MAYO CLINIC LABORATORIES

Test Definition: ROPG

Measles (Rubeola) Antibodies, IgG, Serum

Overview

Useful For

Determining immune status of individuals to the measles virus

Documenting previous infection with measles virus in an individual without a previous record of immunization to measles virus

Method Name

Multiplex Flow Immunoassay (MFI)

NY State Available

No

Specimen

Specimen Type

Serum

Ordering Guidance

This assay tests only for IgG-class antibody. For both IgM and IgG antibody testing, see ROGM / Measles (Rubeola) Virus Antibody, IgM and IgG, Serum.

Specimen Required

Supplies: Sarstedt Aliquot Tube, 5 mL (T914)
Collection Container/Tube:
Preferred: Serum gel
Acceptable: Red top
Submission Instructions: 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) with the specimen.

Specimen Minimum Volume

0.4 mL

Reject Due To

Gross	Reject

hemolysis	
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 measles virus is a member of the Paramyxoviridae family of viruses, which includes parainfluenza virus serotypes 1-4, mumps, respiratory syncytial virus (RSV), and metapneumovirus. The measles virus is one of the most highly contagious infectious diseases among unvaccinated individuals and is transmitted through direct contact with aerosolized droplets or other respiratory secretions from infected individuals. Measles has an incubation period of approximately 8 to 12 days, which is followed by a prodromal phase of high fever, cough, coryza, conjunctivitis, and malaise. Koplik spots may also be apparent on the buccal mucosa and can last for 12 to 72 hours.(1,2) Following this phase, a maculopapular, erythematous rash develops beginning behind the ears and on the forehead and spreads centrifugally to involve the trunk and extremities.

Immunocompromised individuals, pregnant women, and those with nutritional deficiencies are particularly at risk for serious complications following measles infection, which include pneumonia and central nervous system involvement.(1,3)

Following implementation of the national measles vaccination program in 1963, the incidence of measles infection has fallen to fewer than 0.5 cases per 1,000,000 population, and the virus is no longer considered endemic in the United States.(4) Measles outbreaks continue to occur in the United States however, due to exposure of nonimmune individuals or those with waning immunity to infected travelers. The measles outbreak in 2011 throughout Western Europe emphasizes the persistence of the virus in the worldwide population and the continued need for national vaccination programs.(5)

The diagnosis of measles infection is often based on clinical presentation alone. Screening for IgG-class antibodies to measles virus will aid in identifying nonimmune individuals.

Reference Values

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

Interpretation

The reported antibody index (AI) value is for reference only. This is a qualitative test, and the numeric value of the AI is not indicative of the amount of antibody present. AI values above the manufacturer recommended cutoff for this assay indicate that specific antibodies were detected, suggesting prior exposure or vaccination.

Positive: AI value of 1.1 or higher
The presence of detectable IgG-class antibodies indicates prior exposure to the measles virus through infection or immunization. Individuals testing positive are considered immune to measles infection.

Equivocal: AI value 0.9-1.0
Submit an additional sample for testing in 10 to 14 days to demonstrate IgG seroconversion if recently vaccinated or otherwise clinically indicated.

Negative: AI value of 0.8 or lower
The absence of detectable IgG-class antibodies suggests the lack of a specific immune response to immunization or no prior exposure to the measles virus.

Cautions

Immunoglobulin G-class antibodies to measles 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 specimens collected 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 Measles IgG multiplex flow immunoassay (MFI), 115 prospective serum specimens were analyzed in a blinded fashion by the Diamedix Measles IgG EIA (Diamedix, Miami, FL) and the BioPlex Measles IgG assay. Specimens with discordant results after initial testing were repeated by both assays during the same freeze/thaw cycle. The results are summarized below:

	Diamedix Measles IgG EIA		
BioPlex Measles IgG		Positive	Negative
	Positive	88	0
	Negative	4*	23

*Same result upon repeat testing
Sensitivity: 95.7% (88/92); 95% Confidence Intervals (95% CI): 89.0%-98.6%
Specificity: 100.0% (23/23); 95% CI: 83.1%-100.0%
Overall Percent Agreement: 96.5% (111/115); 95% CI: 91.4%-98.6%

Clinical Reference

1. Perry RT, Halsey NA. The clinical significance of measles-a review. J Infect Dis. 2004;189 Supp 1:S4-S16. doi:10.1086/377712
2. Babbott FL, Gordon JE: Modern measles. Am J Med Sci. 1954;228(3):334-361
3. Liebert UG. Measles virus infections of the central nervous system. Intervirology. 1997;40(2-3):176-184
4. Centers for Disease Control and Prevention (CDC). Measles-United States, 1999. MMWR Morb Mortal Wkly Rep. 2000;49(25):557-560

5. Centers for Disease Control and Prevention (CDC). Increased transmission and outbreaks of measles-European Region, 2011. MMWR Morb Mortal Wkly Rep. 2011;60(47):1605-1610
6. Theel ES, Sorenson M, Rahman C, Granger D, Vaughn A, Breeher L. Performance characteristics of a multiplex flow immunoassay for detection of IgG-Class antibodies to measles, mumps, rubella, and Varicella-Zoster viruses in presumptively immune health care workers. J Clin Microbiol. 2020;58(4):e00136-20. doi:10.1128/JCM.00136-20

Performance

Method Description

The BioPlex 2200 Measles 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 measles 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 based on 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 Clinical Diagnostics Group, Hercules, CA)

PDF Report

No

Day(s) Performed

Monday through Saturday

Report Available

Same day/1 to 3 days

Specimen Retention Time

14 days

Performing Laboratory Location

Mayo Clinic Jacksonville Clinical Lab

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

86765

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
ROPG	Measles (Rubeola) Ab, IgG, S	77310-1

Result ID	Test Result Name	Result LOINC® Value
ROG	Measles (Rubeola) Ab, IgG, S	35275-7
DEXG3	Measles IgG Antibody Index	5244-9