

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*.<sup>(1)</sup>

### Supportive Data

This assay was validated by testing 30-spiked positive EDTA 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/mL.

### 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 *rxkB* 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             |