

FROM CLINICAL TO MOLECULAR BIOLOGY III (ML0276)

1. language

English

2. course contents

Coordinator: Prof. ZANNONI GIAN FRANCO

Academic Year: 2022/2023

Year Course: VI year

Semester: Annual

UFC: 5

Modules and lecturers:

- CLINICAL PHARMACOLOGY (ML0279) - 1 cfu - ssd BIO/14

Prof. Cesare Mancuso

- CLINICAL PHARMACOLOGY PROFESSIONAL TRAINING (ML0278) - 1 cfu - ssd BIO/14

Prof. Giacomo Pozzoli, Pierluigi Navarra

- INFECTIOUS DISEASES IV (ML0281) - 1 cfu - ssd MED/17

Prof. Carlo Torti, Alberto Borghetti

- INFECTIOUS DISEASES PROFESSIONAL TRAINING (ML0277) - 1 cfu - ssd MED/17

Prof. Giancarlo Scoppettuolo, Mothanje Barbara Patricia Lucia, Katleen De Gaetano Donati, Antonella Cingolani, Rita Murri

- PATHOLOGY IV (ML0280) - 1 cfu - ssd MED/08

Prof. Riccardo Ricci, Gian Franco Zannoni, Esther Rossi

3. bibliography

ROBBINS & COTRAN: Pathologic Basis of Disease. 9th Edition, 2014

B.G. Katzung, S.B. Masters, A.J. Trevor. Basic & Clinical Pharmacology. McGraw Hill, Lange. 12th Edition

Goodman & Gilman's The Pharmacological Basis of Therapeutics. McGraw Hill. 12th Edition

4. learning objectives

The course is divided in 5 different modules that are strongly integrated.

Students are expected to work towards meeting the following objectives:

Knowledge and understanding (Dublino 1)

To recognize morphological and functional differences between normal and diseased tissues and to understand, from a structural, morphological, functional and biochemical perspective, the different types of pathological lesions.

To understand the mechanisms of host/microbes interaction in health and disease, the main features of the most important microbes (bacteria, virus, fungi and parasites) of medical relevance, with a focus on the molecular determinants of pathogenesis and resistance to host defenses.

To understand the public health aspects of zoonotic diseases addressing, in particular, epidemiology, ecology and approaches to control.

To understand the principles of drug action and the various mechanisms by which drugs can achieve their pharmacological effects.

To understand the fundamental principles of pharmacokinetics and how specific patient characteristics and genetics can affect the response to a particular class of drugs.

To understand the scientific basis underlying how different drugs can interact within the body and can have undesirable effects.

To understand the pharmacology and clinical use of the major class of drugs including drugs affecting the autonomic and central nervous system, antimicrobial and chemotherapeutic drugs used in the treatment of cancer.

Applying knowledge and understanding (Dublino 2)

Students will be able to interpret data originating from a clinical microbiology laboratory, to apply principles of diagnostic and clinical microbiology, to recognize the signs and symptoms of infectious diseases and to identify preventive and therapeutic measures.

Students will be able to recognize the morphological characteristics of different pathological tissues

Making judgements (Dublino 3)

Students will be able to integrate pathological findings with clinical manifestations of diseases and to understand the mechanisms underlying signs and symptoms of diseases.

Students will be introduced to the principles of clinical drug development and to the methodology of clinical trials.

Communication skills (Dublino 4)

To become familiar with essential terminology related to human diseases and to the concepts of disease etiology and pathogenesis

To describe the basic features of the most important zoonoses, to discuss the modes of transmission of zoonotic diseases from animals to humans and how this spread is influenced by characteristics of the hosts, vectors and infectious agents.

To explain how zoonotic diseases are controlled and to describe the various methods of investigation for these diseases, for both epidemic (outbreaks) and endemic cases.

Learning skills (Dublino 5)

Students will learn the morphological and functional alterations that pathogens and aberrant stimuli can induce in molecules, cells and tissues and their consequences for the entire

organism as well as the basic defense mechanisms in response to them.

5. PREREQUISITES

Knowledge of: molecular and cellular biology, microbiology; clinical medicine; general pharmacology; general pathology.

