Kaneka UBIQUINOL™

100+ STUDIES 80+ PATENTS 45+ YEARS OF RESEARCH

Mitochondrial Energy

The New Frontier of Healthcare

THIS DOCUMENT IS INTENDED FOR REGISTERED HEALTHCARE PRACTITIONERS ONLY.

WHAT IS MITOCHONDRIAL ENERGY?

There is no life without energy and no energy without mitochondria. Mitochondria are complex cellular organelles of which hundreds to thousands are found in all cells in the body, except for red blood cells, with the primary function being to produce energy. In fact, these energy "engines" produce around 90% of the biochemical energy required by cells to survive.

This energy – adenosine triphosphate (ATP) – can't be stored and the mitochondria must function constantly to produce the large amounts needed to sustain life.

In addition to energy production, mitochondria have important roles in biological activities including in heat production, calcium storage, apoptosis, cell signaling and immune system health.[1]

Dysfunction of mitochondria (due to inflammation, oxidative stress or suboptimal nutrient levels) is associated with most chronic disease states, including obesity, type 2 diabetes, chronic fatigue syndrome (CFS), infertility, cardiovascular disease, hypertension, non-alcoholic fatty liver disease (NAFLD) and other age-related diseases such as neurodegenerative disorders.[2-8]

Studies demonstrate that a defect in mitochondrial function in one tissue has consequences for the whole body.[5] Mitochondrial dysfunction also compromises the body's ability to respond effectively to stress, and then stress further impacts mitochondrial dysfunction.[2,9]

IMPORTANCE OF UBIQUINOL

Ubiquinol is a vital cofactor in the generation of ATP and is of critical importance to mitochondrial function and, therefore, optimal health during our lifespan.

Depletion of ubiquinol, therefore, has a significant impact systemically on metabolic regulation, brain function, immunity and regulation of inflammatory pathways, linking it to the pathogenesis of a range of disorders.[10-16]

WHAT IS UBIQUINOL AND HOW DOES IT WORK?

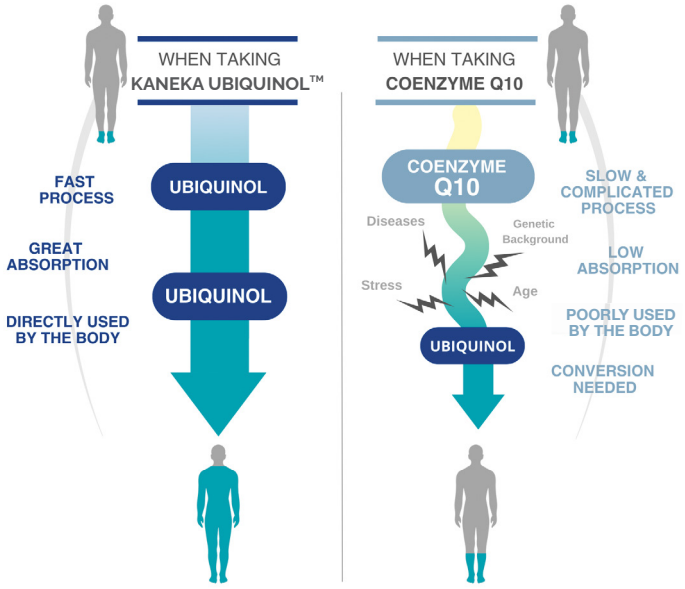
Coenzyme Q10 (CoQ10) is a fat-soluble, endogenous antioxidant nutrient that comes in two forms – ubiquinone and ubiquinol. Ubiquinol is the active, more bioavailable form that naturally occurs in the body.

Whereas ubiquinone needs to be converted into ubiquinol, after absorption from the small intestine and liver, to exert its antioxidant activity.

