MAYO CLINIC LABORATORIES

Test Definition: DENGS

Dengue Virus, Molecular Detection, PCR, Serum

Overview

Useful For
Aiding in the diagnosis of acute infection caused by dengue virus

Testing Algorithm
For more information see:
-Mosquito-borne Disease Laboratory Testing
-Assessment for Dengue Virus Infection

Special Instructions
- Mosquito-borne Disease Laboratory Testing
- Assessment for Dengue Virus Infection

Highlights
Detection of dengue virus nucleic acid in serum is suggestive of recent exposure and acute infection with dengue virus.

The presence of dengue virus nucleic acid in serum can be used as a marker for acute-phase infection. Patients with a history of symptoms for more than 1 week may be negative by molecular tests (ie, real-time polymerase chain reaction) and may require serologic testing to confirm the diagnosis of dengue virus infection.

Method Name
Real-Time Reverse Transcription Polymerase Chain Reaction (RT-PCR)

NY State Available
Yes

Specimen

Specimen Type
Serum

Ordering Guidance
The presence of dengue virus nucleic acid in serum overlaps with the presence of dengue virus nonstructural protein 1 (*NS1*) antigen (DNSAG / Dengue Virus NS1 Antigen, Serum). Patients with a history of symptoms for more than 1 week may be negative by molecular tests (ie, real-time polymerase chain reaction) and may require serologic testing (DENVP / Dengue Virus Antibody/Antigen Panel, Serum) to confirm the diagnosis of dengue virus infection.

Specimen Required
Collection Container/Tube:

Preferred: Serum gel
Acceptable: Red top
Submission Container: Sterile container
Specimen Volume: 0.5 mL Serum
Collection Instructions: Within 2 hours of collection, centrifuge and aliquot the serum into a sterile container.
Additional Information: Serum specimens not aliquoted from the serum gel collection tube into a sterile container **will be rejected**.

Forms

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

Specimen Minimum Volume

Serum: 0.3 mL

Reject Due To

Gross hemolysis	Reject
Heat-inactivated specimen	Reject

Specimen Stability Information

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

Clinical & Interpretive

Clinical Information

Dengue virus (DV) is a globally distributed flavivirus with 4 distinct serotypes (DV-1, -2, -3, -4) primarily transmitted by the *Aedes aegypti* mosquito, which is found throughout the tropical and subtropical regions of over 100 countries. DV poses a significant worldwide public health threat with approximately 2.5 to 3 billion people residing in DV endemic areas, among whom 100 to 200 million individuals will be infected and approximately 30,000 patients will succumb to the disease annually.

Following dengue infection, the incubation period varies from 3 to 7 days. While some individuals remain asymptomatic, the majority will develop classic dengue fever. Symptomatic patients become acutely febrile and present with severe musculoskeletal pain, headache, retro-orbital pain, and a transient macular rash most often observed in children. Fever defervescence signals disease resolution in most individuals. However, children and young adults remain at increased risk for progression to dengue hemorrhagic fever and dengue shock syndrome, particularly during repeat infection with a new DV serotype.

Detection of DV nucleic acid in serum is a marker of acute infection with this virus. Importantly, the period of time that the virus can be detected in serum is brief and, therefore, molecular testing should be performed within the first week following onset of symptoms. After this time, serologic testing is the preferred method for diagnosis of DV infection.

Reference Values

Negative
Reference values apply to all ages.

Interpretation

Positive:
The detection of dengue virus nucleic acid in serum is consistent with acute-phase infection.

Dengue virus nucleic acid may be detectable during the first 1 to 7 days following the onset of symptoms.

Negative:
The absence of dengue nucleic acid in serum is consistent with the lack of acute-phase infection.

Dengue virus nucleic acid may not be detected if the serum specimen is collected immediately following dengue virus infection (<24-48 hours) and is rarely detectable following 7 days of symptoms.

Cautions

Results should be used in conjunction with clinical presentation and exposure history.

Negative dengue virus (DV) polymerase chain reaction results may occur if the specimen was collected more than 7 days following symptom onset. Serologic testing for the presence of IgM and IgG antibodies to DV is recommended in such cases.

