** **That collected and focused light can be used to gain this effect, is now being appreciated in experiments done on water by Pollack and many others.** We also know that mitochondria concentrate protons between its inner and outer membranes, but we don't seem to understand why precisely. We might finally be seeing why a mitochondrion does this. This is where we store particles with massive energy stores and it is also capable of driving chemiosmosis to make ATP to unfold proteins to make larger exclusion zones around proteins to trap more light in the EZ and harness more of the energy of the photons released from the subatomic particles in mitochondria. Einstein's mass equivalence has always given us the answer of mass-energy transfer, we just did not understand how a cell was designed to use the physical abilities it contains because of our flawed perspectives.

Consider more biology abilities as it relates to light or the absence of light at night during sleep. Cortisol helps germinate new neuron circuits during the daytime when sunlight is present, but melatonin is critical in pruning arborization in neurons and new neuronal connections and proteins at night when a light is absent. Melatonin is made from serotonin which is both biologic amines that are created from UV light. These aromatic amines are put in the protein sequence that is coded for by nucleic acids. Nucleic acids contain more ability to

store electromagnetic waves than water can in a cell. Proteins and water become parasites for light energy and proton information. They are both capable of storing light energy in their atomic lattice. **The proteins with aromatic amines like melanin are able to absorb UV light during the day and offload it at night in the absence of light when the DC electric current vanishes from cells.** The DC electric current vanishes during night time because the brain uses the PE to use photonics at this time. *As things condense at night they get smaller and the QED force dynamics get even stronger in cells*. This is an easy fundamental change to make in the brain because of the photoelectric effect built into DHA. DHA can turn light into a DC electric current or turn this current into the light again. The RPE in the eye has massive stores of DHA and is a factory for all the biogenic amines we use in the eye and brain. This is why dopamine, melatonin, serotonin, and melanin are critical proteins in UV light storage in a cell. This powerful light is downloaded to the cell when sunlight is absent from the RPE and central retinal pathways of the eye. This implies, at night when the sun is absent, light has to be very active in our CNS. Why, is this control switch important? Light controls atoms. Atoms are small quantum dots. It turns out physics has already proven that one single photon of light can control 3000 atoms. The stored light imparts direct programming or atoms to photons, just as a laser controls atoms in a physics lab optically. This explains why cells release monochromatic ELF-UV light. The brighter light is the more it uses non-optical signaling, while light released from other organelles signal other things. So why is light the choice at night? The release of light at night inside of us raises the relative intensity of the light to other cells to make sure non-optical signaling works specifically at night. *It turns out non-linear optical signaling is most active in ubiquitination of proteins made by the amino acids in the brain.*

What are the practical applications of all these physical

abilities in the photoelectric effect? Melatonin has been widely studied in biology for its role in photoperiodism in seasonal breeders, but it is also a potent antioxidant. Ubiquitin, a protein also widespread in living cells, contributes to many cellular events, although the most well known is that of tagging proteins for destruction by the proteasome. Melatonin interacts with the ubiquitin-proteasome system to regulate the central activity of thyroid hormone type 2 deiodinase; the subsequent regulation of T3 is central to the melatonin-induced changes in seasonal reproduction and seasonal changes in metabolism. This is also why excessive blue light can alter thyroid function in humans. Many papers have shown that glutathionylation (sulfates from cysteine think EE 12 blog) of this enzyme protects proteins from unnecessary degradation by ubiquitination. So the sulfur atoms are carried by melatonin, and the lever controlling melatonin is how much UV light momentum is in its aromatic amino acids to power its abilities. When UV light is present in melatonin, it limits protein degradation in the brain. When it is absent, we see higher ubiquitin rates in the CNS, and disease results. Once again, you see the lack of UV light does not allow us to properly program the atoms in melatonin to do the job they are designed to do. Light controls the proteins in biochemistry, and not the other way around.

When this process is broken, and the correct light frequencies are missing, the result is low brain sulfate levels, while excessive amounts of metals begin to precipitate out in our tissues. Precipitation of metals in tissues has the atomic effect of speeding up our organ clocks in relation to the SCN because of how light and metals interact photo-electrically. This completely ruins circadian signaling and speeds up ubiquitination rates and increases epigenetic activation. This implies all diseases maybe simply due to altered light activation and/or loss of epigenetic control of proteins (histones/chromatin/methyl groups) that condense and uncondensed DNA/RNA.

