WHAT POWERS LIFE AND DEATH

Readers Summary

1. What are mitochondria?
2. What do Computer chips and mitochondria have in common?
3. Why do we have females and male sexes?
4. Does lightening really power life?
5. Why Africans were able to move and why the Inuit are now in trouble?

Mitochondria are the parts of our cells that generate energy. We now know that the leptin hormone controls how the brain maintains its pulse on energy generation. Today, we are going to go over how the powerhouses in our body generate that energy and why it is critical to us in disease and in health.

Mitochondria were stolen by animal cells from a primitive bacteria. The reason? It allowed simple plant and yeast cells to no longer be a prisoner to the low energy generation of fermentation and photosynthesis for energy production. If you don’t have enough energy in the cell you can’t make future plans to make complex tissues like a brain unless you provide the energy for future cell divisions and evolutionary growth. So animal cells seem to have symbiotically absorbed a Rickettsia like bacteria to harness the energy it could make. This bacteria generated a lot of energy by using the sun’s light to generate sugar from carbon dioxide and water. That process is called photosynthesis. Photosynthesis allowed for a much more efficient energy production than fermentation. This chemical process was further refined by evolution and natural selection in the mitochondria to form a chemo-osmotic gradient on the inner surface of the mitochondria to generate massive amounts of power compared to simple bacteria. This evolutionary change has allowed evolution to proceed to very complex structures like the human brain.

Semiconductor engineers get paid massive amounts of money in Silicon Valley to make sure electrons move across silicon wafers as fast as possible to increase our computing power in computers. Well, evolution did the exact same thing about 2 to 3 billion years ago. Mitochondria allow electrons to dance over their inner membrane to make energy. Animal cells now contain thousands of these power plants in their cells. The amount of DNA found in mitochondria is even more impressive. They have 10-20 times more mitochondrial DNA than nuclear DNA even today. Moreover, we inherit our entire mitochondrial DNA from our mothers. We get none from our dad at all. If you did, you would get a mitochondrial disease and likely die a very early death. In fact, this is the reason animals have two sexes to replicate. We need a male and female to make sure the inheritance of mitochondrial DNA is perfect. It has to have nanoscopic precision in order to work perfectly in all animals including us. We now know that mitochondria transfer electrons on its inner membrane using complexes for transport that use quantum mechanics to generate adenosine triphosphate (ATP).
ATP is the fuel of life for unfolding proteins to allow water to bind and hydrate proteins for the quantum effects of water to occur. We make it from our diet. Food provides the electrons for mitochondrial energy production. Those electrons pass down the mitochondria's respiratory electron chains to react with oxygen delivered to our cells by the blood. Every animal alive uses this exact mechanism to drive energy production. ATP is the back up system to water superconduction we call protonicity. is the fuel of life. We make it from our diet. Food provides the electrons for mitochondrial energy production. Those electrons pass down the mitochondria's respiratory electron chains to react with oxygen delivered to our cells by the blood. Every animal alive uses this exact mechanism to drive energy production. To understand how the electrons chains work think of this analogy. Visualize a garden hose with some holes in it along its length. If the water's flow is blocked at the end it leaks more water at the holes. At those leaky points electrons come

out and form free radicals in cells. Interestingly enough, there are very few reasons that block electron flow and very few known to restore flow once again in biologic systems. The leakiness of the mitochondrial complexes drive signaling for new mitochondrial biogenesis, increasing telomere length to allow more cell divisions, and to stimulate DNA and RNA to act if need be. Mitochondrial leakiness also drives apoptosis and autophagy decisions in the cell. (See levees 19 and 15 respectively in The Quilt) Mitochondrial leakiness is the critical point in aging and in disease propagation.

