PROTOCOL FOR LIFE BALANCE®

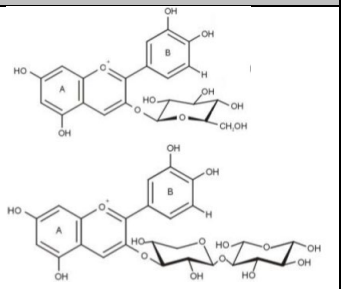
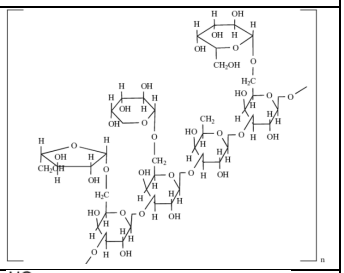
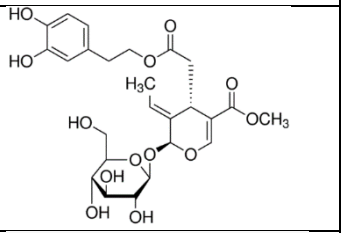
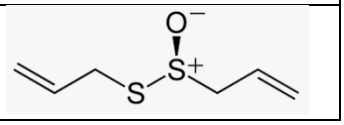
Dietary Supplement Information
for Physicians with Naturokinetics®
PRODUCT CODE: P1811
CATEGORY: IMMUNE SUPPORT*

A-Biotic™

TECHNICAL SUMMARY

A-Biotic™ is a botanical formula with garlic designed to support healthy immune system function.* Garlic has been used for centuries by traditional herbalists. This formula also includes elderberry concentrate, standardized olive leaf extract, ImmunEnhancer™ (a proprietary larch extract), as well as oregano and rosemary oils.

Chemical Name and Structure Formula:

Ingredient	Chemical name	Structure
Black Elderberry (*Sambucus nigra*) Anthocyanins	- 3-glucoside cyaniding (top) - 3-sambubioside cyaniding (bottom)	
ImmunEnhancer™ (Arabinogalactan)	4-[6-[(3,5-dihydroxy-4-methoxyoxan-2-yl)oxymethyl]-3,5-dihydroxy-4-methoxyoxan-2-yl]oxy-2-(hydroxymethyl)-6-methyloxane-3,5-diol	
Oleuropein	2-(3,4-Dihydroxyphenyl)ethyl (2S-(2alpha,3E,4beta))-3-ethylidene-2-(beta-D-glucopyranosyloxy)-3,4-dihydro-5-(methoxycarbonyl)-2H-pyran-4-acetate	
Allicin‡.	Thio-2-propene-1-sulfinic acid S-allyl ester	

Allergen and Additive Disclosure: Not manufactured with wheat, gluten, milk, egg, fish, or shellfish ingredients. Produced in a GMP facility that processes other ingredients containing these allergens.

Delivery Form: Enteric coated softgel

ROLE AS NUTRIENT/FUNCTION

While elderberry has a long history of use by herbalists, its mechanism of action has not yet been fully elucidated. *In vitro* studies have shown that anthocyanins and flavanols extracted from elderberries possess powerful free radical-scavenging properties.* *In vitro* data also suggest that elderberry extract has some immunomodulatory properties.*

Supplement Facts

Serving Size 1 Softgel

	Amount Per Serving	% Daily Value
Calories	5	
Elderberry (*Sambucus nigra*) (Fruit/Berry) (50:1 Concentrate) (Equivalent to 2,500 mg)	50 mg	†
Olive Leaf Extract (*Olea europaea*) (min. 18% Oleuropein)	40 mg	†
Garlic Extract (*Allium sativum*) (Bulb)	40 mg	†
Oregano Oil (*Origanum vulgare*) (min. 55% Carvacrol)	40 mg	†
ImmunEnhancer™ [Arabinogalactan from Larch Tree (*Larix laricina*)]	10 mg	†
Rosemary Oil (*Rosmarinus officinalis*)	5 mg	†

† Daily Value not established.

