MAYO CLINIC LABORATORIES

# Test Definition: UHBAG

Histoplasma and Blastomyces Antigen, Enzyme Immunoassay, Urine

## Overview

### Useful For

Diagnosing *Histoplasma capsulatum* or *Blastomyces dermatitidis* infection without differentiation between the organisms

Monitor antigen levels following initiation of antifungal treatment

### Highlights

This test detects *Histoplasma* and *Blastomyces* antigen in urine, without differentiation between the 2 fungal pathogens.

This test aids in the diagnosis of histoplasmosis or blastomycosis alongside other routine methods, including culture, molecular testing, and serology.

This test can be used to monitor response to antifungal therapy.

### Method Name

Enzyme Immunoassay (EIA)

### NY State Available

Yes

## Specimen

### Specimen Type

Urine

### Specimen Required

**Supplies:** Sarstedt Aliquot tube, 5 mL (T914)
**Container/Tube:** Plastic vial
**Specimen Volume:** 3 mL
**Collection Instructions:**
1. Collect a random urine specimen, with no preservative.
2. **Do not centrifuge** to remove particulates.

### Specimen Minimum Volume

2.5 mL

### Reject Due To

| | |
|---|---|
| Gross hemolysis | Reject |
| Turbid Colored | Reject |

### Specimen Stability Information

| Specimen Type | Temperature | Time | Special Container |
|---|---|---|---|
| Urine | Refrigerated (preferred) | 14 days | |
| | Frozen | 28 days | |
| | Ambient | 7 days | |

## Clinical & Interpretive

### Clinical Information

*Blastomyces dermatitidis* and *Histoplasma capsulatum* are dimorphic fungal agents with increasingly overlapping endemicity throughout the Midwestern, South Central, and Southeastern United States, particularly in regions around the Ohio and Mississippi River valleys, the Great Lakes, and the Saint Lawrence River. These agents are also found in regions of Canada.

These 2 fungi maintain a yeast form in the host at body temperature but are maintained as molds in the environment, which release spores that are inhaled by individuals leading to infection. Through phylogenetic analysis, *B dermatitidis* has been separated into 2 distinct species: *B dermatitidis* and *Blastomyces gilchristii,* both able to cause blastomycosis. *B dermatitidis* infections are frequently associated with dissemination, particularly in older patients, smokers, and immunocompromised hosts, while *B gilchristii* has primarily been associated with pulmonary and constitutional symptoms. Additional species of *Blastomyces* have recently been discovered and characterized; however, the performance characteristics of this assay for these species are unknown.

Approximately half of patients infected with *Blastomyces* will develop symptoms that are frequently nonspecific, including fever, cough, night sweats, myalgia or arthralgia, weight loss, dyspnea, chest pain, and fatigue. Symptoms may appear anywhere from 3 weeks to 3 months following infection.

For *Histoplasma* infections, clinical manifestations are largely dependent on the fungal burden at the time of exposure and the patient's underlying immune status. While the vast majority (>90%) of exposed individuals will remain asymptomatic, individuals seeking medical attention can present with a diverse set of symptoms ranging from a self-limited pulmonary illness to severe, disseminated disease. Individuals at risk for severe infection include those with impaired cellular immunity or have undergone organ transplantation, are HIV positive, or have a hematologic malignancy.

Diagnosis of blastomycosis and histoplasmosis relies on a combination of assays, including culture and molecular testing performed on appropriate specimens, and serologic evaluation for both antibodies to, and antigen released from, the organism. Although culture remains the gold standard method and is highly specific, these organisms can take several

days to weeks to grow, and sensitivity is diminished in cases of acute or localized disease. Similarly, molecular testing offers high specificity and a rapid turnaround time, however sensitivity is imperfect. Detection of an antibody response to *Blastomyces* or *Histoplasma* offers high specificity; however, results may be falsely negative in patients who are acutely ill or are immunosuppressed.

## Reference Values

Histoplasma/Blastomyces Antigen Result:
Not Detected

Histoplasma/Blastomyces Antigen Value:
Not Detected: 0.0 ng/mL
Detected: <1.3 ng/mL
Detected: 1.3-20.0 ng/mL
Detected: >20.0 ng/mL

Reference values apply to all ages.

## Interpretation

Not detected:
No antigen from *Histoplasma* or *Blastomyces* detected. False-negative results may occur depending on extent of disease or site of infection. Repeat testing on a new specimen if clinically indicated.

