



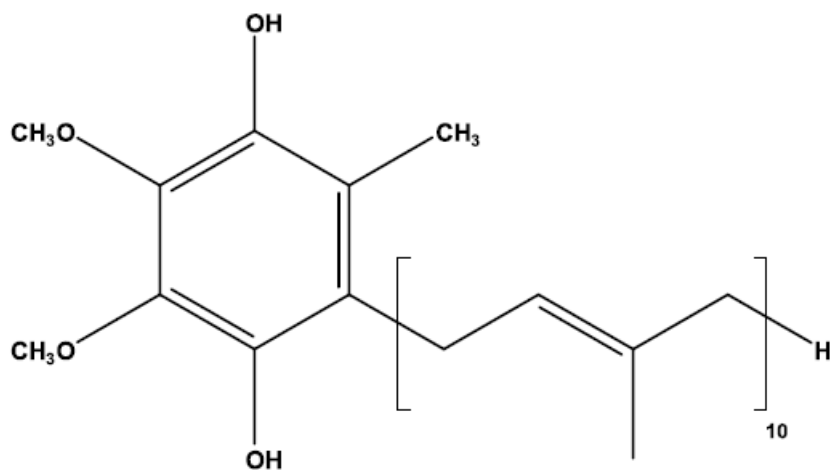
## CLASSES

Dietary Supplement

## DESCRIPTION

CoQ10 is a vitamin-like substance which is produced naturally in the body and plays a critical role in the creation of cellular energy. CoQ10 is available in two forms: Ubiquinone (US Pharmacopeia [USP] Name - ubidecarenone), which is the oxidized form of CoQ10, and Ubiquinol, which is the reduced (lipophilic antioxidant) form that has two additional electrons. Ubiquinol is better absorbed than CoQ10 and raises blood levels of Total CoQ10 more effectively than CoQ10.<sup>1-3</sup>

CoQ10 (ubiquinone) must be converted to Ubiquinol in the serum where it is transported via plasma lipoproteins to cells. Conversion loses efficiency with aging and in individuals with certain chronic health conditions, resulting in lower levels of CoQ10 in the heart and other major organs.<sup>4,5</sup> Administration of Ubiquinol circumvents this problem and therefore Ubiquinol is called the active form of CoQ10.



## HOW SUPPLIED

Since 2007, supplied by Kaneka Nutrients, developer of the patented technology for producing the active form of CoQ10, Kaneka Ubiquinol™. Prior to its introduction, only the oxidized form of CoQ10 was commercially available, also supplied by Kaneka Nutrients. Kaneka Ubiquinol™ is utilized in over 200 brands of consumer products globally and is the only Ubiquinol supplement ingredient available today.

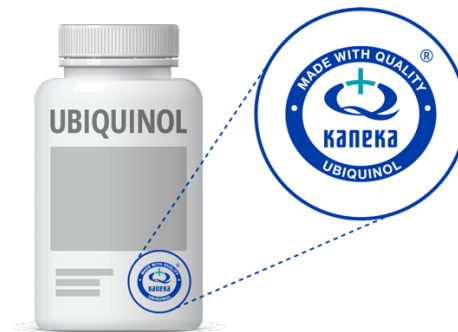
Available in 50 mg, 100 mg or 200 mg soft gels.

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## OTHER COMMON NAMES

Ubiquinol  
Ultra CoQ10  
Advanced CoQ10  
QH-absorb  
Mega CoQ10

Ubiquinol supplements may be branded by other names or descriptors, including those noted above. To ensure patients are purchasing and taking the Ubiquinol form of CoQ10, direct them to look for the Kaneka Quality Seal on the label of the supplement bottle.



## MECHANISM OF ACTION

CoQ10/Ubiquinol participates in the mitochondrial electron transport chain as a cofactor at the level of Complex III where it shunts electrons. It also acts as a lipophilic antioxidant in the mitochondrial membranes.

