MAYO CLINIC LABORATORIES

Test Definition: URRP

Ureaplasma species, Molecular Detection, PCR, Varies

Overview

Useful For

Rapid, sensitive, and specific identification of *Ureaplasma urealyticum* and *Ureaplasma parvum* from genitourinary, reproductive, bone, spine, joint, and lower respiratory sources

This test is **not intended for** medicolegal use.

Method Name

Real-Time Polymerase Chain Reaction (PCR) using LightCycler and Fluorescent Resonance Energy Transfer (FRET)

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 *Ureaplasma* DNA is not likely.

Submit only 1 of the following specimens:

Specimen Type: Swab
Supplies:
-Culturette (BBL Culture Swab) (T092)
-BD E-Swab (T853)
-M4-RT (T605)
Sources: Vaginal, cervix, urethra, urogenital, chest/mediastinal; bronchus or lung (donor swab), or upper respiratory sources (only infants <3 months: nasopharynx, nose, throat)
Container/Tube:
Preferred: Culture swab transport system (Dacron or rayon swab with aluminum or plastic shaft with either Stuart or Amies liquid medium)
Acceptable: Swab in transport media: M4, M4-RT, M5, M6, universal transport media, or ESwab
Specimen Volume: 1 swab

Collection Instructions:
Vaginal:
1. Collect specimen by swabbing back and forth over mucosa surface to maximize recovery of cells.
2. Place swab back into swab cylinder.
Urethra or cervical:
1. Collect specimen by inserting swab 1 to 3 cm and rotating 360 degrees.
2. Place swab back into swab cylinder.
Wound:
1. Collect specimen by swabbing back and forth over wound surface to maximize recovery of cells.
2. Place swab back into swab cylinder.

Specimen Type: Fluid
Sources: Pelvic, peritoneal, amniotic, prostatic secretions, semen, reproductive drainage or fluid, pleural/chest, chest tube, pericardial
Container/Tube: Sterile container
Specimen Volume: 1 to 2 mL

Specimen Type: Respiratory
Sources: Sputum, tracheal secretions, bronchial washings, bronchoalveolar lavage, lung; or nasal washings (Note: Nasal washings may only be submitted for infants <3 months of age)
Container/Tube: Sterile container
Specimen Volume: 1 to 2 mL

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 top (no anticoagulant), or sterile container
Specimen Volume: 1 mL
Collection Instructions: Send specimen in original tube.

Specimen Type: Urine-first void, kidney/bladder stone, or ureter
Container/Tube: Sterile container
Specimen Volume: 10 mL or entire specimen
Collection instructions: Urine first void: Specimen can be collected at any time during the day. The patient should not have urinated for at least 1 hour prior to specimen collection. The first voided portion is the initial 20 to 30 mL of the urine stream obtained **without** cleaning the external urethra.

Specimen Type: Tissue
Sources: Placenta, products of conception, urogenital, respiratory, bronchus, chest/mediastinal, bone, spine, or joint
Container/Tube: Sterile container
Specimen Volume: 5 mm(3)
Collection Instructions:
1. Collect fresh tissue specimen.

2. Submit fresh tissue only, do not add fluid to tissue
3. Refrigerate or freeze specimen.

Forms

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

Specimen Minimum Volume

Fluid: 1 mL
Urine-first void: 2 mL
Swab: 1 swab
Tissue: 5 mm(3)

Reject Due To

Cotton or calcium alginate-tipped swab, wooden shaft swab, transport swab containing gel or charcoal Formalin-fixed and/or paraffin-embedded tissues, Port-a-Cul tube Anaerobic fluid vials Dry swab (no pledget or sponge) Bone marrow Decalcified bone Slides Respiratory fluid specimens placed in viral transport medium (M4-RT, M4, or M5) Body fluid	Reject

specimens placed in viral transport medium (M4-RT, M4, or M5)	

Specimen Stability Information

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

Clinical & Interpretive

Clinical Information

Ureaplasma urealyticum and *Ureaplasma parvum* have been associated with a number of clinically significant infections, although their clinical significance may not always be clear as they are part of the normal genital microbiota. *U urealyticum* and *U parvum* have been associated with urethritis and epididymitis. They may cause upper urinary tract infection and have been associated with infected kidney stones. *U urealyticum* and *U parvum* may be isolated from amniotic fluid of women with preterm labor, premature rupture of membranes, spontaneous term labor, or chorioamnionitis. They may also cause neonatal infections, including meningoencephalitis and pneumonia. In addition, *U urealyticum* and *U parvum* have been reported to cause unusual infections, such as prosthetic joint infection and infections in transplant recipients.

