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Mold and Mycotoxin Protocol

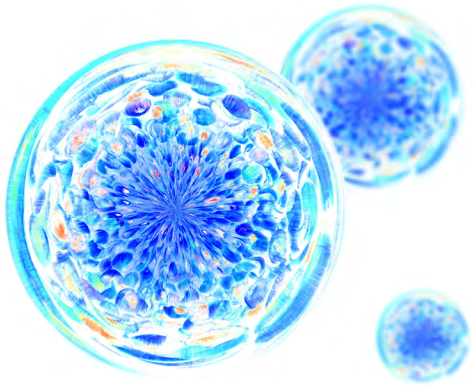
Of the estimated hundreds of thousands of mold species on earth, the vast majority live in harmony with humans, rarely causing disease. But around 200 are known to potentially cause serious illness in humans by releasing microscopic molecules known as "mycotoxins." And most of these mycotoxin-emitting species reside indoors.[1]

Mold illness presents with non-specific, poorly-defined health effects that overlap with other conditions. There are well-established physiological mechanisms through which mold illness can occur by inducing hypersensitivity reactions and infection in susceptible individuals.[2]

Botanicals combined with the use of binders offer powerful foundational support, and can be used with other therapeutics.

When managing mold illness:

- Eliminate or reduce environmental exposure.
- Include Biocidin® to assist in the removal of biotoxins and harmful microbes. Biocidin® has the following key activities, crucial for mold illness:
  - Antifungal botanicals
  - Biofilm disruption
  - Immune support
  - Antioxidant/anti-inflammatory
  - Gut-barrier integrity support
- Utilize G.I. Detox®+, a formula with broad-spectrum binding capacity, to absorb and eliminate mycotoxins and cellular debris.



Clinical Relevance

In approximately 75% of the population, biotoxins, including mycotoxins, are identified by the immune system and excreted. However, the remaining 25% have genetic variations that affect metabolic detoxification pathways, preventing excretion. When these pathways are impaired, it can result in systemic inflammation and, if untreated, eventual Chronic Inflammatory Response Syndrome (CIRS), also known as biotoxin illness. Biotoxin illness describes "a group of symptoms, lab findings, and targeted test results associated with biotoxin exposure, especially in genetically-susceptible people."[3]

The most common route of exposure for people suffering from mold illness is inhalation of air in water-damaged buildings (WDB) – either at home, work, or even in a car. CIRS can also result from additional sources. Make sure to evaluate all possible routes of exposure.

[1] https://www.collaborativemed.com/mold-and-mycotoxin-illness-what-to-know/
[2] Borchers, Andrea T et al. "Mold and Human Health: a Reality Check." Clinical reviews in allergy & immunology vol. 52,3 (2017): 305-322. doi:10.1007/s12016-017-8601-z
[3] https://www.survivingmold.com/docs/UNDERSTANDING_CIRS_EDITV2A.PDF

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Clinical Relevance (continued)

Inhaled biotoxins commonly found in a WDB include:

- Fungi (mold and its fragments)
- Bacteria (and its fragments)
- Volatile organic compounds
- Endotoxins
- Actinomycetes – a bacteria that acts similarly to mold

Biotoxins from other sources:

- Tick or insect bite
- Ingestion through contaminated food
- Contact with contaminated water[3]

Symptoms

The symptoms of mold illness are often misdiagnosed or go unexplained conventionally. Mycotoxin exposure and CIRS may affect many areas of the body. However, there are some noted pathognomonic symptoms such as:

- Electric shock sensations
- Ice-pick-like pains
- Vibrating or pulsing sensations running up and down the spinal cord

Other Common Mycotoxin Illness Symptoms		
Muscle weakness	Fatigue with cognitive impairment	Sensitivity to light
Numbness and tingling	Joint and muscle pain	Chronic sinus congestion
Disequilibrium	Headaches	Rashes, eczema, psoriasis
Dizziness	Gastrointestinal (GI) symptoms	Sensitivity to light touch
Severe anxiety and depression	Chest tightness and pain	Metallic taste in the mouth

