MAYO CLINIC LABORATORIES

Test Definition: MMPGM

Mumps Virus Antibody, IgM and IgG, Serum

Overview

Useful For

Diagnosis of mumps virus infection

Determination of postimmunization immune response of individuals to the mumps vaccine

Documentation of previous infection with mumps virus in an individual with no previous record of immunization to mumps virus

Profile Information

Test Id	Reporting Name	Available Separately	Always Performed
MMPM	Mumps Ab, IgM, S	Yes	Yes
MPPG	Mumps Ab, IgG, S	Yes	Yes

Method Name

MMPM: Enzyme Immunoassay (EIA)
MPPG: Multiplex Flow Immunoassay (MFI)

NY State Available

Yes

Specimen

Specimen Type

Serum

Specimen Required

Supplies: Sarstedt Aliquot Tube, 5 mL (T914)
Collection Container/Tube:
Preferred: Serum gel
Acceptable: Red top
Submission Container/Tube: Plastic vial
Specimen Volume: 1 mL Serum
Collection Instructions: Centrifuge and aliquot serum into plastic vial.

Forms

If not ordering electronically, complete, print, and send Infectious Disease Serology Test Request (T916) with the specimen.

Specimen Minimum Volume

Serum: 0.9 mL

Reject Due To

Gross hemolysis	Reject
Gross lipemia	Reject
Heat-inactivated specimen	Reject

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Refrigerated (preferred)	14 days	
	Frozen	14 days	

Clinical & Interpretive

Clinical Information

The mumps virus is a member of the Paramyxoviridae family of viruses, which include parainfluenza virus serotypes 1-4, measles, respiratory syncytial virus, and metapneumovirus. Mumps is highly infectious among unvaccinated individuals and is typically transmitted through inhalation of infected respiratory droplets or secretions. Following an approximate 2-week incubation period, symptom onset is typically acute with a prodrome of low-grade fever, headache, and malaise.(1,2) Painful enlargement of the salivary glands, the hallmark of mumps, occurs in approximately 60% to 70% of infections and in 95% of patients with symptoms. Testicular pain (orchitis) occurs in approximately 15% to 30% of postpubertal men and abdominal pain (oophoritis) is found in 5% of postpubertal women.(1) Other complications include mumps-associated pancreatitis (<5% of cases) and central nervous system disease (meningitis <10% and encephalitis <1%).

Widespread routine immunization of infants with attenuated mumps virus has dramatically decreased the number of reported mumps cases in the United States. However, outbreaks continue to occur, indicating persistence of the virus in the general population.

Laboratory diagnosis of mumps is typically accomplished by detection of IgM- and IgG-class antibodies to the mumps virus. However, due to the widespread mumps vaccination program, in clinically suspected cases of acute mumps infection, serologic testing should be supplemented with virus isolation in culture or detection of viral nucleic acid by polymerase chain reaction testing in throat, saliva, or urine specimens.

Reference Values

IgM:
Negative: Index value 0.00-0.79
Reference value applies to all ages.

IgG:
Vaccinated: Positive (> or =1.1 AI)
Unvaccinated: Negative (< or =0.8 AI)
Reference values apply to all ages.

Interpretation

A positive IgG result coupled with a positive IgM result suggests recent infection with mumps virus. This result should not be used alone to diagnose mumps infection and should be interpreted in the context of clinical presentation.

A positive IgG result coupled with a negative IgM result indicates previous vaccination to or infection with mumps virus. These individuals are considered to have protective immunity to reinfection.

A negative IgG result coupled with a negative IgM result indicates the absence of prior exposure to mumps virus and nonimmunity. However, a negative result does not rule-out mumps infection or response to vaccination. The specimen may have been collected before the appearance of detectable antibodies. Negative results in suspected early mumps infection or within a week following vaccination should be followed by testing a new serum specimen in 2 to 3 weeks.

Equivocal results should be followed up with testing of a new serum specimen within 10 to 14 days.

Cautions

Serum specimens obtained during the acute phase of infection or soon after vaccination may be negative for IgM- or IgG-class antibodies by serological tests.

All positive IgM results must be interpreted cautiously as some false-positive results or heterotypical responses of the IgM have been seen in the serum of pregnant women or in patients with an acute infection caused by cytomegalovirus, herpes simplex virus, measles, rubella, or parvovirus.

Testing for IgM-class antibodies to mumps virus should be limited to patients with a clinically compatible disease.

Mumps virus shares antigenic relationships with other viruses of the paramyxovirus group; therefore, serologic cross-reactions are possible, but uncommon, with this test procedure.

