PROTOCOL
FOR LIFE BALANCE™

Technical Information Sheet

Cardiovascular support
Arterial / Cholesterol support

CoQ10
400 mg

Description

Coenzyme Q10, also known as ubiquinone, is present in almost all cells and is essential for mitochondrial energy production.[1-3] The highest concentration of Coenzyme Q10 (CoQ10) is found in the heart muscle, where constant chemical energy availability is imperative.[1-4] In addition to supporting cardiac function through energy production, CoQ10 also serves as a fat-soluble antioxidant, providing vascular structures and other tissues with protection against damages from free radicals and oxidative stress.[1-4,9] Vitamin E has been added to the formula for additional, synergystic antioxidant protection.

Features & Benefits

- Provides Antioxidant Protection (lipophilic)
- Assists with Cellular Energy Production
- Promotes Cardiovascular Health
- Supports Healthy Heart Muscle Function
- May promote Healthy Blood Pressure already within the normal range
- Supports Healthy Muscular Function
- Replenishes Healthy Blood Levels of CoQ10

Suggested Usage

As a dietary supplement, take one softgel 1-3 times daily with a meal or as directed by your healthcare practitioner.

Allergen Checklist

Contains no sugar, salt, starch, yeast, wheat, gluten, soy, milk, egg, shellfish or preservatives.

Cautions / Interactions

See page 2

Technical Summary

Coenzyme Q10 is a naturally occurring fat-soluble vitamin-like quinone, also called ubiquinone as it is "ubiquitous" or present in all eukaryotic cells. CoQ10 is a mitochondrial coenzyme essential for the production of ATP.[1-3,8,29,33,39,41] Being at the core of cellular energy processes, it assumes importance in tissues with high energy requirements, such as cardiac cells which seem to be sensitive to low CoQ10 production.[14,27,28,29] In the past decades, CoQ10 has been a popular research subject, especially concerning its antioxidative properties protecting against peroxidation of lipid membranes. By improving antioxidant status and cellular bioenergetics, CoQ10 supplementation may play a role in promoting heart health.[4,29,30,31,32,33] Indeed, mounting evidence derived from experimental as well as clinical studies suggests that supplemental CoQ10 may possess cardiosupportive,[1-13,31-34] cytoprotective,[1-3,6-8,15] and neuroprotective[1-3,6-8,15,34] properties. Emerging scientific works also indicate that supplemental CoQ10 may promote healthy aging and longevity.[35] In the human body, the fat-soluble antioxidant tocopherol (vitamin E) often works in concert with CoQ10.[36]

Mechanisms of Action

Clinical studies have demonstrated that supplemental CoQ10 is able to raises blood levels in healthy individuals,[37] as well as in those affected by potential deficiency states, such patients taking certain medications or aging individuals.[5-7,9,11-13,24,31-34,42,43,46,48-53] Experts consider CoQ10's benzoquinone ring its functional group, which is able to assume three alternate redox states: the fully oxidized or ubiquinone (Q) form; the univalently reduced ($1e^- + 1H^+$) ubisemiquinone (•QH), a semi-radical; and the fully reduced ($2e^- + 2H^+$) ubiquinol form. Experts hypothesize that the polyisoprenyl chain facilitates the stability of the molecule within the hydrophobic lipid bilayer. In addition, the length of the CoQ isoprenoid chain may affect the mobility, intermolecular interaction with membrane proteins, and auto-oxidizability.[38] The physiological roles of CoQ10 in biological systems are most well characterized in the inner mitochondrial membrane, where its main functions are: (i) carrier of electrons from respiratory complexes I and II to complex III, (ii) generation of superoxide anion radical by auto-oxidation of ubisemiquinone and (iii) quenching of free radicals.[39] Thus, CoQ10 plays a key role in mitochondrial bioenergetics, while also functioning as a potent antioxidant.[29] It is the only lipid soluble antioxidant synthesized endogenously.

