



UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

SYLLABUS DEL CORSO

Diagnostica di Laboratorio

1718-4-H4101D039

Aims

CLINICAL BIOCHEMISTRY 1 AND CLINICAL PATHOLOGY: Roles, limits and aims of laboratory tests. How to ask for a test. Pre-analytical, analytical and post-analytical variability. Lab test interpretation: reference values and decisional process; sensibility, specificity and predictive values. Lab tests for cardiovascular risk and myocardial infarction. Coagulation tests and oral anticoagulant therapy monitoring. Immunopathology and immunodeficiency diagnostics. Tests for allergy. CLINICAL MICROBIOLOGY. Diagnostics of respiratory, CNS, gastro-enteric, genito-urinary infections. Pregnancy and infant infections. Systemic, cardiac, bone, joint and skin infections. Nosocomial infections. Antibigram. PATHOLOGIC ANATOMY METHODS AND TECHNIQUES 1. Tumoral staging. Types and management of pathological samples. Principles and methods of histopathological diagnosis: interpretation, clinical correlation, and impact on prognosis and therapy. CLINICAL BIOCHEMISTRY 2 and LABORATORY MEDICINE TECHNICAL SCIENCES: Lab tests for anaemia, diabetes, hepatic and pancreatic diseases, celiac disease, osteoporosis. Lab test in oncology, endocrinology and rheumatology. Inflammation markers. PATHOLOGY METHODS AND TECHNIQUES 2. Contribution of telepathology, immunocytochemistry, electron microscopy, and molecular biology to completion of pathology report. Autopsy pathology: objectives, procedures and report. Death certification. MEDICAL GENETICS. Indications for diagnostic, prognostic and therapeutic genetic tests. Significance of genetic testing, and related Italian laws. Reproductive Genetic Screening, increased genetic risk for prenatal diagnosis (eg. trisomy 21). Use of technology for the detection of genetic diseases and diagnostic applications: cytogenetics: techniques for preparation of conventional karyotypes, FISH. Molecular biology: PCR and gel electrophoresis. Digestion with restriction enzymes (RFLP), allele-specific amplification (ARMS), hybridization with allele specific oligonucleotides. Molecular cytogenetics: CHG CHG-array. Genetic biomarkers in clinical oncology as prognostic, predictive and pharmacodynamics tool. Application of predictive Bayesian statistical models. Appropriate use of specific databases for genetic testing.

Contents

The goal of the course is to provide the tools for the correct use of biochemical, haematological, immunological, microbiological, pathological and genetic tests, and the definition of their indications and interpretation.

Detailed program

Clinical laboratory. LIS. Organization principles. The correct request of lab tests. Pre-analytical, analytical and post-analytical variability. Conditions able to affect lab test results. Lab test interpretation: reference values and decisional process; sensibility, specificity and predictive values. General rules of Quality assessment and their application in the different sections of lab. Techniques for the collection of biological fluids/materials to submit to biochemical, microbiological, and genetic tests. Blood and biological fluid analysis: urines, cerebrospinal fluid, synovial, pleural, pericardic, peritoneal and amniotic fluid collection, analysis. Auto protection measures. Laboratory evaluation of immunity response. Immunopathology and immunodeficiency diagnostics. Autoimmunity. Hyper sensibility reactions and their lab evaluation. Tests for allergy. Lab test in endocrinology. Lab tests for anaemia, diabetes, hepatic and pancreatic diseases, celiac disease, osteoporosis. and rheumatology. Inflammation markers. Lab tests for cardiovascular risk and myocardial infarction. Coagulation tests and oral anticoagulant therapy monitoring

Direct and indirect techniques in bacteriology, virology, and parasitology. Evaluation of in vitro sensitivity of microorganisms to antibiotics.

Application of molecular diagnostics to Clinical Biochemical, Microbiology Genetics and Pathology labs.

Principles and methods of histopathology diagnosis.

Autoptic diagnosis. The autopsy request. Differences between medical and legal autopsy. Contribution of tele pathology, immunocytochemistry, electron microscopy, and molecular biology to completion of pathology report

Indications for diagnostic, prognostic and therapeutic genetic tests. Significance of genetic testing, and related Italian laws. Reproductive Genetic Screening, increased genetic risk for prenatal diagnosis (eg. trisomy 21). Use of technology for the detection of genetic diseases and diagnostic applications: cytogenetics: techniques for preparation of conventional karyotypes, FISH. Molecular biology: PCR and gel electrophoresis. Digestion with restriction enzymes (RFLP), allele-specific amplification (ARMS), hybridization with allele specific oligonucleotides. Molecular cytogenetics: CHG CHG-array. Genetic biomarkers in clinical oncology as prognostic, predictive and pharmacodynamics tool. Application of predictive Bayesian statistical models. Appropriate use of specific databases for genetic testing.

Prerequisites

Propaedeutic skills

Teaching form

Lectures, exercises, traineeship.

Textbook and teaching resource

McPherson RA, Pincus MR Henry's Clinical Diagnosis and Management by Laboratory Methods, 23a English edition. Ed. Elsevier, 2016

Federici G. Medicina di laboratorio ed McGraw-Hill. IV ed., 2014

Marshall W, Lapsley M., Day A Clinical chemistry ed Mosby. 8a ed. Ed. Elsevier, 2016

Microbiologia Clinica (autori: Mims c., Dockrell HM., Goering RW., Roitt I., Wakelin D., Zuckerman M.) EMSI, 2006, III ed.

Microbiologia Clinica (autore: Cevenini R.) PICCIN.

Kumar V, Abbas A., Fausto N., Aster J.C. Robbins & Cotran Pathologic Basis of Disease Ed. Saunders, 8th ed., 2010

Mariuzzi, G.M. Anatomia patologica e correlazioni anatomo-cliniche Ed.Piccin, 1° 2007

TNM CLASSIFICATION OF MALIGNANT TUMOURS UICC International Union Against Cancer, Wiley-Liss VI ed.

Robbins e Cotran - Le basi patologiche delle malattie / V. Kumar et al. Elsevier 2011.

Moreover, the teachers will provide educational material.

Semester

First semester third year.

First semester, fourth year.

Assessment method

Written (33 multiple choice quiz) and oral test

Office hours

Teachers receive by appointment, required by email.