Immunoglobulin G-class antibodies to mumps virus may be present in serum specimens from individuals who have received blood products within the past several months but have not been immunized or experienced past infection with this virus.

Supportive Data

IgG:
To evaluate the accuracy of the BioPlex Mumps IgG multiplex flow immunoassay (MFI), 500 prospective serum samples were analyzed in a blinded fashion by the SeraQuest Mumps IgG enzyme immunoassay (EIA) and the BioPlex Mumps IgG assay. Specimens with discordant results after initial testing were repeated using both assays during the same freeze/thaw cycle. Further discrepancies were evaluated by the Mumps IgG VIDAS enzyme-linked fluorescent immunoassay (ELFA; bioMerieux, Inc). The results are summarized below:

	SeraQuest Positive	SeraQuest Negative	SeraQuest Equivocal

BioPlex Positive	412	4(a)	8
BioPlex Negative	3(b)	48	3
BioPlex Equivocal	5	6	11

(a) All 4 samples tested positive by VIDAS Mumps IgG ELFA
(b) One of 3 samples tested negative by the VIDAS Mumps IgG ELFA

Sensitivity: 98.1% (412/420); 95% CI: 96.2%-99.1%
Specificity: 82.8% (48/58); 95% CI: 70.9%-90.6%
Overall percent agreement: 94.2% (471/500); 95% CI: 91.8%-96.0%

Clinical Reference

1. Hviid A, Rubin S, Muhlemann K. Mumps. Lancet. 2008;371(9616):932-944
2. Hodinka RL, Moshal KL. Childhood infections. In: Storch GA, ed. Essentials of Diagnostic Virology. Churchill Livingstone; 2000:168-178
3. Litman N, Baum SG. Mumps virus. In: Bennett JE, Dolin R, Blaser MJ, eds. Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases. 9th ed. Elsevier; 2020:2087-2092

Performance

Method Description

IgM:
The ASI Mumps IgM EIA (enzyme immunoassay) is based on the principle of the capture of serum immunoglobulins by anti-human IgM monoclonal antibodies found on the solid phase. A subsequent incubation with mumps antigen in a complex with monoclonal antibodies conjugated to horse radish peroxidase selects the IgM antibodies specific for the antigen. Peroxidase substrate is added and the enzymatic reaction is stopped by the addition of a sulfuric acid solution which results in a yellow color change. The intensity of the yellow color is proportional to the amount of specific antibodies present in the sample and is read in an enzyme-linked immunosorbent assay microplate reader.(Package insert: ASI Mumps IgM EIA test. Arlington Scientific Inc; 860096AM Rev 03/14/2025)

IgG:
The BioPlex 2200 Mumps IgG assay uses multiplex flow immunoassay technology. Briefly, serum samples are mixed and incubated at 37 degrees C with sample diluent and dyed beads coated with mumps antigen. After a wash cycle, antihuman-IgG antibody conjugated to phycoerythrin (PE) is added to the mixture and incubated at 37 degrees C. Excess conjugate is removed in another wash cycle, and the beads are resuspended in wash buffer. The bead mixture then passes through a detector that identifies the bead based on dye fluorescence and determines the amount of antibody captured by the antigen by the fluorescence of the attached PE. Raw data is calculated in relative fluorescence intensity. Three additional dyed beads, an internal standard bead, a serum verification bead, and a reagent blank bead are present in each reaction mixture to verify detector response, the addition of serum to the reaction vessel, and the absence of significant nonspecific binding in serum.(Package insert: BioPlex 2200 System MMRV IgG. Bio-Rad Laboratories; 02/2019)

PDF Report
No

Day(s) Performed
MMPM: Tuesday
MPPG: Monday through Friday

Report Available
1 to 7 days

Specimen Retention Time
14 days

Performing Laboratory Location
Mayo Clinic Laboratories - Rochester Superior Drive

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 has been cleared, approved, or is exempt by the US Food and Drug Administration and is used per manufacturer's instructions. Performance characteristics were verified by Mayo Clinic in a manner consistent with CLIA requirements.

CPT Code Information
86735-Mumps, IgG
86735-Mumps, IgM

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
MMPGM	Mumps Ab, IgM and IgG, S	77250-9

Result ID	Test Result Name	Result LOINC® Value
MUMP1	Mumps Ab, IgM, S	6478-2
DEXG5	Mumps IgG Antibody Index	25418-5
MUMG	Mumps Ab, IgG, S	6476-6