MAYO CLINIC LABORATORIES

Test Definition: TWRP

Tropheryma whipplei, Molecular Detection, PCR, Varies

Overview

Useful For

Aiding in the diagnosis of Whipple disease, especially for identifying inconclusive or suspicious cases, using tissue or fluid 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

Varies

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 *Tropheryma whipplei* DNA is unlikely.

Submit only 1 of the following specimens:

Specimen Type: Fresh tissue or biopsy
Sources: Small intestine (duodenum, ileum, or jejunum), lymph node, bone, joint, synovial, liver, pancreas, spleen, lung, heart valve (and other heart tissues), or brain
Container/Tube: Sterile container
Specimen Volume: Entire collection or 5 mm(3) - approximately the size of a pencil eraser
Collection Instructions:
1. Collect fresh tissue specimen.
2. Submit tissue only, do not add fluid to tissue.

3. Refrigerate or freeze specimen.
Specimen Stability Information: Refrigerated (preferred) 7 days /Frozen 7 days

Preferred Paraffin-embedded tissue block:
Supplies: Tissue Block Container (T553)
Specimen Type: Formalin-fixed, paraffin-embedded tissue block (FFPE)
Sources: Small intestine (duodenum, ileum, or jejunum), lymph node, bone, joint, synovial, liver, pancreas, spleen, lung, heart valve (and other heart tissues), or brain
Container/Tube: Tissue block
Collection Instructions: Submit a formalin-fixed, paraffin-embedded tissue block to be cut and returned.
Specimen Stability Information: Ambient (preferred)/Refrigerated

Acceptable Paraffin-embedded tissue block:
Specimen Type: Formalin-fixed, paraffin-embedded tissue block (FFPE)
Sources: Small intestine (duodenum, ileum, or jejunum), lymph node, bone, joint, synovial, liver, pancreas, spleen, lung, heart valve (and other heart tissues), or brain
Container/Tube: Sterile container for each individual cut section (scroll).
Collection Instructions: Perform microtomy and prepare five separate 10-micron sections. **Each section (scroll) must be placed in a separate sterile container for submission.**
Specimen Stability Information: Ambient (preferred)/Refrigerated

Specimen Type: Fluid
Sources: Cerebrospinal or ocular (eg, vitreous humor)
Container/Tube: Sterile vial
Specimen Volume: 0.5 mL
Specimen Stability Information: Refrigerated (preferred) 7 days/Frozen 7 days

Specimen Type: Synovial fluid
Container/Tube:
Preferred: Lavender top (EDTA)
Acceptable: Pink top (EDTA), royal blue top (EDTA), sterile vial containing EDTA-derived aliquot, red clot tube (no anticoagulant), or sterile container
Specimen Volume: 0.5 mL
Collection Instructions: Send fluid specimen in original tube (preferred).
Specimen Stability Information: Refrigerated (preferred) 7 days /Frozen 7 days

Forms

If not ordering electronically, complete, print, and send a Gastroenterology and Hepatology Test Request (T728) with the specimen.

Specimen Minimum Volume

Fresh tissue or biopsy: 5 mm(3); Paraffin-embedded tissue block: Two 10-micron sections; All other specimens: See Specimen Required

Reject Due To

Tissue in formalin, formaldehyde, or acetone	Reject
Specimens other than those listed in Specimen Required	Reject
Slides	Reject

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Varies	Varies		

Clinical & Interpretive

Clinical Information

Whipple disease is a chronic, systemic illness that, in most 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. 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 allowed 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 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 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
1 week

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
TWRP	Tropheryma whipplei PCR	97206-7

Result ID	Test Result Name	Result LOINC® Value
SRC56	Specimen source	31208-2
22302	Tropheryma whipplei PCR, Result	97206-7