Due to its essential role in energy production, ubiquinol is concentrated in organs that require the most energy, such as the heart, liver, intestines, muscles and kidneys. Ubiquinol accounts for around 96% of the total CoQ10 pool in human plasma.[17,18]

In addition, ubiquinol is a powerful antioxidant that protects cell membranes and cellular components, including proteins, lipids and DNA, from oxidative damage. It is also able to regenerate other antioxidants, such as vitamins C and E, to further protect the body from damaging effects of free radicals.[19,20]

UNDERSTANDING UBIQUINOL



UBIQUINOL FOR OPTIMAL HEALTH

Unfortunately, our production of ubiquinol declines with age, as does the ability to convert ubiquinone to ubiquinol.[19] This impaired production and conversion is believed to contribute to age-related declines in cellular energy production and function, as well as increased oxidative damage.[21]

In these instances, supplementing with stabilised active ubiquinol may be helpful in bridging the gap, and supporting the body, in balancing oxidative stress and protecting cells against free radical damage.

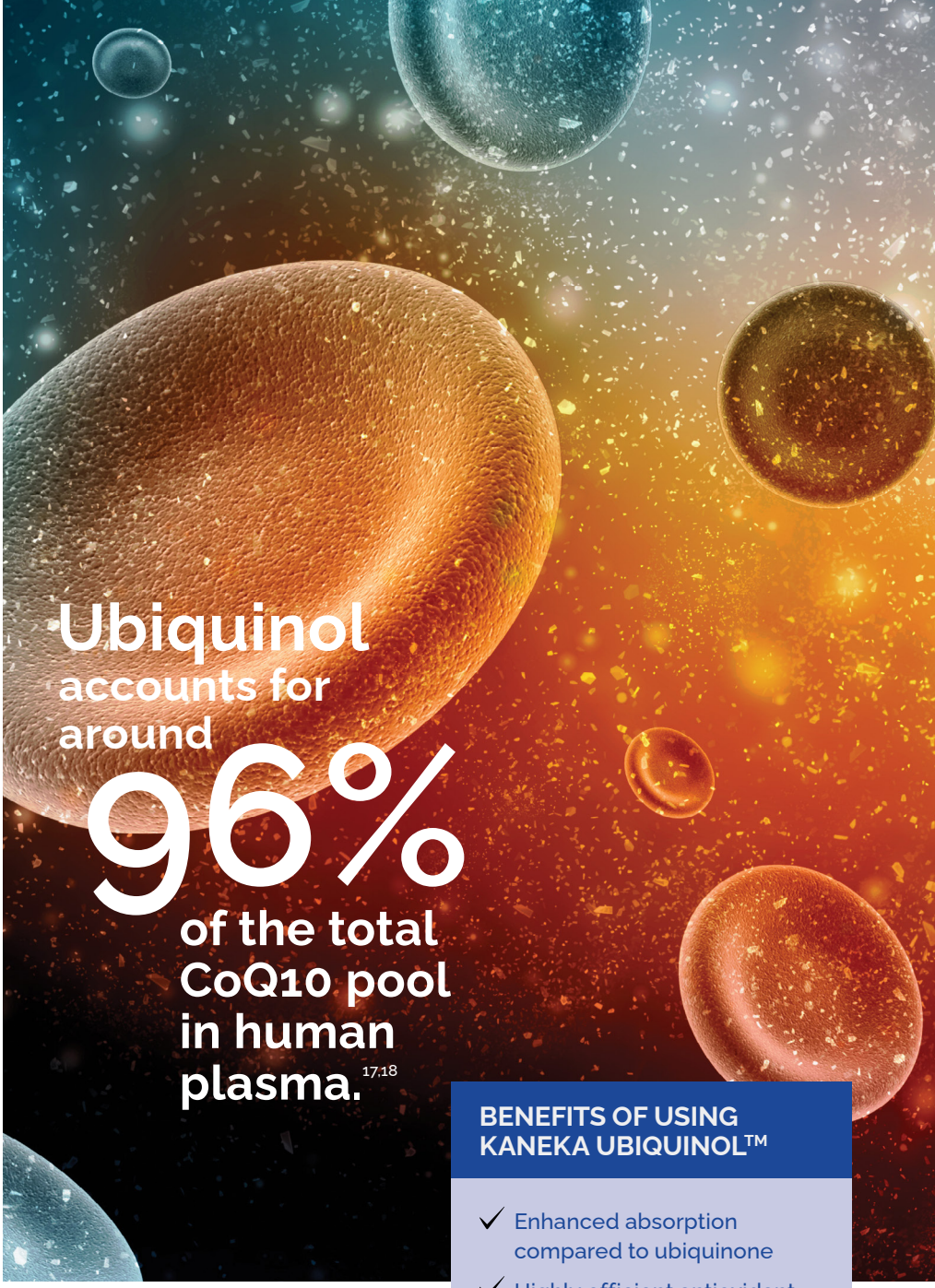
WHEN MIGHT YOU NEED TO SUPPLEMENT WITH KANEKA UBIQUINOL™?

