



UNIVERSITÀ
degli STUDI
di CATANIA

DEPARTMENT OF BIOLOGICAL, GEOLOGICAL AND
ENVIRONMENTAL SCIENCES

Master's Degree in Health and Cell-Molecular Biology

Academic Year 2020/2021 - 1° Year - Cell-Molecular Biology

Curriculum

APPLIED MOLECULAR MICROBIOLOGY

BIO/19 - 8 CFU - 2° Semester

Teaching Staff

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LEARNING OBJECTIVES

With the course of Applied Molecular Microbiology, students will broaden and deepen the basic knowledge in the biomolecular field captured with the first degree. The course explores the molecular aspects of pathogenicity, virulence and antibiotic resistance of the major human pathogens, and their clonal relationship. The new identification technologies and study of microorganisms are also addressed (genomes, metagenomes, proteomes etc) as well as the basics of the interaction host parasite including immunological aspects. From the application point of view, they are taken into consideration the vaccine preparations (both traditional and recombinant) as well as some examples of microbial products produced with advanced technologies. The students then, will possess an integrated understanding of biological phenomena and advanced scientific training in morphological / functional level, chemical / biochemical, cellular / molecular and evolutionary aspects of the microbial world.

DETAILED COURSE CONTENT

Study of microorganisms involved in bio-medical and industrial applications.

Overview of taxonomy and identification of microorganisms. Host-parasite relationships. Molecular mechanisms of pathogenicity.

Molecular biotechnology of microbial systems. Phylo-genomics: the benefit between phylogeny reconstruction and genomic analyses.

Genetic and genomic application in the study of new molecular targets for therapeutic agents.

Screening for microbial Products: potential bacteriocins,.

sRNA regulators reprogram bacteria Enzymes, monoclonal and polyclonal antibodies, nucleic acids as therapeutic agents.

Study of molecular mechanisms of antibiotic-resistance. Vaccines. Traditional and recombinant technologies in industrial microbiology.

TEXTBOOK INFORMATION

1. Deho' Galli - Biologia dei Microrganismi - Casa editrice EA
2. Brock - Biologia dei Microrganismi - vol. 2 Casa Editrice CEA
3. Perry JJ et al - Microbiologia vol 2 - Casa Editrice Zanichelli
4. <https://onlinelibrary.wiley.com/doi/book/10.1002/9780470688618> (free for all students)

For consultation:

1. Glick et al - Molecular Biotechnology 3th ed. ASM
 2. Brodgen KA et al - Virulence mechanisms of bacterial pathogens 3th ed ASM
 3. Specific publications
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