Energy and Epigenetics 9: Quantum Sleep

Readers Summary

1. How did modern researchers miss what other already found 55 years ago?
2. Does the quantum action of sleep drive you away from consensus?
3. Sleep semiconduction concussion/PTSD and "Quantum You."
4. How does quantum sleep set the stage for quantum memory?
5. How does neolithic disease initially manifest?

"Each night, when I go to sleep, I die. And the next morning, when I wake up, I am reborn." – Mahatma Gandhi

Truer words have never been spoken than this quote. Today, I am going to show you how sleep mechanistically really happens in you and all humans. In my view, the modern biology of sleep can be viewed as an emergent property of the physical laws of chemistry, which, in turn, can be viewed as an emergent property of subatomic particle physics and how those particle interact. The interaction of these particles often causes consternation and confusion in people who have a "biologic bent" in their mind's eye. I suggest if you are one of these people, you begin to embrace the complexity and paradox. Because when you do, you begin to see quantum actions specifically, not driving your own "consensus in thought." This is often what biologists cling to. You should not embrace group thinking ever. Look at the complexity of elemental parts and the behavior they exhibit. Often the whole exceeds the sum of the parts in the quantum world. See and feel what they do, to understand why they do it in this way. Soon you will see the beauty in nature's quantum actions, which creates a conflict in the mind on purpose, which allows us to see things

with more ‘dimensions’ than we are capable of appreciating with our senses.

Quantum Sleep

Recently, several science magazines have reported on a study about neuronal firing and sleep. I smiled when I saw it. *Proceedings of the National Academy of Sciences* 108(28), 11650-5.

During waking hours, electrical signals travel from dendrites – antenna-like projections at one end of the cell – through the cell body. From the cell body, they then travel the length of the axon, a single long projection at the other end of the cell. This electrical signal stimulates the release of chemicals at the end of the axon, which bind to dendrites on adjacent cells, stimulating these recipient cells to fire electrical signals, and so on. When groups of cells repeatedly fire in this way, the electrical signals increase in intensity. Dr. Bukalo and her team examined electrical signals that traveled in reverse from the cell’s axon, to the cell body and out its many dendrites. The reverse firing, depicted in this diagram, happens during sleep and at rest, appearing to reset the cell and priming it to learn new information.

In the article, Dr. Bukalo and her team examined electrical signals that traveled in reverse – from the cell's axon, to the cell body and out its many dendrites. Her team seemed shocked by the finding and excited. ***They reported neuronal reverse firing happens during sleep and at rest, appearing to reset the cell.*** So why did I laugh? Dr. Robert O. Becker found the same thing over 50 years ago, but no one in biology seems to realize it, because his research was published in non-biologic journals. The blogosphere clearly knows sleep is important, but they too are clueless on what Dr. Becker found 55 years ago and how it applies to regeneration in you during sleep. Moreover, he found some even more interesting things than Bukalo's group. Not only does the direct current in neurons change signal direction during sleep compared to wakefulness, but so does the DC electric current in interfascial water layer below myelin. It changes it polarity. This is the main current used for regeneration of all tissues in all animals Becker tested. When the electric current changes it also means the polarity of the magnetic field in the brain and in nerves has to change in sleep and under anesthesia. The reason is based upon Maxwell law's of electromagnetism for which these two findings belong to. Again Becker proved this experimentally long ago. Dr. Becker actually put animals into a deep general anesthesia state with just a powerful magnet of 3000 Gauss. Becker got these ideas by read the work of Ralph Gerard while he was in medical school in the 1940s. Ralph Waldo Gerard was an American neurophysiologist and behavioral scientist known for his wide-ranging work on the nervous system, nerve metabolism, psychopharmacology and biological basis of schizophrenia. Many modern-day psychiatrists would do themselves, and their patients, a great service by reading his work.

Gerard was working on the DC electric current in frogs way before Dr. Becker took up the challenge in other animals. Gerard never took his experiments as far as Becker did with respect to the brain. In fact, when Becker was at the VA in

Syracuse, NY, he had trouble getting funding for his DC electric current research in the peripheral nervous system in the late 1950s. Ironically, this happened even though in four years he published massive amount of papers on his findings on salamanders and on bone physiology. So he complained to the Dean of the medical school at the time, who had happened to work with Gerard in Chicago. When the Dean saw just how much Becker had done and how he was pushing the boundaries of Gerard's original work, Becker got his funding rapidly. With that money, Becker quickly ran a series of unbelievably important experiments (that most still have no clue about).

In these experiments, **he proved how anesthesia works mechanistically and how sleep and wakefulness happen globally.** The problem was, he did not realize what he found back then. Why? Because many other discoveries had yet to have been made to allow him to understand the data back then. I realized the brilliance of his work immediately when I read it in 2008. Let us see first what Gerard did to make sense of what Becker did.

BIOLOGY GEEKS: In a series on experiments at the University of Chicago, Gerard, while working on frogs, was studying the cortex where it was one layer thick and all the cells were lined up pointing in the same direction. In these studies they found a negative potential on the side of the dendrites from incoming neurons, and positive potentials on the axons which leave the cortex. The results of these studies showed for the first time a steady direct current along the normal direction of transmission lines in neurons to and from the cortex. **Here was the first proof in biology that nerve cells were polarized.** These experiments also showed that the DC current was not within the nerve axon or dendrite, but they were outside of it. It also showed the DC current was not ionic because it could not cross a gap junction of salt water. They also found in intact frog brains that there was a **steep polarization between the front and back of the brain. The frontal lobes were more negative with respect to the occipital**

lobes. This implied there was a current flowing up the brain stem between the two hemispheres to the front of the brain. In the 1930s, no had a clue what that really meant physiologically. In fact, today in 2013 no one still does. Ironically, simultaneously, Hans Berger discovered electrical potentials on the scalp of humans in 1924, and he soon discovered these currents were the brain's electrical pulse's. He called it an electroencephalogram. EEG's are foundational to neurology, sleep medicine and neurosurgery today. No one realized that Gerard and Berger's work were complimentary, until Becker came along. Becker did the experiments to prove the brain was completely an electromagnetic quantum computer, but he never realized what he found. But I think I might have an idea just how important this work is. Read on.