- **For those with chronic conditions**
  Low levels of ubiquinol have been found in older people and in those with type 2 diabetes, impaired immunity, and cardiovascular, neurological and liver diseases.[10-16]

- **With the use of statin medication**
  Statins inhibit the enzyme (HMG-CoA reductase) that produces cholesterol, but this enzyme is also required for the production of ubiquinol.[22,23] Statin use has shown to decrease plasma CoQ10 by 45%.[24]

- **For those over 20 years of age**
  With increasing age and prolonged stress due to lifestyle, diet or environmental factors, the ability to convert ubiquinone to ubiquinol declines and our ubiquinol ratio (ratio of ubiquinol/ubiquinone or ubiquinol/total CoQ10) reduces.[25-27] Ubiquinol production starts to decrease after 20 and, by 80 years of age, the myocardial concentration of ubiquinol has reduced by around half.[28]

- **For vegan and vegetarian diets**
  About 25% of plasma CoQ10 is derived from the daily diet,[29] and the richest dietary sources of CoQ10 are meat and fish. Lower levels of CoQ10 are present in most dairy products, vegetables, fruits and cereals.



HOW TO CHECK UBIQUINOL LEVELS

A blood test can provide a measurement of plasma CoQ10 concentrations.

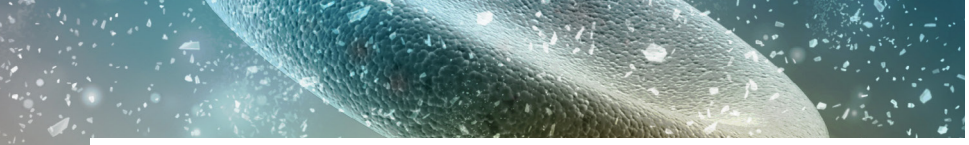
The normal range for blood CoQ10 levels varies between pathology labs but is usually between 0.7-1.9 mg/L (or mcg/mL). The ubiquinol:ubiquinone and ubiquinone:total CoQ10 ratios are used as markers of oxidative stress.

Blood levels may not always accurately reflect the amount of CoQ10 in tissues and cells. You can have normal, or even elevated levels, in the blood but still have a deficiency in muscles and immune cells.

Talk to your qualified healthcare practitioner for referral, information and interpretation of lab results.

BENEFITS OF USING KANEKA UBIQUINOL™

- ✓ Enhanced absorption compared to ubiquinone
- ✓ Highly efficient antioxidant activity
- ✓ Supports male and female fertility
- ✓ Supports healthy energy synthesis, assisting fatigue, physical performance and exercise recovery
- ✓ Helps maintain a healthy cardiovascular system
- ✓ Helps reduce stress and improve sleep-related issues
- ✓ Improves mitochondrial health and accelerates recovery from post COVID-19 syndrome
- ✓ May be of benefit to people experiencing increased oxidative stress, as occurs with normal healthy ageing



