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## MICROBIOLOGIA ED IGIENE

14 CFU - 2° Semester

### Teaching Staff

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**Office Hours:** da lunedì a venerdì, preferibilmente dopo appuntamento telefonico

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### LEARNING OBJECTIVES

- **Microbiology and clinical microbiology**

The aim of the course is to provide students with the fundamental concepts regarding what microorganisms are and their role as pathogenic agents for humans. The basic elements of the microbial physiology and pathogenicity, of the host-parasite relationships, and of the interactions between microorganisms and antimicrobial agents, as well as the essential principles of the prophylaxis and diagnosis of infectious diseases with particular regard to those of odontostomatological interest will also be provided.

- **Hygiene**

## Educational Objectives

*To have depth knowledge regarding: sources and methods for health data collection, epidemiological methods for their analysis and interpretation, causes of death, health determinants and risk factors in the lifestyle, health determinants and social risk factors, methods for the prevention of chronic diseases, mode of occurrence and spread of infections, interventions on individuals and on communities for their prevention, principles and application of preventive medicine in the community, principles and methods of communication applied to health information and health education for oral hygiene, sanification in odontoiatric environment, odontostomatological diseases of social interest.*

### ▪ ANTIBIOTIC RESISTANCE IN ORAL BACTERIA

The aim of the course is to provide students with the fundamental concepts regarding antimicrobial drugs and resistance mechanisms of microorganisms in humans.

The basic elements, objectives of Course of Microbiology and Clinical Microbiology, regarding microbial physiology and pathogenicity, host-parasite relationships, and interactions between microorganisms and antimicrobial agents, as well as the essential principles of the prophylaxis and diagnosis of infectious diseases, particularly in Dentistry, will be related.

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## DETAILED COURSE CONTENT

### ▪ Microbiology and clinical microbiology

**BACTERIOLOGY** - Bacterial cell, bacterial staining methods, metabolism, bacterial nutritional requirements and cultivation, bacterial division and growth curve. Bacterial genetic modifications. The human normal bacterial flora. Opportunism. Bacterial pathogenicity and virulence mechanisms. Bacterial strategies against host defences. Biofilm, bacterial synergism, quorum-sensing. Direct and indirect diagnosis of the bacterial aetiology diseases. Disinfection; sterilization. Antibacterial agents: mechanism of action, spectrum of activity. Antibiogram. MIC, MBC. Antibiotic resistance mechanisms. Innate or acquired resistance. Bacteria of medical interest, with particular attention to Streptococcus, Staphylococcus, Spirochetes, anaerobic bacteria, Neisseria.

**VIROLOGY** - General characteristics of viruses. Viruses of medical interest, with particular attention to HBV, HCV and HIV.

**MICOLOGY** - General characteristics of fungi. Fungi.

**PROTOZOOLOGY** - General characteristics of protozoa. Protozoa as human pathogens.

**ORAL MICROBIOLOGY.** The oral ecosystem. The oral cavity as habitat. The main native microorganisms of the oral cavity. Characteristics of the oral streptococci. Role of the bacterial factors on the colonization of the oral cavity, adhesion factors, bacterial-bacterial interactions. Dental plaque: formation, composition, variations, microbial interactions, biochemical activities and mineralization.

Dental caries: etiopathogenetic theories, caries as infectious and multifactorial disease, main

bacteria involved. Caries prevention. Microbiological aspects of periodontal diseases. Therapeutic approaches to the infections of the oral cavity.

## ▪ Hygiene

PROGRAM:

DEFINITION AND OBJECTIVES OF HYGIENE

□ INTRODUCTION TO SANITARY DEMOGRAPHY

□ EPIDEMIOLOGY: OBJECTIVES AND APPLICATION

The most important epidemiological measures. Sources of sanitary data.

Epidemiological studies: descriptive epidemiology; analytical epidemiology; experimental epidemiology.