Becker knew medicine was trying to cut ties with "electricity and vitalism theories" in the 1940-50s. He knew intuitively that biology was wrong to condemn a theory that clearly had had a strong experimental foundation in Gerard and Berger's work. He thought these findings by Gerard might explain how humans heal wounds and regenerate all their tissues. Tissue regeneration and bone regeneration is what made Dr. Becker famous in the next 20 years. This is how I learned about his work in bone physiology as a spine surgeon.

His work proved that nerves used a semiconductive current. He experimentally showed the Hall effect on salamander nerves when he froze their nerves and showed their was a DC current present all the time. This proved beyond a shadow of a doubt, that the layer below myelin provided a DC current to periosteum to signal bone regeneration or resorption to occur. The experiments were detailed and reproducible in every animal he tested. As an orthopedic surgeon, Becker knew that biochemists in the 1960s were trying to reduce all aspects of life to a mechanical interaction of molecules in a cell. He realized they were throwing the baby out with the bath water because they studied cells by fragmenting them and

homogenizing them in their preparation for experiments by draining them of all its intracellular water to study. Becker knew this was a bad idea because of how important interfascial water was in generation of the Hall effect for the semiconducting DC electric current below myelin. **He had a hunch that electromagnetism is what animated these molecules. Thank God he did, because he was right, and he may have given mankind the chance to go back the right the biologic paradigm of wellness eventually.**

He was dramatically influenced by Albert Szent Gyorgyi, who became a Nobel Laureate for discovering vitamin C. He was the first scientist to publicly say he believed that all of biology used semiconduction to animate life. In fact, Szent Gyorgyi's on March 21, 1941, gave a speech to the Budapest Academy when we mentioned that he felt electricity had to be part of life's magic, but he believed it was semiconduction that was the key missing piece. Becker took the implications of that speech, and in 20 years, proved Szent Gyorgyi correct with his work in human bone regeneration. Most people in the blogosphere are in the dark about these findings. **You should not be any longer because they have massive implications for sleep and regeneration.**

Sleep Cycles

- **Pre sleep:** beta waves or normal alertness
- **Phase 1:** alpha waves, mind at rest, eyes closed but still conscious (meditation)
- **Phase 2:** theta waves or light sleep
- **Phase 3:** delta waves or deep sleep
- **Phase 4:** REM/sleep/dreaming
- **Phase 5:** theta waves or light sleep, signaling the end of a sleep cycle

The first thing Dr. Becker did when he got his money from the dean of the medical school was to pass electric current

through the brains of salamanders. He found when he passed a minute current from front to back to cancel out the DC current, it fell unconscious immediately. When he passed small currents through their heads, the delta waves on the EEG got bigger as Becker increased the electric current. The trend in all animals was they got more sleepy and unresponsive as the DC electric current increased. He then decided to use delta waves as his "research marker" because of the induction of sleep in the animals. **He then hypothesized: did chemical anesthetics work by blocking the DC current?** He found it worked to a certain extent, but he could not assess the real effects of the DC electric current because of the side effects of the drugs on the current. He also found a direct correlation that head voltages dropped as the chemical anesthetics took affect. He then used a direct current to partially awaken the salamanders by reversing the current of flow.

Sleep and Memory

The most important thing Becker found during this line of work is that he could put the salamanders to sleep with a DC current and wake them up just by changing the direction of the DC current. He proved 50 years ago what was recently just heralded as a great finding by Olena Bukalo, PhD. at the National Institutes of Health. Her recent data backs up what Becker already found and published.

When the mind is at rest, the electrical signals by which brain cells communicate appear to travel in reverse direction, wiping out unimportant information in the process, but sensitizing the cells for future sensory learning. The reason why Dr. Bukalo's study was important is that she realized why this finding was important. Dr. Becker did not, and never did.

Dr. Bukalo first stimulated the cells with reverse electrical impulses, her group next stimulated the dendrites again with

electrical impulses traveling in the forward direction. In response, the neurons generated a stronger DC electric signal. Remember, Becker is the person credited with discovering that the DC current was present in all animals and humans and the source of regeneration. This current was found to be located outside the neuron axon and below the myelin and associated with myelinogenesis.

We have known for sometime that sleep plays a major role in the the ability of the brain's cells to grow and repair themselves. This is also important in myelin growth. We saw this in Energy and Epigenetics 1 and the infant brain. This is why infants tend to sleep a large portion of the young lives while eating a predominate ketogenic diet to provide the fats needed for myelination. Becker found the regenerative DC electric current was tied to the interfascial (glylymphatic) water below the myelin layers. Have a look at the article link you just passed.

Recent research has further given credibility to Becker's working hypothesis about the regenerative currents in humans. Work was recently published in The Journal of Neuroscience where mammals were forced to stay awake or allowed to sleep and the effect on myelination was assessed. Researchers looked particularly at how sleep, or lack thereof, affected gene activity of cells called oligodendrocytes. These cells are the cells which play a role in the production of myelin in the brain. Schwann cells do this in the peripheral nervous system. Myelin covers brain and spinal cord nerve cells projections as a sort of "insulation" and is vital to the production of the DC current from the CSF space. The study shows that sleep seems to turn on genes known to play a part in the formation of myelin. This helps explain why infants need to sleep so they can grow myelin in their brains to mature the nervous system. Meanwhile the research also showed lack of sleep was linked with the activation of genes associated with cell stress and death. Sleep is vital for wellness because it helps

maintain myelin, which is critical in maintaining our ability to regenerate tissues when we sleep in autophagy. Becker was the first person to suggest this long ago.

