



# IMAGE AWARENESS WELLNESS INSTITUTE

## CoQ10

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### INTRODUCTION

Coenzyme Q10 is not a vitamin. It is, however, a perfect example of what has been called a contingent nutrient. Contingent nutrients are those which are necessary for the healthy existence of the cells of the body, but which can be produced within the body or which the body can often get along without. Contingent nutrients may not be produced in adequate quantities to meet needs under certain environmental conditions or at certain stages of life such as aging.

CoQ10 is produced in the body by the same metabolic pathway that manufactures cholesterol. Medications that interfere with cholesterol synthesis like statin medications also block CoQ10 synthesis. Statin drugs can reduce blood levels of CoQ10 by up to 40%. This reduction has been associated with oxidative damage to cells and impaired energy production.

CoQ10 production is also inhibited by beta blockers and medications that lower blood pressure. CoQ10 can also inhibit the anti-clotting effect of warfarin (Coumadin).

Even without exposure to pharmaceutical antagonists to CoQ10 levels of the nutrient in the body generally peak in the 20's and then begin to decline with increasing age.

Conditions which have been investigated and shown some response to CoQ10 include congestive heart

failure, immune deficiency, encephalomyopathy, ataxia, Parkinsonism, Huntingtons disease, diabetes, and cancer.

### REFERENCES:

Davis, Donald, "Nutritional Needs and Biochemical Diversity," in Bland, Jeffrey, *Medical Applications of Clinical Nutrition*, New Canaan, CT.: Keats Publishing, 1983, 50-55.

Ghirlanda, D., et al., Evidence of plasma CoQ10-lowering effect by HMG-CoA reductase inhibitors: A double-blind, placebo-controlled study, *Clinical Pharmacology*, March 1993; 33(3):226-229.

Crane, Frederick L., History of ubiquinone (coenzyme Q) and an overview of function, *Mitochondrion*, 7S (2007) S2-S7.

### DUANE GRAVELINE STORY

Anyone who doubts the importance of Coenzyme Q10 need only read the stories of what can happen to the body when deficiencies develop. Deficiency of CoQ10 can be induced by the stronger statin medications



such as Lipitor. They can cut the internal production of CoQ10 in half in a matter of weeks leaving free radicals to damage the DNA of the mitochondria where energy is produced for the body.

### Cognitive Effects

One of the most dramatic stories of the risk of statin drugs and subsequent CoQ10 deficiency is that of Dr. Duane Graveline. Graveline was a physician working for NASA in 1999 when he was diagnosed with elevated cholesterol and placed on the statin drug Lipitor.

Graveline writes, "Back in 1999 when Lipitor was first started, I lived on the side of a mountain in Vermont. Climbing that mountain was a normal, almost daily event for me, as was cutting and splitting my own wood and doing odd jobs for my neighbors. I thrived on physical activity and work."

Graveline was placed on 10 mg. of Lipitor when his annual astronaut physical revealed elevated cholesterol. Six weeks later he developed transient amnesia. He returned home from a walk in the woods acting confused and gave no evidence of recognizing his wife. A neurologist diagnosed transient global amnesia which lasted about six hours.

The doctor in him led Graveline to suspect Lipitor since it was a new medicine for him. He stopped the



medication and had no further symptoms for a year.

At the next yearly physical cholesterol was still elevated. Graveline's doctors suggested a half dose of Lipitor (5 mg.). Six weeks later Graveline had his second amnesia episode.

Graveline's first episode had been characterized by inability to form new memories. The second episode of amnesia erased memories all the way back to his high school days. The episode lasted for 12 hours. He had no awareness of being a physician or flight surgeon, a husband and father of four children, medical school training, being an astronaut or author of several books.

Graveline became convinced the amnesia problem was caused by Lipitor, but his physicians refused to consider the idea. Graveline gave permission to publish his experience in *People's Pharmacy* and their email was flooded with hundreds of case reports of the cognitive damage resulting from the use of the stronger statin medications such as Lipitor. Graveline concluded that as many as 10,000 people a year could be suffering nerve damage as a result of the use of statin medications. The primary source of this damage was depletion of CoQ10 after sustained use of the medications.

### Muscle Damage

One of the well-known side-effects of statins is damage to the muscles including the heart. Heart damage is often diagnosed as cardiomyopathy and congestive heart failure.

Graveline became convinced that his 3 1/2 months of statin usage contributed to muscle damage and a rapid physical deterioration which he experienced. He wrote, "The feeling of weakness and easy fatigability of legs and low back made me cringe at the idea of exercise. A chair became my preferred refuge. I am now a doddering old man with withered limbs, a stranger in the mirror."

He goes on to say that this transition was not a result of getting old, "to transition thusly in just a few years was clearly not normal and hundreds of other people, all statin users, were experiencing the same thing." Graveline's neurologist suspected mitochondrial mutation secondary of statin use.

