MAYO CLINIC LABORATORIES

Test Definition: HBRP

Histoplasma capsulatum/Blastomyces species, Molecular Detection, PCR, Varies

Overview

Useful For

Rapid detection of *Histoplasma capsulatum* and *Blastomyces dermatitidis* DNA

Aiding in the rapid diagnosis of histoplasmosis and blastomycosis

Testing Algorithm

For more information see Meningitis/Encephalitis Panel Algorithm

Special Instructions

- Meningitis/Encephalitis Panel Algorithm

Method Name

Real-Time Polymerase Chain Reaction (PCR)

NY State Available

Yes

Specimen

Specimen Type

Varies

Ordering Guidance

Urine is not an acceptable source for this assay. Studies indicate that *Histoplasma* DNA is not routinely found in the urine of patients with disseminated histoplasmosis. The recommended test for urine specimens is UHBAG / *Histoplasma* and *Blastomyces* Antigen, Enzyme Immunoassay, Urine.

Shipping Instructions

Specimen must arrive within 7 days of collection; specimens received after 7 days will be rejected.

N-acetyl-l-cysteine-sodium hydroxide (NALC/NaOH)-digested specimen must arrive within 7 days of digestion.

Necessary Information

Specimen source is required.

Specimen Required

The high sensitivity of amplification by polymerase chain reaction requires the specimen to be processed in an environment in which contamination of the specimen by *Histoplasma* or *Blastomyces* species DNA is not likely.

Submit only 1 of the following specimens:

Specimen Type: Body fluid
Sources: Body, spinal fluid, bone marrow
Container/Tube: Sterile container
Specimen Volume: 1 mL

Specimen Type: Respiratory
Sources: Bronchoalveolar lavage, bronchial washing, sputum
Container/Tube: Sterile container
Specimen Volume: 1 mL

Specimen Type: Tissue or bone
Container/Tube: Sterile container
Specimen Volume: 5-10 mm
Collection Instructions: Collect a fresh tissue or bone specimen.

Acceptable:
Specimen Type: N-acetyl-l-cysteine-sodium hydroxide (NALC/NaOH)-digested respiratory specimens
Sources: Lavage fluid, bronchial washing, gastric washing, respiratory fluid, sputum, or tracheal secretion
Container/Tube: Sterile container
Specimen Volume: 2 mL
Collection Instructions:
1. Submit digested specimen treated with NALC/NaOH.
2. Clearly indicate on container and order form that specimen is a digested specimen.

Forms

If not ordering electronically, complete, print, and send a Microbiology Test Request (T244) with the specimen.

Specimen Minimum Volume

Body fluid or respiratory specimen: 0.5 mL

Reject Due To

Specimen in anaerobe vial or viral transport medium (including but not limited to M4, M5, BD viral transport media,	Reject

thioglycolate broth) Feces Swab Tissue in formalin fluid Urine	

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Varies	Refrigerated (preferred)	7 days	
	Ambient	7 days	
	Frozen	7 days	

Clinical & Interpretive

Clinical Information

Infections with *Blastomyces dermatitidis* and *Histoplasma capsulatum* cause a variety of clinical manifestations ranging from self-limited, mild pulmonary illness to potentially life-threatening, disseminated disease. Primary infections are acquired through inhalation of conidia that are present in the environment. In the United States, most cases of blastomycosis and histoplasmosis occur along the Ohio and Mississippi River valleys, although recent studies suggest the geographic area of endemicity may be expanding.

The gold standard for diagnosis of blastomycosis and histoplasmosis remains isolation of the organisms in culture. Although sensitive, recovery in culture and subsequent identification may require days to weeks. This polymerase chain reaction assay can provide rapid and specific detection and differentiation of *B dermatitidis/gilchristii* and *H capsulatum* directly from clinical specimens.

Reference Values

Not applicable

Interpretation

A positive result for *Histoplasma capsulatum* indicates presence of *Histoplasma* DNA; a positive result for *Blastomyces dermatitidis/gilchristii* indicates presence of *Blastomyces* DNA.

