MAYO CLINIC LABORATORIES

Test Definition: WHIPB

Tropheryma whipplei, Molecular Detection, PCR, Blood

Overview

Useful For

Aiding in the diagnosis of Whipple disease, especially for identifying inconclusive or suspicious cases, using whole blood specimens

Testing Algorithm

For information see Infective Endocarditis: Diagnostic Testing for Identification of Microbiological Etiology.

Special Instructions

- Infective Endocarditis: Diagnostic Testing for Identification of Microbiological Etiology

Method Name

Real-Time Polymerase Chain Reaction (PCR)

NY State Available

Yes

Specimen

Specimen Type

Whole Blood EDTA

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 *Tropheryma whipplei* DNA is unlikely.

Container/Tube:
Preferred: Lavender top (EDTA)
Acceptable: Royal blue top (EDTA), pink top (EDTA), or sterile vial containing EDTA-derived aliquot
Specimen Volume: 1 mL
Collection Instructions: Send whole blood specimen in original tube (preferred)

Forms

If not ordering electronically, complete, print, and send 1 of the following forms with the specimen:
-Microbiology Test Request (T244)
-Gastroenterology and Hepatology Test Request (T728)

Specimen Minimum Volume

0.5 mL

Reject Due To

Bone marrow	Reject

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Whole Blood EDTA	Refrigerated (preferred)	7 days	
	Ambient	7 days	
	Frozen	7 days	

Clinical & Interpretive

Clinical Information

Whipple disease is a chronic, systemic illness that, in the majority of cases, involves the small intestine and its lymphatic drainage. The disease primarily affects adults of middle age, with a peak incidence in the third and fourth decades of life. Clinical findings may include malabsorption, chronic diarrhea, abdominal pain, arthralgia, fever, and central nervous system symptoms.

Pathologic changes associated with Whipple disease are distinctive, with diagnosis dependent on histologic examination of biopsy specimens from involved tissues. Electron microscopic or special high-resolution light microscopic examination of the lamina propria of the small intestine of patients with untreated Whipple disease reveals many rod-shaped bacillary organisms. These tiny bacilli, referred to as Whipple bacilli, measure about 0.25 micrometers long and are seen as periodic acid-Schiff-positive granules within macrophages. These inclusions represent fragments of the cell walls from degenerating bacilli.

Culture of Whipple bacilli from biopsy material is laborious, and the organism is very slow growing. Definitive identification of the Whipple-associated bacillus has been difficult because of these limitations. Molecular techniques using polymerase chain reaction and nucleotide sequencing allow classification of this bacillus as an actinomycete not closely related to any other known species, which has been named *Tropheryma whipplei*.

Reference Values

Not applicable

Interpretation

A positive result indicates the presence of *Tropheryma whipplei* DNA.

A negative result indicates the absence of detectable *T whipplei* DNA, but it does not negate the presence of the organism and may occur due to inhibition of polymerase chain reaction, sequence variability underlying primers or probes, or the presence of *T whipplei* DNA in quantities below the limit of detection of the assay.

Cautions

Test results should be used as an aid in diagnosis and not be considered diagnostic in themselves. The single assay should not be used as the only criteria to form a clinical conclusion, but results should be correlated with patient symptoms and clinical presentation. A negative result does not negate the presence of the organism or active disease.

Supportive Data

A total of 321 clinical specimens (including blood, tissue, cerebrospinal fluid, and synovial fluid) were evaluated for the presence of *Tropheryma whipplei* DNA by targeting the heat shock protein 65 gene using the LightCycler Whip assay and results were compared to those of a conventional polymerase chain reaction (PCR) assay. The sensitivity and specificity of the LightCycler Whip assay compared to conventional PCR were 98% and 99%, respectively. The analytical sensitivity was less than 50 targets per reaction. The LightCycler Whip showed no cross reaction when tested on a panel of 28 organisms genotypically closely related to *T whipplei* by BLAST analysis.

Clinical Reference

1. Ramzan NN, Loftus E Jr, Burgart LJ, et al. Diagnosis and monitoring of Whipple disease by polymerase chain reaction. Ann Intern Med. 1997;126(7):520-527
2. Morgenegg S, Dutly F, Altwegg M. Cloning and sequencing of a part of the heat shock protein 65 gene (hsp65) of "Tropheryma whippelii" and its use for detection of "T. whippelii" in clinical specimens by PCR. J Clin Microbiol. 2000;38(6):2248-2253
3. von Herbay A, Ditton HJ, Schuhmacher F, Maiwald M. Whipple's disease: staging and monitoring by cytology and polymerase chain reaction analysis of cerebrospinal fluid. Gastroenterology. 1997;113(2):434-441
4. Dolmans RA, Boel CH, Lacle MM, Kusters JG. Clinical manifestations, treatment, and diagnosis of Tropheryma whipplei infections. Clin Microbiol Rev. 2017;30(2):529-555. doi:10.1128/CMR.00033-16

Performance

Method Description

Nucleic acid is extracted from all specimens using the MagNA Pure extraction system. The resulting nucleic acid is tested for the presence of the target DNA of *Tropheryma whipplei* using the LightCycler real-time polymerase chain reaction (PCR). The instrument amplifies and continuously monitors the development of target nucleic acid using fluorescent resonance emission technology after each cycle. Analysis of the PCR amplification and probe melting curves is accomplished through the use of the LightCycler software.(Sloan LM, Rosenblatt JE, Cockerill FR III. Detection of *Tropheryma whipplei* DNA in clinical specimens by LightCycler real-time PCR. J Clin Microbiol. 2005;43[7]:3516-3518; Geibdorfer W, Moter A, Bogdan C. *Tropheryma whipplei*, In: Carroll K, Pfaller M, eds. Manual of Clinical Microbiology. 12th ed. ASM Press; 2019:1189-1197)

PDF Report

No

Day(s) Performed

Monday through Sunday

Report Available

2 to 7 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

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
WHIPB	Tropheryma whipplei PCR, B	97205-9

Result ID	Test Result Name	Result LOINC® Value
SRC89	Specimen Source	31208-2
56064	Tropheryma whipplei PCR, B, Result	97205-9