



ATP – The Energy of Life

ENERGY FOR: HEALING, DNA REPAIR, CELLULAR FUNCTION, LIFE!

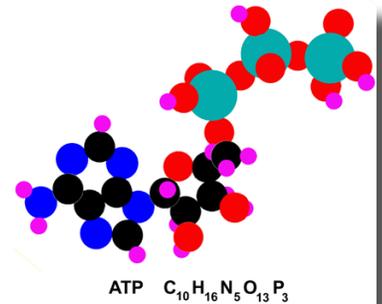
by Dr. Jack Tips (N.D., Ph.D., C.Hom, C.C.N.)

This “Cellular Healing” series of Research Reports empowers practitioners to apply nutrition at the cellular level where true healing occurs. Nutrition that is “cell-ready” delivers vital healing molecules closer to the yet deeper realm of nucleoproteins, enzymes and chromosomes; and the yet deeper realm of atoms.

ATP Basics. The body’s inner healing directives operate at the cellular level. Healthy cells promote healthy metabolic and tissue function. Inside the cells are the very life processes that determine what level of health a person can experience. The “coin of the realm” for cellular activity is ATP¹—Adenosine TriPhosphate, the chemical energy of life.

One thing is common to all healing – ATP, the energy that gets the work done. A person who is lacking in adequate ATP simply cannot heal properly. The ability to directly

boost ATP production nutritionally is nothing short of phenomenal because ATP is the chemical energy that is absolutely necessary for practically every life process. *Energy is everything. Energy is Life.* The cells say, “Give me the energy and I will heal myself!”



ENERGY IS EVERYTHING

Energy is the foundation of health. Energy and health are so closely allied in an interchangeable cause-and-effect relationship, that one can say, “Energy is synonymous with health.” If your body can make energy, it is healthy. If your body is healthy (properly nourished), it can make plenty of energy.

Energy and persistence conquer all things. – Ben Franklin

Energy is eternal delight. – William Blake

Energy is the essence of life. – Oprah Winfrey

Energy is everything. – Doc Wheelwright

In this Report, let’s take a look at the enigma of cellular life, for here we’ll discover an important facet of natural healing—the energy supply and how boosting ATP is a primary and fundamental pathway to reversing disease and minimizing the ravages of aging.

The Universal Cellular Energy Crisis

Many practitioners do not realize the massive extent of cellular fatigue occurring in their patients due to damaged mitochondria²—the cellular organelles (engines) that produce ATP. “Damaged mitochondria” are one of the

1 **ATP** – abbreviation for adenosinetriphosphate, an ester of adenosine and triphosphoric acid, C₁₀H₁₂N₅O₄H₄P₃O₉, formed esp. aerobically by the reaction of ADP and an orthophosphate during oxidation, or by the interaction of ADP and phosphocreatine or certain other substrates, and serving as a source of energy for physiological reactions, esp. muscle contraction. In simple terms, ATP is the body’s chemical life energy, the currency the body uses to accomplish its life-processes.

2 **Mitochondrion** (singular), **Mitochondria** (plural) – inside most cells are organelles known as ‘mitochondria’ that often referred to as “cellular power plants” because they generate most of the cell’s **a**denosine **t**ri**p**hosphate (ATP) which is the source of the body’s chemical energy. Mitochondria are also involved in cellular communication (signaling) where the cell’s innate intelligence is able to perceive changes in its environment and direct responses such as tissue repair, immunological actions, and homeostasis. When the mitochondria cannot perform correctly (often due to a lack of raw materials to generate energy), diseases such as diabetes, cancer, autoimmune diseases often occur.



five primary reasons that patients don't respond to "the old time nutritional therapies" like they used to. The other four reasons include toxins and electromagnetic radiations, cell inflammation from general and localized free radical³ cascades, lack of methylation⁴, and lack of cell membrane fluidity.

Cellular energy fatigue is all-pervasive today because environmental toxins and electro-magnetic radiations cause cellular inflammation that interrupts the normal energy production processes and expends the cells' energy resources. Cellular inflammation (stress) expends methyl groups (discussed in Research Report #6: *Methylation—The Body's Alchemical Wizardry*), but the double whammy is that cellular inflammation damages the cells ability to generate ATP. That, coupled with reduced intake of viable nutrients and

overconsumption of sugar (which damages the mitochondrial 'Citric Acid Cycle'⁵ that generates most of the cell's ATP), the cells struggle to produce the proper fuel for life.

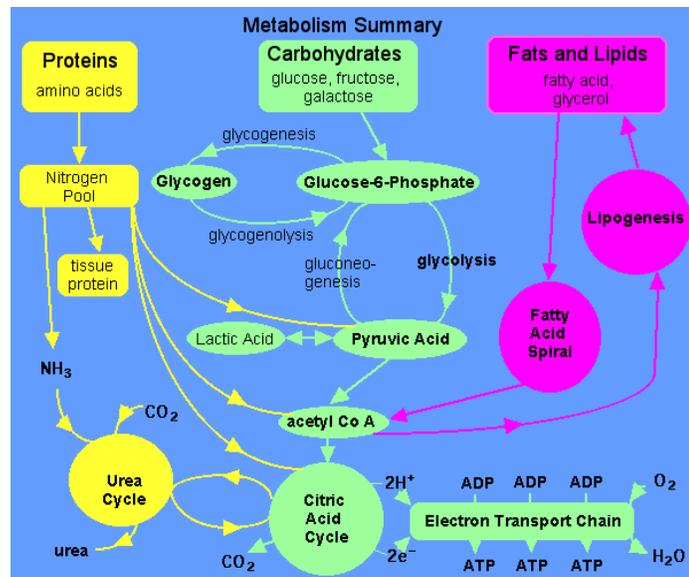
This shortage of fuel is a common denominator of virtually all chronic-degenerative diseases. As a general statement, one can say, "All chronic-degenerative diseases begin with a lack of energy." Coupled with the lack of energy is the lack of electron donors known as antioxidants—glutathione, catalase, and super oxide dismutase. A shortage of antioxidants means that the mitochondrial membranes and DNA are damaged, fail to perform properly, and so according to Nature's Law, the cell must be destroyed (apoptosis) or else it can become a tumor.

