RAPID IDENTIFICATION OF MICROORGANISMS WITH THE MALDI BIOTYPER SYSTEM

In the last decade there has been a great revolution in microbiology laboratories, especially in the clinical field, due to the use of MALDI-TOF (matrix-assisted laser desorption ionization time-of-flight) mass spectrometry for microorganisms identification.

This technical session will show the applications and advantages of the use of MALDI-TOF mass spectrometry using the MALDI Biotyper system (Bruker Daltonics) for the identification of microorganisms in the field of microbiology in food, in the environment and in the pharmaceutical industry.

Sample preparation is performed by transferring a small amount of isolated colony onto an MSP96 steel plate (Bruker Daltonics, Germany), covered with 1 µL of portioned HCCA matrix solution (Bruker Daltonics, Germany) and allowed to dry. Spectra are acquired on a microflex mass spectrometer (Bruker Daltonics, Germany) automatically using the MALDI Biotyper software (Bruker Daltonics, Germany). The software assigns a score to each identification between 0 and 3, which makes it possible to assess the reliability of the identification using MALDI (considering scores greater than 2,000 as reliable at the species level).

The MALDI Biotyper system is a technique that allows the rapid identification of bacteria, fungi and yeasts through a phenotypic approach based on libraries of microorganisms.

While conventional methods take days to confirm a contamination, MALDI Biotyper technology allows results to be obtained in minutes, reducing response time and therefore downtime costs for manufacturing or storing products.

The system performs a “similarity” calculation between a molecular fingerprint obtained by mass spectrometry of an unknown microorganism and the molecular fingerprints of standard strains characterized and stored in a reference library. In this way, microorganisms can be identified to the species level within minutes after performing standardized sample preparation procedures.

The inclusion of different strains of these microorganisms in the library allows MALDI Biotyper to be applied in identification processes with high efficiency. In this sense, the growth of the database in collaboration with collections of microorganisms and users around the world allows to cover a greater number of species and strains to obtain exact results. Likewise, each user can create their own libraries with their microorganisms of interest.