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commentary

Impact of New and Fast Technologies for Species Identification: Value for Infectious Diseases Patients

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Matrix assisted laser desorption/ionisation time of flight mass spectrometry (MALDI-TOF MS) has been introduced several years ago as a new method for bacterial identification [1,2]. Since a couple of years a variety of studies have been investigated the accuracy of a MALDI-TOF MS-based identification of grown colonies [3-6]. Since proteomic profiles were compared to a database, the accuracy of the identification results depends on the database used [7,8]. For most identification approaches, protein peaks in the mass-to charge ratio of 2000 to 10000 Da have been used, most of them thought to represent ribosomal protein peaks. The results of commercial databases are believed to be very high in accuracy. The time to species identifications is significantly reduced to minutes compared a couple of hours using a biochemical identification strategy. The species information allows an optimization of an empiric therapy up to 24 hours earlier compared to the classical identification strategy. In severe infectious diseases even hours could influence morbidity and mortality.

The direct identification of bacteria from materials such as urine and blood culture has also been published and introduced in some diagnostic laboratories [9-13]. Even though the accuracy seems to be lower compared to that of direct identification, studies investigating the direct identification approach from various clinical specimens are welcome.

Up to now only a few "proof of principle" studies have been published with regard to MALDI-TOF MS and an epidemiological application [14,15]. In addition, other techniques, such as Raman-spectroscopy [16,17] or the PlexID® system, have been described. The accuracy and more important, the possibilities and limitation has been often only scarcely investigated and would have a great impact on infectious diseases therapy. Whether these technologies are suitable to identify certain pathogenicity factors [18-20] or resistance [21-23] is current ongoing research in medical microbiology.

Since any kind of information beside species information would have a great impact on infectious diseases treatment and therapy, this is a challenge of the next years.

In the detection of the threat of the next century, the detection of outstanding resistant organisms, such as carbapenemase-producing enterobacteriaceae [24]. The introduction of methods and technologies that directly identify underlying resistance mechanisms will be of eminent importance. Therefore studies with a clear hypothesis and a well-organized study structure are highly appreciated even in cases of a negative result.

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