Memory is the ultimate ability to regenerate our daily experiences in order to create knowledge. **It turns out Bukalo's work proved that Becker's DC electric current regenerates our neural networks to remember and recall events.** She also demonstrated that the neural connections appeared to strengthen with repeated polarization changes in electrical stimulation. She still has not realized why this is big news. When you use my model of the Quantum brain I mentioned in Energy and Epigenetics 5 and Energy and Epigenetics 6, it should be crystal clear why this is huge. **This is why sleep works in cycles, and it explains how sleep actually works mechanistically.**

This pattern of cyclic polarity changing of electric currents appears to underlie the formation and regeneration of new memories. It also explains why memory is lost and the ability to regenerate or heal any tissue is altered when sleep declines . You have learned in the Brain Gut series **the axiom in neurosurgery is the circuits that fire together, wire together.** Have a look back at this post now, because it is a critical one for understanding how sleep ties directly into transgenerational epigenetics and optimal regeneration.

A neural network that is reset or regenerated but never stimulated again may simply fade from use over time. This reversal of current is how we strengthen circuits and prune others.

Hall Effect and Anesthesia

Any one who tells you life does not use semiconduction to work has not read the literature with a discerning eye.

After Becker found that the DC current could induce sleep and

anesthesi,a he really stepped the game up. He experimentally proved that the DC current was a semiconducting current by proving the Hall effect in frozen nerves using a strong magnet. No one seems to know exactly what he found. I want to share with you how amazing his work was. Here is where Becker tried to advance Gerard's work to the brain level from the peripheral nervous system. What he found still is untapped by modern medicine and biology.

Becker reasoned if a DC current could induce sleep and anesthesia, why could not an altered magnetic field do the same thing? He knew he could not measure the Hall effect in the brain as he did in peripheral nerves, but he knew from Maxwell's laws of electromagnetism that magnetic fields act at 90 degree angles to direct electric currents in the nerves. So he reasoned if he placed a strong magnetic field perpendicular to the brain he could induce anesthesia in any animal. It was a pretty bold idea to state, and an even more bold experiment to undertake. Guess what? Becker showed his intuition was spot-on correct. He did the experiment to induce a general anesthetic with a 2,000 Gauss magnet and he got diffuse delta waves on his EEG recording. So what did he do for an encore? He increased the magnetic field to 3,000 Gauss, and the animal was in a complete general anesthetic state. The shocker of this experiment? When he stopped the magnetic field effect just by removing the magnet, the animal woke up with none of the side effects of modern anesthetic drugs within seconds! This stunned him as an orthopedic surgeon, and it stunned me when I read it in 1999 and again in 2005, when it dawned on me what he really discovered. **I still wonder why no one in medicine has used this in humans for sleep apnea, insomnia, PTSD, mental illness or for anesthesia? You might be beginning to see why I became a fan of using a magnetico pad to improve my ability to sleep and regenerate now.**

The reason it has not been done or expanded upon in anesthesia, in my humble opinion, is Becker's work on nerves

and bone is still not well known in medicine today, and in the 1960s when he found this, no one could fathom that the brain worked via a DC electric current and via a 90 degree magnetic field to that current. It was untenable during this period to think this outside the box. Well, Maxwell's laws describe the effect perfectly and Becker proved they existed in us. Not only is "medicine is the dark" on sleep, but so is the current ancestral community and what it really means for optimal health. Sleep and regeneration are coupled, and Dr. Becker proved the mechanism long ago.

Quantum Memory

All this background data was important for me to review for you today. Using my model of the Quantum brain, and how the electromagnetic field works to animate life, I figured out how sleep begins, how it reverses to awaken us and how it stimulates memory. Pretty big statement huh? Well read on! It also explains why neuro-degeneration destroys memory early on in the disease process.

NEUROLOGY AND NEUROSURGERY GEEKS: Most people know that all neuro-degeneration diseases are associated with memory loss. In Alzheimer's disease, the hippocampus in the wall of the temporal horns of the CSF ventricular system is one of the first regions of the brain to suffer damage from this disease. Memory loss and disorientation of spatial relations are included among the early clinical symptoms. People with extensive, bilateral hippocampal damage may experience anterograde amnesia. This is the inability to form or retain new memories.

Sleep apnea patients suffer the same effects but over a much longer time frame. Hippocampal place cells interact extensively with head direction cells, whose activity acts as an inertial compass, and conjecturally with grid cells in the neighboring entorhinal cortex. Head direction cells track

gravity. The arrangement of spatial firing fields all at equal distances from their neighbors led to a hypothesis that these cells encode a cognitive representation of Euclidean space spatially. The discovery also suggested a mechanism for dynamic computation of self-position in space/time based on continuously updated information about position and direction. More proof that our brain is a quantum computer of astounding capability.

What makes grid cells especially interesting is that the regularity in grid spacing does not derive from any regularity in the environment life lives in, or in the sensory input available to an animal. In other words, grid cells appear to encode a type of abstract spatial structure that is constructed inside the brain and imposed on the environment by the brain with no regard for the sensory features of the environment. This is how the brain recreates our spatial reality. Quantum memory will surely get its own blog to show you its complexity in the future.

