Ask Your Healthcare Professional About These Products for Nutritional Support

GlucoBalance® - Healthy glucose levels depend on the presence of a wide range of micronutrients. The typical American diet, high in refined and processed foods, is often lacking adequate levels of these important nutrients. In addition, individuals with blood sugar disorders may have a special dietary need for higher amounts of micronutrients supplied by **GlucoBalance®**

ChondroSamine Plus® - Connective tissues, like those found in joints, require adequate supplies of important nutrient building blocks to maintain their integrity. This is especially true following injury, or for those with chronic conditions such as osteoarthritis. **ChondroSamine Plus®** supplies a wide array of essential key nutrients, including forms that are unique to Biotics Research Corporation.

Bio-Multi Plus™ is a versatile, balanced multiple vitamin and mineral supplement supplying unique forms of important nutrients available exclusively from Biotics Research Corp. Available in three versions: **Bio-Multi Plus™**, **Bio-Multi Plus™** *Iron Free*, and **Bio-Multi Plus™** *Iron & Copper Free*. Ask your clinician which formula is right for you.

Optimal EFA® Caps provide a complete, healthy balance of the health-promoting fatty acids, so important to good health. Fatty acid imbalances are common, and essential fatty acid (EFA) deficits generally occur in combination. Therefore, supplementation with the balanced combination of EFAs supplied by **Optimal EFA® Caps** is prudent for optimal health.

Osteo-B Plus® offers comprehensive nutritional support for bone health. The importance of calcium for bone health is well-known; however, new evidence clearly supports the view that multiple nutrients are essential to nurture the skeletal system. **Osteo-B Plus®** provides these essential nutrients.

Intenzyme Forte™ is an outstanding and highly effective proteolytic enzyme formulation. It offers an effective treatment for muscle soreness and discomfort due to the rigors of overexertion. **Intenzyme Forte™** supplies important enzymes that offer additional benefits, including support for the immune system, hormone processing, circulatory system, and digestive system.

B12-2000™ is a flavorful lozenge supplying sublingually absorbed B12, with folic acid and B6, nutrients negatively impacted by oral contraceptive use. **B12-2000™** provides nutrients that not only protect against neural tube defects, but also suppress homocystine levels in men and women.

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For more information, consult your Healthcare Professional or:

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LIT-066 Rev. 5/09

BIOTICS RESEARCH CORPORATION
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BioProtect™

Antioxidant Support for Your Health

Multi-Nutrient Support

from Biotics Research Corporation

Why BioProtect™?

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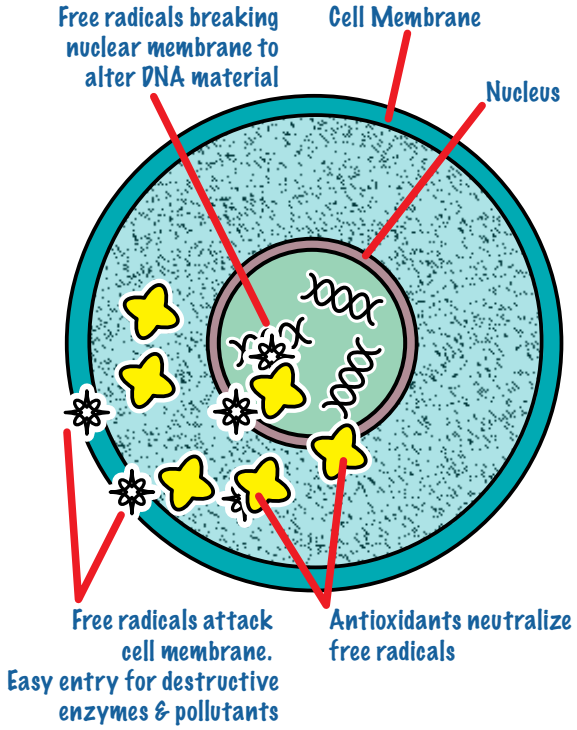
It is a known fact that we need oxygen to live. Our bodily functions, including metabolism, require an oxygen-rich environment. Energy production depends upon molecular oxygen to completely oxidize fats and carbohydrates. But oxygen is a double-edged sword. Why? In undergoing chemical reactions, oxygen is stripped of some of its stabilizing components (ie: hydrogen), which in turn causes it to become an unstable and chemically-charged molecule. These chemically-charged oxygen molecules are called reactive oxygen species (ROS), a type of free radical. In ROS, the hydroxyl radical (OH-) reacts instantaneously with any biological molecule from which it can steal a hydrogen atom. As well as damaging cell membranes, cells experience oxidative stress in the presence of ROS.