Supportive Data

Assay Inclusivity:
The Altona RealStar Dengue virus reverse transcription polymerase chain reaction (RT-PCR) assay was tested using control strains of each of the 4 dengue serotypes and was able to detect serotypes 1, 2, 3 and 4.

Accuracy:
A commercial panel (SeraCare) of known positive samples for dengue virus serotypes 1, 2, 3, and 4 was tested. Each member of the panel was tested in triplicate, and all replicates were positive by the Altona RealStar Dengue assay.

Thirty analyte-negative serum samples were spiked (1:10 dilution) with plasma samples collected in South America during an outbreak of dengue virus and determined to be positive for the virus. Of the 30 spiked serum samples, 29 (97%) were positive by the Altona RealStar Dengue RT-PCR assay.

Limit of Detection:
The limit of detection in serum was determined to be the following:

Dengue serotype 1:14 genomic targets/mcL (7000 genomic targets/mL)
Dengue serotype 2: 2 genomic targets/mcL (1000 genomic targets/mL)

Dengue serotype 3: 1.6 genomic targets/mcL (800 genomic targets/mL)
Dengue serotype 4: 13 genomic targets/mcL (6500 genomic targets/mL)

Reference Range (Analytical Specificity):
A total of 20 serum samples collected from normal donors were analyzed by the Altona RealStar Dengue RT-PCR assay, and all 20 were negative.

A cross-reactivity panel of bacteria (n=12), viruses (n=15), and parasites (n=2) was tested, and all were negative by the Altona Dengue RT-PCR assay.

Clinical Reference

1. Miller JM, Binnicker MJ, Campbell S, et al. Guide to Utilization of the Microbiology Laboratory for Diagnosis of Infectious Diseases: 2024 Update by the Infectious Diseases Society of America (IDSA) and the American Society for Microbiology (ASM). Clin Infect Dis. 2024:ciae104. doi:10.1093/cid/ciae104
2. Pillay K, Keddie SH, Fitchett E, et al. Evaluating the performance of common reference laboratory tests for acute dengue diagnosis: A systematic review and meta-analysis of RT-PCR, NS1 ELISA, and IgM ELISA. Lancet Microbe. 2025;6(7):101088. doi:10.1016/j.lanmic.2025
3. Hunsperger EA, Munoz-Jordan J, Beltran M, et al. Performance of dengue diagnostic tests in a single-specimen diagnostic algorithm. J Infect Dis. 2016;214(6):836-44
4. Paz-Bailey G, Adams LE, Deen J, Anderson KB, Katzelnick LC. Dengue. Lancet. 2024;403(10427):667-682
5. Shi Y, Wang J, Zhao H, et al. Integrative advances in dengue virus diagnostics: From technological innovation to tiered diagnostic systems. J Med Virol. 2025;97(11):e70688

Performance

Method Description

The Altona Real Star DENV is a qualitative, reverse transcription polymerase chain reaction (RT-PCR) assay targeting the 3' untranslated region polyprotein gene. The assay includes a heterologous amplification system internal control to identify possible RT-PCR inhibition and to confirm the integrity of the reagents of the kit. Specimens are run on the LightCycler 480 following nucleic acid extraction using the NucliSENS EasyMag (BioMerieux). RT-PCR technology utilizes a reverse-transcriptase reaction to convert RNA into complementary DNA, PCR for the amplification of specific target sequences, and target specific probes for the detection of the amplified DNA. The probes are labelled with fluorescent reporter and quencher dyes. Probes specific for DENV RNA are labelled with the fluorophore FAM. The probe specific for the internal control is labeled with the fluorophore JOE. IC control in corresponding detector channels of the RT-PCR instrument.(Package insert: RealStar Dengue RT-PCR Kit 2.0. Altona Diagnostics; 01/2017)

PDF Report

No

Day(s) Performed

Monday, Wednesday, Friday

Report Available

1 to 5 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
DENGS	Dengue Virus, PCR, Serum	7855-0

Result ID	Test Result Name	Result LOINC® Value
606372	Dengue Virus, PCR, Serum	7855-0