EVIDENCE FOR KANEKA UBIQUINOL™

Condition	Dose and duration	Outcome	Ref
Stress and sleep disorders	100 mg/day, 8 weeks	Ubiquinol reduced stress and improved sleep-related problems in healthy subjects with high stress sensitivity.	2
Exercise performance	200-300 mg/day, 6 weeks	Ubiquinol significantly improved clinical parameters (decreased body mass index, percent body fat, and systolic and diastolic blood pressures) and enhanced physical performance by increasing aerobic capacity (measured as VO2 max) in trained men, aged 20-30 years. Ubiquinol supplementation significantly enhanced physical performance measured as maximum power output versus placebo in young healthy trained German Olympic athletes.	30, 31
Post/Long COVID-19	200 mg/day, 28-32 days	Platelet mitochondrial respiratory chain function, oxidative phosphorylation and endogenous CoQ10 levels were reduced in patients after 4-7 weeks of overcoming acute COVID-19. Targeted mitochondrial therapy with CoQ10 supplementation in patients with post COVID-19 syndrome improved mitochondrial health and accelerated the recovery from the infection.	32, 33
Influenza (acute)	N/A	CoQ10 levels were significantly lower in 48% of patients with acute influenza infection, compared to 7% of the control group, and were correlated with several inflammatory markers.	34
Dyslipidaemia-related endothelial dysfunction	100-200 mg/day, 8 weeks	Ubiquinol significantly ameliorated dyslipidaemia-related endothelial dysfunction. This effect was strongly related to increased nitric oxide bioavailability and partly mediated by enhanced LDL antioxidant protection.	35
Statin-associated fatigue and myalgia	30-200 mg/day, 12-24 weeks	Side-effects of fatigue and myalgia, commonly seen in statin therapy, may be a result of ubiquinol depletion. Supplementation of CoQ10 alongside statin medications effectively raised serum levels and negated pain by 53.8% and muscle weakness by 44.4%.	36, 37
Statin-associated cardiomyopathy	Average 300 mg/day, average 2.8 years	In patients receiving long-term statin therapy, statin-associated cardiomyopathy may develop that responds safely to statin treatment discontinuation and ubiquinol supplementation.	38
Heart failure	600 mg/day, 12 weeks	Among patients with heart failure with preserved ejection fraction (HFpEF), treatment with ubiquinol significantly reduced heart failure symptoms, levels of BNP and lactate, and increased left ventricular ejection fraction and ATP production.	39
Pulmonary arterial hypertension	300 mg/day, 12 weeks	Ubiquinol improved right and left ventricular heart function in patients with pulmonary arterial hypertension, and also led to an improvement in haemoglobin production and red cell maturation. Therefore, ubiquinol supplementation may benefit those with depressed myocardial function.	40
Sperm health	150-400 mg/day, 6-26 weeks	Multiple studies on the effects of ubiquinol on sperm health parameters have shown a positive influence on sperm concentration, morphology and motility.	41-43
Female fertility	100 mg/day, 8-16 weeks	The antioxidative properties of ubiquinol may improve the secretion of follicle stimulating hormone (FSH) and luteinising hormone (LH) levels among infertile females. Supplementation of ubiquinol combined with omega-3 oil improved pregnancy rate in patients undergoing *in vitro* fertilisation for unexplained infertility.	44, 45
Fatigue	100-150 mg/day, 12 weeks	Both 100 mg and 150 mg of ubiquinol demonstrated an anti-fatigue effect in healthy individuals experiencing fatigue in daily life.	46
Physical performance, endurance and recovery	300 mg/day, 2-6 weeks	Ubiquinol improved physical exercise capacity, with supplementation during high intensity exercise modulating exercise-induced inflammation. Supplementation also decreased oxidative stress and increased plasma nitric oxide, which is known to improve endothelial function, energetic substrate supply and muscle recovery after strenuous exercise.	31, 47, 48
Chronic fatigue syndrome	150 mg/day, 12 weeks	Ubiquinol improved sleep quality in patients with chronic fatigue syndrome, as well as depression symptoms and arithmetic task performance.	49

FOR MORE INFORMATION

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To speak with one of our scientists or consulting healthcare professionals about how to best incorporate ubiquinol in health protocols, contact hello@ubiquinol.net.au

ABOUT KANEKA

Kaneka Corporation, established in 1949 and headquartered in Japan, provides diversified products, including pharmaceutical intermediates and food supplements.

Kaneka is acknowledged as the world leader in CoQ10 production, using patented original manufacturing. The next generation of CoQ10, Kaneka Ubiquinol™ is supported by more than 10 years of research.

Kaneka Ubiquinol™ is the only supplemental ubiquinol ingredient available today and is utilised in hundreds of consumer products around the world. Kaneka Ubiquinol™ is now being shown in repeated clinical trials as the most effective and powerful form of CoQ10 available.

Kaneka is the sole manufacturer of stabilised and regulatory approved ubiquinol globally.

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