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Healthy and Happy Monthly Newsletter

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CO Q10 is Every Cell's Friend: It Creates Energy for the Body to Expend

As we age, our body's ability to maintain its resiliency diminishes. But if given the tools that it needs to sustain its existence, imbalance and dysfunction in the body need not occur in the process. Among the many symptoms associated with aging are low energy and fatigue, but why? As we age, our thirst and hunger sensations are reduced, and the mineral, nutrient, and enzyme deficiencies that result can effect several hundred processes in the body that influence everything from ringing in the ears, to more serious conditions like cancer, heart disease, and stroke.

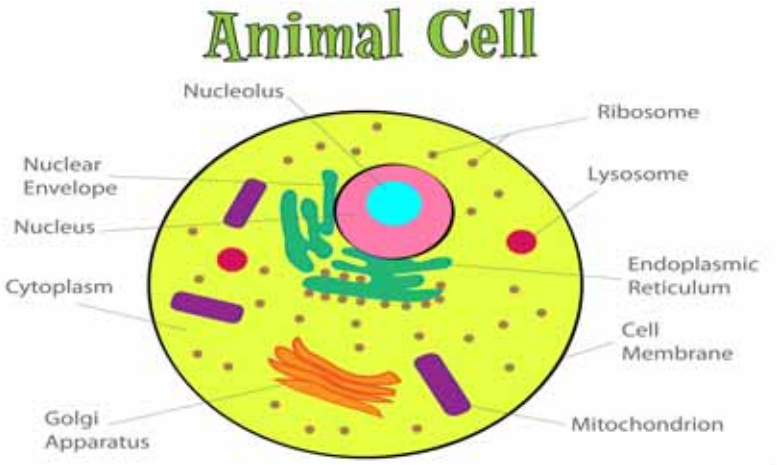
While there are a host of substances that are vital to our health and survival, one that influences the efficiency by which all of our bodily functions transpire is Coenzyme Q10. Would you be interested to know that CO Q10 plays a critical role in energy production, and that without it every living cell in your body as well as your DNA will become adversely affected? If so read on as we highlight and explore the benefits of an adequate CO Q10 concentration in the body, and discuss the importance of its role in vascular health, preventing and treating circulatory diseases, cancer, and more.

Otherwise known as ubiquinol, Coenzyme Q10 is naturally produced in the body. A coenzyme is a non-protein organic compound that combines with a protein to form an active enzyme. An enzyme is a biological catalyst that speeds up a chemical reaction inside of a living thing.

CO Q10 was discovered in 1957 by scientist Fred Crane. Since that time many research studies point to the fact that CO Q10 can yield extraordinary results for both maintaining health and treating diseases associated with aging. Today, CO Q10 is available in supplement form. Making it a routine part of your daily vitamin regimen may be necessary for reasons of which you will become aware in the following paragraphs.

With every breath that we take, and every beat of our heart, we are burning energy and we are aging. While this cycle of life is inevitable, and there is no fountain of youth, there are ways to slow the aging process and the breakdown of our body's cells and mechanisms of repair. Ubiquinol is the active form of CO Q10, and it is a powerful anti-oxidant that can help with energy production, reduce inflammation, and lessen the damaging effects of oxidative stress that exhaust the body and extinguish our very life force.

If you think back to your junior high biology class, you may recall studying single celled organisms, and specifically discussing the mitochondria. The mitochondria is known as the "powerhouse" of the cell, since it is the site inside of the cell that is responsible for producing energy compounds, like ATP, an essential energy source for innumerable cellular processes that take place in all living beings. The more complex the organism becomes, in order to carry out its metabolic processes, the more the demand for energy production increases.



With this in mind, it should come as no surprise that mitochondrial division is proportional to a cell's energy demand. For example, repeatedly stimulating a muscle cell will hasten the production of mitochondria in that cell, to compensate for its increased energy needs. Therefore, cells that make up high energy organs, like muscles, contain more mitochondria than cells with lower energy needs.

A typical animal cell will contain around 1000 to 2000 mitochondria. So, muscle cells will contain a high amount of structures that are capable of producing available energy in the form of ATP. The production of ATP by the mitochondria takes place by a process known as cellular respiration, which in essence is the use of oxygen, glucose, amino acids and fatty acids to produce energy from the food that we eat. Notwithstanding the aging process, every cell in the body is constantly producing energy, and ubiquinol has been shown to assist the mitochondria to produce this energy more efficiently and effectively.