When the body's natural defenses are overwhelmed, free radicals indiscriminately attack neighboring molecules. Many chronic conditions have been associated with damage from free radicals, ensuing as a result of an imbalance between radical-generating and radical-scavenging systems. This type of condition is termed "oxidative stress." Oxidative stress may initiate chain reactions that damage cell components, including DNA and proteins, as well as metabolic processes (ie: damage to the proteins in the lens of an eye). Additionally, continued exposure to environmental toxins overburdens the bodily systems. As part of the body's normal defense mechanism, the organs, particularly the liver, modify potentially damaging compounds using oxidative enzymes called cytochrome hydrogen, stripping them from the oxygen molecule, thus P450 oxidases. These enzymes utilize hydrogen, stripping them from the oxygen molecule, thus rendering ROS molecules.



Mammalian cells possess elaborate defense mechanisms to detoxify radicals, with a key metabolic constituent being superoxide dismutase (SOD). The organs, particularly the liver, modify these potentially damaging compounds using cytochrome P450 oxidases. However, exposure to environmental toxins and metabolic stress overburdens the body, increasing the need for antioxidants. Additionally, the normal process of aging diminishes the body's ability to respond adequately to oxidative stress.

BioProtect™ supplies potent, broad-spectrum antioxidant support. Antioxidants have the ability to "scavenge" free radicals and inhibit their chain reactions. The multitude of antioxidants provided by **BioProtect**™ play various roles and act in synergy to support the body's natural defense mechanisms. For example, natural carotenoids, including lycopene, are able to quench singlet oxygen, thereby inhibiting free radical chain reactions. Superoxide dismutase (SOD) and catalase are supplied via our specially grown, biologically active vegetable culture. SOD is our primary enzymatic free radical scavenger, and is the only enzyme specifically designed to disarm free radicals in the body. In a double-blind, placebo-controlled study, orally ingested vegetable culture source SOD (a proprietary product of Biotics Research Corporation) was shown to significantly increase erythrocyte SOD activity in humans. Additionally, catalase plays an important supporting role. Hydrogen peroxide, also a strong oxidizing agent (ROS), is produced from the action of SOD on superoxide. Cells rely on catalase to convert hydrogen peroxide to oxygen and water.

Supplement Facts

Serving Size: 3 Capsules — **Servings Per Container: 90**

	Amount Per Serving	% Daily Value
Vitamin A (as natural mixed carotenoids)	7,500 IU	150%
Vitamin C (ascorbic acid)	300 mg	500%
Vitamin E (d-alpha tocopheryl acetate and mixed tocopherols)	90 IU	300%
Zinc (as zinc gluconate)	15 mg	100%
Selenium (from vegetable culture †)	75 mcg	107%
Coenzyme Q_{10}	3 mg	*
L-Glutathione (reduced)	30 mg	*
L-Methionine	105 mg	*
Taurine	105 mg	*
N-Acetyl-L-Cysteine	105 mg	*
Superoxide Dismutase (from vegetable culture †)	90 mcg	*
Catalase (from vegetable culture †)	90 mcg	*

*Daily Value not established

Other ingredients: Gelatin, water, potassium sorbate and glycerin.

† Specially grown, biologically active vegetable culture containing naturally associated and/or organically bound trace elements and phytochemicals including polyphenolic compounds with SOD and catalase, dehydrated at low temperature to preserve associated enzyme factors.

NDC #55146-02801 Rev. 2/09

Biotics Research Corporation

Technical Support

Products #2800 & 2801

BioProtect™

What is a Free Radical?

A free radical is an atom or molecule containing an unpaired electron, which seeks another electron in order to achieve a more stable, less reactive configuration. Free radicals cause biological damage, generally by oxidative processes. Free radicals include superoxide, nitric oxide, hydroxyl radicals and fatty acid peroxyl radicals. The harmful effects of free radicals may be expressed directly as damage to cell components, or indirectly by a disturbance in the redox state of the cell that maintains the metabolic central processes.

