

# Biofilm Plus™



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Biofilm Plus™ provides a powerful formulation which combines enzymatic activity with nutraceuticals to manage biofilm formation and control inflammatory processes seen with exposure to damp and mold-infested buildings, as well as chronic infections. In addition, this blend addresses the hypercoagulability involved in fungal and microbial colonization.

The formation of a biofilm encases microbes in a polymer-based matrix, which decreases the susceptibility to antimicrobials and immune defenses, making these infections difficult to eradicate. This proteolytic enzyme combination was specifically selected for the various enzymatic functions at locations along the alimentary tract, from the sinuses to the small and large intestine, common sites of biofilm formation. The enzyme strength was purposefully kept in a tolerable range to allow for long-term use with little side-effects.

The fibrinolytic effect of the enzymes are matched with ingredients which reduce platelet aggregation, resulting in a mild antithrombotic effect without significantly increasing bleeding risk. The addition of ginger, boswellia and quercetin reduce intestinal lining irritation often seen with mold and mycotoxin exposure, and which may occur when supplementing enzymes on their own.

The nutraceuticals chosen for this formula target many mechanisms to address the chronic inflammation and hypercoagulability seen with mold exposure and biofilm formation. Actions such as inhibition of the COX-2 (cyclooxygenase) enzyme, reduction in NF-Kappa  $\beta$  expression, and prevention of leukotriene formation.

## Enzymes (Proteases, Serratiopeptidase, Trypsin, Chymotrypsin)

Proteases degrade the proteinaceous matrix components of biofilm, and have been specifically studied to prevent Staphylococcus aureus biofilm formation. Serratiopeptidase from the Serratia sp. bacteria in particular has numerous therapeutic applications, including anti-inflammatory, anti-biofilm, mucolytic, fibrinolytic, and wound-healing properties. Enzymes such as trypsin and chymotrypsin are used to both prevent and treat biofilm in multiple medical applications.

Supplement Facts			
Serving Size 2 capsules Servings Per Container 30			
Amount Per Serving	% Daily Value	Amount Per Serving	% Daily Value
InflammENZ™ Proprietary Blend	222 mg *	Quercetin	75 mg *
Proteases, Serratiopeptidase, Trypsin, Chymotrypsin		Rutin	75 mg *
Turmeric Extract ( <i>Curcuma longa</i> )(root) [standardized to contain 95% curcuminoids]	200 mg *	Rosemary Extract ( <i>Rosmarinus officinalis</i> )(leaf) [standardized to contain 7% carnosic acid]	50 mg *
Boswellia Extract (as Boswellin®) ( <i>Boswellia serrata</i> )(resin) [standardized to contain 70% boswellic acids]	200 mg *	Trans Resveratrol	5 mg *
Ginger Extract ( <i>Zingiber officinale</i> )(root) [standardized to contain 5% gingerol]	200 mg *	( <i>Polygonum cuspidatum</i> )(root)	

**Other Ingredients:** Cellulose (vegetarian capsule), microcrystalline cellulose, vegetable stearate, silicon dioxide.  
Boswellin® is a registered trademark of Sabinsa Corporation  
Resveratrol source: Polygonum cuspidatum, extracted without fermentation

### Recommended Use

Take 1 capsule twice daily between meals, or as directed by your health care practitioner.

Does not contain GMOs.

## **Turmeric (standardized to contain 95% curcuminoids)**

As one of the more diverse and broad acting anti-inflammatory herbs, it comes as no surprise that Turmeric protects against the inflammatory cascade induced from mold and mold chemical exposure, including mycotoxins. Turmeric has mild antifungal properties and encompasses a diverse array of antioxidants. Turmeric reduces histamine secretion from mast cells, resulting in amelioration of allergic symptoms.

Turmeric mitigates mycotoxin-induced liver injury via the Nrf2 signaling pathway, and in animal models is neuroprotective and protective to the gastrointestinal system, primarily acting upon the gut microbiota. Turmeric combats mycotoxin effects on hemodynamics by being hemoprotective.

## **Boswellia (standardized to contain 70% boswellic acids)**

The boswellic acids in *Boswellia serrata* are biologically active pentacyclic terpenoid compounds with a number of positive effects on human health, especially in the treatment of inflammation, arthritis, and asthma. They serve as an alternative to, or work in synergy with, commonly used antimicrobial therapies, due to antimicrobial and antibiofilm activities.

