Test Definition: KKBRP

Kingella kingae, Molecular Detection, PCR, Blood

Overview

Useful For
Aiding in the diagnosis of *Kingella kingae* infection using whole blood specimens

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 *Kingella kingae* 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 specimen in original tube (preferred).

Specimen Minimum Volume
0.5 mL

Reject Due To

All specimens will be evaluated at Mayo Clinic Laboratories for test suitability.

Specimen Stability Information

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

Clinical & Interpretive

Clinical Information

Kingella kingae is a fastidious short gram-negative bacillus that may colonize the oropharynx of young children. Colonization may occasionally lead to invasive disease via hematogenous dissemination, primarily in children younger than 4 years of age. This most commonly results in bone and joint infection; *K kingae* is the most frequent cause of osteomyelitis and septic arthritis in children aged 6 to 36 months. *K kingae* may also cause endocarditis, involving both native and prosthetic valves, in patients of any age and is considered part of the HACEK (*Haemophilus* species, *Aggregatibacter* species, *Cardiobacterium hominis*, *Eikenella corrodens*, and *Kingella* species) group of organisms, known for causing culture-negative endocarditis. *K kingae* produces a repeat-in-toxin (RTX) toxin.

Diagnosis of *K kingae* infection may be challenging due to the fastidious nature of the organism in culture. Evaluation of blood by polymerase chain reaction is a useful tool for the diagnosis of some cases of *K kingae* infection.

Reference Values

Not applicable

Interpretation

A positive result indicates the presence of *Kingella kingae* DNA.

A negative result indicates the absence of detectable *K kingae* 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 *K kingae* DNA in quantities less than the limit of detection of the assay.

Cautions

Test results should be used as an aid in diagnosis. A 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.

This assay does not detect species of *Kingella* other than *kingae* or *negevensis* (see Supportive Data).

This assay cross-reacts with *Kingella negevensis*.(1)

Supportive Data

This assay was validated by testing 30-spiked positive ETDA whole blood samples and 10-negative samples. No PCR inhibitors were encountered. The assay was 100% sensitive and specific. The assay showed no cross-reactivity when tested with a panel of 67 bacterial isolates, including *Kingella* species other than *kingae*. The limit of detection in EDTA-whole blood was 1.3 CFU/mcL.

Clinical Reference

1. El Houmami N, Bzdreng J, Durand GA, et al: Molecular tests that target the RTX locus do not distinguish between Kingella kingae and the recently described Kingella negevensis species. J Clin Microbiol. 2017 Oct;55(10):3113-3122
2. Murphy TF: Moraxella catarrhalis, Kingella, and other gram-negative cocci. In: Bennett JE. Dolin R, Blaser MJ, eds. Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases. 9th ed. Elsevier; 2020:chap 213
3. Zbinden R: Aggregatibacter, Capnocytophaga, Eikenella, Kingella, Pasteurella, and other fastidious or rarely encountered gram-negative rods. In: Jorgensen JH, Carroll KC, Funke G, Pfaller MA, eds. Manual of Clinical Microbiology.

11th ed. ASM Press; 2015:652-666
4. Yagupsky P: Kingella kingae: carriage, transmission, and disease. Clin Microbiol Rev. 2015 Jan;28(1):54-79
5. Madigan T, Cunningham SA, Ramanan P, et al: Real-time PCR assay for detection of Kingella kingae in children. J Pediatr Infect Dis. 2018;13(3):216-233. doi: 10.1055/s-0038-1641603

Performance

Method Description
Nucleic acid is extracted from the specimen using the automated MagNA Pure instrument. Target specific primers are used to amplify the *rxtB* gene region of *Kingella kingae*; amplification is monitored by detecting fluorescence produced by target specific fluorescence resonance energy transfer hybridization probes. This real-time polymerase chain reaction (PCR) takes place on a LightCycler instrument. Detection of the *K kingae* target is performed through melting curve analysis using the LightCycler software.(Cockerill FR, Uhl JR: Applications and challenges of real-time PCR for the clinical microbiology laboratory. In: Reischl U, Wittwer C, Cockerill F, eds. Rapid Cycle Real-Time PCR Methods and Applications. Springer-Verlag, 2002:3-27; Zbinden R: Aggregatibacter, Capnocytophaga, Eikenella, Kingella, Pasteurella, and other fastidious or rarely encountered gram-negative rods. In: Carroll KC, Pfaller M, eds. Manual of Clinical Microbiology. 12th ed. ASM Press; 2019:656-669)

PDF Report
No

Day(s) Performed
Monday through Friday

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

Test Definition: KKBRP

Kingella kingae, Molecular Detection, PCR, Blood

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
KKBRP	Kingella kingae PCR, B	65809-6

Result ID	Test Result Name	Result LOINC® Value
48451	Specimen Source	31208-2
48338	Kingella kingae PCR, B	65809-6