



Pan Fungal DNA Testing at Micropathology Ltd

Globally, nearly a billion people are estimated to suffer fungal based diseases, with specific fungal families such as *Candida* causing millions of mucosal infections and more than 150 million people developing serious disease, which can seriously limit their lives and even lead to death (Bongomin et al 2017). The detection and management of fungal diseases can be difficult with downstream problems of the correct usage of antibiotics and the potential then of misdiagnosis selecting for greater numbers of antimicrobial resistant organisms. Therefore, accurate identification of fungal infections helps in antimicrobial stewardship. A fungal infection or 'mycoses' are a common occurrence due to many environmental and physiological factors. Infection usually in the lungs via inhalation of spores, or localised on the skin and may become persistent. It is also strongly associated with individuals who have a weakened immune system especially with opportunistic fungal pathogens, and antimicrobial use is also a risk factor although healthy individuals are also susceptible. Mycosis is classified according to tissue levels, starting from the outermost layer of skin i.e. superficial, then increasing deeper. Systemic fungal infections can occur, which can be life threatening. The most common type of fungi causing infections is dermatophytes, which are attracted to keratin found in the skin, hair, and nails. Traditionally the accurate identification of fungi has been by culture which can take a number of days followed by careful phenotypic and microscopic analysis with reference to drawings and photographs. However, often this is being superseded in laboratories by what is now becoming the 'Gold Standard' of DNA sequencing to identify fungi (Terrero-Salcedo and Powers-Fletcher, 2020).

Micropathology Ltd uses PCR for qualitative detection of Pan-fungal DNA coupled with sequencing. Fungal species detected on this assay include: *Candida albicans*, *C. glabrata*, *C. krusei*, *C. tropicalis*, *Cryptococcus neoformans/gattii*, *Aspergillus flavus*, *A. fumigatus*, *Exophiala spp.*, *Fusarium spp.*, *Metarhizium anisopliae*, *Microspora arundinis*, *Neosartorya pseudofischeri*, *Rhizopus sp.*, *Scedosporium apiospermum*. In addition to the Pan-fungal DNA assay other fungal assays available at Micropathology include *Aspergillus* genus DNA, *Candida albicans* DNA, *Cryptococcus neoformans* DNA, *Pneumocystis jiroveci* DNA and the serological based assay Galactomannan.

References:

Bongomin, F.; Gago, S.; Oladele, R.O.; Denning, D.W. (2017) Global and Multi-National Prevalence of Fungal Diseases—Estimate Precision. *J. Fungi* 3, 57.

Terrero-Salcedo, D. and Powers-Fletcher, M. V. Updates in Laboratory Diagnostics for Invasive Fungal Infections (2020) *Journal of Clinical Microbiology* 58 (6)