



UNIVERSITÀ
degli STUDI
di CATANIA

DEPARTMENT OF GENERAL SURGERY AND MEDICAL-
SURGICAL SPECIALTIES
Master's Degree in Medicine and Surgery
Academic Year 2015/2016 - 2° Year

MICROBIOLOGY - channel 3

MED/07 - 7 CFU - 1° Semester

Teaching Staff

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DETAILED COURSE CONTENT

Module of Bacteriology (3 credits)

1. Microorganisms and parasites: infection of the host

1. Microorganism-host relationships.
2. The microbial population normally resident in the human body.
3. Essential characteristics and differences of bacteria, viruses, fungi, protozoa and other parasites known to infect humans.
4. The pathogenic mechanisms of microorganisms.
5. The various possibilities of infection and spread of infection.
6. Infection control: key features of prevention and antimicrobial therapy

2. The prokaryotic cell

1. Fundamentals of microbial physiology
2. The organization of the bacterial cell
 1. Structure and function of the cell wall
 2. Cellular components
 3. Accessory components (capsule, flagella, pili)
 4. Biofilms
 5. The spore

3. The bacterial genetics and cell growth

1. Transfer of genetic information in prokaryotes:
 1. Recombination in bacteria: conjugation, transformation and transduction
 2. Plasmids and transposable elements.
2. The bacterial cell cycle and division

4. The pathogenesis of bacterial infection

1. The phases of bacterial infection
2. Pathogenicity and virulence
3. Mechanisms of pathogenicity
4. Bacterial toxins
5. The host response to bacterial infection

5. Infection control

1. Sterilization, disinfection and antiseptics
2. The antimicrobial chemotherapy:
 1. Classification and main characteristic of principal groups of antibiotics
 2. Mechanism of action
 3. The antibiotic resistance
 4. Susceptibility testing
3. Vaccines

6. The diagnostic principles of bacterial diseases

1. Microscopic examination
2. Direct diagnosis
 1. Culture methods
 2. Other methods
 3. Indirect diagnosis
3. Serological methods

7. Systematic Bacteriology (taxonomy, main characteristics, pathogenicity, infectious diseases, possibility of prevention, diagnosis and antibiotic chemotherapy)

1. Key Features of: Staphylococcus, Streptococcus, Enterococcus, Neisseria, Branhamella, Mycobacterium, Streptomyces, Nocardia, Actinomyces, Corynebacterium, Lactobacillus, Bartonella, Listeria, Gardnerella, Bacillus, Clostridium, Enterobacteriaceae, Haemophilus, Pasteurella, Vibrio, Legionella, Brucella, Bordetella, Acinetobacter, Pseudomonas, Bacteroides, Campylobacter, Helicobacter, Mycoplasma, Ureaplasma, Chlamydiae, Rickettsiales, Spirochetes

Module of Virology (2 Credits)

1. Viruses and sub-viral structures

1. The organization of the viral particle
2. Virus replication
3. Subviral pathogens: prions, viroids, and virusoids

2. The pathogenesis of the viral infection

1. Mode of transmission
2. Types of viral infection: acute and persistent infection (latent, slow, chronic, oncogenic)
3. The host response to viral infection
4. The interferon

3. The control of viral infections

1. The antiviral chemotherapy
 1. Classification
 2. Mechanism of action and resistance
 3. Combined therapies
2. Vaccines

4. The diagnostic principles of viral diseases

1. Culture method
2. Culture independent and molecular methods
3. Serological methods

5. Key features of main viruses of medical importance:

1. Poxviridae, Herpesviridae, Adenoviridae, Human Papillomavirus and Polyomavirus, Parvovirus, Parvoviridae, Parvovirusidae, Orthomyxoviridae, Picornaviridae, Arenaviridae, Bunyaviridae, Calciviridae, Coronaviridae, Filoviridae, Flaviviridae, Reoviridae, human retroviruses, Togaviridae and Rubivirus, Rhabdovirus, Human hepatitis viruses (HAV, HBV, HCV, HDV, HEV, HGV)

Module of Mycology and Parasitology (2 Credits)

1. The Fungi

1. Characteristics of fungi and their metabolism
1. The fungal cell

2. Host-parasite relationships

1. Mechanisms of pathogenicity
 1. Microtism
 2. Mycosis
 3. Mycosis
2. Pathogenesis of mycosis
3. Mode of infection
4. Origin, classification and description of mycosis
5. Dimorphism
6. The host defense to fungal infections

3. The fungi responsible for mycosis

1. Primary pathogens: Dermatophytes, Dimorphic
 1. Yeasts: Candida, Cryptococcus, Malassezia, Trichosporon
 2. Filamentous fungi: Aspergillus, Fusarium, Zygomycetes
3. Fungi responsible for subcutaneous mycosis

4. The antifungal drugs

1. Antifungal drugs
 1. Classification
 2. Mechanism of action and resistance

5. The diagnostic principles of fungal diseases

1. Microscopy and culture isolation
2. Molecular methods
3. Serological methods

6. Parasites

1. Morphological characteristics and pathogenic mechanism of action.
2. Essential characteristics and differences of human infections caused by protozoa and other human parasites.
3. The various possibilities of infection and spread of human parasitic infections.
4. The main parasites of medical importance
 1. Protozoa (Flagellates, Amoeboe, Coccidia, Microsporidia)
 2. Metazoans (Platyhelminthes and Nematodes)

7. The antiprotozoal drugs

1. The main drugs
2. Vaccines

8. The diagnostic principles for parasitic infections

1. Blood parasites
2. Enteric parasites and urinary tract parasites
3. Tissue parasites

TEXTBOOK INFORMATION

More recent edition

1. *Microbiologia Medica* - Murray P. R., Rosenthal K.S., Pfaller M. A. - Casa Editrice EDRA
2. *Principi di microbiologia medica* - Antonelli G., Clementi M., Pozzi G., Rossolini G.M. - Casa Editrice Ambrosiana
3. *Principi di microbiologia medica* - La Placa M. Edises

The books marked with the number 1 and 2 are those annotated at "programming" section. Eventual deepening, not mandatory, will be indicated in the "programming"

The student is free to choose any other textbook