Simply put, the cell's expenses are rising and the cell's income (ATP) is declining. Just like in the financial world, increased expenses and decreased revenue is the universal recipe for *bankruptcy*. In health lingo, the recipe is called *disease*.

It's All About Energy. In human health, energy really is everything. Without cellular energy, we cannot have one clear thought, or the ability to digest our food, or the muscle power to walk, or the ability to sleep well. When our bodies have ample cellular energy, they can take care of all aspects of our health—general vitality, metabolic and hormonal processes, immune system effectiveness, nerve transmissions, cellular work, detoxification, repair—with radiant effectiveness.

Further, when there is a lack of cellular energy, there are inevitable problems—the body ages more rapidly, tissues fail, hormones become less effective, arteries harden, cellular communications get garbled, inflammations become chronic, fat gets stored, the brain becomes sluggish, the immune system becomes confused, and pathogens create problems. *With the human body, low cellular energy always leads to one disease or another. Always.*

Basically, when you run out of energy, you die. Energy, defined as the ability to do work, is absolutely and unequivocally required for every life process. Work is defined as a force that moves a mass, or causes potential energy to be converted to kinetic energy. But, hey, we all know what work is in the



3 **Free Radical** – An atom or group of atoms that has at least one unpaired electron and is therefore unstable and highly reactive. In animal tissues, free radicals can damage cells and are believed to accelerate the progression of cancer, cardiovascular disease, and age-related diseases.

4 **Methylation** – denotes the addition of a methyl group (CH_3) to a substrate or the substitution of an atom or group by a methyl group. Methylation is a form of alkylation with a methyl group, rather than a larger carbon chain, replacing a hydrogen atom. Enzymes catalyze methylation; such methylation can be involved in modification of heavy metals, regulation of gene expression, regulation of protein function, and RNA metabolism.

5 The **Citric Acid Cycle** — aka **tricarboxylic acid cycle (TCA cycle)**, **Krebs cycle**, or **Szent-Györgyi-Krebs cycle** — is a series of enzyme-catalyzed chemical reactions, which is of central importance in all living cells, especially those that use oxygen as part of cellular respiration. In human cells, the Citric Acid Cycle occurs in the matrix of the mitochondrion.

practical sense—it takes energy.

We need to rise above the smog of conventional thinking to realize that the sun is shining brightly above the clouds. Conventional thinking provides nutrients to the body when there is not the energy to utilize them. Creative thinking provides energy to the body so innate processes can utilize nutrients and function the way Nature intends.

– Dr. Jack Tips



energy, and rightly so.

Another interesting fact is that 1/2 of the dry weight of our bodies is mitochondria. And bacteria outnumber our cells ten to one. Now that does not leave much room for anything else, and can make us wonder what we really are? Water bags of bacteria and “cellular batteries” called

mitochondria. (And sometimes we think we’re so important!)

ATP—The Dividing Line Between Health and Disease

Happy Cells. So let’s get acquainted with the cells’ energy processes and learn how to have healthy, energetically charged cells that perform their duties with joy and ease. Joy? Happy cells? Well, yes. Energized, properly functioning cells generate a healthy vitality and vibrancy associated with a joyous and positive outlook in life. Either a person is spiraling upward on the “mitochondrial-ATP energy continuum”, or spiraling down into disease on the “adrenal-cortisol energy-loan continuum.” We need both processes for survival, but we must return to the feel good, calm, strong, well-being energy of ATP.



Need a dose of “happy?” Just increase your ATP! (And reduce oxidative damage, inflammation, and have adequate methyl groups!)

Mitochondria. To understand energy at the cellular level, we need to know that inside the cells are specific power-generating organelles called mitochondria. These energy-generators are necessary for the life of practically every kind of cell in our bodies (red blood cells excepted), and each cell contains over 2500 mitochondria. Some can have over 10,000 mitochondria! With one nucleus and thousands of mitochondria, we could say that our cells are obsessed with

As the human body ages, the number of functional mitochondria decreases and elderly people often have less energy than younger people. The decline in the number of mitochondria may not be a function of time, but instead it’s a function of the lack of energy needed to protect and repair all cellular processes including maintenance of mitochondria. Also, radiation, toxins and chemicals damage mitochondria.

We all need to increase ATP for health and longevity. Clinically speaking, ask this question: “Are this patient’s symptoms a result of impaired cellular energy?” Supporting ATP production can accelerate successful outcomes.

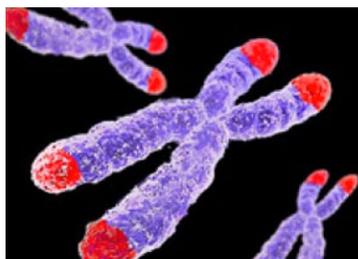
Mitochondria can multiply. The cells have several metabolic pathways that stimulate mitochondrial biogenesis – activation of the PGC (Peroxisome proliferator-activated receptor Gamma Co-activator 1 alpha)-Ia which is called the “master regulator” because all biogenesis stimuli utilize this protein. There’s also the enzyme, AMPK (5’ adenosine monophosphate-activated protein kinase), called the “fuel gage” because it stimulates glucose uptake and stimulates PGC-Ia. Nitric Oxide’s role in releasing oxygen from hemoglobin stimulates PGC-Ia to increase mitochondrial energy engines, and the “fountain of youth gene—SIRT1—



instructions PGC-1a to increase mitochondria.

However, with age, mitochondria become damaged and incapable of producing the ATP necessary for optimal health. Medical research has found that people in poor health often have only a fraction of their mitochondria able to produce ATP properly—and their biogenesis faculties are not activated to increase healthy mitochondria.