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Mold and the GI Tract

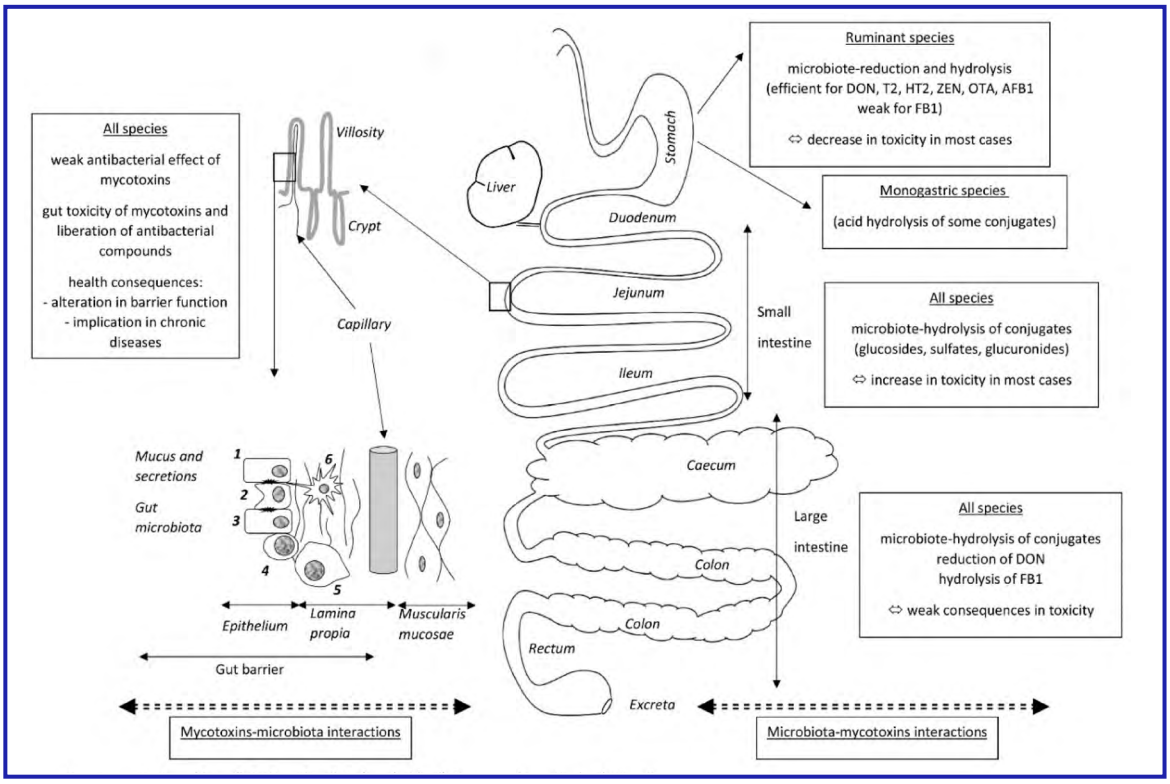
Mycotoxin-induced GI dysfunction results from four modes of damage:

- Physical (disrupted structural integrity)
- Chemical (thinned mucosal layer)
- Immunological (imbalanced inflammatory factors)
- Microbial (dysfunctional bacterial homeostasis)

GI Symptoms Related to Mycotoxins/Mold	
Intestinal permeability	Food intolerance (histamine, lactose, fructose)
Chronic or recurrent candidiasis	Dyspepsia
Food sensitivities	Inflammatory bowel disease

The Microbiome

Findings show a profound interaction between gut microbiota and ingested mycotoxins. Beneficial microbes aid in the mycotoxin removal process by metabolizing or binding them for elimination. Studies also demonstrate mycotoxins can alter the gut microbiota, which illustrates the bidirectional relationship between the two.