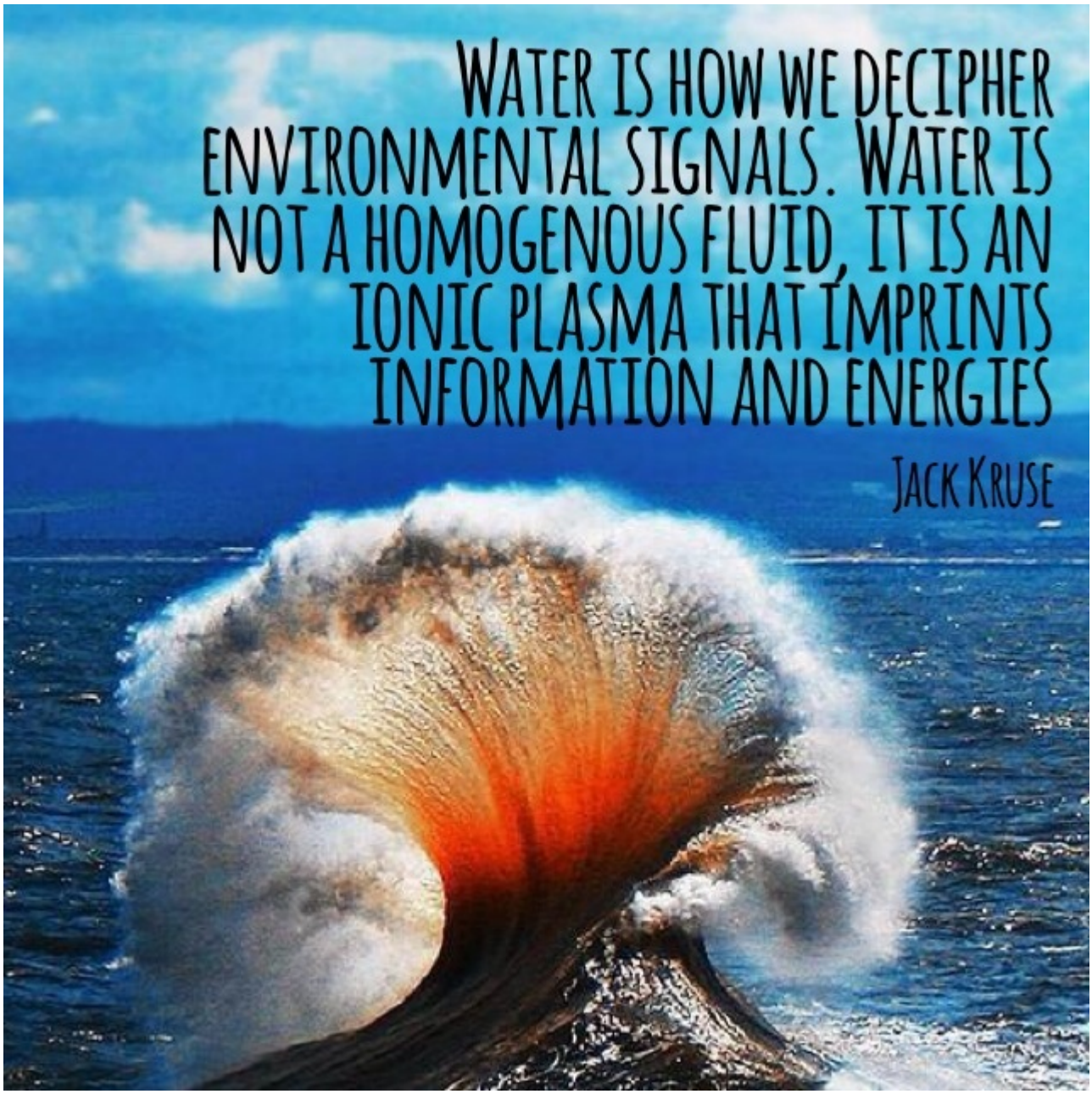
THE WAVINESS OF LIGHT

There is another side to light's fundamental story. Light can also act as a wave. The first serious challenge to the particle theory of light by Newton was made by the English scientist Thomas Young in 1803. Young possessed one of the most brilliant minds in the history of science. A *physician by training*, he was the first to describe how the lens of the *human eye changes shape* in order to focus on objects at differing distances. He also studied physics, and, amongst other things, definitely established the wave theory of light, as described below. Finally, he also studied Egyptology and helped decipher the Rosetta Stone hieroglyphics.
Young knew that sound was a wave phenomenon, and, hence, that if two sound waves of equal intensity, but 180 degrees out of phase, reach the earth and they cancel one another out, and no sound is heard. This phenomenon is called interference. Young reasoned that if light were actually a wave phenomenon, as he suspected, then a similar interference effect should occur for light. This line of reasoning leads Young to perform an experiment which is nowadays referred to as Young's double-slit experiment.

In Young's experiment, two very narrow parallel slits, separated by a distance, are cut into a thin sheet of metal. ***Monochromatic light***, from a distant light-source, passes through the slits and eventually hits a screen a comparatively large distance from the slits. Young reasoned that according to Huygens' principle, each slit radiates spherical light waves. The light waves emanating from each slit are superposed on the screen. If the waves are 180 degrees out of phase then destructive interference occurs, resulting in a dark patch on the screen. When UV light hits the surface of the skin destrucutve interference actually occurs. On the other hand, if the waves are completely in phase then constructive interference occurs, resulting in a light patch on the screen.
Young believed that his experiment would show alternating

bands of light and dark columns in the screen as light passed through the slits to prove light was, in fact, a wave and not a particle. The results of his experiments have been duplicated millions of times. He was right and this was contrary to what Newton was selling science in 1803. So what happened as a result?

When Young first presented his findings to the Royal Society of London he was ridiculed badly. His work only achieved widespread acceptance when it was confirmed, and greatly extended, by the French physicists Augustin Fresnel and Francois Argo in the *1820's*. The particle theory of light was dealt its final death-blow in 1849 when the French physicists Fizeau and Foucault independently demonstrated that light propagates ***more slowly through water*** than through air. Cells are filled with water are they not? And the water inside cells is capable of being structured into an exclusion zone. Is this how light is controlled in biology in some fashion using water in some novel way? Yes. **Light becomes trapped in an EZ and it retains its optics by excluding all solutes from it above the size of a proton.** The exclusion zone (EZ) water has a different optical density, therefore it has a different optical ability of refraction than bulk water from your tap.



So why is all this important? Light has a duality fundamentally. It can acts as a particle or wave photoelectrically. **You do not have to understand or like this, just accept it because nature is absurd at times in what she gives us.** Realize however, that life takes full advantage of *all the ways* in which light interacts with surfaces because sunlight has both high and low frequency light that show both aspects of light. How light and water interact depends upon the light frequencies present in the environment. Recall from your high school physics, that the particle theory of light

can only account for the *law of refraction* on the assumption that light propagates faster through dense media, such as water, than through rarefied media, such as air. **This is why Pollack's experiments have found that the EZ absorbs at a different light frequency once it is formed from infrared light.** For this reason, you might see why when we added photons or electrons to water we create an exclusion zone (EZ) in cell water. EZ water has a different density from bulk water from your tap because it is more viscous and carries a negative charge. We are familiar with bulk tap water but not so well acquainted with exclusion zone water bound to the tensegrity system and DHA that is hydrophilic. Things inside the cell are hydrophilic because they contain electrons. This is why Dr. Gerald Pollack's work is a critical missing piece to changing the perspectives of cell biology. Biologists will never understand light this well because they are not trained in physics. No one is cell biology realizes this because they continue to forget the basics of optics in physics. They have no fundamental understanding of how light works photoelectrically in a substance with a changing density, viscosity, with refraction. This is why water breaks nature's symmetry. When the EZ forms, the EZ then begins to absorb light in the 270 nm rage to increase the EZ power and potency. This is in the ultraviolet range. Water absorbs ideally in the red frequency range 1500 nm -3000 nm. Red light builds the battery and once the EZ is formed UV light adds massive power to the EZ to drive all biochemical reactions via enzyme flux using proton tunneling. This makes water an ideal infrared chromophore used initially to build it. Why would nature do this? Because all mitochondria release IR light from their cytochromes 24/7. When we are awake and UV light is present we need more energy to become awake. At night when we sleep we don't need a large EZ to remain alive. The EZ made with infrared light has longer wavelengths and uses the wave aspect of light more than the particle aspects of life as we sleep. This is important because at night in REM sleep we don't make much ATP to unfold more proteins. We remain more

condensed, because energy is being harvested in a different way in the mitochondrial matrix, so we don't bind as much water to our proteins. Why? To make the proper free radicals to entangle to proteins and lipids in our body requires absolute stillness. Motion disturbs the ability to entangle particles. This is why we are paralyzed in REM sleep. Entanglement of particles, to make free radicals also requires the use of monochromatic light.

The EZ created using UV light has many different optical properties than one made by IR light alone. Why? During the night the EZ must be different than it is during the daytime. This is the basis of how every cell in your body tells night from day. The EZ of the daytime is more powerful than the one at night. One of the key changes is UV light makes the EZ denser. More dense water has more electrons in it to attract UV light photoelectrically. This creates larger coherent domains in water that can move freely to share their energy and information in redox reactions in cells. The PE effect only works between light and electrons. Anything with more electrons means more UV light will interact with it. This is why DHA is important. **Cooling water or adding UV light to water both acts to increases the density of the EZ. This is the fundamental basis of why we designed the Quantlet device as we have.** Optical coherence tomography shows that water can flow in the circulatory system even after death. EZ water during the mid portion of the day uses the particle aspects of light because this is when UV and IR light are present. The EZ stores energy the charge separation of water and in the order it places on the molecular arrangement of hydrogen and oxygen. Now you are beginning to see why my perspective about life has radically changed from what I was taught. I began to realize these things were significant for cell biology.

Light is difficult for biologists to understand because of these details contained within the photoelectric effect. *This is part of the reason why they miss the boat on the importance*

of DHA to the eukaryotic family of life. The results of their experiments vary so much and often come out differently depending on whether the light is measured by the media it travels in to consist of particles or wave. They do not even realize it matters. This means the time of the day they perform experiments alter the outcomes. It also means the type of light used can do the same thing. For example, consider the following: If it acts more wave-like, the energy contained in one of those waves should depend only on its amplitude, that is, on the intensity of the light. Other factors, *like the frequency*, should make no difference. So is this true in real life, in cells?