When the mitochondria have a short supply of oxygen and fuel (polysaccharides⁶) to make ATP properly, they can have their own, independent genetics damaged by the very free radicals (rogue electrons) that result from making energy, and this is the start of the life-destroying mitochondrial diseases that we now know include all the “no known cause, no known cure” chronic-degenerative and auto-immune diseases.



Also, cells can lose their “identity” – the telomeres⁷ on the ends of the DNA strands – due in part to free radical damage in the cell nucleus as well as to the general aging

process. As this occurs, cells lose the ability to function properly. Why did they lose their identity? Lack of energy and protective phytonutrients such as resveratrol, vitamins, flavonoids, flavonols, flavones, flavanones, flavan-3-ols, and anthocyanidins, etc. This is why “Cellular Identity Factors” listed on many of the Systemic product labels as “RNA/DNA Factors” are so important to genuine cellular healing.

Since the mitochondria have their own unique genetic code and require energy to repair and maintain themselves, they suffer when environmental and metabolic toxins, and the resulting inflammations, choke off their oxygen and nutrient

⁶ **Polysaccharide** – refers to carbohydrate structures (C₆H₁₀O₅ – comprised of carbon, hydrogen and oxygen), that are linked together as repeating units. Poly means “many” and saccharide means “carbohydrate”. Polysaccharides play an important role as part of the optimal fuel for the cell to create energy. They also play a major role in the workings of the immune system, reproductive system, elimination of pathogens, blood clotting, and body-development.

⁷ **Telomeres** – formerly known as “junk DNA,” a region of DNA located on the ends of chromosomes that protect the genetic code from degeneration. Doc Wheelwright’s research on Cellular Identity Factors showed that telomeres could be protected and thus was a forerunner of the “life extension” movement.

supply. When additional energy is available, the cells repair their DNA via enzymes and peptides. This is why cellular energy is so important—it keeps our bodies and minds young. With energy and nutrients, the cells can protect themselves from free radical damage and quickly repair any damage as it occurs.

Natural Free Radical Protection.

The mitochondria create free radical electrons as a by-product of producing ATP. The mitochondria also produce the antioxidants to immediately capture and neutralize the free radicals, and even use the resulting molecules to derive more energy. So all should be in order according to Nature’s plan.



But unfortunately, human beings are suffering from an alarmingly increasing amount of free radical damage and this is why antioxidant supplements are highly touted and big sellers in the health food industry. With Systemic Formulas, the ROX (Super Anti-oxidant with Resveratrol) is the premier antioxidant supplement and dosages are measured with the simple and convenient Meta-Oxy Test.



The primary reason for mitochondrial decline is that, without adequate energy, the mitochondria are unable to control the free radicals necessary to the *Citric Acid Cycle* production of ATP, and thus become damaged by their own metabolic by-products. Today’s diet simply does not include enough fruit and vegetables to keep the mitochondria supplied with the raw materials to function properly—and thus we have the age old fact that our errant diets are the primary cause of all of our diseases.

Optimal ATP. What can you do with optimal energy? Everything that your body is designed to do. But if you don’t have enough fuel for your body, the mitochondria shut down

or go dormant – just not enough work to do. If you have a good dietary intake of macronutrients that are properly assimilated, then the mitochondria are all happy in their work because there is plenty of fuel. If you have abundant macronutrient intake and exercise (increases oxygen), the cells can take that lifestyle and make more mitochondria (mitochondrial biogenesis) to make more energy for you. Thus the equation: More ATP Energy = More Life.

One of the reasons that ‘couch potatoes’ (people who are lethargic and don’t get exercise) don’t feel so good, become obese, and get heart disease, is that their bodies don’t get enough oxygen (aerobic metabolism) to make the energy that their bodies require for all the basic life processes.

With extra energy, your body can perform the functions of optimal health—repair tissue, protect cells that are reproducing, fight foreign invaders, destroy aberrant cells, make a vibrant personality, repair and protect the cells’ DNA (genetic code), burn up toxins and detoxify cellular wastes efficiently, have radiant skin and hair, and have all your tissues work properly. Tissues that work properly do not allow diseases to occur. This is why we say that the very best of health is already inside your body. Your body just needs energy to release your innate optimal health blueprint and to do that requires ATP.

As the dietary nutrients are made available to a cell for energy, the cell must engage a complex process to render energy with the least amount of work. Nature has a directive called the *Law of Economy* to make the most energy with the least amount



of energy expenditure. This process involves the help of micronutrients such as vitamins, minerals and enzymes.

Dietarily, to be on the positive side of the energy equation, a person must derive more energy from food than it takes to digest, process, and

transport it through the cell wall into the cell, and detoxify the wastes. This is the fundamental and immutable case for having a diet that is significant in certain raw foods. This concept

is explained in the book “The Pro-Vita! Plan For Optimal Nutrition” that expounds upon Doc Wheelwright’s famous “Low Stress Diet Plan.” [Book info at www.apple-a-day-press.com]

Raw foods contain the enzymes that help the body digest and assimilate their nascent nutrients.

Their molecules are intact the way that Nature made them as opposed to being altered by heat or processing, or even worse, genetically-modified by unscrupulous pesticide corporations.