Other ingredients: Softgel Capsule [bovine gelatin (BSE-free), glycerin, enteric coating, water, carob], Rice Bran Oil, Beeswax and Soy Lecithin.

- **With Garlic Extract**
- **Plus Olive Leaf Extract, Elderberry & Oregano Oil**

SUGGESTED USAGE: Take 1 softgel 2 times daily as needed, or as directed by your healthcare practitioner.

ImmunEnhancer™ is a unique ingredient supplying arabinogalactans. Arabinogalactans are hemicellulose carbohydrates found in the cell walls of plants, in particular the larch tree. Clinical studies have demonstrated that these polysaccharides stimulate immune responses when administered orally.* Arabinogalactans have been shown to increase activity of immune cells and immune markers and have been shown to influence the activation of immune pathways.*

Olive leaf extract is traditionally used as an herbal tea for its health benefits.* This extract is standardized for oleuropein, a polyphenol commonly found in olive leaves. Preclinical data suggest that oleuropein influences host immune responses by promoting phagocytosis activity and by inhibiting the synthesis of specific cytokines.*

Garlic has been used for centuries by traditional herbalists. Bioactive compounds found in garlic are thought to enhance immune system responses.* Many of garlic's effects are attributed to allicin, ajoene, and other organosulfur constituents such as S-allyl-L-cysteine.‡

NATUROKINETICS®

Liberation: Disintegration of the enteric-coated softgel is tested with two USP testing methods set to simulate two different GI environments. Softgels are exposed to a low-pH media simulating the gastric environment. In these conditions, disintegration occurs after 60 minutes, confirming the acid resistance of these enteric-coated softgel capsules. Softgels are also exposed to a more neutral environment, simulating the

‡ Garlic has many naturally occurring bioactive compounds, allicin is one of the better studied. This product is not standardized to allicin, information below is mainly focused on allicin for convenience. More information on other garlic active compounds can be found elsewhere.

intestinal tract. In these conditions disintegration occurs within 60 minutes, confirming that the capsule will dissolve while in the intestine.

Absorption: Several pharmacokinetic studies have demonstrated that after oral administration of an elderberry extract, anthocyanins can be detected in volunteers' blood. The average C_{max}, T_{max} and elimination half-life of anthocyanins are respectively 97.4 nmol/l, 72 min., and 133 min. Anthocyanidins in elderberry can be detected in plasma 30 minutes after ingestion.

Arabinogalactans are fermented by the large intestinal flora to form short-chain fatty acids. These compounds are rapidly absorbed in the colonic lumen to enter portal and peripheral circulation.

Oleuropein is poorly absorbed due to its large size. It is suspected that as it is a glycoside, it can potentially be transported across the intestinal wall via sodium-dependent glucose transporter.

After oral ingestion, even in enteric-coated capsules, allicin cannot be detected in serum. Preclinical data suggest that allicin is subjected to a powerful hepatic first-pass effect. Another naturally occurring garlic compound is S-allylcysteine (SAC), a water soluble organic sulfur compound, which is known to be readily absorbed and of high bioavailability.

Distribution: The specifics of the distribution of elderberry anthocyanins have not yet been clinically evaluated; however, based on known anthocyanin bioavailability data, it is suggested that elderberry anthocyanins are distributed in the GI wall, blood vessel walls, liver, and brain.

Pre-clinical data suggest that arabinogalactans are mainly found in the liver.

Sulfur organic garlic compounds (hydro and liposoluble) and their metabolites have been detected in the serum, kidney, and fat tissue 24 hours post-ingestion.

Metabolism: The metabolism of elderberry anthocyanins has not yet been fully elucidated and some remain unmetabolized in the body. Some evidence indicates that some elderberry anthocyanins such as cyanidin-3-glucoside and cyanidin-3-sambubioside are methylated in the liver in a way similar to what has been established for other flavonoids. Glucuronide forms of some elderberry anthocyanins, peonidin monoglycuronide and cyanidin-3-glucoside monoglucuronide, have been isolated in the urine of healthy volunteers after the ingestion of an elderberry extract, suggesting that conjugation with glucuronic acid is part of the metabolic pathway of elderberry anthocyanins in the body.

