

CLINICAL SPECIFICATIONS

STACHYBOTRYS CHARTARUM

Pathogen Type:

Stachybotrys chartarum is a black mold that produces asexual spores. It is found in soil, water and air especially in and around water-damaged buildings.

Associated With:

Edema^{reviewed in 1}
 Organic toxic dust syndrome²
 Pulmonary hemosiderosis^{reviewed in 1}
 Sick building syndrome³

Known Cross-Reactions: *Aspergillus*, *Penicillium*⁴

Clinical Significance:

The detection of antibodies to *Stachybotrys* indicates the patient has increased risk of chronic fatigue syndrome, fibromyalgia, a variety of autoimmunities including neuroautoimmunity. People can be exposed to *S. chartarum* via dermal contact, ingestion, and inhalation. Lungs do not have the same multi-layer, protective barriers to toxins as the protective layers covering intestinal cells.¹ As *S. chartarum* infiltrates the body, it inhibits protein synthesis and stimulates pro-inflammatory cytokine, namely, interleukin-1, interleukin-6 and tumor necrosis factor- α .¹ Although exposure to *S. chartarum* is often associated with indoor air, however, it is important to note that rural air can harbor *S. chartarum*. Barnes *et al.* found that 49% of the serum samples collected from a general population in Kansas had IgG, and 9% had IgE, immunoglobulins to *S. chartarum* proteins.⁵ The most common mode of invasion is via inhalation. Molds, through the production of enzymes such as serine chymotrypsin-like proteinase, cleaves lungs and gut barrier proteins and then finds their way into the blood. In the blood, immune system reaction against them results in the release of proinflammatory cytokines and the production of antibody against mold antigens. The molds and their mycotoxins, enzymes and proinflammatory cytokines alter the blood brain barrier function and allow for the entry of autoreactive, T-helper (Th1), Th7 and antibodies into the nervous system causing damage to microglia, astrocytes and neurons, which leads to the neuroautoimmunity commonly seen in patients exposed to molds.

This array tests for IgG immune reactivity associated with *Stachybotrys chartarum*. This is not a measurement of acute infection. Equivocal or out-of-range results indicate IgG antibody reactivity to the tested antigen. We tested 288 blood donor sera against *Stachybotrys chartarum* antigens at optimal dilution, 16% of these donors were IgG and IgA reactive.

References:

1. Miller, et al. *Stachybotrys chartarum*: cause of human disease or media darling? *Med Mycol*, 2003; 41:271-291.
2. Sorenson WG, Lewis DM. Organic dust toxic syndrome. In: Howard D, Miller JD (eds). *The Mycota*, vol. VII. Berlin: Springer-Verlag, 1996: 159-172.
3. Brasel, et al. Detection of airborne *Stachybotrys chartarum* macrocyclic Trichothecene mycotoxins on particulates smaller than conidia. *Appl Environ Microbiol*, 2005; 71(1):114-122.
4. Vojdani. Cross-reactivity of *Aspergillus*, *Penicillium*, and *Stachybotrys* antigens using affinity-purified antibodies and immunoassay. *Archives Environ Health*, 2004; 59(5):256-265.
5. Barnes, et al. IgE-reactive proteins from *Stachybotrys chartarum*. *Ann Aller Asth Immunol*, 2002; 89:29-33.