Mycotoxin and gut microbiota interactions.[4]

[4] Guerre, Philippe. "Mycotoxin and Gut Microbiota Interactions." *Toxins* vol. 12,12 769. 4 Dec. 2020, doi:10.3390/toxins12120769

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Risk Factors for Biotoxin Illness

- Moisture in the home, work, or car
- Immune suppression
- Genetic susceptibility and/or a family history of reactivity to mold
- Other chronic infectious illnesses

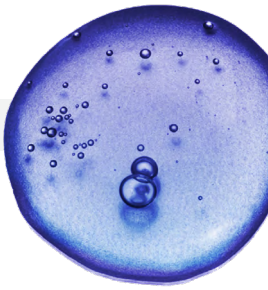
CLINICAL PEARLS

Don't Forget to Check for *Candida*!

An often overlooked area when addressing mold is susceptibility to overgrowth of *Candida spp*.

Because both mold and *Candida* are fungal, the immune system can become either hyperreactive (creating more inflammation) or suppressed (creating vulnerability to infection) when *Candida* is present. For this reason, treating *Candida* – and asking the patient to avoid foods high in sugar – can be helpful. For activity in the GI tract, it is optimal to start with Biocidin® Liquid and G.I. Detox®+.

Candida grows in the mouth as an opportunistic organism and can translocate to the GI tract, causing dysbiosis or Small Intestinal Fungal Overgrowth (SIFO). Addressing the oral microbiome with Dentalcidin® Toothpaste and Dentalcidin® LS Oral Rinse can restore healthy balance and prevent this outcome.



See our Candida and SIBO/SIFO protocol sheets for more information.

Biofilms Play a Significant Role

Biofilms are communities of bacteria embedded in an extracellular matrix, making them resistant to eradication. They are responsible for most chronic and recurrent infections and contribute to toxic load and inflammatory burden. They can be found almost anywhere in the body. The nose and sinuses are major internal reservoirs where mold is harbored in biofilm communities and continually generates the release of internal mycotoxins. This activity demonstrates the chronic nature of fungi/mold in the sinuses and explains the difficulty in treatment.[5]

See our Biofilms protocol sheet for more information.

[5] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3920250/

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Include Detoxification Support

Mycotoxins are, as the name implies, toxins. They are eliminated primarily through the liver via bile and the kidneys via urine. Additionally, biofilms harbor bacterial metabolites and toxins, including mycotoxins. (In fact, they are so sticky they are used for bioremediation of toxic waste sites and mycotoxins!) Biofilms and mycotoxins can impact patient comfort, compliance, and tolerance of a therapeutic protocol. When biofilms are broken down and mycotoxins mobilized, the metabolites present may cause damage to the surrounding tissues or transient increases in inflammation. Unfortunately, mycotoxins bound to bile can be metabolized and reabsorbed via enterohepatic circulation once excreted into the small intestine. Including a binder, such as Biocidin Botanical's G.I. Detox®+, can prevent the reabsorption of mycotoxins and reduce the burden on the liver, making detoxification more efficient, improving the patient experience, and promoting compliance.

Optimize liver and kidney function

Additionally, consider including botanicals, such as those found in Liver GB+™, to support the liver and kidneys, including:

Artichoke	Stimulates bile flow, enhances fat digestion, supports detoxification, liver and kidney health
Milk Thistle	Enhances absorption, detoxification, and digestion, protects liver and kidneys
Turmeric	Helps support & stimulate bile flow, protects and supports the liver and kidneys
TUDCA	Supports healthy bile flow and gallbladder health, protects and supports the liver, thins bile, protects kidneys
Ginger	Improves production and flow of bile, promotes gastric emptying and reduces intestinal transit time, helps ease indigestion, belching, gas, and feelings of fullness after eating, and protects kidneys

Don't Forget the Sinuses

Fungal and bacterial biofilms can be present in the sinuses and become an ongoing exposure to pathogens. Patients with mold exposure and concurrent immune suppression must be evaluated and treated for chronic sinus infections, both fungal and bacterial.

[5] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3920250/

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One bacteria – Multiple Antibiotic Resistant Coagulase Negative Staph (MARCoNS) – secretes toxins that lower Melanocyte Stimulating Hormone (MSH) and raise cytokine levels.