NEUROBIOLOGY GEEKS: So where does this all tie back into the quantum sleep story? Neural activity in nearly every part of the hippocampal system is modulated by the limbic theta rhythm, which has a frequency range of about 6–9 Hz in rats. The theta waves signal a new sleep phase is getting ready to begin. This corresponds to a phase reversal of the DC current in the brain to strengthen memories or lessen them based upon Becker and Bukalo's work. It turns out, a portion of the hypothalamus called the medial septal area is the central controller of theta waves that signal the reversal of polarity of the electromagnetic field of the brain. Grid cells, like hippocampal place cells, show strong theta modulation. Microglia are very abundant in the dentate gyrus (DG) where the hippocampus is located. **Today we have increasing evidence that these are the cells that mediate the inflammation-induced reduction in neurogenesis.** The inflammation is induced from from nonnative EMFs across the brainstem. The microglia sense

this field effect and they release calcium because calcium homeostasis in the brain is tied to calmodulin signaling. As discussed in Energy and Epigenetics 3, Calmodulin signaling has been found to be altered due to nonnative electromagnetic radiation from any source. Few people know this and even fewer understand the science that explains it. **This is one major reason why memory is destroyed by non-native EMFs. This is also why memory is lost early on in neuro degenerative diseases. November is Alzheimer's Awareness month. You would do well to try to understand these implications.**

What Dreams Are Made Of

It turns out that microglia inhibits the normal proliferation of neural stem/progenitor cells despite the absence of inflammatory stimulus. The inflammatory stimulus is from natural sunlight light during wakefulness which acts to oxidize cells to cause inflammation. This changes water chemistry in the brain. This is why I have consistenly told you we are oxidized in our cells during sunlight hours by design. UV AM sunlight is that key. At night, the cells becomes chemically reduced to form new neural networks. This is how we build new memories. This implies that sleep is used to make huge numbers of neural circuits. Remember, **neural circuits that fire together, wire together and eventually sync together to form neural networks or memory.**

Guess what dreams really are? They are the "firing up" of these newly made neural networks, so they become operational using light.

The electromagnetic radiation from light and the Earth's magnetic field oxidizes neural circuits with native EMF from the sun. This native EMF, uses the photoelectric effect on our surfaces, and actually initially imprints our neural circuits with this information and energy. This is how the semiconducting circuits in your brain are made to absorb these

energies. What strengthens these circuits is constant use and reuse of these networks, and the stimulus is this native electromagnetic force of light. This explains why 48% of brain circuits are tied to the photoelectric effect as I told you in Brain gut 11. **Circuits that fire together, wire together.** New circuits are made with BDNF and progesterone, but they need melatonin and cortisol cycles to be perfect to make the system imprint new information carried in these photons and electrons. If the system is not used consistently, we take them apart during sleep. This implies that the function of sleep is to chemically reduce the neural circuits that are used constantly during wakefulness. That is precisely why quantum sleep happens. Quantum sleep is the ultimate reset switch in the brain to offset the damage during wakefulness. When circadian cycles are off for any reason, and we cannot perceive the native EMFs correctly, we get alterations in memory and in sleep. Sleep happens to be radically disturbed in neuro-degenerational diseases. This is fundamentally why memory is lost early on in all these diseases.

How Do We Generate Quantum Sleep in Humans: The "Coolest" Part of Life

Light is the most potent synchronizing factor for the circadian system. Light information travels directly from intrinsically photosensitive ganglion cells in the retina to the master circadian clock located in the suprachiasmatic nuclei (SCN) of the hypothalamus. **Light only enters the eye, skin, gut, and the pineal gland in the human body.**

This helps explain why exposure to artificial long wavelength blue light at night can lead to disruptions in metabolic energy homeostasis in mammals (van Amelsvoort et al., 1999; Parkes, 2002; Knutsson, 2003; Ha and Park, 2005; Obayashi et al., 2013).In the morning we need shorter wavelength blue UV frequencies to wake us up and set up the circadian release of

the AM hormones I spoke about in Cold Thermogenesis 7. *To most biologists and scientists, however, it remains unclear how environmental lighting affects metabolism.* If you understand this blog and the last few, it begins to make total sense. **When you understand from Becker and Bukalo's work that neuron flow is *bidirectional electrically and magnetically,* one can understand how we wake up and fall to sleep.**

The pineal gland collects light signals from the RPE of the retina by way of the photoelectric effect, while it simultaneously senses the magnetic field from the Earth and from its input from the superior cervical ganglion due to the change in paramagnetic blood flow. **This means the pineal gland is an organ which uses optical magnetic resonance.** This is a term coined by 2005 Nobel Laureate Roy Glauber.

IN NON-GEEK TERMS: The pineal gland acts just as a laser acts in a physics experiment: to make the signals brought to it act in coherent fashion.

NEUROSURGERY GEEKS: Blood flow is higher during wakefulness than it is in sleep. This is a sympathetic nervous system ganglia that allows the pineal to sense the differences in magnetic field during day light and night time. The pineal also has calcium crystals in it to sense the gravitational field and waves the animal is in. These three sensory inputs simultaneously allow the human to create a ***pattern of coherent action***, just like a laser did in Glauber's work. **This all occurs in the posterior third ventricle of the human brain to generate an electromagnetic vortex in the CSF/water in the pineal recess of the ventricular system.** This vortex direction of flow, activates or deactivates, the SQUID in the surface ependyma cells. The ependyma is the *inner surface* of the human brain adjacent to CSF/water. The flow wakes us up to sunlight and puts is to sleep with darkness, and the CSF vortex is the quantum switch that does it. The cilia in the ependyma cells begin to beat coherently in the direction of the vortex. The polarity is created by the flow of the vortex because of the

electromagnetic signals generated in the pineal gland, which then is transduced to the fluid waves in CSF. The cilia in the ventricular system pay deep attention to the native electromagnetic forces from the resonant cavity of the Earth (Schumann resonance).

A row of cilia on the ependymal cells in the human brain

When it is dark the pineal gland generates a vortex that spins outward in a clockwise fashion similar to a hurricane. This diminishes electron flow to the ependymal SQUID and they begin to work less optimally as well and support the clockwise rotations of CSF. When the vortex changes its flow, it changes the direction and polarity of Becker's DC current below myelin and outside the axons. This is the current that determines how we regenerate tissues. So the current of flow really contains our health or wellness quotient. How powerful or inefficient our CSF vortex is determines the wellness or illness we have. If we have less CSF, we generally have some disease in the brain. This allows less CSF water structure to occur in the vortex, and it contains less electrons to deliver to the SQUID to power life and regeneration. Most importantly it reverses the current's polarity in the brain during sleep to dissipate energy. This allows us to go to sleep and wake up as the electromagnetic radiation on Earth's surface change daily. The SQUID in our brain surface on the outside and inside of our ventricular system in our brain is critically important.

