MAYO CLINIC LABORATORIES

# Test Definition: MYCO

Mycoplasma pneumoniae Antibodies, IgG and IgM, Serum

## Overview

### Useful For

Screening for recent or past exposure to Mycoplasma pneumoniae

This test should **not be used** as a screening procedure for the general population.

### Profile Information

| Test Id | Reporting Name | Available Separately | Always Performed |
|---|---|---|---|
| MYCOG | M. pneumoniae Ab, IgG, S | No | Yes |
| MYCOM | M. pneumoniae Ab, IgM, S | No | Yes |
| MYCON | M. pneumoniae Ab Interpretation | No | Yes |

### Reflex Tests

| Test Id | Reporting Name | Available Separately | Always Performed |
|---|---|---|---|
| MMYCO | M. pneumoniae Ab, IgM, S by IFA | No | No |

### Testing Algorithm

If the *Mycoplasma pneumoniae* IgM result is reactive or equivocal, then *M pneumoniae* IgM by indirect immunofluorescence assay will be performed at an additional charge.

### Method Name

MYCOG, MYCOM: Enzyme Immunoassay (EIA)
MMYCO: Indirect Immunofluorescence Assay (IFA)
MYCON: Technical Interpretation

### NY State Available

Yes

## Specimen

### Specimen Type

Serum

### Ordering Guidance

Detection of IgM or IgG class antibodies to *Mycoplasma pneumoniae* provides exposure information. The preferred method of diagnosis of acute *M pneumoniae* infection is by molecular detection; order MPRP / *Mycoplasma pneumoniae,* Molecular Detection, PCR, Varies.

## 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
**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

0.5 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

*Mycoplasma pneumoniae* is a small bacterium transmitted via organism-containing droplets. It is a cause of upper respiratory infection, pharyngitis, and tracheobronchitis, particularly in children, and has been associated with approximately 20% of cases of community-acquired pneumonia. Central nervous system and cardiac manifestations are probably the most frequent extrapulmonary complications of infections due to *M pneumoniae*. The disease is usually self-limited, although severe disease has been reported in immunocompromised patients.

Identification of *M pneumoniae* by culture-based methods is time consuming and insensitive. Serology-based assays for *M pneumoniae* have several drawbacks. The development of IgM antibodies takes approximately 1 week, and the IgM response may be variable in adults or decreased in immunosuppressed individuals. Confirmation of the disease is dependent on the observation of a 4-fold rise in IgG antibody titers between acute and convalescent specimens, several weeks following the initial onset of illness, providing clinical utility only for retrospective testing. Real-time polymerase chain reaction offers a rapid and sensitive option for detection of *M pneumoniae* DNA from clinical specimens allows for diagnosis of acute or current infection.

## Reference Values

IgG: Negative
IgM: Negative
IgM by indirect immunofluorescence: Negative

## Interpretation

| IgG ELISA result | IgM ELISA result | Interpretation |
|---|---|---|
| Positive | Negative | Results suggest past exposure. |
| Positive | Reactive | Prior exposure to *Mycoplasma pneumoniae* detected. Confirmatory testing for IgM to *M pneumonia* will be performed by an immunofluorescence assay. |
| | Equivocal | |
| Negative | Negative | No antibodies to *M pneumoniae* detected. Acute infection cannot be ruled out as antibody levels may be below the limit of detection. If clinically indicated, a second serum should be submitted in 14 to 21 days. |
| Negative | Reactive | No prior exposure to *Mycoplasma pneumoniae.* Confirmatory testing for IgM to *M pneumonia* will be performed by an immunofluorescence assay. |
| | Equivocal | |
| Equivocal | Negative | Recommend follow-up testing in 10 to 14 days if clinically indicated. |
| | Reactive | Confirmatory testing for IgM to *M pneumonia* will be performed by an immunofluorescence assay. |
| | Equivocal | |

ELISA = Enzyme-linked immunosorbent assay

## Cautions

A diagnosis of *Mycoplasma pneumoniae* infection should not be solely based on results of serologic testing for this agent. Test results should be interpreted in conjunction with clinical evaluation and the results of other diagnostic procedures (eg, molecular detection).

The continued presence or absence of antibodies cannot be used to determine the success or failure of therapy.

Testing should not be performed as a screening procedure for the general population. Testing should only be done when clinical evidence suggests the diagnosis of *M pneumoniae*-associated disease.

The performance of this test has not been established on neonates and immunocompromised patients.

