

## LIMITATIONS OF MALDI-TOF MS IN THE FUNGAL IDENTIFICATION: COULD LC-MS/MS BE A SOLUTION?

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Fungal polyphasic identification aims the integration of different taxonomic characters. By using numerous techniques, it is assumed the level of variation in the technique can be reduced, although variation in the fungal specimen remains. In the ground-breaking paper by Cain et al. (1994), a new methodology for the identification of bacteria by Matrix-Assisted Laser Desorption/Ionisation Time-Of-Flight Mass Spectrometry (MALDI-TOF MS) was presented, where sample preparation involved minimal purification of cells. Holland et al. (1996) described for the first time an improved method for the rapid identification of whole bacterial cells by MALDI-TOF MS, establishing the basis of the current methodology. This inspired the use of MALDI-TOF MS in fungal identifications (Kallow et al. 2006, Santos et al. 2010). MALDI-TOF MS has now been applied routinely to analyse the chemical cellular composition of microorganisms, providing rapid and discriminatory proteomic profiles for identification and subtyping. The application of this technique for the identification of clinical fungal samples is currently well-established based on the remarkable reproducibility for the measurement of constantly expressed and highly abundant proteins, such as ribosomal proteins, that are used as biomarkers to generate a fingerprint profile that range between 2 and 20 kDa. However, the fungal identification by MALDI-TOF MS can be limited in some fungal taxonomic group, especially when genetically closely related species are under evaluation. In order to overcome this limitation, new methodologies based on liquid chromatography coupled to mass spectrometry (LC-MS/MS system) have been evaluated. Although it means a methodology which involves consumables more expansive, the preliminary results obtained for fungal species have been satisfactory and have cut-edge the limitation faced in the use of MALDI-TOF MS technique. In this poster, a detailed comparison MALDI-TOF MS vs. LC-MS/MS for fungal identification will be presented and discussed.

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