PHYSICS GEEKS: With natural sunlight hitting the retina, the photoelectric signal is sent directly to the pineal gland. CSF becomes more excited as energy is added to it by the excited photons. The physiologic response is cortisol levels begin to rise in the plasma. This implies that the hormone response is a direct action of the photoelectric effect. Maybe you are

beginning to see why Energy and Epigenetics 4: Light, Water and Magnetism is a key piece to the puzzle.

When light enters the body it heads to the pineal and the photoelectric energies are added to CSF/water. This acts to decrease the Earth's magnetic flux on paramagnetic blood flow. This is the essence of optical magnetic resonance. Birds and bees use this same thing to navigate the globe. Think EE 5. This is why the only sensory afferent nerves to the pineal gland comes from the superior cervical ganglion which sits on the vascular tree close to the heart. (Anatomy lesson) When the photoelectric effect is present is increases blood flow from the heart toward the brain and passes through vessels that the superior cervical ganglion sit upon. This increase in vascular tone occurs in the AM and decreases in the PM as light begins to dim. This is how the pineal gland senses the diurnal changes in the magnetosphere and yokes it to sunlight in our paramagnetic blood.

Energy and Epigenetics 3 flashback quote

NON-GEEKS: Why is ion frequency important for you to understand? Ion cyclotron resonance is a phenomenon related to the movement of ions in a magnetic field. Moreover, **it links the photoelectric effect to the magnetic field that ions are in**. Whatever the frequency of the electromagnetic field strength is dictates how biochemistry reactions will be altered for the better or the worse." Why is this quote important? **Your "favorite biochemists" are clueless to this quantum effect. QED is not "built into the chemical equation" as the guru's tell you.**

Light and magnetism directly affect calcium signaling in the pineal gland that starts the cyclic structuring or un-structuring of the vortex in the third ventricle. This is where EE4 meets EE 3 on the blog. **Nature uses only the longest**

threads to weave her patterns in the Quilt, so each small piece of her fabric reveals the real organization of the entire tapestry.

Continuing the Current Blog

When this happens in the pineal gland via calcium signaling, the electromagnetic energies cause the vortex to change the direction of circulation by becoming a counterclockwise funnel vortex from a clockwise vortex. This means the vortex rotates the opposite direction. When it rotates in the opposite direction it reverse the current of flow of the DC current. This is how all life wakes up and goes to sleep. We focus electron flow and we disperse electron flow by the direction of spin of the vortex toward or away from the SQUID inside the ventricular system of the brain. Remember this current is below myelin layer and outside of the axons of neurons born directly in the CSF space, called the glylymphatic channels. It also affect water flows between neurons and glial cells.

CONCUSSION/PTSD ALERT TRUTH BOMB: When a human sustains head trauma of sufficient energy, the vortex is changed immediately. ***This is exactly what a concussion or PTSD event does to a human brain as well.*** It reverses the vortex immediately, in spite of the environmental signals the brain is getting from the environment, and the pineal gland sends out the incorrect signaling at the wrong time to cause post-concussive syndromes. Younger patients are more afflicted because they have lower levels of myelination in their brain to regenerate their circuits to offset concussion symptoms.

An outwardly expanding vortex (clockwise rotation) is used by nature to encourage breakdown and decomposition of energy streams. This is what we see in hurricane that acts to dissipate excessive atmospheric energy to the land below, in outward bands. **This is precisely how the pineal gland works to structure CSF water in wakefulness or un-structure it during**

sleep to reverse the DC current in the subarachnoid space. It reverses the vortex, and by doing so, it lowers the temperature of CSF in the vortex with the simultaneous release of melatonin. Both of these actions structure the water in CSF but disperses the energy flows directed over the reticular system of the brainstem. This decreases electron flow into the brainstem, but the relative coolness during this action improve the current of flow in neurons but in the opposite direction of wakefulness. This is why Becker's work in the 1960s on salamanders and humans are seminal. Anytime their is a reversal in the electric field current, it is associated with a change in the polarity of the magnetic field. **The pineal gland pays attention to light, dark, magnetic fields and to gravity.** The vortex direction of spin is critical in dissipating or dispensing energy/currents toward the hypothalamus or increasing it when light is present. This is what allows all animals to sleep and awaken. Inwardly spiraling vortices are used in nature to build up, to create, and to energize flows of energy and electrons.

Vortices manage energy by gathering it up or dispersing it. The target of the vortex is in the anterior third ventricle and it is the hypothalamus and all of its deep grey nuclei that function as they do based upon the direct flow of CSF in the vortex. In this way the brain allows the nuclei to act as Maxwell demon's by coupling and uncoupling their physiologic function based upon nothing but the direction on electron flow. The DC current all work bidirectionally in al neurons. This explains why sleep and metabolism are yoked in all parts of the tree of life in all life forms. It also explains why the gut shuts down in sleep when the vortex reverses. It explains why we get REM sleep when the current begins to reverse over the optic plate during the cycles of sleep. It also explains why memory is increased by sleep and why dreams occur in sleep. The direct current of flow allows us to see things during sleep in an electromagnetic reversal of flow of the CSF. The key to the mystery has always been the mechanism

and the hidden reality that neurons in most higher mammals allow for bidirectional flow of electron current toward or away from the SQUID called the ependyma. The vortices harness energy everywhere in nature keeping the entire cosmos organized and alive. This occurs in black holes, and it occurs in our brain. A vortex is the epitome of nature's use of opposites in the maintenance of balance. In fact, vortical movement is a perfect example of balance through polarity of the flow of the fluid or gas. In the case of the mammalian brain it is the polarity of the current of flow and its magnetic field. It is also nature's finest creative and organizing force.

