PATHOGENESIS AND MICROBIOLOGY

Modules: Microbiology and clinical microbiology, General pathology
Year/Semester**:** 2018/2019, second semester
Credits**:** 4

PROFESSORS	COLLABORATOR	HOURS	NOTES
Prof Raffaella Bonecchi	Dr Marinos Kallikourdis Dr Sebastien Jaillon	30	University researchers with previous experience in teaching the degree course

COURSE OBJECTIVE

By the end of the course the student will:

- Be knowledgeable in the causes, and the pathogenetic and physiopathological mechanisms of disease
- Be able to describe the main cellular changes in the course of disease
- Understand the inflammatory and healing processes

TEACHING METHOD: Lectures
ASSESSMENT METHOD: Written exam with 30 multiple-choice questions.
MODULE: General Pathology
Second semester CREDITS: 2

MODULE OBJECTIVES

- The student will be able to know the causes, and the pathogenetic and physiopathological mechanisms of disease.
- The student will be able to describe the main cellular changes in the course of disease.
- The student will be able to understand the inflammatory and healing processes.
- The student will be able to distinguish the characteristics of innate and adaptive immunity.
- The student will be able to recognise the causes and stages of neoplastic progression.
- The student will be able to recognise the main causes and consequences of vascular disease and thrombosis.

RECOMMENDED READING:

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Elementi di patologia generale PONTIERI novembre 2012 PICCIN
TEACHING METHOD: Lectures
ASSESSMENT METHOD: Written exam with multiple choice questions, and a possible oral examination

1. Introduction to pathology (Bonecchi) Learning objectives
The student will be able to describe the concept of disease, aetiology and pathogenesis. The student will be able to distinguish the various types of cellular adaptation to stress: hypertrophy, atrophy, hyperplasia, metaplasia.

2. Cell damage (Bonecchi) Learning objectives
The student will be able to recognise the various types of harmful stimuli and their impact on the cells

3. Acute inflammation I (Bonecchi) Learning objectives
The student will be able to define the various phases of acute inflammation (vascular changes, leukocyte recruitment, phagocytosis, cellular mediators).

4. Acute inflammation II (Bonecchi) Learning objectives
The student will be able to recognise and classify soluble mediators of inflammation, and the complement system

5. Systemic manifestations of inflammation (Bonecchi) Learning objectives
The student will be able to describe the systemic manifestations of acute inflammation and the effects on tissue

6. Chronic inflammation (Bonecchi) Learning objectives
The student will be able to describe the main differences between acute and chronic inflammation, and
The student will be able to recognise the main features of granulomatous inflammation.

7. Cicatrisation and wound healing (Bonecchi)
Learning objectives
The student will be able to describe the stages of the healing process.
The student will be able to describe the outcome of the healing process.

1. General principles of specific immunity (Kallikourdis) Learning objectives

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The student will be able to distinguish the main differences between innate and specific immunity

2. Humoral immunity: antibodies (Kallikourdis)
Learning objectives
The student will be able to describe the mechanisms of activation of humoral immunity and antibody production.

3. Cell-mediated immunity (Kallikourdis)
Learning objectives
The student will be able to describe the mechanisms of cell-mediated immunity.
The student will be able to distinguish stimuli that activate an adaptive T cell-mediated response.

4. Immunopathologies(Jaillon) Learning objectives
The student will be able to describe major immune system disorders and their mechanisms.

5. Tumours (Jaillon) Learning objectives
The student will be able to classify the various types of tumours and understand the molecular basis of carcinogenesis.

6. Tumours II (Jaillon) Learning objectives
The student will be able to understand the stages of neoplastic progression and metastasis.

7. Atherosclerosis (Bonecchi) Learning objectives
The student will be able to describe the molecular basis and outcomes of the atherosclerosis process.

8. Haemostasis and Thrombosis (Bonecchi) Learning objectives
The student will be able to describe the mechanisms underlying the process of coagulation and its dysregulation.

MODULE: microbiology-serology (Monari)
SEMESTER: Second semester
CREDITS: 1

LESSON 1
Introduction to serology Learning

Learning objectives
The student will be able to:
- -distinguish the main diagnostic methods in order to interpret the analytical data provided by the laboratory report
- -understand the antigen-antibody interaction
- -understand the meaning of sensitivity, specificity and diagnostic accuracy

TEACHING METHOD: Lecture

LESSON 2
Tuberculosis and Legionella

Learning objectives
The student will know about:
- -the history of the disease
- -the epidemiological implications
- -strategies to prevent infection and disease spread
- -the diagnostic methods