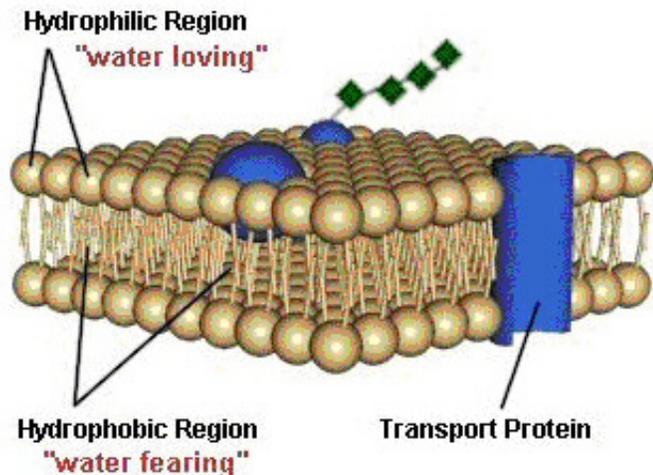
The *Law of Economy* is predominant throughout Nature. All Life seeks to function the best it can with the least amount of energy expenditure. This law permeates the natural actions of life. Trees will reach for the sun knowing that their energy expenditure will be rewarded when their leaves break through the top of the canopy. A cactus is an efficient water-holding structure. Pollens release on a windy day. Throughout Nature is an Innate Intelligence that knows how to utilize energy—only Humankind has committed the ignorant and indulgent crime of waste and overuse of energy resources. Nature conserves energy and the species that handle energy the best are the ones that survive.

Cellular and Mitochondrial Membranes. Right here, at the cell’s front door is where many people are struggling with their health. If the foods they eat are damaged (overcooked, combined with chemical food additives such as Aspartame®, mono-sodium glutamate, and unnatural chemical preservatives); include trans-fats such as partially-hydrogenated oils; or lack their innate nutrients (processed foods, grown on mineral-depleted soil with chemical fertilizers); contain xenobiotic⁸ substances (pesticides,



⁸ **Xenobiotic** – a completely synthetic chemical compound, which does not naturally occur on earth and thus believed to be resistant to environmental degradation. Loosely refers to all chemicals that do not belong in the human body, thus includes all synthetic drugs and hormones, food additives, preservatives, pesticides, fungicides, herbicides, chemicals, plastics, heavy metals, etc. Today, genetically modified foods (corn, soy, beets, Hawaiian papaya, etc.) are considered xenobiotic because they have genetic structures that are foreign to Nature and the body.

Cell Membrane



herbicides, fungicides, chemicals); have their molecular structures altered (Genetically-Modified foods); or certain nutrients are deficient due to dietary indiscretions (poor food choices, excessive alcohol); or digestion is impaired due to stress and dietary abuse; then it's the cells that suffer. We live and die at the cellular level.

As you can tell, practically everyone's cells are suffering due to dietary issues. The body systems that are most susceptible to environmental toxins are: 1) enzyme systems, 2) hormonal systems; 3) energy systems (ATP); 4) immune system; and these systems are exactly where we are finding so many of the health concerns occurring today.

The cellular "front door" refers to the cell membrane, a selectively permeable screen through which the food nutrients must pass. The only nutrients that can pass through the cell membrane are tiny molecules—less than one billionth of a unit (10^{-9}) or between 1 and 100 nanometers. The purpose of digestion and the enzymes that split molecules and render the food to such a tiny size is simply this—they reduce the large food molecules to a size the cells can use. It's all about the cells!

So with the cell, size matters, and the smaller the better. This means that large molecules are barred at the door, but nucleo-proteins (one, two, and three chain peptides), tiny molecules of essential fats, and only simple sugars (glucose, galactose, fructose, ribose, xylose, for example) can pass the

gatekeepers of the cell membrane.

The Energy "Catch 22". As a side note, the cell wall is a separate 'organ' with innate intelligence of its own. Many people's cell membranes are damaged from the effects of oxidative stress, and this is why so many people take antioxidant nutrients to counter the damaging effects of air pollution and trans-fats in the diet. However, the very best antioxidants are those that are produced by the cells such as glutathione (GSH). And what do you think the cells need, in addition to nutritious food, to produce just the right antioxidants? Yes, it's energy. It's ATP. With Systemic Formulas, the EPIC (Metabolic NO/ONOO Micro Antioxidant) is designed to support the mitochondrial need for antioxidants as well as increase GSH and break the chronic free radical cascade.



When more energy is produced inside the cell by the mitochondria, the cell can synthesize its own antioxidants and use fatty acids in the diet to repair the cell membrane. So energy is the key. The "Catch 22" is that the mitochondria need the fuel to help repair and maintain their and the cell membranes, but the fuel (as well as hormone-messages and oxygen) can't pass through the cell membrane in the proper quantity (called insulin resistance where the hormone insulin can't get the cell to accept more glucose) because the cell membrane is damaged by environmental pollution (pesticides and industrial toxins), free radical damage (from environment and foods), dehydration, dietary indiscretions (poor food choices), and a lack of ATP energy.

If only we could prime the pump or jump-start the repair process by getting a perfect fuel through the cell membrane to the mitochondria. And that's exactly what nutritional supplementation can help the body do! Why? Because the *Citric Acid Cycle* requires a large array of nutrients to safely make ATP. By stoking the cells with good nutrients, mitochondrial ATP production is primed and operative. The

⁹ **Catch-22**, a book by Joseph Heller. This is a reference to a bureaucratic catch, which embodies multiple illogical and paradoxical reasonings. Generally refers to a situation where there is always an exception to any rule. For example, to be dismissed from combat, a soldier must be deemed crazy, but if the soldier wants to preserve his or her life and leave combat duty, then he is not really crazy.

body then uses the ATP to heal and repair itself including mitochondrial biogenesis so there is more ATP for future use.

Your Body's Energy Cycle Simplified!

Now the conversion of macronutrients into energy occurs in the cells and there is a specific process for each of the macronutrients to be converted to a substance known to biologists and nutritionists as *Acetyl Coenzyme A* (Acetyl-CoA). It's helpful to understand that proteins, fats, and carbohydrates can all end up as the "energy starter molecule" Acetyl-CoA if they are to be used for ATP energy production.

This is a survival feature for human beings. If the only food you can acquire is fat, then the body will perform "beta-oxidation" and turn that fat into the raw material of energy—Acetyl-CoA. If the only food between you and starvation is protein, then the cells can render it into Acetyl-CoA via a process known as "deamination." [This is how people lose muscle mass when they lose weight incorrectly.] And if you only have carbohydrates for survival, the body can hydrolyze the starch molecules and convert the chief carbohydrate, glucose, to Acetyl-CoA via a process known as "glycolysis."

