



Histoplasma capsulatum

Histoplasma capsulatum (teleomorph: *Ajellomyces capsulatus*) is a microfungus that is endemic to most of the United States, with particularly high concentrations in the Mississippi, St. Lawrence and Ohio River valleys. The fungus thrives in matter with high nitrogen content, in particular, bird manure (i.e. pigeon or starling roosts). Local outbreaks are usually correlated to the disturbance of roosting sites (i.e. a building renovation), which can produce large numbers of airborne fungal spores.

Histoplasmosis (an infection by *Histoplasma capsulatum*) can be acute, chronic or disseminated. Acute infections are most common in otherwise healthy individuals and it is estimated that more than 95% of these cases will clear up on their own with little more than flu-like symptoms. Chronic histoplasmosis is a disease that can reactivate years, and even decades, after the initial exposure as the host's immune system weakens. Disseminated histoplasmosis is commonly associated with those individuals with impaired immune systems (such as AIDS patients), and occasionally otherwise healthy individuals under the age of two years. Disseminated histoplasmosis can be life-threatening and is considered a serious fungal infection.

The detection and quantitation of *Histoplasma capsulatum* faces many problems. First, and foremost, *H. capsulatum* cannot be identified by classical nonviable testing. The spores of *H. capsulatum* are too similar to certain other fungi to allow an accurate identification. This means all *H. capsulatum* investigations must be by viable cultures. The analysis is further complicated by the fact that *H. capsulatum* is a very slow growing fungus. Under ideal laboratory conditions, the fungus takes between six to eight weeks to grow to maturity. These facts dissuade most indoor air quality (IAQ) investigators from testing for this organism. Due to this long growth time, special media must be used for any type of bioaerosol sampling, as you must both promote the growth of *H. capsulatum* while simultaneously suppressing the growth of more rapidly growing fungi (i.e. *Aspergillus*, *Penicillium*, etc.).

So when should an IAQ investigator look for *Histoplasma capsulatum*, and how should it be done? *Histoplasma capsulatum* should be suspected in any situation which involves the removal of a significant amount of bird manure, especially in the geographical locations mentioned above. The most common situations involve the renovations of exposed areas in the upper floors of buildings (attics, unfinished upper floors, etc.) where birds have been known to roost for extended periods of time. Another common situation, though unusually from the IAQ standpoint, are areas where chickens have roosted for significant periods of time (i.e. old farm renovations). Sampling is most appropriately done with an Andersen-style impactor utilizing specific media. The most common media for this test are BHI-CC (Difco) and Mycosel (Difco, BD), both of which are available from EMSL with advanced notice. Swab samples may also be submitted, but bulk material should not be submitted as it poses an elevated biosafety risk to the analytical lab.



Culture Based Analysis:

EMSL Code: M120

TATs available: 8 weeks (Please note that this test requires 7 weeks of incubation to rule out a negative result, positive results may be reported sooner).

Sample Types Accepted: Air (agar plates) and swabs

Sample Types Not Accepted: Spore Traps, Tape Lifts, Bulks, or Soils

For Air Sample Collection: This method commonly uses an Andersen N-6 type impactor (e.g. EMSL VP-400 Microbial Sampler Product ID 8709001) with Mycosel/Mycobiotic Agar, Dermatophyte Test Medium (DTM) or Brain Heart CC Agar (BHCC). 3-5 minute sampling at 28.3 lpm.

For Swab Sample Collection: Butterfield's solution swab or similar

Sample Shipment: Complete an EMSL Chain of Custody (COC), available on our website (www.emsl.com), detailing client name and information, project name or number, sample #, and a description of the area. Place samples in a cooler with reusable freezer packs. Overnight shipping recommended.

PCR Based Analysis:

EMSL Code: M208

TATs available: 3 hr, 6 hr, 1 day, 2 day, 3 day

Sample Types Accepted: Air (PCR cassette) and swabs

Sample Types Not Accepted: Spore Traps, Tape Lifts, Bulks, or Soils

For Air Sample Collection: 3-piece EMSL PCR cassette (Product ID 8715309) with vacuum pump. Sample as much air as desired through the upper opening. There is no upper limit to sampling time. Record the VOLUME of air sampled and ship the cassette to EMSL.

For Swab Sample Collection: Butterfield's solution swab

Sample Shipment: Complete an EMSL Chain of Custody (COC), available on our website (www.emsl.com), detailing client name and information, project name or number, sample #, and a description of the area. No refrigeration is needed. Overnight shipping recommended.