The Oxygen Paradox

The foundation of energy metabolism is based on efficient oxidation of carbohydrate and fat by mitochondria which depends upon oxygen. Paradoxically, oxygen also creates damaging molecules in the body called reactive oxygen species (ROS). Thus, oxidative stress can be considered a condition experienced by cells in the presence of oxygen. Damaging oxidizing agents include ROS, such as hydrogen peroxide, lipid peroxides, and free radicals. Tissues can be damaged by ROS when the body's defenses are overwhelmed. Free radicals indiscriminately attack neighboring molecules to make up for their own deficiency and they initiate chain reactions. Free radicals and ROS may damage vital components of cells, including DNA and proteins, for example, the lens proteins of the eye.[1] Free radicals can oxidize LDLs; oxidized LDLs are implicated in events that can cause damage to arteries.[2]

What Can Cause ROS and Free Radicals *(in vivo)*

Energy production: The body's metabolism requires an oxygen-rich environment. Mitochondrial ATP production depends upon molecular oxygen to completely oxidize fat and carbohydrate. Impaired mitochondria can "leak" superoxide, which can further damage mitochondrial energy producing systems.[3]

Detoxification: The liver, intestine and kidney modify potentially damaging compounds using oxidative enzymes classified as cytochrome P450 oxidases. These enzymes use molecular oxygen inefficiently, yielding superoxide.[4]

Chronic inflammation: Inflammation can lead to tissue damage. During inflammation free radicals and ROS are produced in amounts that can eventually overwhelm cellular defense mechanisms.[6]

Diet: The typical U.S. diet is low in fruits, vegetables and associated phytochemicals believed to minimize free radical damage.[5]

Leaky gut syndrome: "Leaky gut syndrome" characterized by increased intestinal permeability, can increase the uptake of potentially damaging substances.[7]

Aging: Aging diminishes the abiity to respond adequately to oxidative stress.[8]

BioProtect's™ Multiple Antioxidant Nutrients

Mixed, natural carotenoids. Typical fruits and vegetables supply alpha carotene, beta carotene, lutein, zeaxanthin, and lycopene.

Beta carotene, the major precursor of vitamin A, is a powerful lipid-soluble antioxidant able to quench singlet oxygen and to inhibit free radical chain reactions. Beta carotene is aided by other carotenoids to block free radicals and to boost the immune system.[9] Recent studies indicate that natural mixed carotenoids (including isomers of beta carotene) are better absorbed and function as more effective antioxidants than synthetic (all trans) beta carotene.[10] (Lycopene is a member of the carotenoid family which imparts a healthy red color to fruits and vegetables.) Lycopene is not found in the natural mixed carotenoids found in the sea algae *Dunaliella salina*. **BioProtect**™ blends the lycopene produced from specially bred and cultivated tomatoes with the natural mixed carotenoids isolated from *Dunaliella salina*. Unlike the synthetic beta carotene or mixed carotenoids found in other products, **BioProtect**™ provides a full spectrum blend of the natural carotenoids, beta carotene, alpha carotene, lycopene, zeaxanthin, crytoxanthin, and lutein. Biotics Research Corporation was the first supplement manufacturer to incorporate natural, mixed carotenoids throughout its product line.

Vitamin E, emulsified. Vitamin E functions as the body's major lipid-soluble antioxidant. It quenches free radicals and singlet oxygen, and it protects membrane lipids against free radical attack, and it reduces LDL oxidation *in vitro*.[11] Vitamin E blocks the formation of nitrosamines and also enhances the immune system, including activation of phagocytic activity of white cells in elderly patients.[12]

Vitamin C. Vitamin C (ascorbic acid) is a versatile water soluble antioxidant found in blood and tissues. Several organs and cell types, including adrenal glands and lymphoytes, accumulate high levels of vitamin C. Elevated serum vitamin C is associated with enhanced immune function, reduced heavy metal toxicity and increased liver clearance of toxins.[13] Ingested vitamin C can inhibit the formation of nitrosamines and fecal mutagens. As an example of the synergistic effects of antioxidants, vitamin C can recycle vitamin E.[14] Recent saturation studies indicate that the RDA for vitamin C should be increased to at least 200 mg for healthy young adults.[15]

Sulfur amino acids. Methionine functions primarily as the source of the thiol amino acid, cysteine, which helps maintain proteins in a reduced state. Methionine can complex heavy metals via cysteine, and as a methyl donor, methionine assists detoxication reactions. N-acetyl-l-cysteine is a stable derivative of cysteine absorbed rapidly deacetylated to yield free cysteine in cells where it increases glutathione levels and enhances detoxification reactions.[16]