Performance of the IgM assay has not been tested with specimens known to be positive for antibodies to organisms that are known to be associated with lower respiratory illness (ie, influenza A and B, cytomegalovirus, *Chlamydophila pneumoniae*, parainfluenza), and closely related serovars known to cross-react with *M pneumoniae*, such as *Mycoplasma genitalium* and *Mycoplasma hominis*, as well as various *Ureaplasma* species. Cross-reactivity studies with such organisms have not been performed with this assay.

The IgG removal system included with the IgM test system has been shown to functionally remove the IgG from specimens containing total IgG levels ranging from 300 to 600 mg/mL. The effectiveness of this removal system at IgG levels exceeding 600 mg/mL has not been established.

### Clinical Reference

1. Smith T: *Mycoplasma pneumoniae* infections: diagnosis based on immunofluorescence titer of IgG and IgM antibodies. Mayo Clin Proc. 1986;61(10):830-831
2. Holzman RS, Simberkoff MS, Leaf HL: *Mycoplasma pneumoniae* and atypical pneumonia. In Bennett JE, Dolin R, Blaser MJ, eds. Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases. 9th ed. Elsevier; 2020:2332-2339

## Performance

### Method Description

IgG:
Diluted sera are incubated in antigen-coated microwells. Any antigen-specific antibody in the samples will bind to the immobilized antigen. The plate is washed to remove unbound antibody and other serum components. Peroxidase conjugated goat-antihuman IgG is added to the wells and incubated. The conjugate will react with the IgG antibody/antigen on the solid phase. The wells are washed to remove unreacted conjugate. The microwells containing immobilized conjugate are incubated with peroxidase substrate solution. Hydrolysis of the substrate by peroxidase produces a color change. After a period of time, the reaction is stopped by the addition of diluted acid, and the color changes are measured photometrically. The color intensity of the solution depends on the antibody concentration in the serum sample.(Package insert: *M pneumoniae* IgG Test System. Zeus Scientific Inc; Revision Date 12/2017)

IgM Enzyme Immunoassay:
Test sera are diluted with the sample diluent provided. The sample diluent contains antihuman IgG that precipitates and removes IgG and rheumatoid factor from the sample, leaving IgM free to react with immobilized antigen. Diluted sera are incubated in antigen-coated microwells. Any antigen-specific antibody in the samples will bind to the immobilized antigen. The plate is washed to remove unbound antibody and other serum components. Peroxidase-conjugated goat-antihuman IgM (chain specific) is added to the wells and incubated. The conjugate will react with the IgM antibody/antigen on the solid phase. The wells are washed to remove unbound conjugate. The microwells containing immobilized conjugate are incubated with peroxidase substrate solution. Hydrolysis of the substrate by peroxidase produces a color change. After a period of time, the reaction is stopped by the addition of diluted acid, and the color changes are measured photometrically. The color intensity of the solution depends on the antibody concentration in the

serum sample.(Package insert: *M pneumoniae* IgM Test System. Zeus Scientific, Inc; Revision Date 9/22/2016)

IgM Indirect Immunofluorescence Assay:
*Mycoplasma pneumoniae* antigenic substrate is fixed onto microscope slide wells. Serum that has been pretreated to remove IgG antibodies is incubated with the substrate. If IgM antibody to *M pneumoniae* is present, it will bind to the substrate. Fluorescein-labeled antihuman-IgM conjugate is added to the slide wells, and the slide is incubated. If antibody is present, it can be observed as a characteristic positive, bright, apple-green fluorescent reaction when the slide is read on a fluorescence microscope.(Package insert: *Mycoplasma pneumoniae* IgM IFA Antibody Test System. Zeus Scientific, Inc; 09/2019)

### 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 modified from the manufacturer's instructions. Its performance characteristics were determined by Mayo Clinic in a manner consistent with CLIA requirements. This test has not been cleared or approved by the US Food and Drug Administration.

### CPT Code Information
86738 x 2-*Mycoplasma pneumoniae* by EIA
86738-*Mycoplasma pneumoniae* by indirect IFA (if appropriate)

### LOINC® Information

| Test ID | Test Order Name | Order LOINC® Value |
|---|---|---|

| | | |
|---|---|---|
| MYCO | M. pneumoniae Ab, IgG and IgM, S | 58733-7 |

| Result ID | Test Result Name | Result LOINC® Value |
|---|---|---|
| MYCOG | M. pneumoniae Ab, IgG, S | 45224-3 |
| MYCOM | M. pneumoniae Ab, IgM, S | 5257-1 |
| MYCON | M. pneumoniae Ab Interpretation | 69048-7 |