"MSH is a hormone made in the pituitary gland that plays a crucial role in regulating many other hormones, inflammation responses, and defenses against foreign microbes. ... Deficiency of MSH is very common in patients with CIRS and often does not return to normal levels despite treatment. Low MSH increases susceptibility to mold illness, chronic fatigue, chronic pain (from decreased endorphin production), insomnia (from decreased melatonin production), sexual dysfunction, and other hormonal abnormalities."[3]

When MSH is low, inflammation goes unchecked, contributing to chronic inflammation and leaky gut (due to its role in healing the GI mucosa).[3]

To address biofilms and harmful organisms, consider the use of Biocidin® LSF orally and in a nasal rinse, which allows access to the sinuses.

Environmental and Lifestyle Recommendations

- Get out of the mold environment and remediate immediately.
  - Dry up wet materials quickly. Mold can grow in as little as two days.
  - Repair leaks. Fix leaks on the roof, foundation, and walls of the house. Unclog HVAC units. Replace old pipes.
  - Keep humidity levels below 60% in rooms.
  - Test the suspected environment for mold.
- Evaluate smoking and alcohol consumption.
- Limit simple carbohydrates and sugar.
- Avoid foods containing high levels of yeast and histamine.

See our Histamine Protocol Sheet for more information.

- Address stress levels. Chronically elevated cortisol levels are an impediment to cure. Practices to help balance cortisol include:
  - Deep breathing
  - Simplifying
  - Learn to be proactive in setting personal boundaries that support self-care
  - Consistent sleep/wake cycles
- If you've determined *Candida* is present, studies show that brushing your teeth more frequently reduces levels in the stool. *(What grows in the mouth will grow in the gut!)* Dentalcidin® Toothpaste and Dentalcidin® LS address biofilms and microbial imbalances. Use Biocidin® TS to maintain healthy immune activity in the mouth.

Questions?

For clinical questions, email clinical@biocidin.com

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Therapeutic Plan Suggestions

Mold and Mycotoxin Clearance Support

PROTOCOL INCLUDES 2 PHASES

PHASE I: USE BIOCLEAR® MICROBIOME DETOX PROGRAM FOR 1-2 MONTHS FOR GUT SUPPORT

CORE PROTOCOL		
Biocidin® Liquid or Capsules	Titrate to 10 drops 2x/day	Titrate to 2 capsules 2x/day
G.I. Detox®+	2 capsules at bedtime. 1 hour away from food, supplements, and medications. Temporarily increase dose to 2 capsules 2-3x/day if Herxheimer reaction observed/worsens.	
Liver GB+™	2 capsules daily, 15-20 minutes before a meal. May be taken in divided doses.	
Proflora® 4R	1 capsule any time	
G.I. InnerCalm®	1 stick pack mixed in water, 1-2 times daily, taken any time	
ADDITIONAL SUPPORT		
Dentalcidin®	2-3x/day	
Dentalflora®	Dissolve 1 tablet in mouth daily at bedtime, at least 30 minutes away from other oral care, food, or drinks	

PHASE II: USE COMPREHENSIVE CLEANSING PROGRAM™ FOR APPROPRIATE DURATION

CORE PROTOCOL	
Biocidin® LSF	Titrate to 2 pumps 2x/day
G.I. Detox®+	2 capsules at bedtime. 1 hour away from food, supplements, and medications. Temporarily increase dose to 2 capsules 2-3x/day if Herxheimer reaction observed/worsens.
Liver GB+™	2 capsules daily, 15-20 minutes before a meal. May be taken in divided doses.
Proflora® 4R	1 capsule any time
G.I. InnerCalm®	1 stick pack mixed in water, 1-2 times daily, taken any time
Olivirex®	Titrate to 2 capsules 2x/day
Biotonic®	20 drops 2x/day
Dentalcidin®	2-3x/day
Dentalflora®	Dissolve 1 tablet in mouth daily at bedtime, at least 30 minutes away from other oral care, food, or drinks