Detected:
Antigen from *Histoplasma* or *Blastomyces* (unable to differentiate) was detected, below the limit of quantification (<1.3 ng/mL). Result should be correlated with clinical presentation, exposure history, and other diagnostic procedures, including culture, serology, histopathology, and radiographic findings to aid in the differentiation between histoplasmosis or blastomycosis.

Detected:
Antigen from *Histoplasma* or *Blastomyces* (unable to differentiate) detected. Result should be correlated with clinical presentation, exposure history, and other diagnostic procedures, including culture, serology, histopathology, and radiographic findings, to aid in the differentiation between histoplasmosis and blastomycosis.

Detected:
Antigen from *Histoplasma* or *Blastomyces* (unable to differentiate) detected, above the limit of quantification (>20.0 ng/mL). Result should be correlated with clinical presentation, exposure history, and other diagnostic procedures, including culture, serology, histopathology, and radiographic findings, to aid in the differentiation between histoplasmosis or blastomycosis.

## Cautions

Due to significant cross-reactivity between galactomannan antigens from *Blastomyces* and *Histoplasma,* this assay does not differentiate between these 2 dimorphic fungal agents. To differentiate, consider fungal culture, molecular testing, or serology testing.

Positive results should be correlated with other clinical and laboratory findings (eg, culture, serology).

Low-level positive antigen levels may persist following resolution of infection and completion of appropriate treatment regimen.

Sensitivity of this assay to detect antigen from species other than *Blastomyces dermatitidis* or *Histoplasma capsulatum* is unknown.

False-positive results may occur less frequently with other dimorphic agents (eg, *Coccidioides*).

### Clinical Reference

1. McBride JA, Gauthier GM, Klein B. Clinical manifestations and treatment of blastomycosis. Clin Chest Med. 2017;38(3):435-449
2. Chapman SW, Dismukes WE, Proia LA, et al. Clinical practice guidelines for the management of blastomycosis. Clin Infect Dis. 2008;46(12):1801-1812
3. Wheat LJ, Freifeld AG, Kleiman MB, et al. Clinical practice guidelines for the management of patients with histoplasmosis: 2007 update by the Infectious Diseases Society of America. Clin Infect Dis. 2007;45(7):807-825
4. Granger D, Streck NT, Theel ES. Detection of *Histoplasma capsulatum* and *Blastomyces dermatitidis* antigens in serum using a single quantitative enzyme immunoassay. J Clin Microbiol. 2024;62(1):e0121323. doi:10.1128/jcm.01213-23

## Performance

### Method Description

The assay detects *Blastomyces dermatitidis* antigen in human serum samples using specific, proprietary antibodies in an enzyme-linked immunosorbent assay format. The detection method involves an enzyme/substrate system with the level of urinary *B dermatitidis* antigen proportional to the assay signal. The patient specimen result is compared to a cutoff calibrator and a standard curve of a series of assay calibrators (1.25 to 20.00 ng/mL) to determine the presence or absence of antigen and, if present, to establish a quantitative level of *B dermatitidis* serum antigen.(Package insert: *Blastomyces dermatitidis* Urinary Antigen Detection Kit. Gotham Biotechnology; V1, R3, 06/2021)

### PDF Report

No

### Day(s) Performed

Monday through Sunday

### Report Available

Same day/1 to 3 days

### Specimen Retention Time

14 days

### Performing Laboratory Location

Rochester

## Fees & Codes

### Fees

- Authorized users can sign in to Test Prices for detailed fee information.
- Clients without access to Test Prices can contact Customer Service 24 hours a day, seven days a week.
- Prospective clients should contact their account representative. For assistance, contact Customer Service.

### Test Classification

This test was developed and its performance characteristics determined by Mayo Clinic in a manner consistent with CLIA requirements. It has not been cleared or approved by the US Food and Drug Administration.

### CPT Code Information

87449

### LOINC® Information

| Test ID | Test Order Name | Order LOINC® Value |
|---|---|---|
| UHBAG | Histoplasma/Blastomyces Ag, EIA, U | 105123-4 |

| Result ID | Test Result Name | Result LOINC® Value |
|---|---|---|
| UHBAR | Histoplasma/Blastomyces Ag Result | 104871-9 |
| DEXBH | Histoplasma/Blastomyces Ag Value | 104872-7 |