While CO Q10 is naturally produced in the body, a deficiency can occur in individuals with disrupted CO Q10 production resulting from serious metabolic dysfunction, or a mitochondrial insufficiency disorder. Individuals can also experience a CO Q10 deficiency if they do not take in enough CO Q10 through diet or if the body consistently experiences a high energy demand and uses too much CO Q10, like in the case of athletes. Depending on the factors associated with a CO Q10 deficiency, increasing dietary CO Q10 intake or supplementing with CO Q10 and the vitamins and trace minerals that the body needs to produce CO Q10 can be therapeutically beneficial.

During your adolescent development and before the age of 30, depending on your energy needs, you should produce between 400 and 500mg of CO Q10 per day. Have you ever noticed how busy a toddler can be, always on the move, or how a teenager can eat up all the food in the refrigerator and pantry in a matter of a week? Growth and development demand a high amount of energy, and throughout this process CO Q10 plays an integral role. Once we reach the age of sixty, however, most of us have 50-60% less CO Q10 in our bodies, an indicator which may be among the factors that contribute to the aging process.

Trace minerals and nutrients must perform their primary functions, but also act as “precursors” to other nutrients. So, the proper functioning of the body depends on adequate amounts of minerals and nutrients being present to ensure that the metabolic and conversion processes manifest correctly. In this way, the body makes its own CO Q10 by converting other nutrient precursors, like the amino acids tyrosine and phenylalanine in concert with all of the B vitamins, Vitamin C and other trace minerals. In total, the body undergoes seventeen separate processes to convert nutrients and synthesize CO Q10, a testament to the fact that a poor diet, deficient in nutrients and minerals can have a detrimental effect on energy production. To help put the importance of maintaining a healthy diet and taking supplements into perspective, consider the fact that CO Q10 is found in higher concentrations in high energy organs including the heart, brain, liver, stomach lining, mouth and gums, muscles, pancreas, immune cells, and still in every cell in the body. As for the vital organs, the lowest concentrations of CO Q10 are found in the lungs.

CO Q10 is present in abundance in the heart muscle, the most important muscle in your body. Interestingly, there is a strong correlation between congestive heart failure and a low blood and tissue level of CO Q10. Multiple studies support the fact that CO Q10 significantly improves heart muscle pumping ability, and it is an important part of the strategy for maintaining and preventing cardiovascular health events.

Aside from the above mentioned factors for CO Q10 deficiency, one of the most common ways to disrupt CO Q10 production and reduce CO Q10 levels in the body is by taking certain prescription medications, a phenomenon known as drug induced nutrient depletion. For example, cholesterol reducing statin drugs will block the production of both cholesterol and CO Q10. This helps to explain the common side effects of statins, which include fatigue, muscle pain and weakness, and exasperating heart failure.

In addition to the above mentioned symptoms, one of the first things to occur when CO Q10 levels are lowered by a statin drug is a weakening of the heart muscle function. Studies indicate that depleted CO Q10 can impair the heart’s ability to relax and fill with blood after it has contracted during the cardiac cycle. This is known as diastolic dysfunction. After the heart contracts, it takes a lot of cellular energy, or ATP, to get the heart’s muscle fibers to relax. If diastolic dysfunction is severe, it can result in congestive heart failure, causing fluid to back up and creating swelling or edema in the liver, lining of the intestines, between the lung and the lung lining, and in the lower legs, ankles and feet.

If you recall from last month’s newsletter “Cholesterol and Fat Always Get a Bad Wrap: But They’re Essential for Life and as Simple as Math”, cholesterol may be a contributing factor to cardiovascular disease, but it is by no means the sole culprit. In truth, many factors are more important than cholesterol as causes of cardiovascular disease, such as stress, hypertension, smoking and alcohol use, insulin resistance and diabetes, and high triglycerides, accompanied by poor diet and a lethargic lifestyle. If you have high cholesterol, the likelihood that some of these other factors are involved in your overall health risks should be considered and addressed accordingly.