So let us assume, red light and ultraviolet light of the same intensity is used in an experiment. They both should knock out the same number of electrons, and the maximum kinetic energy of both sets of electrons should also be the same, correct? If we decrease the intensity of the light, we should get fewer electrons, flying out more slowly, right? If the light is too faint, we shouldn't get any electrons at all, no matter what frequency you're using, right? What does the experiments on the photoelectric reveal? Our assumptions are false about light. John Ott was the canary in the coal mine in this debate. He could not explain his results, but I can. Why? ***That is not how light works fundamentally. The particle effect of light forces it does act differently than one expects it too.***

In 1900, Max Planck was working on the problem of how the radiation an object emits is related to its temperature. He came up with a formula that agreed very closely with experimental data, but the formula only made sense if he assumed that the energy of a vibrating molecule was quantized—that is, it could only take on certain values. *The energy would have to be proportional to the frequency of*

vibration, and it seemed to come in little "chunks" of the frequency multiplied by a certain constant. This constant came to be known as *Planck's constant*, or ***h***, and it has the value

The constant is a small number, but it was an extremely radical idea to suggest that energy could only come in discrete lumps, even if the lumps were very small. Small things like electrons, in biology, are often overlooked as having massive effects. In fact, in 1900 Planck actually didn't realize how revolutionary his work was at the time; he thought he was just fudging the math to come up with the "right answer," and was convinced that someone else would come up with a better explanation for his formula. Einstein took Planck's idea quite serious. And this is why I take electron abilities in mitochondria so seriously when we reverse the mass equivalence equation as I did in EMF 2 blog. This is how biology creates matter from atoms using light.

Based on Planck's work, Einstein proposed that light also delivers its energy in chunks; light would then consist of little particles, or quanta, called photons, each with an energy of Planck's constant times its frequency. That is where the equation above came from, ***h*** = Planck constant. **The frequency (*f*) of the light makes all the difference in the photoelectric effect.** Higher-frequency photons (think UV) have more energy and momentum, so they make the electrons come flying out faster; thus, switching to light with the same intensity but a higher frequency should increase the maximum kinetic energy of the emitted electrons. **This is why UV light is so important to life in biology. It is also why van Wijk and the Russians have been on the path of ELF-UV for quite some time. Modern biology is way off here.** ***It is the only part of the visible spectrum capable of de-localizing electrons in our cells.***

This means UV light and DHA work in unison allowing us to use

the PARTICLE aspect of light specifically. Since the particle part of life is like being placed in a sandblaster, it would make sense then why eukaryotic cells are much bigger and have redundant cell membranes than prokaryotes and Archea. The size provides more DHA *pi electrons* to target to capture the energy and momentum of the sandblasting that the particle part of light requires during daylight. Nick Lane has not been able to explain why eukaryotic cells are massive compared to Archaea and Prokaryotes in his books. The photoelectric effect can and does provide us with an answer. Neither Archaea or prokaryotes are capable of using UV light in this way because neither uses DHA in their cell membranes. This has limited their ability to harvest energy from the sun, and this has constrained their complexity. In fact, this is why UV light remains deadly to both of these Kingdoms of life.

This is also why Alexander Gurwitsch found in 1923 that ELF-UV light release in cells is the only frequency of light that is capable of stimulating mitosis in eukaryotic cells. Mitosis requires a lot of UV light to be focused on one spot. What is that spot? My bet is the cell membrane where DHA is. I don't think it is in the nucleus. Why? UV light does not penetrate deeply into cells. Mitosis requires massive energy and momentum to cause cell division in a complex cell. If you leave the frequency of light the same but crank up the intensity of the light, more electrons should come out, logically speaking, because there are more photons to hit them. Moreover, they won't come out any faster because each individual photon still has the same energy. **Energy and information in light are tied to its frequency and its angular momentum.** This is why cells don't need to emit a ton of light to get the job done in cell biology. Consider this example: If an egg is broken from an exogenous source, life ends. If the egg is broken by an endogenous force life begins. This points out why cells seem to universally release specific amounts of ELF-UV to get the job of living done.

Are you beginning to see why now Roeland van Wijk's book is so important to read and understand yet if you want to understand where biochemistry went off the rails? A scientist cannot fathom biology works on light's backbone and sport their ignorance by claiming we see no light inside cells when they examine them. The tools they use to study them cannot see the amount nor the wavelength cells emit. It also explains why a surgeon does not see light emission when he cuts you open in the operating room. Despite these facts, we should know to expect a lot of light is being liberated by our incisions. If we had Fritz Popp's photomultipliers in our OR's, I think we'd begin to understand why some surgeries are so devastating to our patients. We might be able to quantify how much light their tissues are losing as we operate to make better decisions. Cancer surgeons have known about this disturbing trend of tumor spread when we open into tumor beds. This is one of the reasons a Whipple operation is so deadly for patients. We remain unaware of why. I have a clue why it is. Any operation that affects light loss at the cell level or below, will not be tolerated well. It rarely gets talked about these days anymore but the observation is always present to those who pay attention to it. I have for ten years. The reason we remain ignorant of these basic observations is humans are blind to UV light and IR light are not visible to the human retina!

Our eyes see a small portion of the spectrum of light. And cells use part of the spectrum we just don't perceive without

eyes. Just because we do not see it does not mean the effect is not present. In fact, Becker proved in the 1960's bone rectified the photoelectric effect in periosteum to heal bone use a Positive and Negative semiconductive junction. It amazes me how blind we are when the truth stares straight at us.

What does this imply? If our environment provides our cells the ability to use a high frequency (UV light), the light emitted by cells should still have the ability to knock out some electrons out of atomic lattice in cells even if the intensity is very low (ELF-UV). The photoelectric effect shows us that is exactly what happens. Therefore, with a few simple measurements, the photoelectric effect would seem to be able to tell us whether light is in fact made up of particles or waves, shouldn't it? Have these studies been done? Yes, they have.

Now think about the experiment I spoke about earlier. The lowest end of the visible part of the solar spectrum is in the red range and infrared area. If the frequency of light is low enough, then none of the photons in this range will have enough energy to knock an electron out of an atom in our tissues, will it? No, it won't. This is why red light and UV light are complementary. So if you use really low-frequency red light, we shouldn't expect to get any electrons de-localized from a cell, no matter how high the intensity is.
Do you see how this photoelectric effect works now? This is why red light is not capable of inducing a photoelectric current in cells. Red light can interact with cells simply by changing the density of water in and around the cell. *Water is the ideal chromophore for red light and as the EZ is made its density changes immediately.* ***This means heat release from a mitochondrion readies a cell for the return of UV light in the morning to raise the photoelectric power inside a cell to***

allow us to live a human life. When you change the density of water you change the way it interacts with specific portions of visible light photoelectrically. **This dance between light and water is detailed and elegant.** You must begin to understand it clearly to get optimal. *Density changes allow us to use the duality of light to our cell's advantage.* **IR light works in tissues more as a wave than as a particle.** So experiments set up incorrectly to measure the particle aspect of red light will never show a result. The opposite is also true of UV light. It works only on the particle aspects of light. No experiments I know even contemplate this kind of design in cell biology and this is why modern biology is blind to these facts. Gerald Pollack's work is closest to understanding these nuances.

THE PE PROOF IN EXPERIMENTS:

In 1913-1914, R.A. Millikan did a series of extremely careful experiments involving the photoelectric effect. He found that all of his results agreed exactly with Einstein's predictions about photons, *not with the wave theory of light*. Millikan actually won a Nobel Prize for trying to disprove Einstein's photoelectric theory. Instead, he wound up proving Einstein correct. Einstein actually won the Nobel Prize for his work on the photoelectric effect and not for the Theory of Relativity.