### The Good News

In March of 2009 Graveline began a supplement program using a combination of 12 different nutrients including CoQ10. Within four weeks, he was able to walk with a walking stick. Sound nutrition allowed him to drag himself out of the hole created by the use of statin drugs. Supplementing with CoQ10 during the use of statins might have prevented the damage in the first place.

The damage to muscle caused by statin medications can become quite serious. A disorder called rhabdomyolysis can be induced by statins. This condition is characterized by rapid breakdown of the skeletal muscle tissue which can destroy the kidneys, sometimes leading to death.

Graveline, Duane, *Lipitor Thief of Memory*, [www.spacedoc.net](http://www.spacedoc.net), 2006, 4-11, 57.

Graveline, Duane, *The Statin Damage Crisis*, [www.spacedoc.net](http://www.spacedoc.net), April 2009, 161-166.

Graveline Photo: <https://commons.wikimedia.org/wiki/File:Graveline-de.jpg>

### DISCOVERY

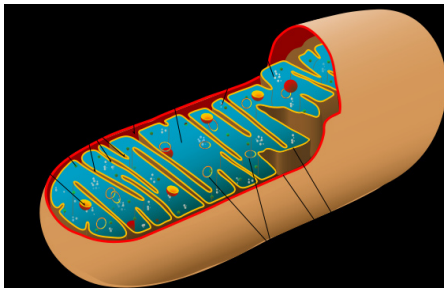
The discovery of CoQ10 was the result of intensive research into how the cells of the body produce energy. This research goes back to the work of Otto Warburg on the use of oxygen by cells, particularly cancer cells. He was awarded a Nobel Prize in 1931 for his work.

In the late 1940's and early 1950's David Green proposed that energy production is contained in an organized complex. He arranged to get up to a dozen beef hearts a day from Oscar Meyer for his research on mitochondria. It should be no surprise that the discovery of CoQ10 which resulted from this research should be important for optimal functioning of the heart.

Green uncovered an important role for carotenoids and what would come to be called CoQ10 in energy production in the mitochondria. When he published his results in 1957 Karl Folkers became interested and studied the compound for 10 years. This research resulted in the use of CoQ10 by Yamamura to treat heart failure.

Karl Folkers was uniquely prepared to research CoQ10 due to his research on the mevalonate pathway. CoQ10 is one of the byproducts of the mevalonate pathway which is also involved in the production of dolichol





(involved with emotions) and cholesterol. Folkers determined the structure of CoQ10 and named it.

Early testing of CoQ10 was hampered by the fact that only 2-3% of the vitamin was absorbed. The later development of gel capsules would greatly improve absorption.

Research eventually showed that CoQ10 was not only involved in energy production, but also acted as an antioxidant in membranes throughout the body. CoQ10 was shown to have an ability to restore oxidized vitamin E molecules into useful antioxidants.

Karl Folkers made a major contribution to CoQ10 research. He began testing its effects on major diseases. CoQ10 was found to benefit a large number of health conditions.

#### REFERENCES:

Crane, Frederick L., History of ubiquinone (coenzyme Q) and an overview of function, *Mitochondrion*, 7S (2007) S2-S7.

Yamamura, Y., 1977. Clinical status of coenzyme Q and prospects. In: Folkers, K., Yamamura, Y. (Eds.), *Biomedical and Clinical Aspects of Coenzyme Q*. Elsevier, Amsterdam, pp. 281-298.

<https://www.pharmanord.com/history-coenzyme-Q10-research>

Otto Warburg: By Kluger Zoltan - National Photo Collection, Serial# 003616, Photo Code D22-123, Public Domain, <https://commons.wikimedia.org/w/index.php?curid=4046280>

Photo Karl Folkers: [https://commons.wikimedia.org/wiki/File:Karl\\_August\\_Folkers.jpg](https://commons.wikimedia.org/wiki/File:Karl_August_Folkers.jpg)

## IMPORTANCE OF MITOCHONDRIA

The most important living things on earth are chloroplasts and mitochondria. Chloroplasts enable plants to convert sunlight, water, and carbon dioxide into energy.

Mitochondria make it possible for

animals to convert food we ingest into cellular energy in the form of ATP (adenosine triphosphate). Mitochondria are very similar to bacteria in structure. They live within cells churning out energy used by cells to carry out life processes.

Mitochondria are so important to the functioning of living organisms that one of the primary biological concepts is the “mitochondrial theory of aging.” This theory contends that the mitochondria are so important to the proper functioning of the cell that cellular operations decline as the capacity of mitochondria to function deteriorates. We call this process aging.

Mitochondria use oxygen to produce energy. Oxygen is a two-edged molecule. It can be used to produce energy within mitochondria, but it can also generate free radicals which can damage the mitochondria.

Mitochondria possess an important antioxidant network to protect against free radicals. CoQ10 is one of the more important building blocks of this antioxidant network. As mitochondria age, they can lose up to half of their structural lipids, energy-shuttling compounds, and antioxidants.

