

FROM CLINICAL TO MOLECULAR BIOLOGY I (ML0171)

1. language

English

2. course contents

Coordinator: Prof. Francesco Ria

Year Course: V Year

Semester: I semester

Modules and lecturers:

- CLINICAL IMMUNOLOGY (ML0177) - 1 cfu - ssd MED/04
Prof. Francesco Ria
- CLINICAL PATHOLOGY (ML0176) - 1 cfu - ssd MED/05
Prof. Carlo Provenzano
- MOLECULAR DIAGNOSTICS (ML0175) - 1 cfu - ssd BIO/12
Prof. Cinzia Anna Maria Calla'
- PATHOLOGY II (ML0174) - 2 cfu - ssd MED/08
Prof. Esther Rossi, Gian Franco Zannoni, Riccardo Ricci
- PATHOLOGY PROFESSIONAL TRAINING (ML0172) - 2 cfu - ssd MED/08
Prof. Gian Franco Zannoni, Riccardo Ricci, Esther Rossi
- PHARMACOLOGY I (ML0173) - 1 cfu - ssd BIO/14
Prof. Cesare Mancuso, Lucia Lisi

3. bibliography

- GEHA & NOTARANGELO. Case Studies in Immunology: a clinical companion. Garland Science
- COPSTEAD-BANASIK: Pathophysiology. 4th Edition. Saunders-Elsevier 2010
- ROBBINS & COTRAN: Pathologic Basis of Disease. 9th Edition, 2014
- Harrison - Jameson - Loscalzo - Fauci - Kasper - Hauser - Longo: Harrison's principles of internal medicine - 19th Edition.
- Lichtman & Abbas: Basic Immunology, Saunders Edt
- Goodman & Gilman': The Pharmacological Basis of Therapeutics. McGraw Hill. 12th Edition
- Watson et al: Recombinant DNA.

4. learning objectives

The course "From Clinical to Molecular Biology 1" focuses on the application of basic knowledge about mechanisms of disease to clinical laboratory. Placed at the transition point between studies of Pathophysiology and clinical disciplines and practice, the course aims at the development of medical reasoning as a process of evaluating the appropriateness, usefulness and limits of clinical laboratory data, and the appropriateness of drug-based therapies. Appropriateness is viewed as the crossroad between clinical evidence, maximization of significance of the laboratory, reduction of false positive and false negative results and optimization of economic management.

Learning objectives according to Dublin's descriptors.

- knowledge and understanding: core informations conveyed by the course cover the type, methods, significance and limits of laboratory medicine and drug usage. This initial acquisition of medical reasoning in clinical practice.
- applying knowledge and understanding: Students will learn how to recognize basic pathologic processes in microscopic tissue sections. They will also understand how to apply their knowledge of pathophysiological mechanisms in the diagnostic process of the most frequent diseases.
- making judgments. Students will be stimulated to follow a practical approach to the diagnosis, through the application of exemplificative algorithms that represent a guide to their clinical attitude.
- communication skills. Students will need to demonstrate the capacity to elaborate the information from multiple sources, and to express synthetically and hierarchically complex concepts.
- learning skills. By the end of the course students will have developed better study skills and strategies aimed at multi-source, self-directed and ongoing learning.

5. PREREQUISITES

Key course prerequisites include knowledge of the fundamentals of human physiology and pathophysiology of organs and systems, body fluids compartments and electrolytes, oxygen transport and acid-base balance regulation. Knowledge of the appropriate scientific English terminology covering the above aspects is also expected.

6. teaching methods

Knowledge and understanding. Core course content will be taught through interactive frontal lessons and more student-centered strategies (i.e. “reverse classrooms”, with contents being provided in advance for students’ homework in the form of slide presentations, book chapters and links to web-based multimedia, and presented in the classroom from students to students under teachers guidance). Integration among different subjects/teachers of the course is actively pursued by means of calendar optimization and organization of multidisciplinary lectures on overlapping topics.

Applying knowledge and understanding. Hands-on practical sessions at the microscope or in the microbiology and genetics laboratory. Voluntary internship in research laboratories.

Making Judgments. By means of small clinical case presentations and Problem based learning sessions the course fosters student’s capacity to reorganize knowledge into individual decisions regarding the diagnostic approach and therapy.

Communication skills. Students are prompted to discuss with the teacher and their classmates the contents learned at home, using appropriate scientific language and possibly with the aid of schemes, catchy images, short summaries (powerpoint presentations).

Learning skills. Self-learning is supported through “flipped classroom” schemes and, at the end of frontal lessons, through referral to original scientific literature, PubMed keywords and related on-line material. Problem-based learning/problem-solving sessions are also provided as afternoon Optional Projects to encourage autonomous literature retrieval and critical appraisal.

7. other informations

Continuous feedback is provided to students during classes, at intervals and at the end of each lesson. Teachers are available for consultation by email or in person, at preset office hours or upon appointment.

8. methods for verifying learning and for evaluation

Methods for verifying learning include

- a) Ongoing: Interactive frontal teaching with class involvement (open questions, multiple choice questions, app-based surveys and written self-evaluation tests).
- b) Final: Written multiple choice evaluation test (including Practicals), covering the entire course content.

Written tests will be administered through the Blackboard platform. Exams will be held preferentially in presence, and in remote mode until restrictions due to the Covid-19 emergency will be in force. Students will be asked to download the Respondus Lockdown Browser in their PC and to take the written tests under the supervision of a video-based proctoring system, after an identification step in video/audio connection with the examiners. Should in-person exams become possible sometime in the course of the year, students will take the test from within the Campus, in a PC-equipped room under the direct supervision of the teaching staff.

Tests are representative of the different disciplines of the integrated course with numbers of question items being proportionate to the respective CFU. Most question items (5 options, one best answer).

In each test evaluation, the percentage of correct answers is translated into marks in an 18 (pass mark)- to -31 (maximum mark with *laude*) scale.

Students must respond correctly to at least half of the test items of each discipline no matter what the total number of correct answers in the test.

During exams, any portable electronic devices including mobile phones must be switched off and put over the desk. Violations will be referred to the Disciplinary Committee.

After exam results are immediately available, students are requested to communicate the acceptance/refusal of the assigned mark by e-mailing to the course secretariat within the indicated deadline.

9. program

Pharmacology

Glucocorticoids

DMARDs

Drugs used in the cytokine storm

Antihypertensive drugs

 ACE inhibitors and sartans

 - and -adrenoceptor-blocking drugs

 Vasodilators and CNS sympatholytic drugs

Diuretics

Molecular Biology

Molecular methodologies in biomarker identification

Use of Biomarker in translational and clinical settings

Plasma Free nucleic acids: application in clinical trials and diagnostics

Molecular Biomarkers in celiac and diabetic disease

Somatic and single cell testing for the definition of minimal residual disease in solid tumors

Clinical Pathology

Clinical pathology of cardiac markers

Clinical pathology of coagulation

Clinical pathology of diabetes diagnosis and follow-up

Clinical pathology of Iron metabolism

Clinical pathology of function kidney

Clinical Immunology

Monoclonal Antibodies. From Bench to bedside

The Clinical Immunology Lab in the diagnosis of autoimmune diseases

The Clinical Immunology Lab in the diagnosis of Allergies

The Clinical Immunology Lab in the diagnosis of chronic inflammatory diseases

Pathology

Hematopoietic system, thymic and splenic diseases

Obstetrics and gynecologic diseases I

Diseases of endocrine system II (pituitary, adrenal and parathyroid glands)

Cardiovascular pathology I