



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## SYLLABUS DEL CORSO

### Proteomica e Metabolomica

2122-1-F0901D046

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#### Aims

The course will provide knowledge of proteomics and metabolomics applied to clinical investigations.

#### Contents

Students will learn concepts of proteomics and metabolomics, in particular they will get knowledge of the different instrumentation, of the various analytical approaches useful to study the proteome and metabolic processes

#### Detailed program

Introduction to the terminology and to the features of the chromatographic techniques used for quali-quantitative investigations. Knowledge of mass spectrometry applied to proteomics. Proteins identification using the "Peptide mass fingerprint" approach. Tandem mass spectrometry (MS/MS). Interpretation of MS/MS spectra of peptides. Bottom-up and top-down proteomics approaches used to identify proteins and peptides. Characterization of posttranslational modification by Mass Spectrometry. Quantitative proteomics: gel-based and gel-free; label-based and label-free. Mass Spectrometry-Imaging technology (profiling and imaging) and its applications. Examples of application in clinical researches. Analytical technologies used in metabolomics. Examples of application in clinical researches.

#### Prerequisites

Lectures and practical lessons

## **Teaching form**

Lectures and practical lessons

Lectures and practical lessons in attendance, subject to any ministerial changes following the COVID pandemic situation

## **Textbook and teaching resource**

Reviews e and scientific articles published on international journals will be provided during the course. Downard K., Mass spectrometry . A foundation course. Royal Society of Chemistry, 2004 ISBN 0-8504-609-7 Gary Siuzdak, Mass Spectrometry for Biotechnology, Academic Press 1996 Per consultazione: J. H. Gross, Mass Spectrometry. A Textbook, Berlin – Heidelberg, Springer Verlag, 2004 E. De Hoffmann, V. Stroobant, Mass Spectrometry. Principles and Application, 2nd Edition Chichester, John Wiley & Sons, 2001. C. Dass, Principles and Practice of Biological Mass Spectrometry, New York, Wiley-Interscience, 2000. ISBN 0471330531 Chapman, John R. Mass Spectrometry of Proteins and Peptides, Humana press 2000, ISBN 0- 89603-609-X Walker, John M. The Proteomics Protocols Handbook Humana Press, 2005

## **Semester**

Second semester

## **Assessment method**

Among the 8 or 10 questions on the contents of the course are included in the written-oral test. The questions are quiz with 4-5 possible answers and only one is correct. Among them, there is always an open one and some that may require the execution of calculations or interpretation of mass spectrum (MS/MS) of peptides. The oral examination will be done based on the written questions.

## **Office hours**

Every day upon appointment.

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