

SUPSI

MALDI-TOF mass spectrometry in clinical and environmental microbiology

Modulo breve

Presentazione

Within the last decade, MALDI-TOF mass spectrometry has become a basic technology for the identification of microorganisms in clinical and environmental microbiology. In 2008, the Laboratory of applied microbiology (LMA) of the University of Applied Sciences and Arts of Southern Switzerland (SUPSI), the Medical microbiology section (SMIC) of the Cantonal Hospital Agency Canton Tessin (EOC) together with the MABRITEC AG were the first in Switzerland to adopt this system for the identification of microorganisms and they can share now many years of experience with interested technicians and researchers.

By comparison with spectra from a given database, MALDI-TOF mass spectrometry allows simple and fast identification of microorganisms such as bacteria, yeasts, and filamentous fungi. Furthermore, LMA also applies this technique to higher organisms such as insects. MALDI-TOF MS at LMA-SUPSI and at SMIC-EOC is performed with 4 different instruments:

- AXIMA-Confidence (Shimadzu Biotech) with linear and reflectron (small molecules) mode;
 - AXIMA-Confidence (Shimadzu Biotech) with linear and reflectron mode, as well as the Coval X detector for the recognition of high mass molecules;
 - Microflex (Bruker Daltonics) with linear mode;
 - VITEK MS Assurance instrument (BioMérieux) with linear mode.
- Moreover, 5 databases are used for the identification of microorganisms (linear mode):
- VITEK MS – (bioMérieux);
 - VITEK MS – SARAMIS RUO (bioMérieux)
 - Homemade database in SARAMIS (LMA);
 - PAPMID (Mabritec): based on sequences of bacterial genomes, containing the molecular masses of the ribosomal as well as significant structural proteins;
 - MALDI Biotyper (MBT) Compass Library (Bruker Daltonics), as well as complementary MBT databases for the identification of filamentous fungi, Mycobacterium sp, and BSL3 bacteria.
- Both SARAMIS and MBT databases are regularly implemented to adapt the identification possibilities to the LMA-SUPSI projects and services.

Participants during the course will have the possibility to work with and compare all these instruments and databases, providing the unique opportunity to experience the advantages and disadvantages of the different systems.

The course will be led by experts of LMA-SUPSI, SMIC-EOC and MABRITEC AG working since a decade with MALDI-TOF MS in both clinical microbiology diagnostics, research and applied microbiology.

Obiettivi

Theoretical introduction to the basics of MALDI-TOF mass spectrometry. Presentation of the different systems available for clinical diagnostics and research. Laboratory applications for the identification of microorganisms from clinical and environmental samples (bacteria, filamentous fungi, yeasts) and from insects (mosquitoes), using different instruments and databases. In addition, a series of presentations given by experts will provide the needed basic concepts and the appropriate tools for the evaluation of the analyses.

Destinatari

Active staff in microbiological diagnostic laboratories, university students in biological and medical sciences. Biologists and technicians interested in MALDI-TOF mass spectrometry.

Requisiti

Formation in biology, medicine, biochemistry, or biotechnology. The course is aimed at laboratory technicians, researchers as well as master and doctoral students.

Crediti di studio ECTS

1 ECTS

Contenuti

Theoretical introduction to mass spectrometry in general and to MALDI-TOF mass spectrometry
Presentation of the various fields of application
Practical preparation and analysis of bacteria, yeasts, filamentous fungi, mosquitoes and plant nodules

Programma

Theoretical introduction to mass spectrometry in general and to MALDI-TOF mass spectrometry
Presentation of the various fields of application
Practical preparation and analysis of bacteria, yeasts, filamentous fungi, mosquitoes and plant nodules

Durata

8 lectures, 8 hours of practical work (19 hours/lessons)

Responsabile/i

Dr. Sophie De Respinis, Dr. Andreas Bruder and Prof. Mauro Tonolla
Laboratory of applied microbiology

Relatore/i

- Laboratory of applied microbiology (LMA), University of Applied Sciences and Arts of Southern Switzerland, Bellinzona (SUPSI), Servizio microbiologia EOLAB, Cantonal Hospital Agency Canton Tessin (EOC), Bellinzona and MABRITEC AG, Riehen.

Date

From 23 to 25 October 2019

Orari

Day 1: 14.00 – 18.00

Day 2: 9.00-12.00 / 13.30-17.30

Day 3: 8.30-12.30

Luogo

SUPSI, Laboratorio microbiologia applicata
Via Mirasole 22a, CH-6501 Bellinzona

Costo

CHF 1'200

Termine d'iscrizione

30.08.2019

Link per le iscrizioni

<https://fc-catalogo.app.supsi.ch/Course/Details/24013>