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This information is provided as a medical and scientific educational resource for the use of physicians and other licensed health-care practitioners ("Practitioners"). This information is intended for Practitioners to use as a basis for determining whether to recommend these products to their patients. All recommendations regarding protocols, dosing, prescribing, and/or usage instructions should be tailored to the individual needs of the patient considering their medical history and concomitant therapies. This information is not intended for use by consumers.

BioCap Immune™ is uniquely formulated to support antioxidative status and a healthy immune response.* Each 4-capsule serving provides 1,000 mg of vitamin C, along with targeted amounts of the bioflavonoids quercetin and resveratrol (as Veri-Te™), 50 mcg (2,000 IU) of vitamin D3, 100 mg of vitamin E isomers (as DeltaGold® delta- and gamma-tocotrienols), 50 mg of trans-geranylgeraniol (as GG-Gold®), and 20 mg of zinc (as bisglycinate chelate). These nutrients work together synergistically to help support immune function, cellular health, and a healthy response to oxidative stress.*

Highlights

- Features a comprehensive blend of immune-supportive nutrients*
- Provides 1,000 mg of vitamin C, 50 mcg (2,000 IU) of vitamin D3, 20 mg of zinc, and 500 mg of quercetin to promote healthy immune function*
- 200 mg of resveratrol (as Veri-te™), 100 mg of delta- and gamma-tocotrienols (as DeltaGold®), and 50 mg of geranylgeraniol (as GG-Gold®) to promote immune health and antioxidative status, and to help protect cells from the effects of oxidative stress*
- Zinc is provided in a chelated form for superior nutrient bioavailability
- Gluten-free, dairy-free, soy-free
- Non-GMO

Vitamin C (ascorbic acid) is an essential nutrient that must be supplied by the diet or supplementation. The body requires adequate amounts of vitamin C for immune function, bone maintenance, proper collagen formation, enzymatic reactions, central nervous system function, and healthy inflammatory responses, along with a broad range of other biological functions to maintain physiological homeostasis.¹ White blood cells have between 10 and 100 times more vitamin C concentrations than plasma.² Healthy immune balance involves vitamin C for various key functions, including:

- Maintaining intracellular redox homeostasis, modulating cytokine production, and regenerating endogenous and exogenous antioxidants³
- Supporting the integrity of mucosal barriers via antioxidant protection of epithelial cell membranes and collagen synthesis³
- Supporting normal differentiation, proliferation, function, and movement of innate immune cells and cytotoxic T cells; promoting normal antibody production and lymphocyte proliferation³
- Promoting natural killer cell activity and chemotaxis, phagocytosis, and microbial inactivation at the site of infection³
- Potentially helping inhibit replication of various viruses (herpes simplex virus-1, influenza virus type A, and poliovirus).⁴ The actions of vitamin C are enhanced by iron, as demonstrated by an in vitro study.⁴

A meta-analysis concluded that vitamin C supplementation was associated with milder symptoms and shorter resolution of upper respiratory tract infections (URTI) and decreased incidence of infection when taken prophylactically.⁵ It was also associated with a reduced incidence of pneumonia, and in older patients, a reduced symptom severity and mortality.⁵ Compared to healthy controls, 62% of patients with community-acquired pneumonia had hypovitaminosis C and 22% were overtly deficient.⁶ The results also exhibited significantly elevated protein carbonyl (a marker of oxidative stress) compared with controls, suggesting that adequate vitamin C intake plays a supportive role during illness and infection when oxidative stress is increased.^{2,5,6}

Quercetin is a flavanol found in various plants that has demonstrated potent antioxidant properties. Studies suggest it may support healthy immune function and a normal inflammatory response.⁷⁻¹² An in vitro study showed that cell entry for a wide spectrum of viral strains was reduced in the presence of added quercetin.¹¹

The mechanisms of action of quercetin were summarized in a review with results indicating that quercetin may reduce viral replication at various stages: reduced endocytosis (through PI-3 kinase inhibition) and inhibition of viral genome transcription (through RNA polymerase inhibition), and viral protein translation. It may also increase viral clearance by promoting mitochondrial antiviral responses.⁸ An in vitro study showed that viral replication in the kidney cells was reduced due to selective regulation of heat shock protein, fibronectin 1, and prohibitin expressions in the presence of quercetin.⁹

Benefits*

- Promotes healthy antioxidative status
- Supports healthy immune function and mucosal health
- Supports a normal inflammatory response
- Promotes cellular health

Supplement Facts

Serving Size 4 capsules		
Servings Per Container 30		
Amount Per Serving	% Daily Value	
Vitamin C (as Ascorbic Acid)	1000 mg	1111%
Vitamin D (as Cholecalciferol)	50 mcg (2000 IU)	250%
Zinc (as Zinc Bisglycinate Chelate)	20 mg	182%
Quercetin	500 mg	*
Trans Resveratrol (Veri-te™)	200 mg	*
Vitamin E Isomers (as DeltaGold® delta and gamma tocotrienols)	100 mg	*
Trans-Geranylgeraniol (GG-Gold®)	50 mg	*

*Daily Value not established.

Other Ingredients: Cellulose (capsule), microcrystalline cellulose, dicalcium phosphate, quillaja extract, stearates (vegetable source), silicon dioxide.