Arabinogalactans are metabolized in the colon by resident microbiota. These carbohydrates are metabolized into short-chain fatty acids to be incorporated into the bloodstream and utilized by the body.

Preclinical pharmacokinetic data suggest that oleuropeins are metabolized into hydroxytyrosol or tyrosol.

Allicin is extensively metabolized in the liver and SAC is metabolized into N-acetyl-SAC.

Elimination: Some anthocyanins from elderberry extract are rapidly eliminated unchanged in urine after oral administration as demonstrated in a multi-dose clinical study showing a dose-dependent elimination of unchanged anthocyanins after ingestion of elderberry juice.

Arabinogalactans are eliminated in the urine. In animal models, larch arabinogalactans were cleared from the blood with a half-life of 3.8 minutes with 30% of total arabinogalactans detected in the urine within 90 minutes post-administration.

Pharmacokinetic data have shown that 15% of oleuropein administered in humans was excreted in the urine along with its metabolites, hydroxytyrosol and tyrosol.

Allicin metabolites are detected in urine, and its volatile metabolites are also detected in breath. N-acetyl-SAC is eliminated in urine.

CLINICAL VALIDATION

- **Immune System Health.*** In a double-blind, placebo-controlled trial with 29 healthy individuals, olive leaf extract supplementation was evaluated for immune system effects. Volunteers were supplemented for eight weeks with either olive leaf extract (around 20 mL, including 120 mg oleuropein) or placebo. The expression of genes involved immune function, cell division and lipid metabolism were evaluated using real-time PCR. Analysis suggests that consumption of olive leaf extract altered gene expression for genes involved in the regulation of immune function.* These results indicate that olive leaf extract may promote healthy immune responses.*

SAFETY INFORMATION

Tolerability: Elderberry extract, arabinogalactans, olive leaf extract, and garlic are well tolerated when used at the recommended levels. Common side effects include mild temporary gastrointestinal disturbances such as nausea, flatulence, vomiting, and bloating. Garlic may also cause malodorous breath, body odor, facial flushing, and dizziness.

Contraindications: *S. nigra* is not recommended for patients allergic or hypersensitive to plants belonging to the *Adoxaceae* or *Caprifoliaceae* families because of the risk of allergic reaction. Do not use this product if you have known allergy/hypersensitivity to garlic, any of its constituents, or to other members of the *Liliaceae* (lily) family, including hyacinth, tulip, onion, leek, and chives. Avoid during lactation as it may alter the odor of the milk, thus affecting infant suckling behavior.

INTERACTIONS

Drug Interactions: Arabinogalactans may interact with immuno-suppressant drugs. Olive leaf extract may interact with anticoagulant and antiplatelet drugs as well as antidiabetes and antihypertensive medications. Garlic is a known inhibitor of CYP2E1, which may result in interactions with acetaminophen, chlorzoxazone, theophylline, some anesthetics, as well as ethanol. Garlic may also interact with anticoagulant/antiplatelet medications, nidrazid and anti-retrovirals.

Supplement Interactions: Olive leaf extract may interact with ginger, ginkgo, *Panax ginseng*, psyllium, fenugreek, cat's claw, coenzyme Q_{10}, fish oil, angelica, clove, danshen, ginger, ginkgo, red clover, turmeric, vitamin E, willow, and others. Concomitant use of garlic and omega-3 fatty acids can theoretically affect the normal coagulation process, caution is advised

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Interaction with Lab Tests: Olive leaf extract may interact with testing of serum levels of calcium and glucose. Garlic supplementation may interfere with INR testing in patients taking anti-vitamin K medications.

STORAGE

Store in a cool, dry place.

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