6. teaching methods

The course is organized with a series of lectures flanked by practical "hands-on" training aimed to give students the ability of examining biological samples, understanding basic diagnostic tools, identifying the major steps in the process of drug development and understanding regulation for safety reporting during development and following the marketing authorization of medicinal products. Students will also be introduced to genetic counseling and interpretation of genetic variants.

Teaching methods are represented by: classroom-taught lesson with the use of slides and videos, and guided practice activities, textbooks, elearning, online scientific papers in order to stimulate:

Knowledge and understanding (Dublino 1): Teachers will show the principal topics of the Histology and the Embriology, by forming the student to use an integrated study method (morfological, biochemical, ultrastructural, molecular). In this way the student will know the functional/physiological aspects and the possible pathological alterations: the student also will perform and improve the ability to observe, to compare and to deduce a correct medical conduct

Applying knowledge and understanding (problem solving) (Dublino 2): the active participation with questions/answers is fundamental, in order to improve the observational and deductive ability, in particular in the professional training. In itinere exam and practical exam by microscope will stimulate the problem solving)

Making judgements (Dublino 3): by observing pathological slide to the microscope, the student will strengthen a critic approach

Communication skills (Dublino 4): the question/answer approach will be preferred and encouraged. When the student will get the language wrong, the teacher will correct the student's work, by stimulating the knowledge of the appropriate technical-scientific terminology

Learning skills (Dublino 5): the classroom-taught lesson will deal with the most important topics of the study program. Anyway text-books, elearning, and online scientific papers will be proposed. It will be allowed to book personal appointment with the teacher in order to ask any doubt or information.

7. other informations

Selected Course

The students can choose 2 different selected courses (seminars and single-subject courses)

Practice and experimental protocols in Anatomic Pathology Institute

The 1 year internship determines 1 CFU

8. methods for verifying learning and for evaluation

Oral exam

Practical activities (at Optical Microscope)

They are performed in the same round of examination

The final grade will be expressed as thirtieth; the passing grade is 18/30; the top grade is 30/30 and it will be assigned when the following skills are completely accomplished

Knowledge and understanding (Dublino 1): by the oral exam, the student will show the acquired knowledges regarding structure and functions of cell, tissue and organs

Applying knowledge and understanding (problem solving) (Dublino 2): by parctical activities, the student will show the acquired ability in the use of the microscope and the observational, comparative, logical competences. *The student* in complete autonomy will correctly identify cells and tissues, and will describe them with the appropriate technical language.

Making judgements (Dublino 3): by parctical activities, the valutative autonomy of the student will be valued

Communication skills (Dublino 4): During Oral exam and Practical activities (at Optical Microscope), teachers will value the adeguate explanatory language and the logical integrated approach of the student

Learning skills (Dublino 5): Oral exam and Practical activities (at Optical Microscope) will allow to value the student learning and the entity of the personal in depth analysis

9. program

CLINICAL PHARMACOLOGY

Opioid agonists and antagonists

Parkinson's disease drugs

Alzheimer's disease drugs

Antiepileptic drugs

INFECTIOUS DISEASES IV

PATHOLOGY IV

Pathology of male genital system and urinary tract:– bladder carcinoma – prostatic disease and benign prostatic hyperplasia – tumors of the prostate

Pathology of cardiovascular system (2nd. part): inflammatory diseases of pericardium and endocardium – primary cardiomyopathies – introduction to cardiac malformations – aneurysms – arteritis- tumors

Pathology of kidney: non-neoplastic diseases of the kidney – nephritic and nephrosic syndrome – primary and secondary glomerulopathies – inflammation of the kidney and the renal pelvis- pathology of the renal transplantation – vascular diseases of the kidney – renal TB - renal and pelvic tumors

Pathology of the breast: Non-neoplastic diseases of the breast (fibrocystic disease) – benign tumors of the mammary gland – breast carcinoma

Skin pathology: nevi – melanoma – non-melanocytic skin tumors

Pathology of the bone: inflammatory diseases of the bone – osseous and cartilaginous tumor