

# ENERGY

## The Power of CoQ10

by Margy Squires

**E**very living cell needs energy. Your body is like a city run by electricity, a network of energy with every cell requiring its share to function. Mitochondria, tiny organelles in each cell, generate that power. Just as we measure electrical energy as watts, cellular energy is measured as ATP units. Want more energy? Get more power!

As in most cities, electrical use is higher where work is concentrated. Likewise, most of the body's mitochondria are in the working heart, liver and skeletal muscles. However, in fibromyalgia and ME/CFS, there is a definite energy crunch in skeletal muscles. Are mitochondria slouching on the job?

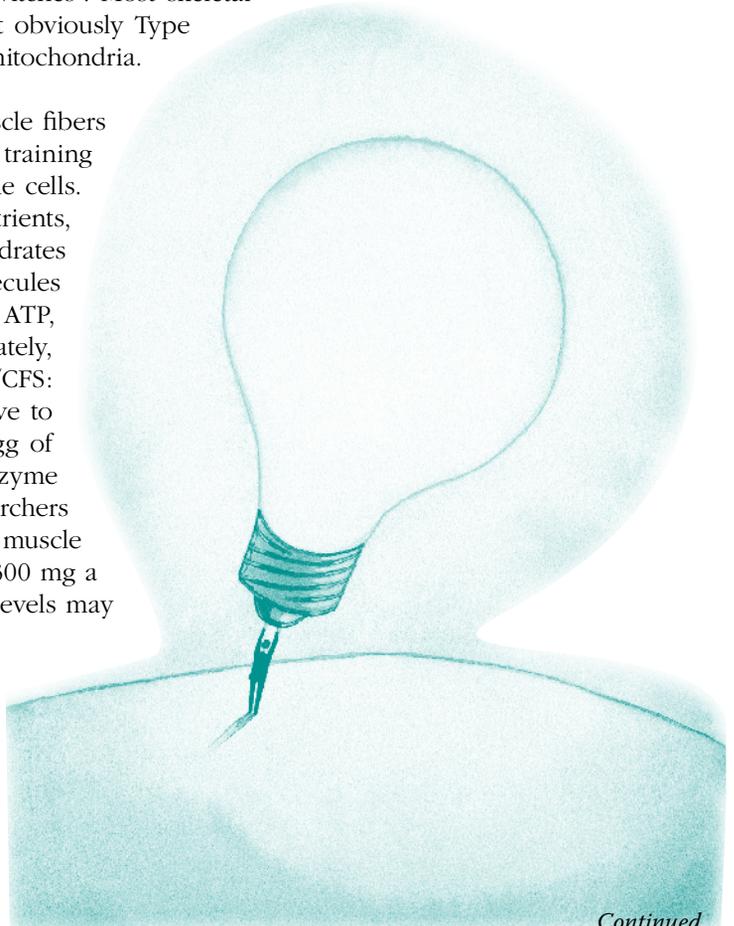
### *I move, therefore I am*

To lift an arm, stretch a leg or even wiggle your fingers, skeletal muscles require energy. ATP is that energy fuel. ATP is produced as a byproduct of a complicated biochemical chain of events known as the Krebs' energy cycle inside the mitochondria. The more mitochondria, the more energy generated. But did you know that the type of muscle itself, specifically the type of fibers, determines the number of mitochondria available: Type I (called slow-twitch) and Type II (fast-twitch). Type I fibers are rich in mitochondria, slow to fatigue and depend on cellular respiration (aerobic) ATP production. Type II fatigue easily since they have fewer mitochondria and depend on glucose (sugar) ATP production. Both types of muscle fibers only have enough ATP for a few "twitches". Most skeletal muscles contain a mixture of Type I and Type II fibers, but obviously Type I fibers can produce more energy because they have more mitochondria.