In a clinical study of 40 cyclists, one group was administered 1,000 mg of quercetin per day for 3 weeks, which included 3 days of intense training. The treatment group experienced a statistically significant lower incidence of URTIs (1 of 20 participants) compared to the placebo group (9 of 20 participants).¹² More clinical studies are needed to confirm these effects for influenza and other types of viruses.

The antioxidant role of quercetin was highlighted by a study that supplemented mice with quercetin after being infected with an influenza virus. The treatment group did not experience any declines in endogenous lung antioxidant levels of SOD, catalase, and glutathione compared to the control group for which significant reductions were observed.¹⁰ A review demonstrated that quercetin reduced inflammatory markers, such as nuclear factor-kappa B (NF-κB) and tumor necrosis factor-alpha in vitro and in animal models, whereas one human study showed a reduction in C-reactive protein.⁷

Resveratrol (as 98% trans-resveratrol) is a plant-derived polyphenol that has antioxidant properties and health benefits related to immune and inflammatory responses.^{13,14} In vitro studies have shown that it may reduce viral replication by as much as 50% to 98%, inhibit viral nucleic acid and protein synthesis, and downregulate viral gene expression and various cellular transcription or signaling pathways.¹³ An in vitro study showed that resveratrol promoted zinc entry inside cells.¹⁵

Resveratrol supports a normal inflammatory response by activating sirtuin 1 and inhibiting cyclooxygenase (COX)-1/COX-2 enzymes and NLRP-3 inflammasome, which tend to be upregulated in response to certain viral infections.¹³ A clinical study observed that the inflammatory markers in cerebral fluid was reduced in the resveratrol group compared to a placebo. In part, this was believed to be due to reduced brain-barrier permeability to inflammatory leukocytes.¹³ Resveratrol supplementation in elder rats was associated with a reversal of age-related decline in immunocompetence.¹⁴

Vitamin E Isomer (as delta- and gamma-tocotrienol [T3]) supplementation was shown in numerous animal and human studies to promote healthy immune function,^{16,17} reduce oxidative stress, and support normal inflammatory response (by reducing levels of CRP, matrix metalloproteinases, interleukin [IL]-6, and inducible nitrous oxide synthase [iNOS]), while inhibiting the activation of NLRP3 inflammasome in macrophages and COX-2 enzymes.¹⁸⁻²⁴ In an animal model of dust mite-induced asthma, the mice given gamma-T3 resulted in reduced levels of bronchoalveolar lavage fluid, serum immunoglobulin E, NF-κB, and oxidative damage biomarkers. Endogenous antioxidant activities and nuclear factor erythroid 2-related factor 2 levels were increased in the lung tissue.²⁵

Mice given delta-T3 had higher levels of tetanus-specific antibodies after immunization with tetanus toxoid compared to the controls. Interferon-gamma levels and IL-4 production by splenocytes were also higher, indicating that delta-T3 may help promote a cell-mediated (TH1) immune response.¹⁷ T3 supplementation in pigs reduced platelet aggregation, thromboxane B4, and platelet factor 4 levels, suggesting that it may support healthy blood circulation.²⁶

Geranylgeraniol (GG) serves as a building block for endogenous synthesis of coenzyme Q10 and other essential cell molecules that support cellular function and energy production, immune health, and a normal inflammatory response.^{27,28} One of the metabolites of GG is geranylgeranylacetone (GGA), which was shown in vitro to upregulate endogenous anti-viral mechanisms.^{29,30}

Vitamin D3, as Cholecalciferol, is the active form of vitamin D3 – 1,25(OH)D3 – shown in cellular studies to promote macrophage activity and enhance antigen presentation and antimicrobial protein synthesis as part of a healthy immune response.⁵ Vitamin D deficiency is associated with an increased risk of acute respiratory tract infection (ARI). A systematic review of vitamin D3 supplementation studies revealed a 25% lower incidence of ARI in those with baseline blood levels ≥25 nmol/L of 25(OH)D3 and a 70% lower incidence for baseline blood levels <25 nmol/L of 25(OH)D3.⁵ Adequate vitamin D status may support the downregulation of inflammatory cytokine secretion, whereas deficiency is associated with increased pro-inflammatory activity.³¹

Zinc is an essential mineral that the body is unable to produce on its own. Inadequate zinc levels weaken the host defense, as it disrupts lymphocyte formation and maturation and intracellular cytokine communication, a critical factor in robust immune responses.⁵ Zinc-deficient populations were found to be at risk of acquiring viral infections and at increasing risk of respiratory and diarrheal morbidity.^{5,32} Zinc inhibits viral RNA polymerase.³² Both human and animal in vivo studies have shown that supplemental zinc was associated with significantly lower incidence of various viral infections and disease burden.³²

Recommended Use: Take 4 capsules per day or as directed by your health-care practitioner.

For a list of references cited in this document, please visit:

<https://www.designsforhealth.com/api/library-assets/literature-reference---biocap-immune-tech-sheet-references>

Dosing recommendations are given for typical use based on an average 150 pound healthy adult. Healthcare practitioners are encouraged to use clinical judgement with case-specific dosing based on intended goals, subject body weight, medical history, and concomitant medication and supplement usage.

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