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Mycoplasma spp.

Introduction:

Organisms formally grouped together as *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 species (such as *Mycoplasma pneumoniae* and *Mycoplasma genitalium*), there exists an attachment organelle, which may aid pathogenicity. Environmental species are a significant cause of cell culture contamination in research laboratories; frequently originating from the microbiota of laboratory staff.

Diagnosis can be difficult due to the fastidious nature of the organism, considerable seroprevalence and the possibility of transient asymptomatic carriage[2]. Micropathology Ltd has developed a range of assays targeting more broadly the genus group formally known as *Mycoplasma* (*Mycoplasma genus*) and specific targets for species *M. pneumoniae* and *M. genitalium.* These assays are most useful diagnostically when species are present in non-sterile sites.

In 2019, a genus-level change was suggested where novel genera names were proposed to further differentiate members of the *Mycoplasma.* These include *Mycoplasmoides* gen. nov., (containing *Mycoplasma pneumoniae* and *Mycoplasma genitalium*); *Mycoplasmopsis* gen. nov.,(*Mycoplasma pulmonis*, *M. orale*, *M. arginini* and *M. fermentans*) *Metamycoplasma* gen. nov.,(*Mycoplasma hominis)* and *Malacoplasma* gen. nov. (*Mycoplasma penetrans).* encompassed by the families *Metamycoplasmataceae* fam. nov. and *Mycoplasmoidaceae* fam. nov[3,4,5,6]. However, this proposal has largely not been adopted by the *Mycoplasma* science community[7]; therefore, although we accept samples with either nomenclature requested, our documentation continues to use the original nomenclature.

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[7]. However, some species within this genus are pathogenic, most notably *M. pneumoniae*. Damage to the respiratory lining caused by this bacterium is responsible for the pathogenesis of infection. *M. pneumoniae* infection has a long incubation period of 1-4 weeks and is sometimes referred to as ‘walking pneumonia’. Infection is more prevalent in colder months, disproportionately affecting children and young adults. Resulting infections are persistent, typically difficult to

detect and diagnose and may rarely also causes encephalitis. UKAS accredited sample types for this assay include: EDTA whole blood, bronchoalveolar lavage (BAL), nasopharyngeal aspirate (NPA), swabs, sputum and ET secretions.

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. UKAS accredited sample types for this assay include: urine and genital swabs. For further details, please refer to the specific user information sheets on this website for *M. genitalium* and for *M. genitalium* resistance testing (macrolide and fluoroquinolone).

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. UKAS accredited sample types for this assay include: genital swabs, urine, thin preps, and semen, in addition to NPAs usually derived from neonates. ET secretions are validated but not UKAS accredited.

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: *M. genitalium, M. hominis, M. penetrans, M. bovis*, and *M. fermentans*. UKAS accredited sample types for this assay include: cerebrospinal fluid (CSF), EDTA whole blood and tissue.

Sample types that are appropriate for *Mycoplasma* testing but not subject to UKAS accreditation are reported alongside a caveat stating that the sample type is not UKAS accredited. Turnaround times are stated in the laboratory user manual with results usually available in practice much sooner than the given time frame. Where there is a delay, we are usually confirming a result and addressing clinical data given with the specimen.

References

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