Millikan's work showed us that light is made of particles! But wait…what about the two-slit experiment of Young done earlier that showed light was a wave? Most people can't see how light could make an interference pattern like Young showed unless it was made of waves. Confused yet?

You should be……because light can be a particle or a wave

depending on what it interacts with. **What it interacts with, determines if it is a wave or particle.** The act of measuring the frequency interaction determines what light can or cannot do in a cell. A cell is designed to be a quantum measuring device for light. This is also why every living thing is made of cells. This is very counterintuitive to most people. This is why biology remains so confused about light and water. Water changes its ability to handle different light frequencies. This is why we need more light gurus and less food guru's.

FERMAT'S PRINCIPLE IS CRITICAL TO CELLS BECAUSE OF DENSITY

The path of light anywhere in the universe is governed be Fermat's principle which states ***that light always takes the route which takes the shortest amount of time.*** Snell's law was found 40 years before Fermat explained how Snell's law works. Let me give you an example of how this works in a cell. Consider that B_{12} deficiency I mentioned earlier. This implies when B_{12} is deficient in a cell, that this loss of chemical information is imprinted into cell water in some way into the atomic lattice of the cell. In this way, water becomes a molecular mirror for a defect in the lattice of atoms missing B_{12}. The pathway to this deficient area is changed optically by altering the density inside this part of the cell. The change in the cell is mediated by a change in water in its interaction with light that is stored in the cell and traversing it. **This changes the charge and angular momentum locally, inside the cell.** This is how the redox potential is fundamentally created in a cell to signal a stimulus change. The change in charge then has another ability. This changes the distance that light has to cover in a cell using Fermat's principle of least time. Do you recall

what Fermat principle really tells us? It tells us how light and time become linked in biology. **Light always takes the fastest route through a medium even it the path is longer in a tissue.** Fermat's law is based upon the least time principle. Fermat's law exists only because the photoelectric effect occurs instantaneously. This is how this universal law of physics unite inside your cells.

Density changes in cell water alter how light can travel in a cell by Fermat's principle. The most common way this is signaled is by changing the exclusion zone (EZ) in the cell. The EZ has been shown to be *denser by Dr. Pollack,* therefore, it has a different refraction and diffraction to light. **Recall from high school physics, that the particle theory of light can only account for the law of refraction on the assumption that light propagates faster through dense media, such as water than through rarefied media, such as air.** This is called Snell's law. Snell figured this out 40 years before Fermat made sense of the effect. They both describe the same effect, just in different ways. This was the key that Feynman used to unify the principle of light and electrons into QED. He created his own way, or formalism to understand how photons and electrons interact.

KEY POINT ALERT

Density increases mass in a cell surrounding lattice and light always bends towards things with mass by gravitational lensing. In this way, light is directed and shuttled to where the chemical defect (B_{12} in our example) arose easily without any energy cost to our cell. **When light is added to our body from one of our surfaces, our tissues know exactly where to send it because of the optical changes made in the exclusion zone, by this photoelectric and photochemical process.** Moreover, it knows what type of matter to create with the light because of the cell's redox potential from these

collisions inside our atomic lattice's. The redox potential of a cell is fundamentally linked to Fermat's principle of least time. Mito-nuclear coaptation is the key to redox potential and to matter creation using light captured within a cell. I mentioned mito-nuclear coaptation briefly in Ubiquitination 5. In this way, light can be directed to nearby mitochondria to make sure Fermat's law is not violated. This is akin to how a pilot sites an airstrip at night to land a plane. Details matter with respect to light and you are getting them laid out on this blog.

I told you about Archimedes principle in the Ubiquitination series for many reasons. Archimedes (287-212 BC) used mirrors to burn invading ships at the siege of Syracuse. Giulio Parigi commemorated this event in a painting in the Galleria deli Uffizi in Florence. I saw this picture when I went through my transformation a decade ago. You can learn an awful lot about your health failures from art if you pay attention to it. Having a high dopamine level help you pay attention to trends that might get you well.

Might Archimedes have tapped Pierre de Fermat's law to do this in real life? George Louis Leclerc, Comte de Buffon (1707-1788) set out to prove this could be done, experimentally in *1747* and was successful. He set up 168 mirrors in an arrangement designed to focus sunlight at a distance of 50 meters. He ignited a plank of wood instantly showing that this system could be used as a weapon. Might cells have the same ability to do this in mitochondria to create matter? **This is what I initially thought of when I looked at this picture in Italy.** *It turns out, the same ability to use sunlight to create matter or destroy it, is built into our cells and our mitochondria*. It sounds hard to believe, doesn't it? David Wallace of MIT re-did the experiment in *2009* and reproduced the results of the *1747* experiment. Physics is capable of many things that we biologist just cannot fathom, yet. Why do I say this?

Biology and medicine don't fully understand light, water, and magnetism and how they work in unison to craft life.

PERSPECTIVE INTERLUDE: When your dopamine is rising you pay attention to trends better. When I was In Italy, I sought out specific works of art tied to my Quilt, because art is easier for most to understand concepts than complex physics. For this reason, I value art over science. I really do, but few of my friends realize it. Creativity is jumping into your mind without a safety net or a set of wings. Creativity is the domain of dopamine creation in the eye. For me, creativity is 100% innovation of light's interaction with my RPE. Innovation is how I created the Quilt document. It is invaluable to me because it healed me and taught me some deep lessons about my profession. We simply re-arrange what we already know to figure out that which is an enigma to us. Anyone can look for paint in an art store, or for definitions in a dictionary, but the innovator looks for answers in a dark alley and for their masterpiece in a slum to escape themselves. Aspiration is worthless without imagination and imagination simply has no boundaries. **Boundaries of belief limit where we look for answers to vexing problems.** Just like our belly needs sustenance our imagination needs ideas to create. When I see paint thrown on the canvas, I just sit back and think about trends I am faced with; to me, that is invaluable in this quest for wellness.

BACK TO EINSTEIN:

It is truly innovative to reverse Einstein's equation and ask what it means to all of human biology. In fact, it is incredibly fundamental to consider it. *That newly born matter spit out of every mitochondrion appears "out of the blue" as jets of particles mostly in the forward projection.* **The input to mitochondria is light and electrons added into the mix and protons are made to collide with protons targets to make things cells need.** It appears ELF-UV light signaling is critical in this photo-electric operation. What they need is

a way to store light energy in the way a cell is built. This is why the Tensegrity system of the cell is critical. Almost all parts of the cell are capable of storing light energy in some form for later use. **It is codified in its atomic lattice and that lattice has to work by Fermat's rules for light.** That projection is also accounted from in mitochondria in the form of "cytochrome mouths" with respect to proton collisions, and in the electron chain transporters with respect to electrons stripped from foods.

What most do not understand today is that the newly created matter in mitochondria maybe familiar constituents of matter, such as protons, electrons, or neutrons, mesons, muons, pions, of any of their accompanying antiparticles. I mentioned some of the particles in the mitochondrial matrix blog already. *Mitochondria even have the ability to create new forms of matter, called free radicals, that can come in two states*.