The point in telling you this is that our food nutrients have specific processes to get on the energy conveyer belt. Plus it confirms our prior point about how these three energy-deriving systems assist the body's Innate Vitality to adapt and survive. Once food nutrients are converted to the uniform molecule, Acetyl-CoA, they are ready for the mitochondria to work its miracle of creating life-energy.

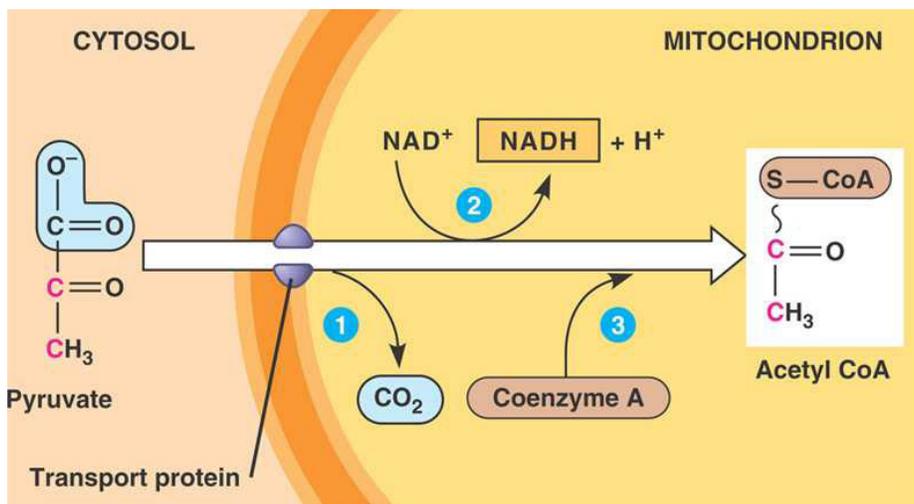
Also, understanding that the body has a 'fuel conveyer belt' that addresses proteins, carbohydrates and fats, we find the basis for the health-destroying impact that table

sugar has on our health. Table sugar crashes into the conveyer belt like a raging bull in a china shop. It hurdles through the body's meticulously planned processes and collides with the mitochondria forcing energy production into the red zone meaning uncontrolled free radical production that damages cells and causes disease. It's the same as if you put jet fuel in your car's gas tank—it's too explosive. Refined sugar damages the cells and mitochondria, and leads to mitochondrial diseases. Each of the three processes to turn food into the raw material of energy has a different level of efficiency. Each process has its own nutritional requirements and each process serves a purpose such as the quick, but not lasting, energy of glycolysis that is needed for the "flight or fight" survival response as opposed to the slow and steady fuel supply associated with well-being that is made by the mitochondria's *Citric Acid Cycle*.



Glycolysis, is an anaerobic process—does not utilize oxygen to make instant energy. It is inefficient as it only renders two molecules of energy per molecule of carbohydrate, but because it can produce energy so quickly, it's a short-term way to respond to emergency situations. We discussed this in Research Report #3: *Acute Coronary Syndrome—It's Not What You Think*, and cited how the heart can use glycolysis to make a quick dose of needed ATP, but in the long run, this process can

increase lactic acid and the resulting acidosis damages the heart cells. Pursuant to this, Systemic Formulas manufactures the HQ (Heart Energy) formula to restore proper ATP production to the heart cells, and thus can help the body





prevent damage to the heart caused by the anaerobic, back-up ATP production processes.

This means that if a really hungry saber tooth tiger jumped out of the bushes and surprised you, your body would have instant energy to flee—all because of glycolysis' ability to throw some instant fuel on your muscle cells for quick ATP.

But your fleeing won't last long and if you have to run far, your body will have to use the normal glucose-to-energy processes of the mitochondria's *Citric Acid Cycle*; and if you have to run really, really far, your body will use the fat-conversion beta oxidation processes because there is more energy in fat than carbohydrates.

Thus glycolysis works fine for a short, emergency sprint, the mitochondrial *Citric Acid Cycle* is terrific for a nice jog around the park, and the fat burning process, beta-oxidation, is particularly useful for a marathon. All energy systems work together to provide the human being a wide range of responses and life activities as well as a strong survival position in Nature.

So you see, our bodies have multiple ways to derive energy for a variety of survival situations. Why? Because without energy we get caught and eaten, or get diseases and die. *Energy is survival.*

Unlike anaerobic glycolysis, the mitochondrial *Citric Acid Cycle* requires oxygen to perform its energy magic—the 'Chinese Rice Bowl' trick of transforming one molecule of glucose into 36 molecules of ATP energy via the *Citric Acid Cycle* and a few more ATP from its *beta-oxidation* processes. This is an excellent return on investment. One that allows human beings to pursue activities other than basic eating, sleeping, defecating, and reproducing, e.g. the human experience of creative thinking, productivity, spiritual endeavors, and artistic expressions.

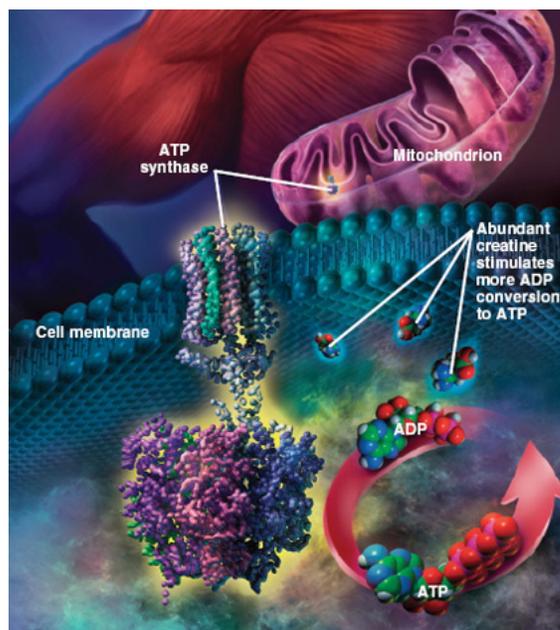
So let's pick up with Acetyl-CoA that starts what's known as the *Citric Acid Cycle* because here's where the miracle of life-maintenance occurs. The mitochondria, with the help of various dietary nutrients, all work together to render 36 molecules of energy from one molecule of glucose—provided

a person has enough oxygen available to the cells. Now that's efficiency! And the waste products of this work are only carbon dioxide (Co₂, which the plants need to breathe) and pure, nascent water (H₂O). The cellular waste product, lactic acid, can be converted to pyruvate and then to more ATP via the electron transport chain¹⁰. Thus the human body sets the standard for making energy without pollution—a model to which human beings should aspire in our external world!