Bacteria generate energy across their outer membrane. This limits their energy production due to geometry. Their energy production falls off due to a falling surface area to volume area ratio. Animal cells, by absorbing the power plant, now figured out how to internalize energy production and expand the surface area of the inner membranes with massive folding like we see in the surface of the brain. These evolutionary changes are believed to have occurred only once in the history of our planet. Endosymbiosis is rare in bacteria. Peter Mitchell was initially ridiculed for his theories on bio-energentics of mitochondria. He showed how effective this evolutionary maneuver was. He showed that this change caused a pH gradient as well as an electrical charge of about 150 millivolts across the inner membrane. This may sound like a small amount of charge, but consider this fact. The inner membrane is only 4-5 nanometers thick, so the voltage across this membrane is about 30 million volts per meter! For comparison, that is equivalent to the energy in a bolt of lightening. That one bolt has the power generate energy of 1500 three thousand square foot homes in one mitochondria. Each cell has hundreds to thousands of those power houses in them. That is the power surge that fueled evolution and complex life forms.

Consider some of the other possibilities of this source of power generation. If electrons are allowed to flow down the

chain uninterrupted, but not coupled to ATP production, this ends up in dissipating intracellular heat. (Remember the leptin posts about uncoupling proteins 1 and 3?) This allows mammalian cells to control their body temperature . Consider another opportunity it allowed us. If more of our “leaky holes” were partially sealed, this would allow us to make too much internal heat. This is not good adaptation if you evolved in say, in Africa at the equator? So uncoupling would be detrimental in that environment because you’d get heat stroke. Since we know that is where humans first evolved, this could explain why we were able to adapt to different climates. We now know that this is true in tropical humans . The more free radicals that are made at rest cause more heat production. This is especially true on a diet high in carbohydrate and protein that was common around the equator due to long growing seasons codified by the photoelectric effect of the sun’s light. Visible light is part of the EMF spectrum. Those foods generate more free radicals at the mitochondria due to increases electron flow through and out of cytochrome one. This would allow them to migrate north or south to colder climates. It also is clear diet effects mitochondrial stress levels as well and it is used as a signaling device in the cell. At the equator foods are filled with glucose, fructose, and water. These foods do not make a lot of ATP compared to fats. What offsets this energy loss? The photoelectric effect from the sun is the short answer. And how does water fit in this story? Water acts like liquid sunshine to facilitate energy transfers in cells to offset the loss of ATP from the foods that are abundant at the equator. The further we go away from the equator the more the diet must be loaded with fats because we are losing the power of the photoelectric effect from the sun as we ahead north or south away from the equator. This implies that food actually codifies how many electrons and protons are contained within its substance. When you look at food as electrons and photons many paradoxes begin to make sense.

This brings up this issue the Inuit have been adapted to in the Arctic. They clearly had mastered uncoupling their mitochondria. Their diets were adapted to high protein and fat thereby promoting leptin sensitivity and the high functioning of UCP3, so they could uncouple and make heat. They are well adapted to cold climates because they dissipate their proton gradients and have the ability to generate more intracellular heat to tolerate the arctic cold. Ironically, this is why they are also less vulnerable to degenerative diseases in their natural habitat and natural diet as well. Once their diets became westernized in the last hundred years with carbohydrates their disease incidence and prevalence rose accordingly. Why? They became leptin resistant and can no longer uncouple. There is a trade off for heat dissipation in the Inuit too. **It is in fecundity rates for the male.** Arctic peoples have a genetic predisposition to male infertility because their higher body temps effect sperm production. When you couple this biologic fact with the fact that humans in the arctic are the “apex predator” it is no surprise why over the last 50 years male children are being born at lower rates there. The reason is simple. Bisphenol A (BPA) from the marine food chain concentrates in apex predators over time. This coupled with their ability to uncouple their mitochondria explain why this has occurred. Here is clear evidence that both diet (electrons/photons) and iatrogenic toxins (BPA in fish) can effect a population by affecting their cellular biology. It is all quantum physics dictating how biochemistry works as the environment changes based upon nature’s laws and not opinion.

Next up, Mitochondrial series continues to give you the 30 ft level of how weight is lost. It is vital to understanding how the Quilt operates.

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