Test Definition: MPPG

Mumps Virus Antibody, IgG, Serum

Overview

Useful For

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

Method Name

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: 0.5 mL
Collection Instructions: Centrifuge and aliquot serum into a plastic vial.

Forms

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

Specimen Minimum Volume

0.4 mL

Reject Due To

Gross hemolysis	Reject
Gross lipemia	Reject
Gross icterus	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 approximately 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

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

Interpretation

Positive:
The presence of detectable IgG-class antibodies indicates prior exposure to the mumps virus through infection or immunization. Individuals testing positive are considered immune to the mumps virus.

Equivocal:
Submit an additional specimen for testing in 10 to 14 days to demonstrate IgG seroconversion if recently vaccinated or if otherwise clinically indicated.

Negative:

The absence of detectable IgG-class antibodies suggests no prior exposure to the mumps virus or the lack of a specific immune response to immunization.

Cautions

Mumps virus shares antigenic relationships with other viruses of the paramyxovirus group; therefore, serologic cross-reactions are possible, but uncommon with this test procedure.(2)

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.

Serum samples drawn early during acute phase of infection may be negative for IgG-class antibodies to this virus.

Supportive Data

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. Samples with discordant results after initial testing were repeated by 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:

Table.

BioPlex Mumps IgG	**SeraQuest Mumps IgG EIA**		
	Positive	Negative	Equivocal
Positive	412	4(a)	8
Negative	3(b)	48	3
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% to 99.1%
Specificity: 82.8% (48/58); 95% CI: 70.9% to 90.6%
Overall Percent Agreement: 94.2% (471/500); 95% CI: 91.8% to 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

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 are 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

Monday through Friday

Report Available

Same day/1 to 3 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

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value

MPPG	Mumps Ab, IgG, S	6476-6

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