UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Microbiology

2425-2-I0301D007-I0301D026M

Aims

Explanation of the fundamentals of microbial genetic code, gene expression adjustments and nature of mutations and gene recombination.

Description of the host-microbe relationships and the mechanisms of microbial pathogenicity.

Description of the atypical mechanisms of inheritance

Description of the diseases due to imprinting defects or to dynamic mutations, and mitochondrial and multifactorial diseases

Contents

By the end of the course, the students will have acquired the general concepts about morpho-functional, metabolic, genetic features of microorganisms and about host-microorganism relationship

Detailed program

THE BACTERIAL CELL:

Features, morphology and structures. Morphology: size, shape, and grouping. Gram stain and Ziehl-Neelsen (microscopy examination and coloring). The cytoplasm. The bacterial ribosomes. Cytoplasmic membrane. The cell wall. The capsule. The flagella. The fimbriae. Mode of bacterial growth. The production and spore germination. Bacterial Classification.

BACTERIAL GENETICS:

The bacterial chromosome. Plasmids. Insertion sequences, transposable elements and reversible. Expression of the bacterial genome. Mutations. Intercellular transfer and recombination of the genetic material. Transformation. Transduction. Lysogenic conversion. Bacterial conjugation.

BACTERIAL METABOLISM:

Characteristics of bacterial metabolism. Biochemical tests commonly used for the identification of bacteria.

BACTERIA-HOST RELATIONSHIPS:

Colonization. Bacterial adhesion and penetration in host tissues. Toxigenic bacteria. Main features and mechanism of action of exotoxin and endotoxin. Bacterial Biofilm.

VIRUSES:

General characteristics, morphology, structures, replication and pathogenesis. Some examples.

FUNGI:

Fungal general characteristics (morphology, structures, replication and pathogenesis). Some examples.

Disinfection and sterilization. Mechanisms of action of antibacterial drugs

Prerequisites

Basic knowledges dealing with biology, genetic and biochemistry

Teaching form

- 7 2-hour frontal lessons in attendance;
- 1 2-hour frontal lesson held in the initial part which is aimed at involving students in an interactive way in the subsequent part. All activities are carried out in attendance.

Textbook and teaching resource

Lanciotti, Microbiologia clinica con approfondimenti online e laboratorio simulato Quinta edizione Eudes 2021

Semester

First semester

Assessment method

Written test (multiple choice test consist of 20 questions) to evaluate knowledges about course program

Office hours

By appointment required by mail

Sustainable Development Goals

GOOD HEALTH AND WELL-BEING