ATP – The Miracle Molecule of Life-Energy

Fuel For Life—ATP. To emphasize this point, ATP is the very currency of cellular life—the biochemical 'dollars' upon which your life is founded. When your cells make the right amount of ATP, everything works well—'everything' includes your brain, digestion, nerves, metabolism, hormones, muscles, libido, immune system, and your detoxification systems. You name it—if you want it to work better, your cells need to make ATP to get the job done.

If you don't make enough ATP for your cells to function optimally, then there are consequences, and the body's necessary "messengers of consequences" are called



¹⁰ A group of compounds that pass electrons from one to another via redox reactions coupled with the transfer of protons across a membrane to create a proton gradient that drives ATP synthesis.

“symptoms¹¹” in the English language. If your ATP levels drop below what is required for fundamental life processes, then you die. Thus if you run low on ATP, your body can allow dread disease processes to occur – it’s the best a body can do under the circumstances. The reason that a poison, such as cyanide, is so deadly is because it stops the enzymes and processes that make ATP by denying oxygen to the cells for mitochondrial function— that’s why it results in a quick and dramatic demise.



So making ATP for life-processes is the activity that separates the living from the dead, the healthy from the diseased, the vital from the weak. Making abundant ATP is tantamount to both survival and optimal health.

Different tissues will spend ATP for different functions. The heart will expend it for muscular contractions over and over with every beat. The leg muscles will contract and expand for movement as needed. The kidneys will use it to filter the blood, make hormones, generate ch'i¹², and repair its tissues. The brain will use it for thought. The immune system will use it to make antibodies to kill a threatening pathogen. The intestines will use it to allow the importation of food nutrients. ATP is the universal currency of life.

ATP and Intestinal Health. Many people know that our health is intimately linked with intestinal bacteria known as “probiotics” or “intestinal flora”—those trillions of friendly bacteria that inhabit our gastro-intestinal tracts and protect us from pathogens, help us digest our food, and make nascent B-vitamins for our energy metabolism and nerves. Probiotic flora prevent intestinal inflammation. Intestinal inflammation

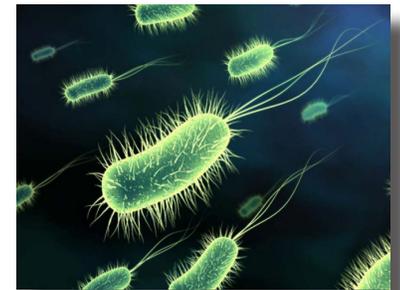
¹¹ **Symptoms** – the body’s perfect expression of the result of something not working correctly. The body’s decision to do the best it can with what it has to work with. Acute symptoms (fever, diarrhea, vomiting, skin eruptions, coughs, etc.) are the body’s expression of its innate healing vitality attempting to correct something such as the elimination of toxins and pathogens. Chronic symptoms are most often the result of a lack of energy (ATP) at the cellular level which can result in either a weak or overactive immune system. Note: symptoms are the body’s communication to help it “correct the cause” of the symptom, not a request to sweep the symptom under the carpet with a suppressive drug (though a drug may be required to reduce tissue damage while the body endeavors to correct the cause.)

¹² **Ch'i** – also called Qi. In Traditional Chinese Medicine, it refers to the life force or the stored essential energy for life. The kidneys are the repositories of a specific kind of ch'i. In other contexts it is called élan vital, and prana. More specifically, it is the flow of energy through and around the living body that links the body and environment into a cohesive functioning unit. Congestion in the flow of ch'i results in disease and pain. Circulation of ch'i and a vibrant supply is representative of good health and longevity.

is much worse than a disease labeled *colitis* or *irritable bowel*, it is a root cause of systemic inflammation which in turn leads to neuro-degenerative diseases via a condition called “leaky gut syndrome” where large food molecules enter the bloodstream and trigger immunological (inflammatory) reactions that can damage the brain, nerves, joints, thyroid, pancreas, arteries, and other tissues.

Few people understand that our intestines are much more than a selectively permeable pipe that holds beneficial bacteria and excretes food residues. Our intestines must also have ATP energy so they can function to help our bodies assimilate nutriment.

Most people know that using antibiotics kills both the ‘good guys’ (beneficial intestinal flora, part of our immune systems) along with the ‘bad guys’ (pathogenic bacteria); and if someone requires an antibiotic



(a possible sign of a lack of ATP—the cells must signal the immune system, and the immune system requires ATP energy to clone antibodies to fight pathogens. This is why people feel so tired when the immune system starts the fever process--the immune system is claiming ATP for its use.), they know to replace the beneficial cultures with a broad-spectrum probiotic cultures. With Systemic Formulas, the ABC formula is used to restore the intestinal flora by providing: Lactobacillus Acidophilus, Bifidobacterium Bifidum, Lactobacillus Helveticus, Lactobacillus Plantarium, Lactobacillus Salivarius and Lactobacillus Bulgaricus.

But what many practitioners don’t account for is that the intestines need ATP energy to perform their specific function of selectively allowing absorption of food nutrients. Many antibiotics and non-steroidal anti-inflammatory drugs disrupt ATP processes as a side effect. Thus the



recipe for restoring gastrointestinal flora after antibiotic use should include not only the ABC probiotics formula, but also an ATP-process booster such as the eNRG (Quantum



Cellular ATP).