Boswellia is used in inflammatory bowel diseases due to its ability to preserve the intestinal epithelial barrier. The mechanism is both by preventing enterocytes from oxidative and inflammatory damage, as well as by protecting the tight junction proteins (zonula occludens-1, ZO-1 and occludin.)

## **Ginger (standardized to contain 5% gingerol)**

Ginger root (*Zingiber officinale*) has various gastroprotective effects, such as free radical scavenging and antioxidant properties, as well as inhibiting lipid peroxidation. Ginger's anti-biofilm active component is Gingerol.

Ginger is used in conjunction with this enzymatic therapy as it's been shown to be effective in preventing gastric ulcers induced by digestive irritants such as nonsteroidal anti-inflammatory drugs (NSAIDs), alcohol, stress, acid reflux, and *Helicobacter pylori*-induced gastric ulcerations in animal studies.

## **Quercetin**

Quercetin is a potent anti-inflammatory bioflavonoid. Mold spores induce allergic responses. Quercetin acts as an inhibitor of mast cell secretion, dramatically inhibiting mast cell tryptase and IL-6 release in a dose-dependent manner. In cell studies, Quercetin is involved in the down-regulation of histidine decarboxylase mRNA transcription from human mast cells, thereby reducing the expression of pro-inflammatory cytokines.

Quercetin is a key cytoprotective factor for mold mycotoxin exposure. It modulates oxidative stress mediators in multiple tissues, resulting in immunoprotective, neuroprotective, nephroprotective, hepatoprotective, and genoprotective effects.

As biofilm is degraded, metabolic byproducts and toxicants may arise, leading to inflammatory reactions.

Potent antioxidant and anti-inflammatory ingredients were added to formulate a well-tolerated enzyme product.

## Rutin

Chronic inflammation is a common aspect in conditions resulting from damp and water-damaged building exposure and the stealth infections that may follow. Rutin is a plant-derived flavonol that “through its strong antioxidant properties, can effectively ameliorate inflammation by reducing the levels of pro-inflammatory markers such as tumor necrosis factor- $\alpha$ , interleukin (IL)-6, cyclooxygenase-2, IL-1 $\beta$ , as well as blocking nuclear factor kappa B (NF- $\kappa$ B)/mitogen-activated protein kinase (MAPK) activation to improve metabolic function.”\*

Rutin in combination with quercetin have antigenotoxic effects after exposure to certain mycotoxins according to cell studies.

## Rosemary (standardized to contain 7% carnosic acid)

Rosemary (*Rosmarinus officinalis*) has been shown in both cell and animal studies to have antibiofilm activity against *Staphylococcus aureus* and *Pseudomonas aeruginosa*, two pervasive biofilm producers. Rosemary was used in combination with antimicrobial treatment to yield a synergistic antibiofilm effect.

Carnosic acid from rosemary extracts are cytoprotective against the oxidative stress induced by certain mycotoxins. Rosemary’s powerful antioxidant, rosmarinic acid, has strong anti-inflammatory properties particularly useful for neuroprotection, hepatoprotection, gastroprotection, mitigation of colitis, as well as anti-nociceptive action.

## Resveratrol

Resveratrol is a naturally occurring polyphenolic antioxidant that has innumerable ways in which it assists the mold-affected or inflamed patient, with studies showing benefit against almost all mycotoxins found in damp and water-damaged environments. Resveratrol’s actions include antioxidant, anti-inflammatory, and protective benefits for the brain and nervous system; respiratory, cardiovascular, digestive, and endocrine systems; specific hepato- and nephroprotection; and gene and cytoprotection.

Resveratrol has antibacterial, antifungal, and antibiofilm properties. Even at “subinhibitory concentrations, resveratrol can alter bacterial expression of virulence traits leading to reduced toxin production, inhibition of biofilm formation, reduced motility and interference with quorum sensing.”\* Resveratrol inhibited growth of *Candida albicans* biofilm in a dose-dependent manner.

## Timing Considerations



There is an art to the timing of biofilm degrading agents. Patients affected by mold exposure benefit greatly when hypercoagulability is addressed. The enzymes contained in Biofilm Plus™ assist with this, however, may also degrade biofilm at a rate faster than the body’s ability to neutralize what’s uncovered.

Biofilm degradation timing is typically best achieved once some amount of antifungal treatment can be used. The enzymes in this product were synthesized through a fermentation process. Fermented products may cause sensitivity in some mold-affected patients.

**For more information about Alight Health Formulas™, email [contact@alighthealthformulas.com](mailto:contact@alighthealthformulas.com)**

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