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Clinical Applications

Based on the currently available research, those desiring to promote cardiovascular health, support the body's energy generating processes, antioxidant defense mechanisms, healthy aging and well-being would benefit from taking CoQ10 supplements. Emerging science also suggests that CoQ10 supplements might be of value for athletes,[15,45] syndromes associated with sudden decline in auditory function,[46,47,48] as well as patients with different diagnoses undergoing surgery.[49,50,51,52] Patients regularly taking therapeutic prescription drugs or undergoing surgery are encouraged to discuss with their physician if CoQ10-supplements might be beneficial for them. Likewise, physicians caring for patients requiring certain prescription drugs are encouraged to review potential drug-nutrient interactions to assess the value of adding CoQ10 supplements.

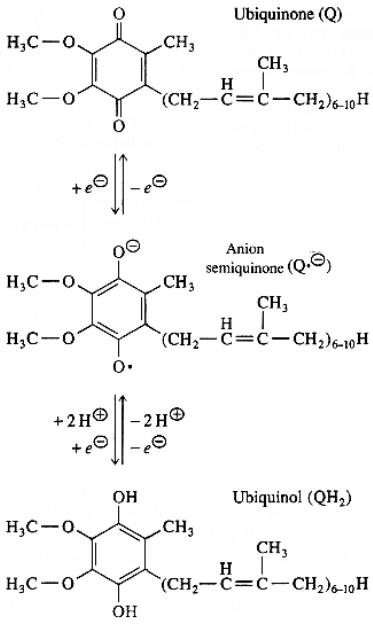

FIGURE 1 Coenzyme Q Redox Stages: fully reduced ubiquinol form (CoQH2), the radical semiquinone intermediate (CoQH·), and the fully oxidized ubiquinone form (CoQ).

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Complementary Products

Consider taking this product in combination with Protocol for Life Balance® **Omega-3 (P1656), Ortho-E™(P0950), Alpha-Lipoic Acid (P3042), Nattokinase (P3140).**

Supplement Facts Serving Size 1 Softgel	**P3198**
	Amount Per Serving
Vitamin E (as d-alpha Tocopherol)	30 IU
Coenzyme Q_{10} (CoQ_{10})	**400 mg**
Soy Lecithin	35 mg

Other Ingredients: Rice Bran Oil, Softgel Capsule (gelatin, glycerin, water, carob) and Beeswax.

Contains no: sugar, salt, starch, yeast, wheat, gluten, corn, milk, egg shellfish or preservatives

Mechanisms of Action Contiinued

Its reduced form, CoQH2, inhibits protein and DNA oxidation, as well as lipid peroxidation of cell membrane structures and lipoproteins present in the circulation. Clinical studies have revealed that supplementation with CoQ10 results in increased levels of CoQH2 within circulating lipoproteins and increased resistance of human low-density lipoproteins (LDL) to the initiation of lipid peroxidation.[40,41] Experimental data also suggests that CoQ10 may affect the activity of endothelium bound extra cellular Superoxide Dismutase (ecSOD), which is considered a biomarker of vascular function.[9,29] Indeed, recent clinical studies have demonstrated that CoQ10 administration can support healthy endothelial function.[42,43] Furthermore, recent scientific data revealed that CoQ10 may affect the expression of genes involved in human cell signaling, metabolism, and transport.[44]

Cautions / Interactions

Coenzyme Q10 supplements may interact with certain medications, such as anticoagulants,[16,17] and selected chemotherapeutic agents.[18-20] Preliminary evidence suggests that doxorubicin's (Adriamycin) cardiotoxicity may be attributed to its interference with CoQ10-synthesis in the heart.[18] Theoretically, taking CoQ10 in supplement form may be of benefit for those taking this medication. However, there is concern that antioxidants might influence some medical treatments, such as chemotherapy (e.g., cyclophosphamide, Cytoxan) and radiation therapy.[19,20] Furthermore, due to CoQ10's influence on blood pressure,[5,11-13] it may have additive effects when used concurrently with antihypertensive drugs; accordingly, caution is advised with its combined use. In recent years, statin drugs have been identified to lower CoQ10 levels in the body;[21-23] current research suggests that CoQ10 supplementation may be useful when taking these medications.[24,25,26] Consult with your healthcare professional if you are taking any of these agents.

References on page 3

Formulated by doctors and clinical scientists exclusively for licensed healthcare practitioners. Manufactured in an A-rated Good Manufacturing (GMP) Certified facility.

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