Micropathology Ltd
Tel 24hrs: +44 (0) 24 - 76 – 323222
Fax / Ans: +44 (0) 24 - 76 - 323333
University of Warwick Science Park, Venture Centre, Sir William Lyons Road, Coventry CV4 7EZ
Website: www.micropathology.com E-mail: info@micropathology.com

Molecular diagnosis of infection with Mycoplasma species

Introduction:

Mycoplasma are amongst the smallest self-replicating organisms within the bacterial domain, with the smallest genomes (totalling approximately 500 to 1000 genes)[1]. These bacteria lack a cell wall around their membrane, conferring natural resistance to common antibiotics, including beta-lactams. Additionally, they contain only the necessary organelles for cell growth and replication, the plasma membrane, ribosomes and a double stranded DNA molecule, which comprises the genome. At the tip of pathogenic *Mycoplasma* species (such as *M. pneumoniae* and *M. genitalium*), there exists an attachment organelle, which may aid pathogenicity. *Mycoplasma* species are a significant cause of cell culture contamination in research laboratories; frequently originating from the microbiota of laboratory staff.

Infection by *Mycoplasma* species is more prevalent in colder months, disproportionately affecting children and young adults. Resulting infections are persistent and typically difficult to detect and diagnose.

Diagnosis and Treatment:

Diagnosis can be difficult due to the fastidious nature of the organism, considerable seroprevalence and the possibility of transient asymptomatic carriage[2]. Micropathology Ltd have developed a range of assays targeting both general *Mycoplasma* species per se and specific targets belonging to this genus. These assays are most useful diagnostically when *Mycoplasma* are present in non-sterile sites.

Test targets available at Micropathology Ltd:

Mycoplasma pneumoniae

Mycoplasma species are frequent colonisers of the oropharynx and urogenital area, therefore presence in these sites may not necessarily indicate an infection[3]. However, some species within this genus are pathogenic, most notably *Mycoplasma pneumoniae*. Damage to the respiratory lining caused by this bacterium is responsible for the pathogenesis of infection.

[1] Baron, S 1996, *Medical Microbiology*, 4th edn, University of Texas Medical Branch at Galveston, Galvestone (TX).
[2] Daxboeck, F. et al. 2003. Laboratory diagnosis of *Mycoplasma pneumoniae* infection. *Clinical Microbiology and Infection*, vol. 9, no. 4, pp. 263-273.
[3] Waites, K and Talkington, D. 2004. *Mycoplasma pneumoniae* and its role as a human pathogen. *Clinical Microbiology Reviews*, vol. 17, no. 4, pp. 697-728.

Mycoplasma pneumoniae infection has a long incubation period of 1-4 weeks and is sometimes referred to as ‘walking pneumonia’. Rarely, *M. pneumoniae* also causes encephalitis. Samples accepted for *M. pneumoniae* testing at Micropathology Ltd include EDTA/ whole blood and any respiratory specimen including sputum, bronchial alveolar lavage (BAL) and nasopharyngeal aspirate (NPA).

Mycoplasma genitalium

Whilst the majority of people with *M. genitalium* in the genital tract do not develop disease, *M. genitalium* is associated with urethritis in men, and cervicitis, pelvic inflammatory disease and infertility in women. It has been formally recognised as an independent aetiological agent of acute and persistent non-gonococcal urethritis and is responsible for approximately 20-35% of non-chlamydial NGU cases (see the specific user information sheets on this website for *M. genitalium* and *M. genitalium* Macrolide resistance). Samples recommended for *Mycoplasma genitalium* DNA detection testing include vaginal swab (females) or first catch urine (male only).

Ureaplasma urealyticum/parvum

Ureaplasma species may cause a range of infections including non-specific urethritis and neonatal respiratory disease. For further details, please refer to the specific user information sheet. Genital swabs and urine are accepted for *Ureaplasma* testing, in addition to respiratory samples derived from neonates.

Mycoplasma genus

Clients may wish to send us samples for *Mycoplasma* genus testing when presented with an unusual disease etiology, and where a specific causal *Mycoplasma* has not been determined. The *Mycoplasma* genus assay has been developed to detect a broad-range of *Mycoplasma* species. Organisms detected using this assay include, but are not limited to: *Acholeoplasma laidlawii*, *M. hominis*, *M. ferementans, M. genitalium, M. gallisepticum, M. salivarius, M. arginine, M. hyorhinis* and *Ureaplasma* species. Samples suitable for testing on this assay include CSF, EDTA/citrated whole blood, tissue culture, and other sterile sites.