Recently, *U urealyticum* and *U parvum* have been found to cause hyperammonemia in lung transplant recipients.(1) In lung transplant recipients with hyperammonemia, the ideal diagnostic specimen is a lower respiratory specimen (eg, bronchoalveolar lavage fluid), although *U urealyticum* and *U parvum* may also be detected in blood. Treatment directed against these organisms has resulted in resolution of hyperammonemia.

Culture of *Ureaplasma* species is laborious, requiring a high degree of technical skill and taking several days. Polymerase chain reaction (PCR) detection is sensitive, specific, and provides same-day results. In addition, PCR allows the differentiation of *U urealyticum* and *U parvum*, which is not easily accomplished with culture. The PCR assay has replaced conventional culture for *U urealyticum* and *U parvum* at Mayo Clinic Laboratories due to its speed and equivalent performance to culture.

Reference Values

Not applicable

Interpretation

A positive polymerase chain reaction (PCR) result for the presence of a specific sequence found within the *Ureaplasma urealyticum* and *Ureaplasma parvum ureC* gene indicates the presence of *U urealyticum* or *U parvum* DNA in the specimen.

A negative PCR result indicates the absence of detectable *U urealyticum* and *U parvum* DNA in the specimen but does not rule out infection as false-negative results may occur due to inhibition of PCR, sequence variability underlying the primers and probes, or the presence of *U urealyticum* or *U parvum* in quantities less than the limit of detection of the assay.

Cautions

Interfering substances may affect the accuracy of this assay; results should always be interpreted in conjunction with clinical and epidemiological findings.

Since *Ureaplasma* species may be part of the normal microbiota, results should be interpreted accordingly.

Clinical Reference

1. Bharat A, Cunningham SA, Scott Budinger GR, et al. Disseminated Ureaplasma infection as a cause of fatal hyperammonemia in humans. Sci Transl Med. 2015;7(284):284re3
2. Stellrecht KA, Woron AM, Mishrik NG, Venezia RA. Comparison of multiplex PCR assay with culture detection of genital mycoplasmas. J Clin Microbiol. 2004;42(4):1528-1533
3. Farrell JJ, Larson JA, Akeson JW, et al. Ureaplasma parvum prosthetic joint infection detected by PCR. J Clin Microbiol. 2014;52(6):2248-2250
4. Waites KB, Bebear C: Mycoplasma and Ureaplasma. In: Carroll KC, Pfaller MA, eds. Manual of Clinical Microbiology. 12th ed. ASM Press; 2019;1117-1136
5. Kenny GE. Genital mycoplasmas: Mycoplasma genitalium, Mycoplasma hominis, and Ureaplasma species. In: Bennett JE, Dolin R, Blaser MJ, eds. Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases. 9th ed. Churchill Livingstone; 2020:chap 184

Performance

Method Description

This polymerase chain reaction (PCR) method employs a target-specific detection system including primers, as well as fluorescent resonance energy transfer (FRET) hybridization probes designed for *ureC* gene of *Ureaplasma urealyticum* and *Ureaplasma parvum*. The LightCycler instrument amplifies and monitors target nucleic acid sequences by fluorescence during PCR cycling. This is an automated PCR system that can rapidly detect amplified product development. The detection of amplified products is based on the FRET principle. For FRET product detection, a hybridization probe with a donor fluorophore, fluorescein, on the 3' end is excited by an external light source, which emits light that is absorbed by a second hybridization probe with an acceptor fluorophore, LC-Red 640, on the 5' end. The acceptor fluorophore then emits light of a different wavelength that is measured with a signal that is proportional to the amount of specific PCR product. The process is completed in a closed tube system and the melting temperature of the probes allows differentiation of *Ureaplasma urealyticum* from *Ureaplasma parvum*.(Cunningham SA, Mandrekar JN, Rosenblatt JE, Patel R: Rapid PCR detection of Mycoplasma hominis, Ureaplasma urealyticum, and Ureaplasma parvum. Int J Bacteriol. 2013;2013:168742. doi: 10.1155/2013/168742)

PDF Report

No

Day(s) Performed
Monday through Friday

Report Available
3 to 4 days

Specimen Retention Time
7 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
87798 x 2
87999 (if appropriate for government payers)

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
URRP	Ureaplasma PCR	69934-8

Result ID	Test Result Name	Result LOINC® Value
SRC80	Specimen source	31208-2
35129	Ureaplasma parvum PCR	69933-0
35128	Ureaplasma urealyticum PCR	51988-4