

# **Mycoplasma**

## **cell defective bacteria**

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# Mycoplasma

## Cell wall defective bacteria

There are over 150 species, at least 15 species infects humans, others infects animals & plants. In humans, 4 species are important; *Mycoplasma pneumoniae* caused pneumonia & has been associated with joint & other infections, *Mycoplasma hominis* which causes postpartum fever & has been associated with uterine tube infections, *Ureaplasma urealyticum* is a cause of nongonococcal urethritis in men & is associated with lung disease in premature infants, & *Mycoplasma genitalium* which is associated with urethral & other infections.

Mycoplasmas are the smallest organisms that can be free-living in nature & self replicating on lab. Media. They have the following characteristics:

1. Small in size
2. Highly pleomorphic because they lack a rigid cell wall & instead are bounded by triple-layered membrane that contain sterol ( so they require serum or cholesterol in the medium to produce sterol for growth).
3. They are completely resistant to penicillin because they lack the cell wall structures, but they are inhibited by tetracycline or erythromycin.
4. It can reproduce in cell-free medium & characteristically embedded beneath the surface.
5. Its growth is inhibited by specific Abs.
6. It has an affinity for mammalian cell membrane.

## Mycoplasma & cell defective bacteria



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**Culture:** Many strains of mycoplasma grow in heart infusion peptone broth with 2% agar (pH 7.8) to which about 30% human ascitic fluid or animal serum has been added. Following incubation at 37 °C for 48-96 hrs, there may be no turbidity, however, Giemsa stain of the centrifuged sediment show the characteristic pleomorphic structures & subculture on solid media yield minute colonies.

### ***M. pneumoniae* & atypical pneumonia**

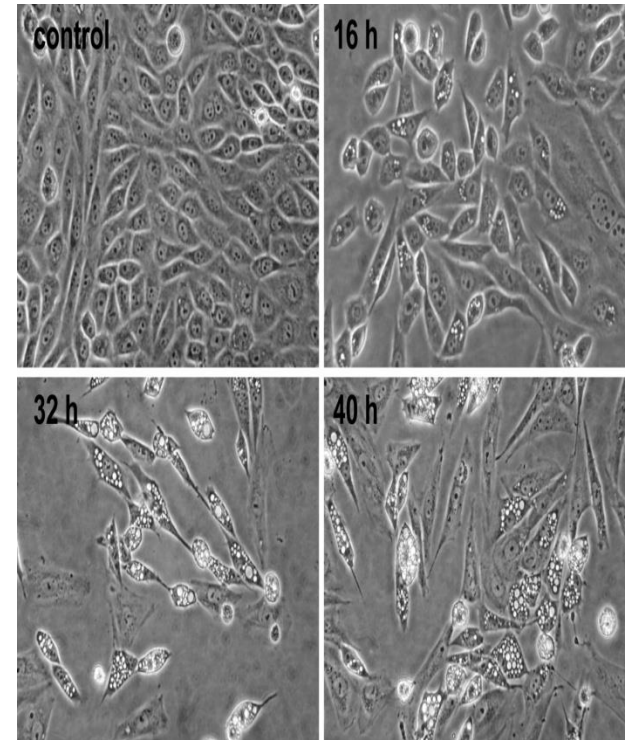
*M. pneumoniae* is a prominent cause of pneumonia, specially in those 5-20 ys old.

### **Pathogenesis:**

*M. pneumoniae* is transmitted from person to person by respiratory secretions. Infection is initiated by attachment of the organism to a receptor on the surface of respiratory epithelial cells. During the infection the organism remain extracellular.

### **Clinical findings:**

Mycoplasma pneumonia is generally a mild disease, the clinical; spectrum range from asymptomatic infection to serious pneumonitis with occasional neurological & hematological involvement & a variety of skin lesions. The IP is 1-3 wks, the onset is usually insidious with fever headache, sore throat, & cough which is non-productive & paroxysmal.



Resolution of pulmonary infiltration & clinical improvement occurs 1-4 wks. Death is rare & usually attributed to cardiac failure. Complication is uncommon, but hemolytic anemia may occur.

Common causes of community –acquired bacterial pneumonia in addition to *M. pneumoniae*, include *St. pneumoniae*, *Legionella pneumophila*, *Chlamydia pneumoniae*, & *H. influenzae*. The clinical presentation of these infections may be very similar. The causative agent must be determined by sputum examination & culture, blood culture & others.

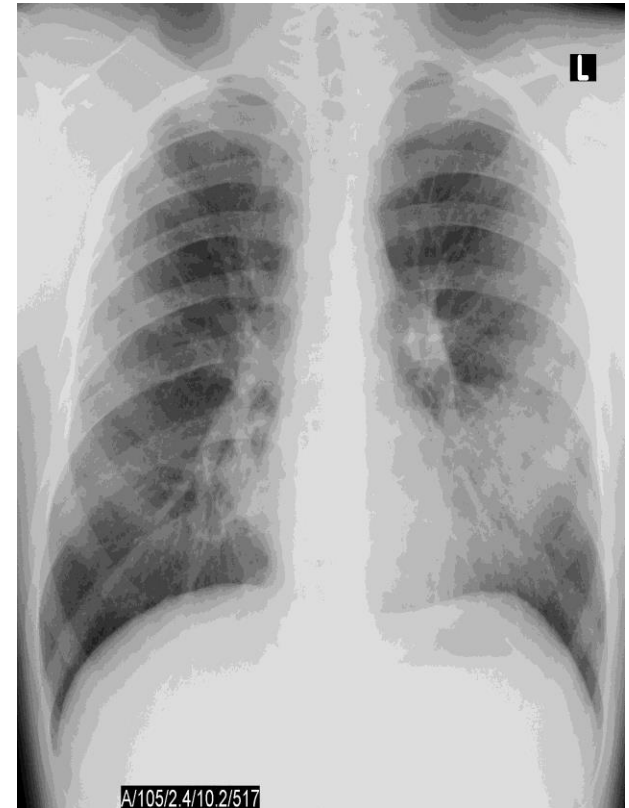
### **Lab diagnosis:**

The causative agent can be cultured from pharynx or sputum. Cold agglutinins appears in about 50% of untreated cases, & a titer of 1:64 or more support the diagnosis. EIA to detect IgM & IgG Abs can be highly sensitive & specific. PCR of specimens from throat swabs or other clinical materials can be diagnostic.

### **Epidemiology:**

*M. pneumoniae* infection are endemic all over the world. In population of children & young adults where close contact is prevails, & in families the infection rate may be 50-90%.

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### ***Mycoplasma hominis***

*M. hominis* has been associated with a variety of diseases. It can be cultured from the urinary T in about 10% in patients with pyelonephritis. It is strongly associated with infections in the uterine tubes. It has been isolated from the blood of about 10% of women with postpartum fever & from patients with urethritis.

### ***Ureaplasma urealyticum***

*Ureaplasma urealyticum* (requires 10% urea for growth) has been associated with variety of diseases. It causes nongonococcal urethritis in some men, but the majority of NGU are caused by *Chlamydia trachomatis*. It also causes infection in female genital tract. It is associated with lung disease in premature low birth weight infants

### ***Mycoplasma genitalium***

*M. genitalium* is associated with some acute & chronic cases of NGU in men. In women, it is associated with endometritis, salpingitis & infertility.

***Mycoplasma hominis***  
***Ureaplasma urealyticum***  
***Mycoplasma genitalium***