## PHARMACOKINETICS

Ubiquinol is administered orally. Being lipophilic, it follows the uptake mechanisms of lipids in the gastrointestinal tract. Ubiquinol is first incorporated into chylomicrons following absorption and transported via the lymphatics to the circulation. There it is transported by triacylglycerol-rich lipoproteins to the liver where it is repackaged primarily into VLDL/LDL particles and HDL particles to a minor extent. About 95% of CoQ10 in circulation exists in its reduced form as Ubiquinol in humans.<sup>6,7</sup> A major portion of CoQ10 in tissues is in the reduced form as Ubiquinol.<sup>8</sup>

CoQ10 has a  $T_{max}$  of 6.5 h and an elimination half-life of 33.19 h. Chronic administration produces a dose-dependent increase in plasma CoQ10. Compared to CoQ10, administration of Ubiquinol raises serum levels 2-fold higher with chronic dosing and over 4-fold higher with acute dosing.<sup>9</sup>

## INDICATIONS AND OTHER KNOWN CLINICAL USE

Supplementation with Ubiquinol replenishes depleted levels and circumvents CoQ10 deficiency.<sup>1,2,10-12</sup>

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CoQ10 deficiency has been reported in congestive heart failure,<sup>13,14</sup> Type 2 diabetes,<sup>15,16</sup> hepatitis,<sup>17</sup> liver cirrhosis,<sup>17</sup> hepatocellular carcinoma,<sup>17</sup> ALS,<sup>18</sup> Alzheimer's disease,<sup>19</sup> juvenile fibromyalgia<sup>20</sup> and Down's syndrome.<sup>21</sup>

Statin drugs inhibit the endogenous production of CoQ10, which has been implicated in fatigue and myalgia; Ubiquinol replenishes CoQ10 stores in these patients.<sup>22,23</sup>

## DOSAGE & ADMINISTRATION

As a dietary supplement, intended for a daily intake of 100-300 mg

Recommended Use:

100 mg/d – Maintenance dose

200 mg/d – To replenish Ubiquinol levels and correct deficiencies

300 mg/d – For more severe deficiencies or to dose load initially and then decrease to 200 mg

## DOSAGE UNDER CARE OF PHYSICIAN

450-900 mg - To address depleted levels and deficiencies observed in congestive heart failure patients

## ADMINISTRATION

Oral administration

## STORAGE

Store at controlled room temperature (68-77° F)

## CONTRAINDICATIONS / PRECAUTIONS

None

## ADVERSE REACTIONS

Ubiquinol is generally well tolerated. As with any dietary supplement, some gastrointestinal discomfort may be experienced.

## DRUG INTERACTIONS

Because of its structural similarity to vitamin K, it has been suggested that CoQ10 may have procoagulant activity and interfere with warfarin. The available clinical trial evidence does not support such a concern.

While there are reports of individual case studies showing an interaction of CoQ10 and warfarin<sup>24,25</sup>, other case studies involving highly monitored patients on warfarin specifically noted no interactions with CoQ10.<sup>13</sup> A well-controlled, double-blind, placebo-

controlled study designed to assess the effect of CoQ10 on warfarin also showed no effect.<sup>26</sup> A prospective study did show an interaction, though by admission of the authors, the results may have been due to chance given a small population that self-reported the data.<sup>27</sup>

Until the dynamics of warfarin, vitamin K and CoQ10 are better understood, patients taking these products together should be closely monitored by the prescribing physician. Administration of Ubiquinol may be appropriate for many individuals taking coumarin or other blood-thinning medications. The addition of any nutrient or even gradual changes in medication dosage levels demands close patient monitoring to ensure maintenance of INR within the acceptable range. Emerging pharmacogenomic data indicates that people with certain genotypes may be more susceptible to variables influencing warfarin activity, sensitivity and resistance.<sup>28</sup>

## PREGNANCY AND LACTATION

There are no adequate and well-controlled studies in pregnant or lactating women to establish safety.

## REFERENCES

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