UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Clinical Biochemistry

2223-1-I0302D005

Aims

Students' skills:

- to describe the most used instruments in BC labs;
- to describe the main biochemical assays;
- to illustrate the basic principles and applications of clinical biochemical techniques: photometric, electrophoresis techniques, hemochromocytometric and urine test, enzymatic assays;
- to describe the metabolic features of the main organs and tissues and tests used to assess them;
- to describe PCR and molecular tests based on it (also sample preparation).

Contents

To provide knowledge about metabolic specificities of main organs and tissues, and on the biochemical and physio-pathological basis of laboratory analysis alterations.
To provide the fundamentals of the main principles of analytical and instrumental techniques employed in Clinical Molecular Biology and Biochemistry laboratory, also for veterinary purposes.

Detailed program

Laboratory instrumentation. Basic principles and applications of the main lab techniques: photometric, electrophoresis techniques, hemo-chromo-cytometric and urine test, enzymatic assays. Evaluation of analytical methods (practicability, reliability, bias).

Laboratory animals notes.

Organ profiles: glucose, lipid protein, ethanol and bilirubin hepatic metabolism, and relates tests. Adipose tissue metabolism, Lipid and lipoprotein metabolism, muscular and myocardial metabolism. Myocardial markers. Nervous system metabolism.

Red cells metabolism. Anaemia and hemoglobinopathies.

Kidney metabolism and hydro-electrolytic balance; renal clearances, creatinine and urea. Metabolic interrelations. Bone and mineral metabolism. Iron balance. Acid-base balance and its regulation.

Techniques for the lymphocyte separation from whole blood. DNA and RNA extraction, purification, quantification and storage: theory and practical aspects. Restriction enzymes: theory and diagnostic applications. Retro transcription reaction. Polymerase chain reaction (PCR): parameters for the amplification (denaturation, hybridization, extension) master mix. Amplification products identification (agarose-gel electrophoresis and hybridization techniques). Genetic mutation identification: indirect (Southern Blot, DGGE, SSCP, PTT, CCM) and direct methods (RFLP, ASA, ASO). PCR product sequencing. Viral nucleic acid assays (HCV, HBV, HIV).

Prerequisites

Biomedical Sciences.

Teaching form

Lectures and exercises

Textbook and teaching resource

SPANDRIO L. BIOCHIMICA CLINICA, ED SORBONA

SILIPRANDI N. TETTAMANTI G. BIOCHIMICA MEDICA ED PICCIN

Semester

Second semester

Assessment method

The final mark is obtained as weighted average of the partial tests, according to the credits (CFU) of each module.

Office hours

By appointment required by mail

Sustainable Development Goals

GOOD HEALTH AND WELL-BEING