METABOLIC CODE®

metabolic code formula

Glut-reg4

Formula Monograph

Glut-reg4 is composed of dietary supplements that help balance blood sugar levels and improve insulin function and utilization, improve carbohydrate metabolism, help balance oxidative stress, help support vascular health and help improve cellular energy and metabolism.

Ingredients:

Supplement Facts			
Serving Size: 2 capsules Servings Per Container: 30			
	Amount Per Serving	**% Daily Value**	**Formula Use(s)**
Vitamin C (ascorbic acid)	40 mg	67%	• Antioxidant • Helps decrease advanced glycation end products (AGEs) and decrease cell toxicity of AGEs
Alpha-lipoic acid (Mixed racemic)	600 mg	*	• Antioxidant • AMP-K activation and insulin receptor activation
Chromium as polynicotinate	1 mg	833%	• Improves insulin regulation and glucose tolerance • Helps regulate GLUT4 • Supports thyroid health

Benfotiamine	100 mg	*	• Lipid soluble and readily absorbable form of Vitamin B1 (Thiamin) • Improves carbohydrate and amino acid metabolism to produce cellular energy. • Helps improve glucose regulation an
Pyrroloquinoline quinone (PQQ), Microactive®	10 mg	*	• Mitochondrial catalyst for improved burning of fuel • Microactive® PQQ is sustained release, offering increased bioavailability and clinical utility
Vanadium (amino acid chelate)	500 mcg	*	• Trace mineral • Helps improve blood glucose regulation • Helps regulate glut transporter expression
* Daily value not established.			

Recommended Uses:
Helps support a healthy metabolism through blood sugar balance and improving insulin signaling sensitivity, decreasing oxidative stress, improving carbohydrate metabolism, vascular health and cellular energy.

Recommended Dosage:
1 capsule, 2 times daily.

Product Overview:
Diabetes in general affects approximately 25.8 million Americans as of 2011, with 18.8 million individuals diagnosed with diabetes and 7 million undiagnosed (National Diabetes Fact Sheet, 2011). More than 90% of the diabetics in the United States are Type 2 diabetics, and the incidence of Type 2 diabetes has increased by over 50% in the past 30 years.
It is also estimated that 24% (almost 1 in 4) people in the US have symptoms of insulin resistance, placing an estimated 70 million people at risks associated with insulin resistance, including the risk of developing type 2 diabetes (American Diabetes Association, www.diabetes.org).

GluT-reg4 contains dietary supplements that help with insulin receptor sensitivity and blood sugar homeostasis, helping to decrease the negative effects of poor blood sugar regulation. ***GluT-reg4*** helps decrease the negative effects of oxidative stress, supports cholesterol and vascular health and helps increase cellular energy and metabolism and improves insulin receptor signaling. ***GluT-reg4*** contains the antioxidant alpha-lipoic acid (ALA) and the nutrients chromium, benfotiamine and pyrroloquinolone-quinone (PQQ). ALA is reported to help improve insulin receptor activation, increase AMP-K activation and improve glycemic control.[1] Chromium provides support for healthy glucose metabolism and helps the body

metabolize carbohydrates and fats.[2] Benfotiamine is a lipid soluble vitamin B1 (Thiamin), which can help improve carbohydrate and amino acid metabolism to produce cellular energy.[3] Pyrroloquinoline-quinone is a redox cofactor that is involved in mitochondrial energy production and in insulin signaling activation.[4]

Supporting Research:

Alpha Lipoic Acid (ALA)

- Antioxidant
- Helps improve insulin receptor activation
- Helps increase AMP-K activation
- Reported to improve glycemic control
- Helps reduce symptoms of neuropathy

Alpha lipoic acid (ALA) is an essential cofactor for mitochondrial bioenergetic enzymes and functions as an antioxidant and anti-inflammatory agent.[5] It is reported in clinical studies to improve insulin sensitivity, improve glycemic control and to help improve symptoms and incidence of neuropathies.[6,7,8] ALA is reported to help activate AMP-K, which upregulates PGC-1 alpha, reducing insulin secretion, improving fatty acid and glucose utilization and regulating cell growth.[9,10] ALA is also reported in laboratory animal studies to reduce the neurotoxic effects of heavy metal exposure, including lead, mercury and cadmium.[11,12,13]

