UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Biochemistry II

2324-1-H4102D001-H4102D003M

Aims

The Biochemistry II module aims to offer the training bases for a detailed molecular knowledge of medicine and modern technological applications to medicine.
The course is aimed at understanding the basic mechanisms responsible for alterations of homeostasis and the onset of diseases. In this way we want to lay the foundations for the molecular understanding of the complex phenomena of communication, interaction and control of cellular and tissue functions. The course also aims to make understanding, at a biochemical and molecular level, the complex communication phenomena between organs and the control systems of their functions and their interrelations in physiological conditions.
It will also be illustrated the possible different uses of different techniques, even with the use of practical common examples, with the aim of providing students the opportunity to learn to choose the best solutions to practical problems in clinical practice in the biochemical field.

Contents

The Biochemistry II module will describe in detail the integrated biochemistry of organs and tissues. It will provide useful knowledge for the best understanding of other medical disciplines and clinics.The main mechanisms of biochemical regulation of the metabolism of blood, of the digestive system, cardiovascular, hepatic, of the nervous system will be illustrated. The hormonal and metabolic regulation of the metabolism and the conditions that can lead to their alteration will be described.

Detailed program

Blood glucose regulation in physiological conditions and in diabetes mellitus. Liver and systematic biochemical metabolism of the liver. Metabolism of ethanol taken with beverages. Metabolic detoxification of toxic compounds,

drugs and xenobiotics. Structure, composition, role and metabolism of the different classes of plasma lipoproteins. Metabolism of erythrocytes, blood coagulation, transport of oxygen in the blood. Hormonal regulation of metabolisms. Gastroenteropancreatic hormones: insulin. glucagon. somatostatin. Hypothalamic and pituitary hormones: GH. Prolactin. ACTH. Vasopressin. Oxytocin. Thyroid hormones. Adrenal hormones. Sex hormones. Hypothalamic–pituitary–adrenal axis. Hormonal control of blood pressure. Approaches based on nanomedicine in the therapeutic, diagnostic and regenerative fields. Nutritional aspects in physiological and pathological conditions. Technological aspects of the assay of different biochemical macromolecules involved in various metabolic processes.

Prerequisites

Basic knowledge of biology and chemistry.

Teaching form

Frontal lessons and self-assessment tests.

Textbook and teaching resource

Biochemistry with clinical cases . T. Devlin

Biochemistry, Berg et al.

Slides, scientific papers/reviews used during the frontal lessons will be loaded on e-learning platform.

Semester

Second semester.

Assessment method

Written and oral examination: 13 multiple-choice questions (2 marks each) + 1 open question (4 marks) to be completed in 45 minutes. The exam is positively evaluate with a score of 18/30 or higher. The questions proposed in the written exam will be constructed in such a way as to induce the student to biochemical-biotechnological reasoning, to understand the units of measurement and to be able to evaluate the skills and competences acquired according to the objectives of the course. The oral examination will include a discussion on the written test, including questions about topics included in the program of the course. The exam will take place remotely if in an emergency covid-19, otherwise in presence.

Office hours

On appointment to francesca.re1@unimib.it.

Sustainable Development Goals

GOOD HEALTH AND WELL-BEING