The triplet state is a creative builder of wellness, and the singlet state is a destroyer of tissues. Free radicals, by themselves, are unstable, much like the particles found at CERN collisions, and they are capable of decay within small tiny fractions of a second, much like CERN's particles are, **unless they are added to other forms of matter in cells to maintain their energy, momentum, and information.** People forget that light interacts with electrons instantaneously. Life takes full advantage of this innate ability to create matter in a cell. DONT FORGET THIS. *It is a key point in the Quilt.*

When they are added properly to our lipid and protein lattices', cells become more coherent. This is why physics uses light to control atoms in their experiments. Light can be used to bring atoms together or tear them apart. The particle aspect of light can tear things apart like a sandblaster does. The wave portion of light brings them together. The key is

what part of light's duality is operational in a cell and during what time of the day? When free radicals are in the wrong state or not added back properly, cells become incoherent or ill, because Fermat's least time law is disturbed. This is a sign that information is lost. When information is lost, the cell redox suffers. Free radicals are normally passed down the way in ECT to oxygen and nitrogen species in cell water just outside the mitochondria called the MINOS. Moreover, changes to the MINOS's atomic structures begin to alter the cells ability to respond to the particle or wave portions of light used to signal at that particular time in a cell. *That alteration determines how light can interact with the cell by Fermat's law.* If the cell's redox state is poor, it implies energy levels are low and cellular proteins are more frequently marked for replacement by the ubiquitin-proteasome to reestablish Fermat's law for light. **Fermat's principle of "least time" leads to the laws of reflection and refraction and the particle aspect of light.** Now it should make clear why the exclusion zone (EZ) of water in cells has a different refraction (due to its higher density) than water in your glass from the tap in your kitchen. Levels of the quantum organization are everywhere if you bother to look for them. The truth is always in front of us but we have to see it from nature's perspective and not the ones we were taught were true.

Few have looked where I have in biology. When you allow discomfort to settle over you, you gain perspective of how nature uses light and water photoelectrically. Discomfort gets people out of their comfort zone and into the zone were optimal exists. This requires dopamine, and to make dopamine we need UV light to hit our RPE. *Cognitive dissonance may be the hardest ailment in the human condition to cure.* In a world that destroys your dopamine creating abilities, you might see why the globe is getting ill. Optimal is not for everyone, because without dopamine they cannot see trends accurately. Society creates dogma, for these reasons, for the

consumption of the masses who lack the ability to create dopamine levels in their RPE using the photoelectric effect. Modern humans just do not appreciate nor enjoy nature anymore……they seek to exploit it instead. Building the modern world indoors is a tragic error because it shows how ignorant we are about the photoelectric effect.

When you do create dopamine within your eye, biology by biohacking becomes like shooting fish in a barrel when you know where to look for optimal effects. Anyone who thinks they can study light's effects on DHA in a eukaryotic membrane outside of a hydrated cell membrane without its other associated proteins and proper light is going to be lead to poor conclusions about DHA as a stand-alone polyunsaturated fat (PUFA). DHA is the most critical part of understanding the Photoelectric effect because it provides the most *pi electron clouds* to attract incident light at our surfaces. The frequencies that collide within our RPE, skin, gut, and lung are not equivalent by natural design. Natural design isn't finished until life is using it well. *Nature is meant to be useful, not to be well understood.* Natural design is the application effort to impose a meaningful order to the environment waves it provides. Light, in the form of the photoelectric effect, is all about these waves. DHA is able to respond to light to make a DC electric current using UV frequencies. DHA is concentrated in the eye for this reason. The retina has more DHA in it than any other part of the brain. This means UV light exposure and ideal retinal DHA levels are the most critical balance in human biology. Note, I said most electrons, with respect to DHA, not all of them. Why? DHA gets an electron boost other electrons from iodine and many other proteins like methyl groups and isothiocyanates.

Isothiocyanates are weak electrophiles. Akin to the reactions

of carbon dioxide, nucleophiles attack on carbon. DHA has 22 carbons in it. This means that these compounds when added to a lipid raft moiety containing DHA become excellent at de-localizing electrons when sunlight hits it. When this occurs our cell membranes change their ability. They become to interact with bright UV light to be able to foster non-linear optical signaling in our eye and our brain. To take full advantage of this PHOTOELECTRIC EFFECT compounds need large electronic dipole moments. It turns out iodine, DHA, methyl groups, and isothiocyanates have these abilities. If you are missing them in your experiments or your equation, results will vary and not be optimized to how nature uses DHA.

The other key way they work in a lipid raft with DHA is the electron donor and acceptor part of the raft have to be far away from one another on that cell membrane to work ideally. With respect to DHA, this occurs naturally because of the 22 carbons with its alternating double bonds. *Dopamine is a biogenic amine.* Amines and methylene are electron donors and cyano's halogens, and nitro's are acceptors (DeMartino 1988). When they bind to DHA they also make the DHA molecule more planar which also helps the electronic effect. This critical when you are changing light into an electric current. Most of the time DHA is not studied in this biologic configuration leading to bad ideas on how DHA really affects humans. **This idea is often repeated by biochemists who do not understand the photoelectric effect.** DHA facilitates the transmission because of the *pi electron cloud*. With UV light activation, its pi electron cloud becomes a giant wire of electrons to create a DC electric current. This helps explain why the DC electric current shows up during daylight hours and disappears at night. People need to gear up on 3D atomic chemistry to get why these atomic interactions work on our surfaces. Disease generation = low DC electric current = poor electronic flow across the cell membranes in the RPE = lower ocular dopamine/melatonin levels = lower frontal lobe dopamine and melatonin levels = lower brainstem dopamine levels =

lowered ocular melatonin = lower brain melatonin = more illness = time is lost by violation of Fermat's principle = eventual neuro-degeneration.

BEWARE OF "PEATOPHILES" IDEALS:

The Epi-paleo Rx is criticized by the people who follow the Peatatarian viewpoint: We should examine this and then leave it to rest.
The Epi-paleo viewpoint is if you have a medical issue related to a neolithic disease, you might consider moving closer to the equator. Why would this idea be put forth based on the duality of light mentioned above? Vitamin D3 acts to lower vibrations from the environment naturally. UVB light creates Vitamin D 3 to be a calcium channel blocker in the skin to limit molecular vibrations to attune our cell membranes to "listen well" to native waveforms from our environment. This makes Vitamin D3 the best natural Faraday cage for life.
Today's modern world is created within a soup of nnEMF and blue light increase vibrations. This is why I give you this idea to consider.
The Peatatarian skeptic will say, "I can't do that because it is impracticable or tough. My answer is if you cannot do it, do the next best thing; next step is to go into the ocean. Why would I say this? Water is the second best natural "Faraday cage" for this problem. Full spectrum sunlight is our best Faraday cage and water is second best. So, for this reason, try to be closer to the ocean, sea, river etc; if not build a home CT deck. It does not cost that much and is quite practical.
Skeptic response: "Besides, some people already have moved closer to the equator and still have problems." My answer, true but what is the real source of their issue. Have you thought it through? Their problems exist because their environment remains toxic because their cell membranes cannot

attune properly to what they allow, even if you do not perceive the reason. Moreover, they choose to stop hacking it, and tire of thinking what they should do because their dopamine level is chronically low, and then fall back to their dietary half-truths provide by their biochemical food guru's.