While there are many favorable studies supporting the use of CO Q10 in combination with statin drugs to alleviate the side effects and the incidence of diastolic dysfunction, as well as other studies that indicate a significant improvement in heart muscle function in patients with cardiovascular disease, the importance of CO Q10 is only just beginning to gain traction with mainstream western physicians who do not routinely use it in conjunction with statin drugs or in the treatment of congestive heart failure. Unfortunately the fear campaign perpetuated by big pharma and the mainstream media over cholesterol, along with a general lack of knowledge and understanding of clinical nutrition in western medical practice, literature and education continues to prevail. Accompanied by a trend of conventional American medical doctors aggressively lowering their patient's blood cholesterol levels, this has resulted in an increasingly severe deficiency in CO Q10 across a notable segment of the American population, and may well be playing a statistically significant role in the prevalence of congestive heart failure in the United States today.

According to the American Heart Association more than 71 million Americans, 28.5% of the population, suffer from one or more types of heart disease, and every 35 seconds someone dies from it. There are also many health conditions that are directly associated with heart disease like high blood pressure, high cholesterol, hardening of the arteries and stroke. There is enough evidence to support that a CO Q10 deficiency may contribute to these complications, but our healthcare system apparently needs more research to prove that it does.

To put this into perspective, the Canadian healthcare system put black box warnings on their statins to recommend supplementing with CO Q10 when taking these drugs. In 2002, over a decade ago, in the United States a medical doctor filed petitions with the Food and Drug Administration calling for a similar black box warning on statin drugs. The FDA has yet to act.

There are several other categories of CO Q10 depleting drugs, including diabetic and blood pressure medications, as well as acid reflux drugs. If you are currently taking one or more of these medications consider discussing CO Q10 depletion with your doctor, and requesting a quality CO Q10 supplement from your pharmacist today. In addition to CO Q10 depletion, many medications can deplete the body of both fat and water soluble minerals and nutrients that perform their own functions in the body and are also necessary as "precursors" in the synthesis of CO Q10.

With this in mind, it is important to gain a thorough understanding of your prescription medications and the deficiencies that can be caused by taking them. You do not want to mistake symptoms like pain, fatigue and low energy, cramping, memory loss, weight gain, or liver problems for new disease states or debilitating conditions. With a strong body of clinically relevant research in support of the benefits of supplementing with CO Q10 and heart health, it is fascinating that evidence also indicates advantageous effects on other heart and circulatory related conditions like stroke, high cholesterol, and high blood pressure.

While more research is necessary to yield conclusive results, CO Q10 is often used as a supplement to lower blood pressure. Two research studies in particular indicated that patients with hypertension who supplemented with CO Q10 experienced a clinically significant reduction in both systolic and diastolic blood pressure without any major side effects. The studies also noted that low blood levels of CO Q10 have been found in people with hypertension, but it is not clear that a CO Q10 deficiency is a cause of the high blood pressure. Considering its antioxidant benefits, a low blood level of CO Q10 should certainly be considered as a likely determinant for the condition.

As a rule, antioxidants are anti-aging, anti-cancer, and anti-inflammatory. Antioxidants help to combat free radical damage to cell membranes and DNA, and prevent cell death. Oxidative stress in the body occurs naturally over time, but diet and lifestyle can indicate the severity to which an individual's self imposed oxidative stress will lead to premature aging, disease, and eventually death.

It is generally accepted across the medical community that hypertension is connected to increased vascular oxidative stress, but consistent with the lack of conclusivity that a CO Q10 deficiency contributes to high blood pressure, the jury is not out on whether oxidative stress is a cause or an effect of hypertension. It is incontrovertible that free radical damage and oxidative stress cause inflammation, and they are ever present in the body as byproducts to normal cellular processes. Inflammation is the body's natural protective reaction to injury or trauma and aids in the process of healing and recovery. Inflammation also weakens the immune system and disrupts certain metabolic processes as well, so while it is not a problem in the short term, over time it can progress into damaging and even life threatening diseases.