Reduced glutathione (GSH). GSH quenches free radicals and helps regulate the redox balance of cells.[17] The important defensive enzyme glutathione peroxidase employs GSH to reduce lipid peroxides and hydrogen peroxide. Glutathione transferase detoxifies potentially damaging chemicals as part of the phase 2 liver detoxification system.[18] Consequently, toxic exposure can deplete the liver of GSH. Orally administered GSH can raise serum glutathione levels.[19]

Taurine. This derivative of cysteine contains oxidized sulfur and does not occur in proteins. It occurs in high levels of heart muscle emphasizing its role in modulating calcium flux and neuron excitability.[21] In cultured human cells, taurine, together with zinc and vitamin E, stabilizes cell membranes.[20] It participates in detoxification reactions and functions as an antioxidant.

Trace minerals. Zinc is linked to antioxidant functions in a variety of ways. It serves as a cofactor for copper/zinc dependent superoxide dismutase, the enzyme that converts superoxide to hydrogen peroxide. Zinc is a component of metallothionein, the most abundant zinc containing protein, which is believed to have a role in heavy metal detoxification. Zinc also stabilizes plasma membranes.[22]

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Selenium as selenocysteine serves as the cofactor for glutathione peroxidase, a group of enzymes that degrade cytoplasmic hydrogen peroxide and reduce fatty acid peroxides to stable forms.[23]

Sorbic acid. This GRAS food additive increases the effectiveness of antioxidant mixtures.[24]

Coenzyme-Q10, emulsified. This lipid soluble nutrient is believed to protect mitochondrial membrane lipids from oxidation.[25] It may also recycle vitamin E. As part of the electron transport system in mitochondria, coenzyme-Q10 plays an important role in oxidative phosphorylation. Suboptimal coenzyme-Q10 levels impair mitochondrial respiration and ATP production, especially in aging heart muscle. Clinical studies have shown that emulsification increases the efficiency of coenzyme-Q10 absorption by up to three fold.[26]

Superoxide Dismutase. SOD is the primary enzymatic free radical scavenger of mammals. In fact SOD is the only enzyme specifically designed to disarm free radicals in the body. SOD catalyzes the conversion of superoxide to hydrogen peroxide and oxygen, thus converting oxygen radicals to less reactive forms of oxygen molecules. Three forms of SOD exist in animals: copper/zinc SOD occurs in the cytoplasm and another copper/zinc SOD occurs in blood and interstitial fluid. This extracellular SOD is bound to the endothelium of blood vessels. Mitochondria contain manganese SOD, the third form of SOD. For these reasons, copper, zinc and manganese are considered antioxidant nutrients. A double blind, placebo controlled study indicates that orally ingested vegetable culture source SOD (proprietary product from Biotics Research Corporation) significantly increases erythrocyte SOD activity in humans.[27]

Catalase plays a significant role in metabolism. Hydrogen peroxide produced from the action of SOD on superoxide remains a strong oxidizing agent and is one of the reactive oxygen species (ROS) found in the body. To cope with hydrogen peroxide production, cells contain a series of enzymes that convert hydrogen peroxide to oxygen and water. Peroxisomes contain catalase to dispose of hydrogen peroxide generated by peroxisomal metabolism. Thus, catalase compliments SOD activity. **BioProtect**™ supplies vegetable culture source catalase (proprietary product from Biotics Research Corporation).

Summary of Noteworthy BioProtect™ Features:

As in nature, **BioProtect**™ provides a wide array of antioxidants and synergists, ranging from vitamins and minerals to phytochemicals and enzymes, especially:

- Balanced, broad spectrum antioxidants and synergists
- Increased bioavailability: emulsified vitamins and cofactors vegetable culture trace minerals
- Natural mixed carotenoids, including lycopene
- Food form polyphenols
- Plant source superoxide dismutase and catalase.

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Superoxide Dismutase (from vegetable culture †)	90 mcg	*
Catalase (from vegetable culture †)	90 mcg	*

***Daily Value not established**

Other ingredients: Gelatin, water, potassium sorbate and glycerin.

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NDC #55146-02801 Rev. 2/09

For more information, contact our Client Services Department or one of our Technical Consultants

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Product Information

BioProtect™ is available in bottles of 90 and 270 capules.

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