But a Peat believer will say, is the Epi-paleo Rx the right solution in this complex web humans have created today? You need to understand light well to make that determination. Biochemist fails big time on this issue. The right solution comes after deep thinking about how light works photoelectrically. The science that underpins this is quantum electrodynamics for which Feynman received the 1965 Nobel Prize. *It gets stronger as the scale of thing gets smaller. They are awfully small in mitochondria.* Feynman said it best in his lectures from the 1960's, that quantum mechanics works whether or not it makes sense to you. Because DHA works photoelectrically the same thing applies to it. This idea is offensive to many people who are biochemists or who focus on biochemical data on DHA. His quantum electrodynamic theory has come under testing in the real world thousands of time now and has never been found to fail in any circumstance as yet. DHA has been tested by nature exclusive now for 600 million years and never been replaced one time. Feynman pointed out in his lectures that these current facts do not mean these pillars cannot collapse in the future, but so far neither one shows any signs of crumbling. It is the best theory science has to date. This is critical to understand and accept.

This means you better understand how light controls your biology via DHA before you defaulting to a biochemical story. Why do I say this? DHA uses UV light to make an electric current and vice versa. Many people question DHA because of the class of biomolecules it comes from. It is a

polyunsaturated fat. Food gurus have the belief that PUFA's are bad actors because of the experiments they have constructed using them. The manner in which the studies were done never took into account how DHA works with water using Fermat's principles of least time. DHA works specifically on the particle aspects of light during daytime and helps water create density changes at nighttime in a cell when certain frequencies of light should be absent. This means what we truly understand about DHA's mode of action is terribly flawed in all the published literature. PUFA's as a class of lipids, do have issues when you look at the biochemical literature, but as Feynman correctly pointed out in his lectures, **" a plausible theory" must always be brought to bear against something observable and in reality to see if it has true merit. So what does nature say about DHA as the measuring stick to the biochemical data?**

So let us look at nature, and our human reality around DHA. **DHA has been present for 600 million years in the eukaryotic tree and NEVER REPLACED EVEN ONCE. If this lipid is bad in any way, just by chance alone you'd expect something else to have been naturally selected for to replace it.** Even though DHA has other competing PUFA's, like DPA, it remains the king of ALL eukaryotic cell membranes. Not only that, DPA is far easier to acquire via the diet and way easier to create on an energy basis, yet, DPA cannot do the job DHA can. DHA remains unchallenged in eukaryotic cell membranes, for some reason. That reason is photoelectric in nature. This raises the question, why has nature specifically continued to use DHA exclusively even when experiments show it has an ugly side? Feynman's insight here bears repetition. When you realize that is nature's choice for this long, any theory that bastardizes DHA, for any reason, maybe "good in theory", but fails under Feynman's test mentioned above. If nature uses it exclusively over 600 million years, we should not, and

cannot question its use, regardless if we have contrary proof from a lab experiment, that it might be a problem. Why do I echo Feynman's viewpoint here? Life is lived in nature and not in a lab. This is why light and electrons confounded physicists for so long. Their experiments prior to 1920 could not be reconciled when light's natural behavior was taken into account. So Feynman, took the unpopular view before QED was accepted by physics, that we should except nature's absurdity, and create a theory to explain how light seems to work in nature, no matter how queer is sounded. That is how QED was born. DHA works on all QED principles. And when he took that unpopular viewpoint, all the mathematics behind photons and electron interactions fit PERFECTLY, as far as we know them today. QED and DHA share this unusual linkage in science. Why can I say this definitively? DHA works with photons and electrons, and QED is the fundamental basis of how photons and electrons work. While biochemists can create many theories and ideas why DHA and QED make no sense for humans to use because of our experimental results, your common sense, really are immaterial in these affairs. The only sense that matters, is Mother Nature's sense, and you must embrace it. 600 million years is a long-term natural experiment. I've never seen a biochemical experiment done even 1/100th that long show that kind of constancy.

Some of you will understand Feynman's logic and some won't accept it. Nature could care less about your feelings or what a "biochemists theory" is. This is why we need more light guru's and less food guru's, in my opinion. We need people who understand that the duality of light is deeply entrenched in DHA's atomic ability to do things so small, we cannot perceive of yet, in a lab experiment at larger biochemical scales, we see differing results. In the quantum works things at the small scale do not act as things do on the larger scale. That is a fundamental tenant in QED. To a discerning

mind, it should be obvious that the biochemical experiments have to be missing several key ingredients in their experimental design that cause them not to match the results that nature gives life. Why Mother Nature uses light and electrons as she does is known and tested. But the fact remains, true today, as it was millions of years ago before the Cambrian explosion where all life exploded, that DHA has a 600 million year history in the eukaryotic family. It is a history built upon irreplaceability in lipid rafts. Biochemists would have a tall order to explain this paradox, and to date none have. A few experiments do not invalidate 600 million years of unfettered use. Feynman used this logic to repair the problems in physics with light and electrons in the 1940's. Biology has to do the same with DHA. Nature is the ultimate arbiter of this debate, not any contrary data. It should be clear that the current data does not explain the precise mechanisms behind nature's use of this lipid. Moreover, when ultra-specialized eukaryotes like humans move from a DHA template there is massive published data and definable problems in a loss of physiologic function. This is well documented by Crawford's work and many others. To say DHA is bad, requires extraordinary proof, using Feynman's logic. Biochemistry and Peat fail miserably at providing this level of proof. Feynman also posited that physics is the only fundamental science, and I agree fully with that opinion. All chemistry is based upon the electrodynamics of how electrons act in the valence shell of atoms. Chemistry then must be rolled into the physics as well. Chemistry is the basis of biochemistry so there is no way biochemistry is fundamental to quantum mechanics. In this way, you begin to realize truly why food cannot be fundamental to light at any level because the laws of QED are fundamental to light and electrons which are both fundamental particles in nature. Those two things interact directly with DHA to cause changes most of us cannot even fathom yet. I am giving you a "few" examples in this blog. And these facts, when laid out on an evolutionary timeline, should stop and make you think deep. Thusly, I have

created a conundrum for all biochemists philosophically. This issue is one that you the reader, must now address yourself to build or destroy your wisdom. Be skeptical, but bio hack your beliefs and Nature Rx to see where they fall. This is how bio hack should be built. Nature cares less about our philosophy either. Nature only exists for who she is. There are many biochemical issues that are contrary to nature today.

Feynman was right to point out that in cases like this, we must accept nature as she is, regardless of our feelings; Feynman said impossible ideas begin by suspending beliefs and then embracing the absurd in things that operate using QED principles. **A good biochemical theory fails terribly when we find that nature has "exploited it".** In this case, DHA is the "something contrary". Nature does not have to explain herself to us; **we have the burden of proof to explain why she does what she does.** This is why I view Feynman's ideas of QED to be substantially better than Peat's ideas with respect to DHA's importance to our health. In Feynman's world, the photoelectric effect, the particle and wave duality, and entanglement of QED were that something contrary, that need explanation. It is clear beyond the day that nature has EXPLOITED DHA for 600 million years without one replacement every recorded. ***That is extraordinary proof of a correlative novelty*** that is based upon evolutionary facts. I argue from a deep position of strength, not weakness, in this regard. Peat does not have any strength in this regard, even though many believe he does. They must explain why DHA has this track record it holds if DHA is so bad. Right now they cannot explain the dominance of DHA based on their half-truth experiments. **We can create experiments that raise doubt, but the probability that nature gives us for its improbable use is staggering**. And that is why you cannot hang your hat on any theory that doubts the veracity of DHA's use in eukaryotic tree. Feynman's logic is strong, in this regard, and should

make you think long and hard. For me, I decided long ago to side with Einstein, Feynman, and Mother Nature and rejected the plausible theories of the biochemists, who think otherwise.