Otto Warburg who won a Nobel Prize for his research on cellular energy production believed that it was damage to the mitochondria that contributed to the development of cancer.

Cancer is generally thought to be the result of damage to the DNA in the nucleus of the cell. Mitochondria, however, also possess machinery for replication. Mitochondria are damaged by all the same substances as

the DNA in the nucleus of the cell: viruses, radiation, and chemical carcinogens. Mitochondria are much more susceptible to damage from these substances than is the DNA in the nucleus of the cell.

In one study sixty minutes of exposure to hydrogen peroxide inflicted damage on mitochondrial DNA that could not be repaired, while the damage to nuclear DNA was repaired within an hour and a half.

Normally the DNA in the nucleus of the cell sends messages to regulate the functioning of the mitochondria. When mitochondria are seriously damaged, however, they send signals which alter the functioning of the DNA of the cell. This reversal of the normal communication pathways is called “mitochondrial retrograde signaling.” These messages are basically a distress call to the cell.

When the mitochondria send these distress signals to the DNA, the way the DNA functions is altered. This is called an epigenetic change. The structure of the DNA is not altered, but the functioning is changed.

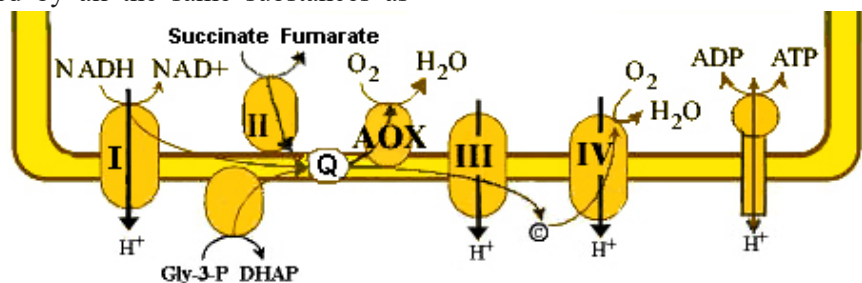
The message of damaged mitochondria results in the formation of hexokinase II which turns the cell into a non-oxygen using fermenter of glucose and makes the cell immortal. Thus is born a cancer cell.

#### REFERENCES:

Hirschey, Matthew D., Dysregulated metabolism contributes to oncogenesis, *Seminars in Cancer Biology* 35 (2015) S129-S150

Christofferson, Travis, *Tripping Over the Truth*, North Charleston, South Carolina: CreateSpace Independent Publishing Platform, 2014, 161-180.

Yakes, Michael F., et al., Mitochondrial DNA damage is more extensive and persists longer than





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nuclear DNA damage in human cells following oxidative stress, *Proc Natl Acad Sci U S A*. 1997 Jan 21; 94(2): 514-519.

[https://commons.wikimedia.org/wiki/File:Animal\\_mitochondrion\\_diagram\\_en\\_\(edit\).svg](https://commons.wikimedia.org/wiki/File:Animal_mitochondrion_diagram_en_(edit).svg)

Four Stages of Energy Production in Mitochondria: By Tingstephen - Own work, CC BY-SA 4.0, <https://commons.wikimedia.org/w/index.php?curid=47069453>

### ABOUT COQ10

Coenzyme Q10 is also known as ubiquinone. The second name derives from the fact that the substance is ubiquitous in the bodies of most animals. It should be common as it is essential for energy production.

CoQ10 is a fat soluble substance similar to vitamins. It is found primarily in the mitochondria or energy factories of the cells where it mops up free radicals. Energy production in the mitochondria is a four step process. CoQ10 is important for the first three steps of this energy production.

Ninety-five percent of the body's energy is produced through aerobic metabolism which involves oxygen. The product of oxygen metabolism is ATP, the form of energy most commonly used by the cells of the body.

CoQ10 is found in greatest abundance in the tissues of the body with

the highest energy requirements such as the liver, heart, and kidney. It is an essential piece of machinery in the process of energy production.

#### REFERENCES:

[https://en.wikipedia.org/wiki/Coenzyme\\_Q10](https://en.wikipedia.org/wiki/Coenzyme_Q10)

### NEOLIFE COQ10

NeoLife has worked for years to produce the most natural and bioavailable form of CoQ10. This supplement is made using the most advanced biogenic technologies to deliver a pharmaceutical grade CoQ10 which is highly bioavailable.

The CoQ10 is accompanied by a unique profile of "partner nutrients" that work synergistically with CoQ10 to improve the health and functioning of the mitochondria. This includes an exclusive Phyto-lipid and Sterol Blend sourced from whole grain lipids and sterols.

NeoLife CoQ10 also contains a proprietary polyphenol blend rich in resveratrol from grapes which further protects mitochondria from oxidative damage. L-Cysteine is added to support the ability of the cells to produce glutathione, a key cellular antioxidant.

MCT from coconut oil and sun-

flower lecithin are added to promote easier energy production. Finally, the unique encapsulation technology allows for digestion of the supplement to begin in as few as two minutes.

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