Sleep is induced or ended by the direction of spin of the vortex in the ventricular system. It is aided by the surface cells in the ventricular system called ependyma. These cells all have cilia projecting them to sense the direction of flow to signal to the spinal cord below that is should remain quiet by causing a loss of the DC electric current Becker found in sleep and in anesthesia. Vortices are the result of a self-organizing flow from the action of the pineal gland forcing CSF/water to begin a counterclockwise or clockwise rotation around its own axis with an increasing or decreasing radius to dissipate the concentration of the flow of electrons on the SQUID of the CNS. Anything that is self organizing should be considered a Maxwell demon. This means little energy is expended while entropy is simultaneously reduced. We talk about this action extensively in the **November 2013 webinar**.

HOW IT HAPPENS:

The system is designed to have a clockwise flow radiating from the pineal gland in the absence of light. It has a counterclockwise flow in light. The counterclockwise flow focuses energy production into the funnel of the vortex and this forms a sub pressured area at the apex of the vortex and concentrates energies. This is what a tornado does in nature.

This area of increased energy carried in the CSF to structure the water in CSF causes an electron burst all over the neocortex to allow us to wake up. The first target of this increase of electron waves is the hypothalamus where the hypocretin and leptin neurons are located. These cells react to the current of flow and its polarity/direction to stimulate or diminish all of the behaviors associated with wakefulness or sleep. The system is designed for redundancy for efficiency. This is part of fractal design of self similarity.

Theoretically, the speed at the center of a vortex is infinite. This is why all black holes have a vortex at their centers. Richard Feynman, a Nobel Laureate, proved this was true experimentally and mathematically over 50 years ago. This makes vortices physically capable of breaking through dimensional boundaries. If you remember what I said in EMF 2, C^2 (light) is the critical piece for biology when the mass equivalence equation is reversed and read right to left. C^2 becomes foundational to where biology begins in life. Well, this is why it is reversed. Quantum mathematics shows you a vortex can and does exceed the speed of light mathematically in a vortex. Using a vortex to structure CSF water is how biology approaches the speed of light squared to achieve consciousness and wakefulness. The vortex is a gateway between levels of energy and reduction of entropy. From a tornado to the spiraling growth of plants, the vortex is Nature’s mechanism for increasing the quality of energy from a lower to a higher level. Black holes can be thought of as vortices, considered by some to be gateways linking different parts of the universe or different universes. Water vortices are how our brains wake us up and put us to sleep. Richard Feynman did some amazing foundational work on quantum vortices in the 50s and 60s. Here again we see how QED scales from cosmologic scales to our own brain, yet again. These vortices help signal environmental signals that the brain codifies into circadian signals.

There is copious previous research to suggests changes in the circadian system can lead to metabolic disruption. I have said for three years on this blog that light exposure was far more important than food. You might want to go back and reread Brain Gut 11 now. The reason is because of the effects of exposure to blue light at night or a lack of UV exposure in the AM on the retina and how the circadian system senses the energy in the vortex of CSF. This is done via the exclusion zone of water. in CSF. CSF is 99.8 % water. It has been well established in the literature that exposure to ecologically relevant levels of even dim light during the night attenuates circadian clock gene and protein rhythms. This can and does change hunger, appetite and feeding behavior, leading to weight gain as we lose energy to the environment. The mechanism contained in this blog, however, has not been well established in the literature because biologists do not take the cues from physics. Becker's work has been published and ignored by biology for 55 years. I was able to use it, plus my observations as a neurosurgeon in surgery in humans of flow in the CSF during awake craniotomies and craniotomies done under general anesthesia. We need to always make sense of observations we have. I told you this powerful message in the Obesity qualia post.

Now you have the mechanism of why I believe sleep and anesthesia happens. You also now have the "quantum basics" of how memory occurs in us as well. That will get its own blog down the pike because it is also an amazing process. If the power, strength, or direction of the vortex is altered by light, magnetism or gravity, it will alter the vortex polarity, to change the firing on the surface of SQUID on the hypothalamus and hippocampus. All of these observations indicate that exposure to dim light at night and/or altered electromagnetic field, both very common in our modern world, can influence the circadian system and metabolism tremendously.

When it is nighttime, the CSF vortex is clockwise and dissipating electrons instead of funneling to the ependymal surface when we sleep. Melatonin rises and temperature drops in the human brain and body. This dropping temperature increase the regenerative DC current in the opposite direction to regenerate the dendrites and strengthen synaptic networks. Remember, networks that fire together, wire together. This is how dreams and intelligence come about during autophagy.

This also links directly to why sleep and weight loss are coupled as well. It also makes sense why weight gain happens when these processes are decoupled by alterations in non-native light or electromagnetic forces. Melatonin release also increases brown fat expansion to burn energy as free heat by lowering the hypothalamic temperature set point in sleep. This is why cold, leptin sensitivity and weight loss are also linked by Mother Nature.

When you dissipate energy more during the day, and when you can not reverse your vortex polarity well at night because fake light and and high levels of EMF alter the ability to create the vortex, sleep apnea is the result. The less energy present at the intraventricular ependymal SQUID in the CNS leads to a higher prevalence and incidence of sleep apnea. As this happens slowly over time, the person emits more black box radiation and consistently loses energy in their brain and this stimulates an increase in fat by mass. Many people with a biologic bent chuckled when I mentioned that obesity is caused when a person is emitting more black box radiation. Modern day physics has already experimentally proven all things emit black box radiation. Fritz Popp, a biophysicist, has taken this science many scales higher. He has shown that we emit light in the form of bio-photons. He also has shown that cancerous cells emit a different energy of bio-photon that a healthy cell does. His work gave me insight to why poor sleep and obesity are linked by the design of a quantum cell. **This occurs because because as energy drops the structure of matter**

is forced to change by the action of the electromagnetic force. When you lose energy you no longer can take that energy and dissipate it, via brown fat (BAT). BAT is active metabolically and disposes of extra energy via generation of heat through uncoupling oxidative phosphorylation in mitochondria by uncoupling proteins. **The physiology of BAT is readily regulated by melatonin. HUGE.**

When light dims as the day ends, melanopsin is activated in all eutherian mammals. These are the mammals who survive the KT asteroid event you heard about in the last chapter of my book. In non-mammalian vertebrates, they have an intrinsically photosensitive iris in there eye resulting in a local pupillary light reflex (PLR). The light reflex is critical in understanding how your eye works as a clock and not a camera.