TEACHING METHOD: Lecture

LESSON 3

Orthomyxoviruses Learning Learning objectives
The student will know about:
- -influenza
- -the genetic basis for epidemics and pandemics and genetic variation
- -the epidemiological implications
- -strategies to prevent infection and disease spread
- -the diagnostic methods
- -the vaccine

TEACHING METHOD: Lecture

LESSON 4, 5
Hepatitis and HIV

Learning objectives
The student will know:
- -the different hepatitis and HIV
- -the molecular basis of viral replication

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- -the epidemiological implications
- -strategies to prevent infection and disease spread
- -the diagnostic methods
- -how to read laboratory reports to interpret the results

TEACHING METHOD: Lecture

LESSON NO. 6,7
Epstein Barr Virus, Toxoplasma gondii, Cytomegalovirus and Rubella Virus
Learning objectives
The student will know:

- -about the different pathologies
- -the related clinical implications
- -the epidemiological implications
- -strategies to prevent infection and disease spread
- -the diagnostic methods
- -how to read laboratory reports to interpret the results

TEACHING METHOD: Lecture

LESSON 8.9
Faecal parasitology

The student will know:

- -how to correctly collect samples for investigation
- -the main associated diseases
- -the available diagnostic methods
- -strategies to prevent infection and disease spread

TEACHING METHOD: Lecture

LESSON NO. 10,11
Blood parasites

Learning objectives
The student will know:

- -about the different pathologies
- -the related clinical implications
- -the epidemiological implications
- -strategies to prevent infection and disease spread
- -the diagnostic methods

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- -how to read laboratory reports to interpret the results

TEACHING METHOD: Lecture

LESSON 12-13
Urinary tract infections

Learning objectives
The student will know:
- -about the different pathologies
- -the related clinical implications
- -the epidemiological implications
- -strategies to prevent infection and disease spread
- -the diagnostic methods
- -how to read laboratory reports to interpret the results

TEACHING METHOD: Lecture

LESSON NO. 14-15
Vaccines

Learning objectives
The student will know:
-the different types of vaccines
-the different time intervals and recalls
- -the epidemiological implications and benefits of vaccine therapy
- -the Italian vaccine schedule
- -the developments for upcoming vaccines

TEACHING METHOD: Lecture

At the end of each lesson, the topic will be reviewed with questions to check what the students' learned during class.

MODULE: Microbiology (Casari) SEMESTER: Second semester CREDITS: 1

LESSON 1
THE BACTERIAL CELL

Learning objectives

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- The student will know the structure of the bacterial cell and how it reproduces.
- The student will know the gram staining technique
- The student will know the ultrastructure and functions of the bacterial cell wall.
- The student will know the processes of host-pathogen interaction: colonisation, symbiosis, commensalism, infection and disease.

TEACHING METHOD: Lecture

LESSON 2
THE CULTIVATION AND IDENTIFICATION OF BACTERIA

Learning objectives
- The student will know the techniques for culturing bacteria
- The student will know the techniques for identifying bacteria
- The student will know the technique for performing blood cultures
- The student will know the blood culture pathway
- The Sepsis Six campaign

TEACHING METHOD: Lecture

LESSON 3

BACTERIAL RESISTANCE AND ANTIBIOTIC SENSITIVITY TESTS

Learning objectives
- The student will know the main mechanisms of bacterial resistance
- The student will know the methodology of antibiotic susceptibility testing.
- The student will know the issues related to the major health-care associated infections, definitions, risk factors and pathogens.

TEACHING METHOD: Lecture

LESSON 4

MICRO-ORGANISMS FOUND IN RESPIRATORY TRACT INFECTIONS

Learning objectives
- The student will know the main causative agents of respiratory tract infections.
- The student will know about the sampling methods for investigating infections of the respiratory system.

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TEACHING METHOD: Lecture

LESSON 5

MICRO-ORGANISMS FOUND IN GASTROINTESTINAL INFECTIONS

Learning objectives
- The student will know the main causative agents of gastrointestinal infections
- The student will know about the sampling methods for investigating gastrointestinal infections

TEACHING METHOD: Lecture

LESSON 6

MICRO-ORGANISMS FOUND IN WOUNDS, ABSCESSES, SUBSTANCES REMOVED DURING SURGERY

Learning objectives
- The student will know the main causative agents of skin and tissue infections.
- The student will know about the sampling methods for investigating infections of skin and tissues.

TEACHING METHOD: Lecture

LESSON 7
MICRO-ORGANISMS FOUND IN CEREBROSPINAL FLUID

Learning objectives
-- The student will be able to know the main causative agents of central nervous system infections
-- The student will know about the sampling methods for investigating infections of the central nervous system

TEACHING METHOD: Lecture

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