



CoQ10

UBQH™

www.integrativepro.com • 800.931.1709

Description

Coenzyme Q10, or CoQ10, is dynamically cycled between two states: **ubiquinone (Q10)**, the oxidized state that shuttles electrons, and **ubiquinol (QH)**, the reduced state that releases electrons. Ubiquinol is an unstable compound and converts to ubiquinone upon exposure to light or oxygen.¹ However, research has led to the development of a method to stabilize ubiquinol. UBQH contains Kaneka QHTM, patented (US10/501,698 US Appl. # 20050147598), stabilized, active ubiquinol. In older individuals, supplementation with stable ubiquinol resulted in greater sustained plasma levels of the active form of CoQ10 (ubiquinol).^{*12}

How It Works

CoQ10 is a nutrient that's found in the mitochondria. Called a "coenzyme" because of its unique ability to participate in chemical reactions and remain unchanged, CoQ10 assists in **two vital cellular activities**: ATP production and free radical scavenging.^{*3,4} To carry out these activities, mitochondrial CoQ10 continuously cycles from ubiquinone, its ATP production state, to ubiquinol, its antioxidant free radical scavenging state.^{*3,4} Ubiquinone contributes to ATP production by the shuttling or transporting of electrons.^{*3,4} To meet the considerable energy needs of cellular activities, the electron transport chain makes considerable quantities of ATP.^{*5} The electron transport chain also creates an enormous amount of free radicals – **about 1 trillion oxygen radicals per cell every day**. Most of these oxygen radicals are contained within the membrane folds of the mitochondria; however, about two percent are able to get free.^{4,6,7} The antioxidant form of CoQ10, ubiquinol, scavenges free radicals within the mitochondria and cell membranes.^{*1} The highest concentration of CoQ10 is found in cardiovascular (heart), nervous system (brain), liver, and kidney cells.⁸

Plasma measures of CoQ10 are the sum of both Q10 (ubiquinone) and QH (ubiquinol). Total CoQ10 measurement consists of the sum of both ubiquinone and ubiquinol levels. For most people, the total circulating CoQ10 measurement is approximately 95% ubiquinol and 5% ubiquinone.^{11,12}

Clinical Research

The benefits of supplementing with ubiquinol have been demonstrated in clinical research.

Conversion of CoQ10

In some instances, individuals do not benefit from CoQ10 (ubiquinone) supplementation.^{9,10} A study by Watson demonstrated a mean plasma CoQ10 level of only 1.7 µg/ml in the active group with only two of 30 subjects (ages 18–75 years old) having a level greater than 2.0 µg/ml.⁹ The Khatta trial, which included fifty-five participants (mean age of 64 years), demonstrated a mean plasma CoQ10 level of 2.2±1.2 µg/ml indicating that some patients in the active group had levels as low as 1.0 µg/ml.¹⁰

Absorption of Ubiquinol

It has been clearly demonstrated that reduced CoQ10 (ubiquinol) is better absorbed than oxidized CoQ10 (ubiquinone) and can better replenish the CoQ10 in the plasma.* In a head-to-head study comparing 100 mg of ubiquinone to 100 mg of ubiquinol in subjects older than 60 years, the reduced form, ubiquinol, showed a 430% increase in plasma levels with peak concentrations occurring several hours faster.¹¹

Energy Production

CoQ10 supports energy production levels which are affected by aging, health condition, and exercise.*^{12,13,14} One hundred Olympic-level athletes realized a significant improvement in a measure of peak power production over placebo after supplementing with 300 mg of ubiquinol.*¹⁴ In a much smaller study, the same dose schedule was used and while plasma levels of both ubiquinol and ubiquinone increased, not all athletes realized increased performance.¹⁵

Cardiovascular Benefits

Ubiquinol is beneficial to the cardiovascular system.* In one study, subjects with low plasma CoQ10 levels despite an average ubiquinone dosage of 450 mg/day were given UBQH instead (average dosage, 580 mg/day). The mean plasma CoQ10 concentration then increased from 1.6 µg/ml to 6.5 µg/ml.¹⁶ A 2011 study demonstrated the ability of ubiquinol to support healthy lipid metabolism.*¹⁷ The study included 53 healthy men who were given 50 mg of QH ubiquinol three times daily for two weeks. The researchers reported that supplementation with ubiquinol was shown to support healthy LDL cholesterol metabolism.*

Conclusion

UBQH would be appropriate for older adults or those requiring higher doses of CoQ10.* Requiring no conversion from ubiquinone to ubiquinol, UBQH is ready to support athletes, healthy aging, nervous system, and heart function.*

References

1. Littarru GP, Tiano L. Bioenergetic and antioxidant properties of coenzyme Q10: recent developments. *Mol Biotechnol* 2007;37:31–7.
2. United States Patent and Trademark Office. Available at: <http://patft.uspto.gov/>. [Accessed April 2, 2014.]
3. Crane FL. Biochemical functions of coenzyme Q10. *J Am Coll Nutr.* 2001;20(6):591–8.
4. Sohal RS, Kamzalov S, Sumien N, et al. Effect of coenzyme Q10 intake on endogenous coenzyme Q content, mitochondrial electron transport chain, antioxidative defenses, and life span of mice. *Free Radic Biol Med.* 2006;40(3):480–7.
5. Morton RA. Ubiquinone. *Nature* 1958;182:1764–7.
6. Turrens JF. Mitochondrial formation of reactive oxygen species. *J Physiol* 2003;552:335–44.
7. Cadenas E. Mitochondrial free radical production and cell signaling. *Mol Aspects Med* 2004;25:17–26.
8. Aberg F, Appelkvist EL, Dallner G, Ernster L. Distribution and redox state of ubiquinones in rat and human tissues. *Arch Biochem Biophys.* 1992 Jun;295(2):230–4.
9. Khatta M, Alexander BS, Krichen CM, et al. The effect of coenzyme Q10 in patients with congestive heart failure. *Ann Intern Med* 2000;132:641–8.
10. Evans M, Baisley J, Barss S, Guthrie N. A randomized, double-blind trial on the bioavailability of two CoQ10 formulations. *J Functional Foods.* 2009. 1: 65–73.
11. Wada H, Goto H, Hagiwara S, Yamamoto Y. Redox status of coenzyme Q10 is associated with chronological age. *J Am Geriatr Soc.* 2007 Jul;55(7):1141–2.
12. Sohmiya M, Tanaka M, Suzuki Y, et al. An increase of oxidized coenzyme Q-10 occurs in the plasma of sporadic ALS patients. *J Neurol Sci.* 2005 Jan 15;228(1):49–53.

13. Alf D, Schmidt ME, Siebrecht SC. Ubiquinol supplementation enhances peak power production in trained athletes: a double-blind, placebo-controlled study. *J Int Soc Sports Nutr.* 2013 Apr 29;10(1):24. [Epub ahead of print]
14. Bloomer RJ, Canale RE, McCarthy CG, Farney TM. Impact of oral ubiquinol on blood oxidative stress and exercise performance. *Oxid Med Cell Longev.* 2012;2012:465020. doi: 10.1155/2012/465020. Epub 2012 Aug 2