KEY POINT: **Melanopsin is a new photopigment (480nm) found in the eutherian mammal and human retina which regulates non-visual functions of light such as the synchronization of the sleep-wake cycle, and relays photoelectric and magnetic signals to the pineal gland and the allows the pupillary reflex to work in dim lighting for mammals to see as the sun rises or falls.**

OPHTHALMOLOGY GEEKS: In 2005, we found out the precise quantized fashion of how melanopsin works with the photoelectric effect of sunlight. Biochemists still do not realize how these findings impact biochemical reactions in humans, but now you do. **This research showed definitively that melanopsin is the true circadian photopigment of all eutherian mammals.** Invertebrates use cyptochromes to perform this physiologic task. Melanopsin's strong homology with invertebrate opsins and the depolarizing light response of ipRGCs suggests they may use a rhabdomeric phototransduction cascade. In rhabdomeric photoreceptors, breakdown of PIP2 by PLC generates two by-products; a membrane-bound component called diacylglycerol (DAG), and inositol-triphosphate (IP3), which is free to move about the cytosol. IP3, on the other

hand, can cause release of intracellular calcium from stores within the cell, which can lead to the opening of so called “store-operated channels”.

This is not good news when one considers the effect of EMF on calcium channels that we discussed in detail in EE 3. Together with diacylglycerol (DAG), it is a secondary messenger molecule used in signal transduction and lipid signaling in all biological cells. While DAG stays inside the membrane, IP3 is soluble and diffuses through the cell to allow proper signaling. If it does not work, signaling in lipid biochemistry breaks down. This is not good news for your neurons or your myelin in your CNS or PNS or your waistline. IP3’s main functions are to mobilize Ca2+ from storage organelles and to regulate cell proliferation and other cellular reactions that require free calcium. In smooth muscle cells, for example, an increase in concentration of cytoplasmic Ca2+ results in the contraction of the muscle cell. It plays a massive role in neurodegenerative disorders like ALS, AD and Huntington’s disease.

In the nervous system, IP3 serves as a second messenger, with the cerebellum containing the highest concentration of IP3 receptors. This helps explain why autism and EMF are also linked at the hip as I discussed in detail in the September 2013 webinar. There is evidence that IP3 receptors play an important role in the induction of plasticity in cerebellar Purkinje cells for proper neurologic development. This is why autism is linked to altered hindbrain development. It turns out that this is directly tied to the proper electromagnetic polarity occurring at the precise quantum time of embryology in humans.

Energy and Epigenetic 3 Flashback

quote:

“The reason why this is important to you and your biology is that when calcium rises inside your cell membrane it is pumped out immediately because a rise intracellular calcium mediates apoptosis and autophagy and cause massive problems in intracellular signaling. Rising intracellular calcium goes by another name you might have heard; **it is called excitotoxicity.**

Excitotoxicity is tied to heart disease, neuro-degeneration, atherosclerosis, sleep apnea, alterations of circadian cycles and autoimmune conditions.

Calcium efflux occurs due to direct alteration of voltage gated channels when a non native electromagnetic field is present.”

Do you understand why it is so damn important yet?

This biochemical cascade described here uses proteins that are loaded with transitional metals found on the periodic table. This is also instructive why artificial light and non-native EMF are not a good thing for cells when you consider what I shared with you in the recent September 2013 webinar. When a photon is absorbed by melanopsin, a response is elicited but the photopigment also becomes desensitized. In contrast to rod and cone photopigments that require the enzymatic retinoid cycle (Vitamin A cycle) to restore their light sensitivity, melanopsin uses the absorption of a second photon from sunlight light to regenerate the photopigment. This light-driven reversibility, called “bi-stability,” is what enables melanopsin to maintain a sustained response to dim lit “lighted stimulation”, contrary to the physiologic action of rods and cones, which only respond to transient changes in light. It is like a dimmer switch being added to your lighting system at home.

Two main mechanisms where melanopsin is used to regulate sleep in mammals are:

1. The circadian mechanism, which determines the optimal time for sleep.
2. The homeostatic system, which keeps track of how long the body is awake and asleep, and triggers "**sleep pressure**" when the body suffers from sleep deprivation.

Dopamine is a factor in the regulation of melanopsin mRNA in intrinsically photosensitive retinal ganglion cells (ipRGCs). ipRGcs are a rare sub-population of ganglion cells (1-3%) whose primary role is to signal light for unconscious visual reflexes, such as pupillary constriction, and regulating a number of daily behavioral and physiological rhythms, like circadian rhythms! This process in the human visual system is used to adjust circadian rhythms to the light/dark cycle of an mammal's environment. This process is known as photoentrainment. The visual behaviors under ipRGC control are remarkably tonic, and require long integration times from ambient light levels as the sun sets or rises. The unique properties of ipRGCs, both functionally and anatomically, make them well suited for regulating such behaviors in humans.

Why is this important to you now? In the September 2013 webinar, you learned about how non-native EMF, within the microwave range, directly effects the **transition metal chemistry** in biologic proteins. These elements are iron, copper, zinc, aluminum, maganese, etc. **Maybe you are beginning to realize why organic and biochemists just don't get quantum biology now?**

The proteins life plays out upon are the stage which the drama of life unfolds. The actors are none other than the small and highly mobile subatomic units called electrons and photons. Most of life's protein contain these transition elements and that makes them targets of non-native electromagnetic forces. If biochemists and chemistry equations don't see their real

actions, they believe they just DON'T happen in life, according to their perspective. This is why life's reality exceeds an organic or biochemistry chemistry mind set. It is also why they cannot, and in my opinion, will not solve our problems.