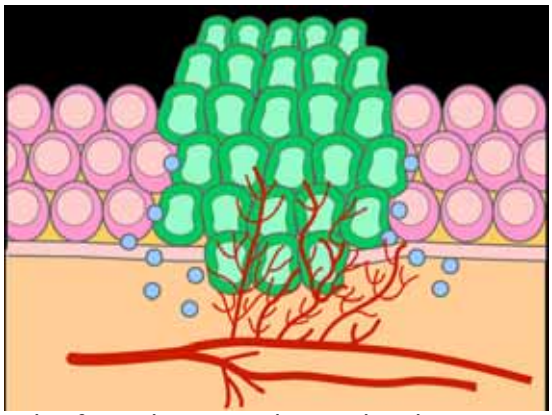
Chronic systemic inflammation is not restricted to certain parts of the body, but it involves the lining of the blood vessels and many internal organs and systems. With this in mind, along with the information presented here, it should not be a stretch to conclude that a CO Q10 deficiency along with deficiencies in its "precursors" will lead to inflammation, not only causing hypertension, but if left unresolved, fueling the severity and collective damaging potential of the condition itself. So, while some research studies may indicate, but mainstream medicine has yet to confirm the benefits of lowering blood pressure and treating hypertension with CO Q10, certainly supplementing with it will help to prevent the down spiraling chain reaction that may result without it.

Aside from promoting heart health, preventing cardiovascular disease, and reducing blood pressure, CO Q10 may also be effective for reducing high cholesterol and blood sugar. Similar to individuals with high blood pressure, people with high cholesterol and diabetes also tend to have lower blood and tissue levels of CO Q10 when compared to those who are healthy. However, according to one a research study by the University of Maryland Medical Center, supplementing with CO Q10 does not lower cholesterol.

Notwithstanding the research study, if you understand the process by which CO Q10 is utilized for metabolizing glucose and fat to produce energy in the form of ATP by the mitochondria of each cell, it becomes clear that CO Q10 can help to lower cholesterol and blood sugar since greater proportions of each are used up in the production of energy instead of the production of cholesterol. Additional research studies confirm that hyperglycemia, or high blood sugar, will lead to an increase in LDL cholesterol by diminishing the body's ability to remove cholesterol. When blood sugar remains elevated, LDL cholesterol and the receptors for metabolizing it in the liver become glycosylated, or coated in sugar, impairing the liver's ability to filter cholesterol out of the bloodstream. So, does CO Q10 help the body to reduce cholesterol? You can connect the dots and decide for yourself.

In addition to the possible cardioprotective benefits of CO Q10, it may also improve exercise performance by enhancing muscle strength and stamina. The proven value added benefits of exercise, lowering blood sugar, cholesterol, and high blood pressure, are a direct result of CO Q10's characteristic of facilitating the production of energy in the form of ATP to better athletic execution, which emboldens the ideas that CO Q10 can lower blood sugar, cholesterol, and high blood pressure. In addition, CO Q10 supplementation should allow the body to experience reduced fatigue after physical exertion. But like the discussion in the above paragraphs, there are research studies to show that it does and that it does not, and that it does not.

TUMOR ANGEOGENESIS



With inflammation and decreased energy production in mind, it should come as no surprise that CO Q10 is also indicated to help treat certain types of cancer. Research studies indicate that there are several mechanisms of action by which CO Q10 may decelerate tumor growth. Some of these mechanisms include CO Q10's ability to bolster the immune system, suppress tumor angiogenesis, and reduce inflammatory markers that may cause cancer cells to multiply more quickly. Tumor angiogenesis is the rapid production of blood vessels that penetrate into cancerous tumors, providing it with nutrients and oxygen so that it can grow and thrive.

Also, as an antioxidant, CO Q10 can help to prevent cancer from developing in the first place. Similar to the therapeutic applications presented above, the mainstream media, big pharma, and the cancer treatment community have yet to be convinced that the promising discoveries of implementing CO Q10 in conjunction with traditional cancer treatments could save many lives. If you or someone that you love is undergoing cancer treatment, consider discussing the use of CO Q10 as a complementary tool to fight and win the battle.

From the information presented here, the powerful potential of CO Q10 should be "front and center" when it comes to preventing and treating a plethora of health conditions and maintaining a healthy body in general. As more research studies are undertaken, and increasing attention is cast upon it, hopefully we will open our eyes to the fact that CO Q10 deficiencies across our population are a significant risk factor for health and human suffering as well as mortality. Among the many mineral and nutrient deficiencies that are dietary and prescription drug induced, the fact that the great majority of us are unaware that our bodies are routinely lacking in the tools that are necessary for a healthy existence should not be dismissed.