BACK TO REAL SCIENCE

Proteins in life are always hydrated to make an EZ and this connection is made to link water, free radicals, proteins, and oxygen in a coherent syncytium designed to share the information, energy, and momentum of light in our environment with our mitochondria. Mitochondria are eukaryotes way of building a CERN like Hadron collider in our cells. Just as CERN can create things from light collisions in it 17-mile circle, mitochondria can create anything it needs to using light energy, if it is properly CONSTRUCTED as designed by nature. Light is all a mitochondria needs to create matter from energy inputs to replace what a cell needs. If there is no energy input, matter cannot be made to make up the deficit, and illness is the result.

TRUTH BOMB: Singlet versus triplet oxygen combined with the bad environment and artificial antioxidants gives the wrong cellular information for construction of our atomic lattice. If the lattice is poor than Fermat's law will be altered for incoming light. Fermat's "least time" principle will be violated and ubiquitination rates will rise as a result. It is akin, to having inclusions in your diamond. The more inclusions you have the less bright a diamond shines and the less it is worth. You can also think it is like having dirt inside your glass that you cannot clean with surface cleaners. The only way to clean that interior glass is to melt it and create a new glass when you remove the impurities. That is fundamentally what an elevated ubiquitin rate implies when a cell can no longer use light as nature designed.

This points out why taking exogenous antioxidants can screw you up on your path to optimal. Proper free radical signaling

is necessary for cell differentiation and proper light signaling using Fermat's principle of least time. No proper radicals = no cell differentiation = impurities inside of the tensegrity system = improper Fermat's law = cancerous cells.

This is also why when cells have an altered ability to handle light using Fermat's principle, pseudohypoxia is universally present and we see low NAD^+ levels. Optimal signaling requires high levels of oxygen in mitochondria to drive the reduction of oxygen using electrons that enter ECT. ELF-UV cannot be made without both ROS or oxygen. Oxygen is the only terminal electron acceptor that mitochondria can use effectively. This is why in cancer states metabolism is slowly shifted away from mitochondrial respiration to cytosolic glycolysis and the PPP when there is a problem. This is why Warburg's metabolism occurs. It's not just about the quantitatively less ATP production (2 vs 36); it is a qualitative issue that the cytosolic ATP levels must differ because of how light can travel through a cell using Fermat's principle. All heme proteins absorb red light. Cytochrome C in mitochondria is a heme protein. If not enough red light can get to this complex at the correct time, that cytochrome does not do its job to affect the density of water around the mitochondria.

The result of this complex interaction: The lack of proper ROS/RNS decreases cell differentiation, leading to mito-nuclear coaptation problems and cancer needs to seek out new mitochondria to survive. That is what metastatic cancer is at its core. A cell looking for a new "quantum heat engine" that works better as nature designed it too with respect to light. Mitochondria use free radicals (ROS and RNS) to code information and energy thermodynamically using the same quantum effects. Mitochondrial cytochrome protein clusters 'shoots' the radicals into cell water and into oxygen valence shell to reduce it and to send to all parts of cell increasing

its coherence as time develops. This process is most effective when we sleep, and when the background terroir is not filled with exogenous antioxidants, to alter the density to change light's interaction in a cell's quantum built-in processes. **Sleep is when biology becomes coherent. Taking exogenous antioxidants ruins that coherence. (*SUPPLEMENTATION WARNING*)**

During wakefulness (DC electric current) life can not entangle electrons and protons. During daytime, the light is sensed multiple color frequencies in sunlight. Coherence requires monochromatic light. Therefore at night IR light dominates cell biology. This is another reason why the DC electric current disappears during the night. The coherence of water is maintained by using its density changes imparted by infrared light release from mitochondria in the absence of light from the eye and gut. This density change can be examined by NMR analysis and water is found to be in its icosahedron molecular form. This is the state that water should be in at night. This is when a light frequency is lowest and when the wave part of the photoelectric effect is in maximum use. This molecular re-arrangement is discussed in Martin Chaplin's research, I have mentioned before in the quantum biology series of blogs. Liquid water is not a bit player in the theatre of life, it's the headline act for mitochondria because of how it interacts photo-electrically and photochemically. **It forms a battery and a motor portion in its molecules that are capable of doing different things for a cell to retain light's information, energy, and momentum.** This is how the photoelectric effect is preserved in a cell's design.

WHERE THE MONOPOLE HIDES?

The size and shape of the water molecule clusters in cell water determines is molecular density and its ability to be coherent for energy transfers using Fermat's least time

principal. Coherent domains in water are hexagonal in shape. The RPE and chloroplast copy this design feature. This molecular form of water stands between the battery portion of cell water (EZ) and the motor (UV aquaphotomics) portions of water to create a sea of topologic defects. Topologic defects are used to create *unusual magnetic phenomena in water.* The incident light energy is what determines the fraction of cell water that is structured to a battery or a motor. This is why the RPE and chloroplasts are hexagonal in shape and why coherent domains of water have also been found to be hexagonal by Martin Chaplin and his NMR studies. The size and shape of things determine their thermodynamic profiles in physics. When you know better, you simply outperform biochemists.

It's time for people to upgrade their seriously degraded game on antioxidants. *Stop believing that pills supplement makers create are good for you*. The data is not there in any study. Over supplemented results from being undereducated about light. Do not forget it. Light alone is fully capable of making all a cell needs to function, even if you cannot fathom it today. How this happens is yet to be elucidated but my December 2015 webinar gave my ideas to my members to consider. We need to focus in on optimizing our light environments to regain wellness. The belief persists because there is a lack of dopamine and melatonin in our eye that builds up in our brain to optimize Fermat's principle of least time. We lose this ability from missing the interaction of DHA to purple light and red light to changes in water density. Purple light and DHA is the only way we can assimilate the particle portion of the photoelectric effect in eukaryotes to build complexity. Red light and water are how we build regenerative processes optimize Fermat's principle in cells to stabilze mitophagy. All things alive are built from cells because cells are designed to spot elegance within the chaos of light's frequencies. My members have been told from the beginning to become more like the Sphinx, while literally, everyone around them in our generation is Gollum with their precious

technology devices shining into their eyes and onto their skin.

SUMMARY:

Light is complex because of the photoelectric effect. Embrace discomfort because it will clear the haze of beliefs that allowed you to get ill, to begin with.

I'll never tell you what to do, but I will always remind you of what you already know, that a wild intelligence resides in your DNA even if you are ignorant of how light controls us.

My philosophy has helped thousands of people to rediscover their inner physician, their inner teacher, and that part of themselves that is free and independent to think, to feel, to perceive and to lead.

Mass is just condensed energy. Light makes all atoms in matter programmable to lower entropy to allow life to manifest. *People forget all these basic factors in physics because they only get and have an experience with matter in their life, and not so much with the energy or information it contains.* That energy is photo-electric in nature. Einstein's mass equivalence equation shows us this side of our nature. It is time biology and clinicians begin to tap it. So when an apple is up high it has energy in it called potential energy. When it drops from the heights to the ground, the action of falling ascribed to gravity is actually a thermodynamic phase change. As the apple falls potential energy is lost to kinetic energy due to the effect of gravity. Kinetic energy is buried in the PE effect,

$\boldsymbol{hf} = W + (KE)_{max}$

When we consume a food like broccoli, for example, and digest it, it is metabolized into carbon dioxide (CO2) and water, plus the light stored from the sun and photosynthesis. We extract the CO_2 and eliminate the water, but the light, an

electromagnetic wave, must be stored somewhere. When taken in by the body, the energy of these photons dissipates and becomes distributed over the entire spectrum of electromagnetic frequencies, from the lowest to the highest. Plants do this in the photopigments in their leaves and we use lipids like DHA to transduce that light signal. *This energy is the driving force for all the chemical reactions of molecules in our body.* Before any chemical reaction can occur, at least one electron must be activated by a photon with a certain wavelength and enough energy from the sun.