GENERAL EPIDEMIOLOGY OF INFECTIOUS DISEASES Infection and disease; reservoirs, sources. Routes of transmission (vehicles and vectors). Infectious diseases within a population. Transmission chains

□ INFECTIOUS DISEASES IN ODONTOIATRY

The mode of spread of diseases: aerial transmission (diphtheria, flue, meningococcal meningitides, parotitis, rubella, tuberculosis, legionellosis); by biological fluids (SIDA, viral hepatitis B, viral hepatitis C, herpetic viruses' infections)

□ PROPHYLAXIS OF INFECTIOUS DISEASES

Sanification in dental practices. Cleaning. Sanification in odontoiatric environment. Sterilization. Hand hygiene Disinfection. Primary prevention of infectious diseases. Vaccinal prophylaxis. Recommended vaccinations in odontoiatry. Vaccination calendar. Serum prophylaxis

□ EPIDEMIOLOGY OF NON INFECTIOUS DISEASES

Multifactoriality. Risk factors. Risk evaluation

□ NON INFECTIOUS DISEASES: PURPOSES AND LEVELS OF PREVENTION

□ AIMS OF NON-INFECTIOUS DISEASES PREVENTION

□ Primary prevention. Secondary prevention: Screening. Tertiary prevention

□ HEALTH EDUCATION

□ Definition and historical evolution of health education. General principles and methodology of health education. Program and evaluation of educational interventions on communities to educate a community on oral health

□ HYGIENE AND SAFETY IN ODONTOIATRIC ENVIROMENT

□ ODONTOSTOMATOLOGICAL DISEASES OF SOCIAL INTEREST

□ Epidemiology of dental caries. The DMFT. Prevention Epidemiology of periodontal disease. Classification of periodontitis. Risk factors. Prevention.

Dental trauma

□ Pregnancy and oral health

## ▪ ANTIBIOTIC RESISTANCE IN ORAL BACTERIA

History and role of antimicrobial chemotherapy in the world

Selective toxicity and mechanisms of action of antimicrobial drugs.

Microbiological characteristics of principal groups of antimicrobial drugs: spectrum of activity, bacteriostatic and bactericidal activity, determination of M.I.C. ed M.B.C.

Principal adverse and toxic effects of antimicrobial agents.

Antimicrobial susceptibility "in vitro" evaluation.

Actual different methods of testing for antibiogram.

Mechanisms of resistance to antimicrobial drugs.

Innate and acquired antibiotic resistance of bacteria.

Cromosomic and plasmidial resistance

Genetic mechanisms of antibiotic resistance in bacteria

Different phenotypic patterns of antibiotic resistance

News on spread of antimicrobial drugs resistance and related problems for human health in Medicine.

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## TEXTBOOK INFORMATION

### ▪ **Microbiology and clinical microbiology**

- La Placa - Principi di Microbiologia Medica - Società Editrice Esculapio.

- Murray P. R., Rosenthal K. S., Pfaller M. - Microbiologia medica - EMSI

- Lakshman Samaranayake - Essential Microbiology for Dentistry - Third edition - Churchill Livingstone, ELSEVIER.

- Lamont R.J., Burne R.A., Lantz M.S., LeBlanc D.J. - Microbiologia ed immunologia del cavo orale - EMSI

- Elliott T., Worthington T., Osman H., Gill M. - Microbiologia medica ed infezioni - Quarta edizione - EMSI

- Microbiologia farmaceutica - Carlone N., Pompei R. - Casa Editrice EdiSES

### ▪ **Hygiene**

<p><b>Igiene in Odontoiatria: M.T. Montagna, P. Castiglia, G. Liguori, M. Quarto.</b> <b>Monduzzi Editore</b></p>
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### ▪ **ANTIBIOTIC RESISTANCE IN ORAL BACTERIA**

-La Placa - Principi di Microbiologia Medica - Società Editrice Esculapio.

-Murray P. R., Rosenthal K. S., Pfaller M. - Microbiologia medica - EMSI -

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