

## Overview

### Useful For

Determination of immune status of individuals to the measles virus

Documentation of 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

Yes

## Specimen

### Specimen Type

Serum

### Specimen Required

#### Container/Tube:

**Preferred:** Serum gel

**Acceptable:** Red top

**Specimen Volume:** 0.5 mL

### Forms

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

### Reject Due To

Gross hemolysis                      Reject

Gross lipemia                         Reject

Gross icterus                         Reject

Heat-inactivated specimen        Reject

### Specimen Minimum Volume

0.4 mL

### 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 include 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 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  $=1.1$  AI)

Unvaccinated: negative ( $<$  or  $=0.8$  AI)

Reference values apply to all ages.

**Interpretation**

Positive: Antibody index (AI) value of 1.1 or higher

The reported 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.

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 if 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**

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

**Supportive Data**

	Diamedix Measles IgG EIA	BioPlex Measles IgG
	Positive	Negative
Equivocal	Positive	420
1(a)	0	Negative
10(b)	27	17

**Clinical Reference**

1. Perry RT, Halsey NA: The clinical significance of measles-a review. J Infect Dis. 2004;189(Supp 1):S4-S16
2. Babbott FL, Gordon JE: Modern measles. Am J Med Sci. 1954;228:334-361
3. Liebert UG: Measles virus infections of the central nervous system. Intervirology. 1997;40:176-184
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

**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 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; 11/30/2018)

**PDF Report**

No

**Specimen Retention Time**

14 days

**Performing Laboratory Location**

Rochester

**Fees & Codes****Test Classification**

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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