Dopamine and melanopsin requires these same transition metals as co factors and catalysts to be used in the enzymes used to build these neurotransmitters. In fact every neurotransmitter uses them. ***Therefore, non-native EMFs will act to destroy the ability of the brain to make melanopsin slowly but steadily over time as exposures remain present in our environment.*** This has massive implications to human neolithic disease generation as you will soon find out in the next few paragraphs.

How Neolithic Disease Begins and is Manifest

Though light was known to influence the circadian mechanism via melanopsin, its effects on non-circadian processes were considered minor from 2005 to 2013, in the literature. That is now changing when you understand how dim light really works in the brain. It has been recently shown in mammals that when melanopsin signaling is altered in the CNS for any reason at all, **mammals lose the ability to catch up on sleep permanently**. This means as they lose the ability to sleep, they simultaneously lose autography efficiency and their regenerative potential for all tissues. This means they lose Becker's current. This is why a lack of sleep often leads to disease and an early death. It also means over time these organisms will lose their memory, and they will gain more fat mass, as this alteration of melanopsin continues. This was recently tested recently on mice using EEG. Despite their lack of sleep in mice, EEG recordings showed definitively that melanopsin-deficient mice did not "catch up" on sleep. This is precisely what we see in humans with obstructive sleep apnea

and insomniacs as well. This is why a lack of sleep leads to death eventually. In humans, death happens in 11 days without sleep. Over time, it gradually manifests in the cardiovascular system, and the heart fails in autophagy. This means that the heart becomes “fibrotic” because it cannot regenerate cardiac muscle fibers over time during sleep because sleep is not recoverable. This is also how the hearts conduction system also become fibrotic to cause rhythms abnormalities. This is why all sleep disorders are associated with heart defects in the literature. This is precisely how Michael Jackson died, and I covered this in Brain gut 9 blog. This is also how marathoner’s will succumb. Insidiously, this occurs below your conscious realization. This is how the quantum physics of life dictates your biochemistry will operate your life.

The Melanopsin Story

Dim light stimulates melanopsin, while 4 hours of darkness is required before melatonin is secreted by the pineal gland. **These two photopigments then act in a precise quantum timing sequence to get a mammal to sleep.** Melanopsin is required for the changing direction of the vortex in the CSF. Once melatonin begins rising in dark, the flow of electrons completely reverses its current’s polarity in the hypocretin neurons and at the leptin receptors at the opposite end of the third ventricle in the brain. This is the target in the quantum brain to induce the deep phases of sleep mentioned above. The sequence of orchestrated natural events to light, dim light, and then total darkness acts to limit creation of fats cells by stimulating adiponectin as the CSF cools at night. Instead, it causes adipocytes to undergo apoptosis and reduce their number to decrease fat mass. This is precisely how the act of sleep reduces fat mass in all mammals. This is why cold and sleep are always linked in nature to lowered fat mass. When these things happen in unison, due to the natural action of the energy vortex in the ventricular system of your brain; it not only increases recruitment of brown adipocytes

to burn fat, but it also elevates their metabolic activity in all eutherian mammals. This molecule is one of the chemicals, called Maxwell demon's, used by mammals in the Ancient Pathway (leptin melanocortin pathway) that I described in detail in Cold Thermogenesis 6 blog, long ago. This is one of the major reason eutherian mammals survived the KT event 67 millions years, as I discussed in the last chapter of my book, The Epi-paleo Rx.

Now you have the entire Quantum sleep story in humans and how it really works. Details matter, folks, in quantum actions … even when other smart people tell you it is all about good food. It is not even close to be true. It is a cog in the wheel of wellness, but it is not primordial to your life.

Sleep is not a break in our life. It is the missing link in the puzzle of human life that determines what it means to be alive.

Whether you realize it or not, how you slept last night probably has a bigger impact on your life than what you decide to eat, how much you eat, how much money you make or where you live. Sleep equals one-third of your life, but it is part of your wellness quotient that we all must have and enter with routine regularity for a deep reason … yet, few understand it. Now, you do.

In life, I have found the questions are complicated, but the answers always seem to be quite simple and elegant.

Leave a comment.

More Support: Webinars by Dr. Kruse

- The Quantum Cell (November 2013)
- Autism, Alzheimer's, Parkinson's: Deconstructing the Cause of Neurodegenerative Disease (September 2013)
- Factor X (May 2012)

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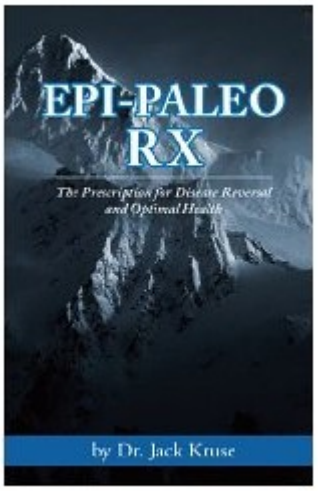	magnetico sleep pads
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Additional Resources

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- Energy and Epigenetics 5: The Quantum Brain
- Energy and Epigenetics 3: Autoimmunity, Cancer, Austism
- Energy and Epigenetics 4: Light, Water and Magnetism
- Energy and Epigenetics 6: Quantum Cell Theory, Life as a Collective Phenomena
- Energy and Epigenetics 8: Quantum Autism
- EMF 2: Einstein, Meet Leptin
- CPC 6: Pseudotumor Cerebri
- CPC 7: Obesity Qualia
- Brain Gut 11: Is Technology Your Achilles Heel?
- So You Completed the Leptin Rx. What's Next?
- Do Food Electrons Impart a Quantum Effect?

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