The human energy crisis today is based on the fact that many people are not getting the proper fuel to their mitochondria. The proper fuel is unavailable because of the quality of diet, lack of exercise, poor digestion of the foods; or the fuel is blocked from

entering the cell by either being too large a molecule (poor diet/poor digestive breakdown), the cell membrane has other 'junk' molecules (pseudo hormones, toxins, chemicals) blocking the entrance pathways; dehydration (from drinking sodas instead of water); or free radical damage to the delicate cell membranes from the oxidation of various toxins as well as cellular waste products. Most all diseases involve damage from free radicals, and free radicals are the result of 1) environmental toxins, 2) lack of dietary antioxidants, 3) damaged mitochondria, 4) lack of cellular ATP energy.

Within many people's bodies, their ATP combustion engines are lined up at the fuel pumps like cars at the gas station during a fuel shortage, but the pumps are not getting the fuel into the gas tank and the engine is damaged from prior abuse (free radicals). And this inevitably means poor performance of body functions, symptoms, pains, low energy, lack of productivity, poor health and depression. Thus scientists say that a lack of cellular energy is a common denominator in all diseases.

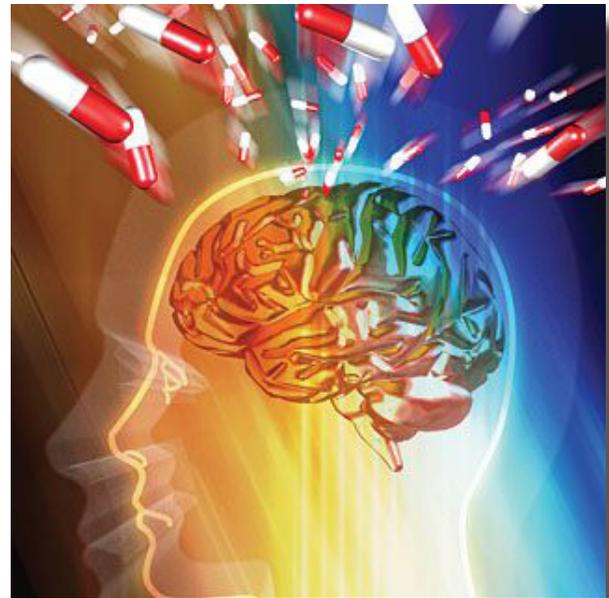
The Human Energy Crisis & Your Clinical Practice

Neuro-Endocrine Function. When the hypothalamus (part of the brain's regulatory mechanism) perceives that the endocrine glands' mitochondria are not producing enough ATP energy (thus reduced hormone output), it sends a signal to the pituitary gland to instruct the energy glands—thyroid and adrenals—to secrete more hormones such as thyroxin molecules from the thyroid gland and adrenaline compounds (epinephrine, norepinephrine), aldosterone (a lack causes salt craving), and cortisol (stress hormone that contributes to

obesity). This provides your cells with the message to ramp up the energy production, but often the cells cannot respond (lack of fuel, lack of oxygen, and damaged mitochondria.).

To counter the lack of fuel, a person may eat sugar or drink caffeine but such boosts are not the gentle, sustaining, feel-good energy of ATP; it's the jangle of a caffeine buzz that can make you revved up and shaky and leave you "burned out" and depleted. Plus the refined sugar starts a disease cycle in the body that can go through hypoglycemia into diabetes. So coffee and a donut is the wrong way to address fatigue.

Your adrenal glands have access to energy – the small amount of glucose stored in your muscles (legs, arms, heart). Thus, while trying to help your energy requirements, accessing muscular glucose actually depletes your energy reserves, and you become more easily fatigued. It's a short-term loan that the body expects to be paid back quickly, except most people's diets do not contain the nutritional materials to pay back that loan. This is a part of what happens with people whose cellular energy declines due to illness, trauma, stress, and all the other reasons cited earlier.



Stimulants Cause Stress. Using coffee-caffeine, sodas, and refined sweets (candy) for energy may help in the short run, but like a loan shark's dollars, you're in big trouble when you can't pay it back. And you can't pay it back unless you address

the cause of your energy crisis – lack of fuel entering your cells to make ATP and the reduced ability of the mitochondria to perform. Further, the stress of stimulants depletes methyl groups—the on/off switches of neurotransmitters and genetic expressions. Herein we find that putting children on amphetamines for attention deficit behaviors artificially engages the brain's energy processes, but depletes methyl groups which ultimately leads to neurotransmitter dysregulations often called “anxiety” and “depression.”

This is how people become addicted to coffee, sodas, and energy drinks. They provide a metabolic jolt of adrenal-driven energy only to find that later they crash and must renew the loan. The end result is that these drinks create an additional metabolic stress on the body and overall energy depletion – the very thing that doctors say is linked with so many of the modern day diseases – osteoporosis, heart disease, diabetes, and cancer.

The largest user of glucose energy (ATP) in the body is the brain. Second to the brain are the red blood cells whose job is to carry oxygen to the brain as well as groups of cells throughout your body so the mitochondria can make more energy. (The body teaches us its priorities!) The heart is another big energy user. So is the liver. When your body is in an altered glucose-energy relationship (carb burner instead of fat burner), such as using your thyroid and adrenal glands to force energy availability, the amount of glucose reaching your brain declines resulting in a ‘sugar craving’ and ‘brain fog’ that is tantamount to poor health. Further, low ATP in the brain is the forerunner of the amyloid protein process associated with Alzheimer's.