Non-native EMF causes electron steal syndrome everywhere in cells including DHA inside your cell membranes and the water that surrounds your DNA. If you get stripped of your of electrons, you have to have more UV/IR in your surrounding to offset their loss. If you do not, it will lead you to lose the ability to be able to properly sense the Earth's magnetic field or the electromagnetic spectrum around your cells. The physics is not that complex. Recall how it works in cold water: Cold water is denser, hence it has more electrons. Isn't it convenient that DHA comes from the marine seafood chain and is most common in colder water fish? The more electrons you collect the more electron repulsion you generate in cold water or temperature so you do not suffer from cold exposure because your endogenous electromagnetic fields protect you from the cold; this is how polar bears, penguins, and fish do it. They are all linked to the marine seafood chain and the sea they swim in is called the photic zone where sun penetrates this water. These mammals do not have a deep source of the UV light so they amplify the PE effect by increasing the number of pi electron clouds in their cell membranes.

LOCATION CONTEXT WITH RESPECT TO LIGHT: Mammals have filled every ecosystem on this planet. Marine mammals and humans have many common ties in how their brains are built. Humans in their natural environment do not need as much DHA as a

marine mammal. Today's modern humans are no longer in their native environment so they need higher amounts of DHA since UV and IR light has been subtracted from our ecosystem while blue light has been added to an excess. You should only consider lowering your DHA intake when you increase your UV/IR exposure WHILE simultaneously limiting your blue light hazard in your eye. This hack requires strong UV/IR in your environment to do correctly. The photoelectric effect is why this recommendation is made. This is the key point of an environmental context. Why? Light needs electron clouds on surfaces to collide into to offload its energy and momentum to our atomic lattice. So the two variables are amount/power of light and amount of pi-electron cloud. If you overwhelm the system with strong UV you won't need as many pi electron clouds to get the job done. **This explains why equatorial zones are easier to recover in than regions outside the tropics.** It also helps explain the global decline in Vitamin D3 levels in humans today. It is also why seafood is not found as commonly in equatorial water in nature. Equatorial water is like a desert for seafood and DHA. The Gulf of Mexico is one place with the exception of this rule. Everything is yoked and connected in nature. It is our job see the threads that connect these things. When we are healthy good times prevail, but this makes biohacking more difficult because the results can be deeply camouflaged by the fundamental physical effects. But bad times have a scientific value for bio-hackers. These are occasions a good learner would not miss because the lesson is filled with natural wisdom of how things truly work in cells.

Take for example two electrons, one inside you from DHA and the other ones in found in abundance of dense cold water. These act to repel each other due to the electromagnetic force in physics. Physicists say that there is a mediator or exchange particle which is transferred between them, called the photon. A photon is a frequency of light and its action is governed by the photoelectric effect. A photon can be a "particle" or a "wave" of light. A beam of light is a great

many photons moving together in unison. Their structure is aligned by frequency or by amplitude, or by both in a cell. ***A cell is a quantum measuring device for light's frequency to make elegance from chaos light brings from our environment.*** When both are yoked properly, we call that light a laser beam. Physicists use lasers to entangle atoms. Life uses light to do the same thing at lower powers in your mitochondria using oxygen and hydrogen to power a cell. Do we have examples of tissues exhibiting laser beam like function? Hyperlink

If you increase the intensity of a beam of light, without changing the frequency of its wave, you actually increase the number of photons present in a cell. In this way, light can act either as a photon or an electron. What determines it, is the media it is traveling and the density. This is the basis of Einstein's photoelectric effect. Light has different characteristics in the vacuum of space than it does in your cells. The difference is that an electron has a small mass, but a photon has no mass. This is very important thermodynamically because of mass equivalence. Energy and mass are interchangeable in this dance, but light's frequency is what allows things to come together or apart in nature. When an electron drops from an excited state to its ground state, the electron releases one photon. It has been recently proven experimentally, one photon released in a lab can entangle 3000 atoms. Here is where physics gets tricky. The concepts of "intensity" and "amplitude" do not apply to an individual photon. For an electron, energy can show up as a combination of speed and mass, because this is what electrons have. Photons have no mass, so their intensity is tied to their wavelength frequency only. Frequency is the key factor for living cells because the light is the key factor that orders atoms in our cells. Cell adhesion is a requirement for proper cell division. Mitosis is controlled by ELF-UV release in eukaryotic cells. Altered cell adhesion is tied to cancer generations and excessive ELF-UV loss and pseudohypoxia.

Light controls cell adhesion.

For a photon, since mass is zero and speed is always the same, this changes only when the density of the medium that light travels in is altered or changed. In a cell that is the key part of the equation, we are all missing. Density is tied to Fermat's least time principal and to the wave aspects of light's duality. the wave aspects of light seem to be more important at nighttime and in females in my bio-hacking experience. It appears the major differences in the photochemistry of night and day and in male and female biochemistry is what aspect of light's duality we use most, and at what part of the day it occurs. Most of my bio-hacks for the last ten years focus in on these counterintuitive findings. Frequency is the only variable available to act as the indicator of the photon's energy, power, and momentum. These aspects of light represent the particle aspects of light best. They seem to be present duringdaytimee and at specific times of the day when UV light is part of the equation. This optical specificity imparts the ability to change matter inside cell's to provide it things it needs to function biochemically. I personally believe this is why proteins like SHBG and lysyl oxidase are so misunderstood by biochemists. They are optical quantum dots that have a frequency switch. If one imagines two ice skaters facing each other as two electrons, and one throws a ball to the other person both skaters will move apart, just as two electrons would repel each other in the scenario above.

When delving inside the proton (or neutron), it is not the electron which actually 'probes' the nucleon of the atom, but it is the photon that does it indirectly. Why is this the case? Because the mass of the electron limits its action and movements in nature. Photons have no mass, therefore, they can be used to energize only electrons as they travel. They have no power to do so with protons or neutrons. These fundamentals have allowed us to build UV laser beams in physics for the

first time now. It turns out every cell alive on this planet also has small UV lasers beams embedded in them; all cells release ELF-UV light to control atoms for the same reason. Roeland van Wijk's book gives tremendous proof's of these feats. This is how life organized to use the photoelectric effect, we just have not evolved enough yet to see these connections to nature. It is an electron that gives some of its energy away (and so loses some of its momenta) to the photon. The momentum in light is tied to its kinetic energy that it is able to transfer to the photon. This transfer process is bidirectional with respect to energy and information. This is why the photon is considered a force carrier (boson) of the electromagnetic force. Energy can be transferred to other forms of physics, but it cannot be created nor destroyed. The more momentum in the light that is transferred to the electron excites it. This elevates its energy above its ground state. The more excited an electron is, the more energy the electron can loses to a released photon that might be trapped in cell water. That energy can be harnessed to do physiologic work. Thusly, the photons trapped in the EZ of cells becomes filled with kinetic and potential energy to do the work biochemistry needs. That force, (light) is what your brain uses at night to do the work of regeneration in sleep as laid out in this blog.

This implies something deep about gravitation too. Gravity is likely an emergent feature of condensed matter, in that it only exists to balance the energy transfers that happen between forms of condensed matter.

That is a blog for another day……

CITES:

http://www.sciencedaily.com/releases/2014/01/140116084838.htm

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