Chromium

- Helps support balanced blood glucose and insulin levels
- Insulin receptor activation
- Increases insulin dependent GLUT-4 levels
- Supports thyroid function by improving T4-T3 conversion

Chromium supplementation has been reported in clinical trials for over five decades to improve insulin regulation and glucose tolerance in people with type 1 and 2 diabetes mellitus, gestational diabetes, and steroid-induced diabetes.[14,15] A 2006 review of 15 clinical studies (n=1690) reported chromium supplementation positivity helps with appetite suppression, including reducing carbohydrate cravings and diurnal eating.[16] Studies report carbohydrate cravings are decreased in patients taking chromium supplement when compared with placebo.[17] Chromium's beneficial effects on blood glucose levels may be due to its ability to increase insulin dependent membrane-associated GLUT-4 levels.[18] Chromium also helps convert T4 to T3, further supporting metabolism.[19]

Benfotiamine (Lipid Soluble Thiamin)

- Essential B-vitamin
- Necessary for conversion of carbohydrates and amino acids for ATP (energy) production
- Benfotiamine is lipid soluble and improves thiamin blood levels

Thiamin (Vitamin B1) is necessary for the metabolism of carbohydrates and amino acids to adenosine triphosphate (ATP), the primary source of energy in the human body.[20] Thiamin is found in good amounts in milk, lean pork, legumes, rice bran, and the germ of cereal grains, but is lost during food processing and cooking.

Benfotiamine is a lipid-soluble form of thiamin (vitamin B1). Oral administration of benfotiamine raises thiamine levels in blood and tissues to a much higher degree than the water-soluble salts.[21]

Several clinical studies support benfotiamine's use in diabetic patients. A 2006 clinical study reported benfotiamine helped prevent macro- and microvascular endothelial dysfunction in patients with type 2 Diabetes.[22] However, a 2013 clinical study reported that benfotiamine had no effect on postprandial vascular function in type 2 diabetic patients.[23] Other studies report that benfotiamine decreases advanced glycation end products (AGE) and markers of endothelial dysfunction and inflammation.[24] Clinical studies also report benfotiamine is beneficial in reducing symptoms associated with diabetic retinopathy.[25]

PQQ (Pyrroloquinoline-quinone)

- Antioxidant
- Helps improve mitochondrial energy production
- Involved in activation of insulin signaling

PQQ is an antioxidant and redox cofactor for the membrane-bound dehydrogenases, leading to the growth and production of cells under stress.[26] PQQ is reported in laboratory animal studies to be a protein tyrosine phosphatase 1B inhibitor, helping to active insulin signaling and improve glucose tolerance.[27,28] Microactive® PQQ is a patented, sustained release form of pyrroloquinine quinone, offering increased bioavailability and clinical utility.

Vitamin C (ascorbic acid)

- Antioxidant
- Supports Beta-cell function
- Helps improve vascular endothelium

Vitamin C is a water-soluble vitamin important in decreasing free radical damage to the body. Reported in clinical studies to support vascular endothelial health, including modulation of nitric oxide synthesis, synthesis and deposition of type IV collagen in the basement membrane, improves endothelial cell proliferation and free radical scavenging.[29]

Vitamin c is also reported to improve glucagon-like peptide 1 (GLP-1), improving pancreatic Beta-cells and their functions.[30,31]

Vanadium

- Antioxidant
- Important in glucose metabolism

Vanadium is a trace mineral that has been reported to be beneficial in glucose and insulin utilization in the body. Laboratory studies report vanadium

improves GLUT4 in skeletal muscle and improves glycogen synthesis.[32,33]

Toxicity, Contraindications, or Side Effects: There are no known toxicities or side effects from taking ***GluT-reg4*** in recommended dosages. If you have a preexisting medical condition and/or are taking prescription or non-prescription medications, talk with your doctor or pharmacist before taking any dietary supplement.

DISCLAIMER: Statements made are for educational purposes and have not been evaluated by the US Food and Drug Administration. They are not intended to diagnose, treat, cure, or prevent any disease.

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