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## **MALDI-TOF mass spectrometry: revolutionising clinical laboratory diagnosis of mould infections**

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## **Abstract**

Clinical diagnosis of mould infections currently involves complex species identification based on morphological criteria, which is often prone to error. Employing an extensive mould species reference spectral library (up to 2,832 reference spectra, corresponding to 708 strains from 347 species), we assessed the extent to which MALDI-TOF mass spectrometry (MALDI-TOF MS) enhanced the accuracy of species identification.

MALDI-TOF MS data were validated against morphology- and DNA sequencing-based results using 262 clinical isolates collected over a four-month period in 2013. The implementation of MALDI-TOF MS displayed a dramatic improvement in mould identification at the species level (increased from 78.2% to 98.1%) and a marked reduction in misidentification rate (i.e., 9.8% to 1.2%). We then compared the mould identification results obtained before (i.e., 2011) and after (i.e., 2013) the implementation of MALDI-TOF MS in routine identification procedures, which increased from 64.57% to 100%. Re-assessment of a set of isolates from 2011 using this procedure, including MALDI-TOF MS, yielded an increase in species diversity from 16 to 42 species. Finally, applying this procedure during a

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