When the blood is not carrying enough oxygen, the end product of glycolysis is lactic acid instead of the pyruvate that can be converted to more ATP via the mitochondrial electron transport chain that we've mentioned. This also occurs when there is a lack of the B vitamins needed for energy synthesis, due to: 1) a lack of raw vegetables in the diet, antibiotic damaged intestinal flora (the bacteria make nascent B vitamins, particularly B-12), and 3) the use of sodas and sweets that rob the body of its B Vitamins through an increased rate of urinary excretion. So, be advised that if you wake up with stiff and sore muscles and you did not overexert yourself, you are

probably lacking in oxygen delivery to your cells, e.g. lacking in exercise.

Excess lactic acid from the loan-shark-approach to energy also stimulates the adrenals to produce the stress hormone, cortisol, which leads to further depletion of glucose from the muscles. A cortisol imbalance causes: 1) loss of tissue integrity, 2) depletes serotonin— your ‘feel good’ neurotransmitter, and 3) fatigue. And more commonly known, excessive cortisol leads to abdominal fat storage.

Now you can see that either a person is spiraling upward on the mitochondrial-ATP energy continuum, or spiraling down into disease on the adrenal-cortisol energy loan continuum. We need both processes for survival, but we must return to the feel good, calm, strong, well-being energy of ATP. This is why having a supplement such as eNRG (Quantum Cellular ATP) is such a blessing to clinicians. Here we start the upward spiral into youthfulness, abundant cellular energy, and optimal health.



That “Lovin’ ATP” Feeling. We should understand what cellular energy feels like. It's not so much a tangible, jump-up-and-down energy feeling; but instead, it's a deep well-being that lets you know you have plenty of energy to do whatever the day demands – that you can handle changes in the weather, unexpected work, lending a hand to someone in need, and even jump up and down if you want to. It keeps us feeling terrific, even when there is much physical and mental work to do.

Let's emphasize this point—ATP is the potential energy of a large lake that feeds the kinetic energy of a waterfall. Most people know the kinetic energy of an artificially boosted energy from caffeine and sugar, but that is in no way the same as the deep, calm feeling of knowing that you have cellular energy to do all that the body needs to do, plus the reserves on tap in case you need to exert yourself.



Sleep Issues. Some people wake up in the middle of the night and can't get back to sleep. A common reason for this is that lactic acid (a metabolic waste product) builds up because the mitochondria lack fuel and have difficulty producing ATP. When lactic acid builds up, the body pH (acid/alkaline balance)

shifts to an acidic pH and there is even less oxygen available for the body's energy processes that occurring during sleep when the body heals and restores tissues. With low oxygen, the body wakes up so the person moves around and breathes in more air. This, in addition to a better functioning brain, is probably a basis for the saying, "It takes energy to sleep."

Further, according to doctors, the lactic acid build up is linked with Chronic Fatigue Syndrome, fibromyalgia, migraine headaches, physical depression, post-partum depression, irregular heartbeat, and diabetes.

Further, according to researchers and biologists, the lactic acid build up is linked with Chronic Fatigue Syndrome, fibromyalgia, migraine headaches, physical depression, post-partum depression, irregular heartbeat, and diabetes.

Summary: This Report is to increase our appreciation and understanding of the importance of mitochondrial

production of ATP—the energy of life. It lays the foundation for the clinical use of Systemic Formulas' eNRG (Quantum Cellular ATP) nutritional product because increasing ATP is necessary for the body to respond to the healing directives of the BioFunction tissue support formulas.

The eNRG formula serves as an "enlivener" and "enabler" for our clinical work as natural health professionals. In a time where practically every patient has a dire cellular energy shortage, the eNRG formula is a blessing that re-energizes the cells so the cells can heal and restore the energy necessary for more optimal health.

— Dr. Jack Tips

For Health Professionals Only. Webinar: *The Secret Life of the Mitochondria* delves into the Citric Acid Cycle and Mitochondrial Biogenesis at www.systemicformulasmedia.com

Disclaimer: This Research Report does not propose a method for diagnosing or treating any disease whatsoever—a process exclusive to the practice of medicine by licensed individuals. This information refers only to whole body nutrition to support the body in caring for itself. It features insights from one individual's clinical perspective and does not constitute labeling for any product.

Stress Support with two meal a day take:

- I Ga (Adrenal)
- I MoRS (Methyl Donors)
- I eNRG (Quantum ATP)
- I ROX (Super Anti-ox)
- I Nc (Nerve Calm)

Simple Alzheimers Prevention Program

with two meals a day take:

- I B (Brain)
- I MoRS (Methyl Donors)
- I I (Eye)
- I ROX (Super Anti-ox)
- I eNRG (Quantum ATP)

Refreshing Sleep in the evening take:

- I-2 DReM (Sleep Aid)
- I eNRG (Quantum ATP)
- I MoRS (Methyl Donor)
- I N3 (Relaxa)



Key Ingredients:

Niacinamide; Vitamin A; Thiamine Nitrate; Riboflavin 5 Phosphate; Pyridoxine Alpha Keto Glutarate; Zinc Lipoic Acid; Manganese Chelate; Magnesium Citrate; K2HPO4; D Calcium Pantothenate; Ribose; Mannose; Ca Pyruvate; Kudzu Extract (Diadzin); Red Clover Extract (Biochanin); Tryptophan; Resveratrol; Alpha Keto Glutaric Acid; Sodium Gluconate; Malic Acid; Glutamine; N Acetyl Carnitine; Succinic Acid; Coenzyme Q10; Medium Chain Triglycerides; Fumarate; Quercetin; Carnosine; Valine Alanine; Aspartic Acid; Nucleosides RNA/DNA; Pantethine; ATP; Luteolin; Irish Moss; Pimento; Mulberry Root; Cleavers Herb; Ginger Root; Ginseng Root; Pyrroloquinoline quinone.

eNRG Keynotes:

- Boost ATP production
- Encourage mitochondrial biogenesis
- Improve cognitive function
- Improve DNA repair
- Cardio-protectant
- Protect from reactive oxygen species
- Neuro-protectant
- Support Citric Acid Cycle
- Support SIRT-1 (longevity gene)
- Supports PGC-1a activation
- Supports AMPK pathways
- Boosts cellular function