A negative result indicates absence of detectable *H capsulatum* and *B dermatitidis/gilchristii* DNA. Fungal culture has increased sensitivity over this polymerase chain reaction (PCR) assay and should always be performed when the PCR is negative.

Cautions

This rapid polymerase chain reaction (PCR) assay detects *Histoplasma capsulatum* and *Blastomyces dermatitidis* nucleic acid and, therefore, does not distinguish between the presence of viable, disease-related organisms and nucleic acid

persisting from previous, treated disease. Test results should be correlated with patient symptoms and clinical presentation before a definitive diagnosis is made.

A negative result does not rule out the presence of *H capsulatum* or *B dermatitidis/gilchristii* because the organism may be present at levels below the limit of detection for this assay.

The sensitivity of the PCR assay from bronchoalveolar lavage fluid is low, and a negative result does not rule out infection.

Clinical Reference

1.Wheat LJ, Azar MM, Bahr NC, Spec A, Relich RF, Hage C: Histoplasmosis. Infect Dis Clin North Am. 2016 Mar;30(1):207-227. doi: 10.1016/j.idc.2015.10.009
2.Azar MM, Loyd JL, Relich RF, Wheat LJ, Hage CA: Current concepts in the epidemiology, diagnosis, and management of Histoplasmosis syndromes. Semin Respir Crit Care Med. 2020 Feb;41(1):13-30. doi: 10.1055/s-0039-1698429
3.Linder KA, Kauffman CA, Miceli MH: Blastomycosis: A review of mycological and clinical aspects. J Fungi (Basel). 2023 Jan 14;9(1):117. doi: 10.3390/jof9010117
4.Smith DJ, Williams SL; Endemic Mycoses State Partners Group; Benedict KM, Jackson BR, Toda M: Surveillance for Coccidioidomycosis, Histoplasmosis, and Blastomycosis - United States, 2019. MMWR Surveill Summ. 2022 Aug 19;71(7):1-14. doi: 10.15585/mmwr.ss7107a1

Performance

Method Description

Following specimen processing, nucleic acids are extracted using the MagNA Pure instrument (Roche Applied Sciences). The extract is then amplified using the LightCycler real-time polymerase chain reaction (PCR) platform (Roche Applied Sciences). The presence of the specific organism nucleic acid is confirmed by performing a melting curve analysis of the amplicon. Primers and fluorescence resonance energy transfer (FRET) hybridization probes were designed to target a 174-base pair (bp) region of the histidine kinase (*DRK-1*) gene of *Blastomyces dermatitidis/gilchristii* and a 192-bp region of the glyceraldehyde-3-phosphate dehydrogenase (*GAPDH*) gene of *Histoplasma capsulatum*, respectively. The acceptor probe for *B dermatitidis/gilchristii* was labeled with a Red-705 dye, while the acceptor probe for *H capsulatum* was labeled with a Red-640 dye. Labeling the acceptor probes with 2 different dyes allows for simultaneous detection and differentiation of *B dermatitidis/gilchristii* and *H capsulatum* within a single PCR assay.(Babady NE, Buckwalter SP, Hall L, Le Febre KM, Binnicker MJ, Wengenack NL: Detection of Blastomyces dermatitidis and Histoplasma capsulatum from culture isolates and clinical specimens by use of real-time PCR. J Clin Microbiol. 2011;49:3204-3208)

PDF Report

No

Day(s) Performed

Monday through Sunday

Report Available

1 to 3 days

Specimen Retention Time
7 days

Performing Laboratory Location
Mayo Clinic Laboratories - Rochester Main Campus

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
87798 x 2

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
HBRP	Histoplasma/Blastomyces PCR	81653-8

Result ID	Test Result Name	Result LOINC® Value
SRC78	Histo/Blasto Source	31208-2
32457	Histo/Blasto Result	81653-8