Coenzyme Q10 is a fat soluble compound best known for its vital function in the production of energy inside cells. It is concentrated in the part of the cell that churns out energy, the mitochondria. A lesser known function of CoQ10 may be its powerful antioxidant activity in cell membranes and in lipoproteins like LDL cholesterol.

Cardiologist, congestive heart failure (CHF) researcher and international CoQ10 expert, Peter H. Langsjoen, MD, FACC says that "The heart muscle uses more energy than any other organ in our bodies". Skeletal muscle, the brain, the liver and gum tissue are also big energy consumers. These organs and tissues require optimal amounts of CoQ10 for optimal energy production for optimal health.

Cells use enzymes to break down chemical bonds in molecules to produce energy. Importantly, enzymes just can't perform without their supporting cast of coenzymes. Many vitamins and CoQ10 are coenzymes and without them energy production is impaired. According to Dr. Langsjoen, "CoQ10 is a coenzyme for three large enzyme systems that are essential for 90% of cellular energy production".

Residing in cell mitochondria, membranes and in lipoproteins, CoQ10 functions to neutralize free radicals and reactive oxygen species - those damaging molecules that are formed simply by breathing and eating.

CoQ10 acts to regenerate or recycle alpha tocopherol (a form of vitamin E) for antioxidant activity. It also protects the lipoprotein LDL cholesterol from lipid peroxidation, a particularly cell damaging reactive oxygen species.

All plant and animal cells contain CoQ10. It is ubiquitous. That means it is found everywhere. And it is why various forms of CoQ10 are called ubiquinone and ubiquinol.

Like cholesterol, your body makes its own CoQ10 which is a biochemical illustration of just how important this compound is to health. It is also found in food. Meat, fish and poultry are good dietary sources of CoQ10. It is especially concentrated in organ meat. A 3 ounce serving of beef contains about 2.6mg of CoQ10, an amount dwarfed by...
Coenzyme Q10 A Vital Energy Nutrient

therapeutic doses used to treat disorders associated with CoQ10 deficiency.

**What causes CoQ10 deficiency?**

Age is a major factor in the development of CoQ10 deficiency. And elderly people that take statin drugs are at an even higher risk of the devastating effects of CoQ10 deficiency.

In his editorial in the current edition of Life Extension magazine, *Conventional CoQ10 Fails Severe Heart Disease Patients*, LEF Director William Faloon presents a chart that illustrates how age affects body organ and tissue concentration of CoQ10.

Information from published studies - Biofactors (1999) and Lipids (1989)

* Heart muscle wall 72% decrease in CoQ10
* Pancreas 69% decrease
* Skin (epidermis) 75% decrease
* Adrenal Gland 47% decrease
* Kidneys 35% decrease
* Liver 10% decrease

**Statins and CoQ10 depletion**

Dr. Langsjoen says that "All statin drugs (HMG-CoA reductase inhibitors) block the biosynthesis of both cholesterol and CoQ10, which explains their common side effects of fatigue, muscle pain, and a worsening of heart failure" and adds that "the current epidemic of congestive heart failure in the US can be termed statin cardiomyopathy".

The Life Extension Foundation estimates that about 5 million have CHF, about 1 million are hospitalized with CHF annually and that "nearly 53,000 die directly from CHF each year".

Merck's statin Mevacor was introduced in 1987. According to Dr. Langsjoen, by 1990 Merck, aware that its statin depleted CoQ10 which could lead to muscle damage, applied for and received two patents for combinations of a statin drug that contained CoQ10.

Do you know anyone taking this statin that contains CoQ10? If not that's not surprising. Dr. Langsjoen says that "Unfortunately to this day the patents haven't been acted on and the vast majority of physicians and patients are completely unaware of statin induced CoQ10 depletion".

Decreased plasma levels of CoQ10 have also been observed with hypertension, diabetes, some cancers, gingivitis (periodontal disease), cataract formation, muscular dystrophy, HIV aids and kidney disorders.
Should you supplement with CoQ10?

After 24 years of treating patients with CHF, Dr. Langsjoen thinks that it makes sense for middle aged people to supplement CoQ10 as a preventative measure.

What form and what dose you consider depends on your individual therapeutic requirements. The most common form of supplemental CoQ10 is available in the form called ubiquinone.

Newer formulas use a form of CoQ10 called ubiquinol, a reduced form that may be more easily absorbed in the bloodstream. Lower preventative and therapeutic doses may be required due to increased absorption.

Commercial lab tests aren't currently available for routine assessment of plasma levels of CoQ10 but within the year the Life Extension Foundation says that they will offer an affordable CoQ10 blood test. The availability of this test will provide an enormous health benefit to the public.

To determine a form and dose that best addresses your individual biochemical requirements for CoQ10, talk to a healthcare professional that is up to date on current CoQ10 research and the benefits of preventative and therapeutic treatment.

Your health issues and your age affect the form and dosage of CoQ10 that is best for you.

If you take pharmaceuticals like blood pressure medications, warfarin, the glaucoma medication timolol, or you are being treated with chemotherapy, it is very important to tell your doctor if you are taking CoQ10.

According to the University of Maryland Medical Center, using CoQ10 can enhance the effectiveness of some of these drugs resulting in the need for lower drug doses. And like most drugs and supplements, therapeutic doses of CoQ10 have not been studied in pregnant and lactating women.

Dr. Langsjoen notes that while treating thousands of patients with congestive heart failure, supplementing with CoQ10 has not led to side effects or drug interactions but he has observed a "gradual lessening of the requirement for many cardiac medications that occurs with the improvement in heart muscle function".

If you are one of the tens of millions of Americans taking statins it is vitally important that you and your physician assess signs of CoQ10 deficiency including fatigue, muscle pain and periodontal disease and request a CoQ10 blood test if necessary.

By using supplemental CoQ10 preventively and therapeutically, a growing body of research shows that you can avoid the long term adverse effects of decreased cellular energy production and impaired antioxidant function.

Research showing that there is increased absorption of the newer form of CoQ10,
ubiquinol is exciting. The therapeutic use of ubiquinol potentially may improve the long term health outcome of millions of people that suffer from degenerative diseases associated with that inevitable condition, aging.

That's good news for your heart, your muscles, your brain, your liver, your pancreas, your kidneys, your gums and teeth, your skin, your eyes, your immune system, your overall health.

Sources:

*Alleviating Congestive Heart Failure with Coenzyme Q10,* Peter H. Langsjoen, MD, FACC, Life Extension, Feb, 2008

*Conventional CoQ10 Fails Severe Heart Disease Patients,* Life Extension Foundation Direction William Faloon, Life Extension, Feb. 2008

*Advanced Nutrition and Human Metabolism,* Groff, Gropper and Smith, pp. 370-375

((http://lpi.oregonstate.edu/infocenter/o...)

((http://www.umm.edu/altmed/articles/coen...)

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