Here's the rub. One of the best ways to increase Type I muscle fibers (and mitochondria) is to do aerobic exercise and strength training 2-3 times per week. Aerobic exercise increases oxygen to the cells. The mitochondria use oxygen (and a number of other nutrients, including amino acids) to convert the foods you eat (carbohydrates and fats) into ATP. Oxygen is like a multiplier for ATP molecules in the Krebs' cycle, doubling and quadrupling ATP. The more ATP, the more energy your muscles will have to move. Unfortunately, you've already figured out the problem for FMS and ME/CFS: *exercise requires energy!* It's like the old saying that you have to spend money to make money. Where is the starting nest egg of ATP supposed to come from? The answer of course is Coenzyme Q10 (CoQ10). In a continuing clinical trial of CoQ10, researchers found skeletal muscle biopsies revealed an increase of Type 1 muscle fiber "generally found in younger individuals" on a dose of 300 mg a day (Linmane et al, *Free Radic Res*, 2002). Boosting energy levels may be as easy as powering up with CoQ10.

### *What is CoQ10?*

CoQ10 is a vitamin-like substance found in every cell of the body, hence its name *ubiquinone*, meaning "everywhere". Specifically, CoQ10 is found in the cell mitochondria and its main function is to transform food to energy within the mitochondria. Every link in the energy chain depends on CoQ10. to "get connected and stay connected", much like



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## Energy: The Power of CoQ10

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the electrical network in a city. Without CoQ10, energy does not happen. Without energy, the cell dies. CoQ10 is also an antioxidant and its fat soluble nature makes it cell friendly. Mitochondria have its own specialized DNA within its structure. By safeguarding DNA, CoQ10 protects the genetic material that “tells” the mitochondria what to do, further preserving cell function and life.

### *But There's More*

CoQ10 is well-known for strengthening heart muscle, especially in congestive heart failure and has a wide range of other health benefits. CoQ10 supplementation facilitates muscle energy metabolism in post-polio (Mizuno et al, Mol Aspects Med, 1997). Research shows CoQ10 improves overall health as well (Folkers et al, Biochem, 1995). In obese subjects, 52% were found to be deficient in CoQ10. Because it improves lipid (fat) synthesis, CoQ10 was found beneficial at 100 mg a day for weight loss, too (van Goal et al, Elsevier Science, 1984). More recently studies have shown high dose CoQ10 slows the progression of early Parkinson's (Shults CW et al, Arch Neurol, 2002). CoQ10 is also being looked at for cancer, kidney disease and diabetes as well. The Everywhere nutrient seems to be valuable *everywhere* in the body!

### *Safety*

Long term use of CoQ10 has shown no adverse side effects with its use. Safety during pregnant or lactating women has not been proven so CoQ10 may not be advised during this time unless under the advice of your physician. Lipid lowering drugs for cholesterol reduction often lower levels of this fat soluble nutrient as well. Since CoQ10 is critical for heart function, taking CoQ10 may be safer than not taking it!

### *Final Note*

The energy cycle, as mentioned above, is a complex chain of events and many nutrients are cofactors in the equation. Two critical ones are magnesium glycinate and malic acid. A chain is as strong as its weakest link: *the Krebs cycle is as dependent on magnesium as CoQ10*. An estimated 75% of Americans are deficient in magnesium.

Finally, dietary sources of CoQ10 in fish and meat are weak and may supply only 3-5 mg, far below the necessary amount for muscle energy or good health. Supplementing is the way to go. A word of caution is warranted. CoQ10 is manufactured in Japan in a strict patented formulation, backed by research. In 2005, a national CoQ10 shortage drove the prices of CoQ10 higher than usual and although the shortage is over, prices have not returned to pre-2005 level. When buying CoQ10, get your money's worth by requesting the Japanese patented process. If the price seems too good to be true, check the source. Now power up and go!

## Do you need CoQ10?

Almost everyone can benefit from this energizing antioxidant. How many health concerns do you have?

- Aging
- Fibromyalgia
- Gum Disease
- Heart Problems  
(Angina, Cardiomyopathy, CHF)
- High Blood Pressure
- High Cholesterol and/or Triglycerides
- Low Energy
- ME/CF5
- Medications
- Menopausal
- Parkinson's
- Stress
- Thyroid Condition
- Weakened Immunity



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