

# Professional Master's Degree

## Advances in Antibiotic Therapy and Antibiotic Resistance



## Professional Master's Degree Advances in Antibiotic Therapy and Antibiotic Resistance

- » Modality: online
- » Duration: 12 months
- » Certificate: TECH Global University
- » Credits: 60 ECTS
- » Schedule: at your own pace
- » Exams: online

Website: [www.techtute.com/us/medicine/professional-master-degree/master-advances-antibiotic-therapy-antibiotic-resistance](http://www.techtute.com/us/medicine/professional-master-degree/master-advances-antibiotic-therapy-antibiotic-resistance)

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# 01

# Introduction

In recent years, scientific and medical communities have focused on the proliferation of bacteria that's resistant to one or more antibiotics, due to the abuse and misuse of these types of drugs. However, this problem has led to hard work in the search for new treatments and the monitoring of the spread of microbial resistance. It is a situation that requires the intervention of medical professionals who are aware of the latest advances in patient healthcare. Through dynamic multimedia content, this Professional Master's Degree will lead students to gain insight on the latest concepts in the use of antibiotics in renal failure, progress in antiparasitic drugs for trypanosomiasis, and antibiotic resistance mechanisms. A 100% online program with a specialized teaching staff that has extensive experience in the field.





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*Over 12 months, this Professional Master's Degree will provide you with the up-to-date knowledge you were seeking on Antibiotic Therapy and Antibiotic Resistance"*



Antibiotic resistance is a major concern nowadays. It has been demonstrated that the unnecessary use of antibiotics in both humans and animals has caused such resistance, and advances in new treatments require research and investments that are currently lacking. This has become a challenge in microbiology laboratories to make correct and rational use of antibiotics.

Medical professionals must be aware of the studies and progress being made in this field, and also of the approval and marketing of new alternatives to antibiotics which are already being produced. All this, without forgetting the important role specialists play in the control and follow-up of antibiotic treatment. This Professional Master's Degree offers students cutting-edge education with the support of a specialized, multidisciplinary teaching team with extensive experience in the use of antibiotics, in their effectiveness in humans and in the advances that are being made today.

To this end, TECH provides innovative teaching materials that encompass the latest technology applied to the latest advances in academic teaching. Through video summaries on each topic, detailed videos and interactive diagrams, students will learn about the latest advances in pharmacology, as well as recent discoveries on the blood-brain barrier, and superbacteria. Simulations of clinical cases will prove very useful to professionals, as they will bring them closer to situations that they will experience in their daily practice.

This Professional Master's Degree offers medical specialists a convenient format that is flexible and compatible with their work and personal activities. Therefore, students will only need a computer or portable device to have access to the syllabus, which is hosted entirely on the virtual campus. With no classroom attendance or fixed class schedules, students studying this program will be able to distribute the workload according to their specific situation at any given time. An excellent opportunity to pursue a university qualification that is at the forefront of academic education.

This **Professional Master's Degree in Advances in Antibiotic Therapy and Antibiotic Resistance** contains the most complete and up-to-date scientific program on the market. The most important features include:

- ♦ Development of case studies presented by experts on Advances in Antibiotic Therapy and Antibiotic Resistance
- ♦ Graphic, schematic, and practical contents created to provide scientific and practical information on the disciplines that are essential for professional practice
- ♦ Practical exercises where self-assessment can be used to improve learning
- ♦ Special emphasis on innovative methodologies
- ♦ Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- ♦ Content that is accessible from any fixed or portable device with an Internet connection



*A program with the most relevant information on the impact of antimicrobial use, and its role in current specialized and professional development"*

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*In this program, TECH provides you with the latest educational tools and professional experts to help you get up to date on antibiotics”*

The program's staff includes professionals in the sector who contribute their work experience to this program, as well as renowned specialists from leading societies and prestigious universities.

The multimedia content, developed with the latest educational technology, will provide the professional with situated and contextual learning, i.e., a simulated environment that will provide immersive education programmed to learn in real situations.

This program is designed around Problem-Based Learning, whereby the professional must try to solve the different professional practice situations that arise throughout the program. For this purpose, the student will be assisted by an innovative interactive video system created by renowned and experienced experts.

*An in-depth study of the emerging problem of parasite resistance, through a flexible specialization program.*

*Learn about new concepts in the use of Amphotericin B, as well as the latest recommendations for the use of respiratory quinolones, from your computer, at any time.*



# 02 Objectives

TECH has designed a Professional Master's Degree whose main objective is to offer medical professionals the latest Advances in Antibiotic Therapy and Antibiotic Resistance. To this end, it will provide content prepared by a team of professionals specialized in the field, who will also guide students through the 12-month program, so that they can obtain the latest information in fields such as antivirals, antifungals and antiparasitics.







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*With this program, you have the opportunity to keep up with new resistance genotype identification that is of clinical significance”*



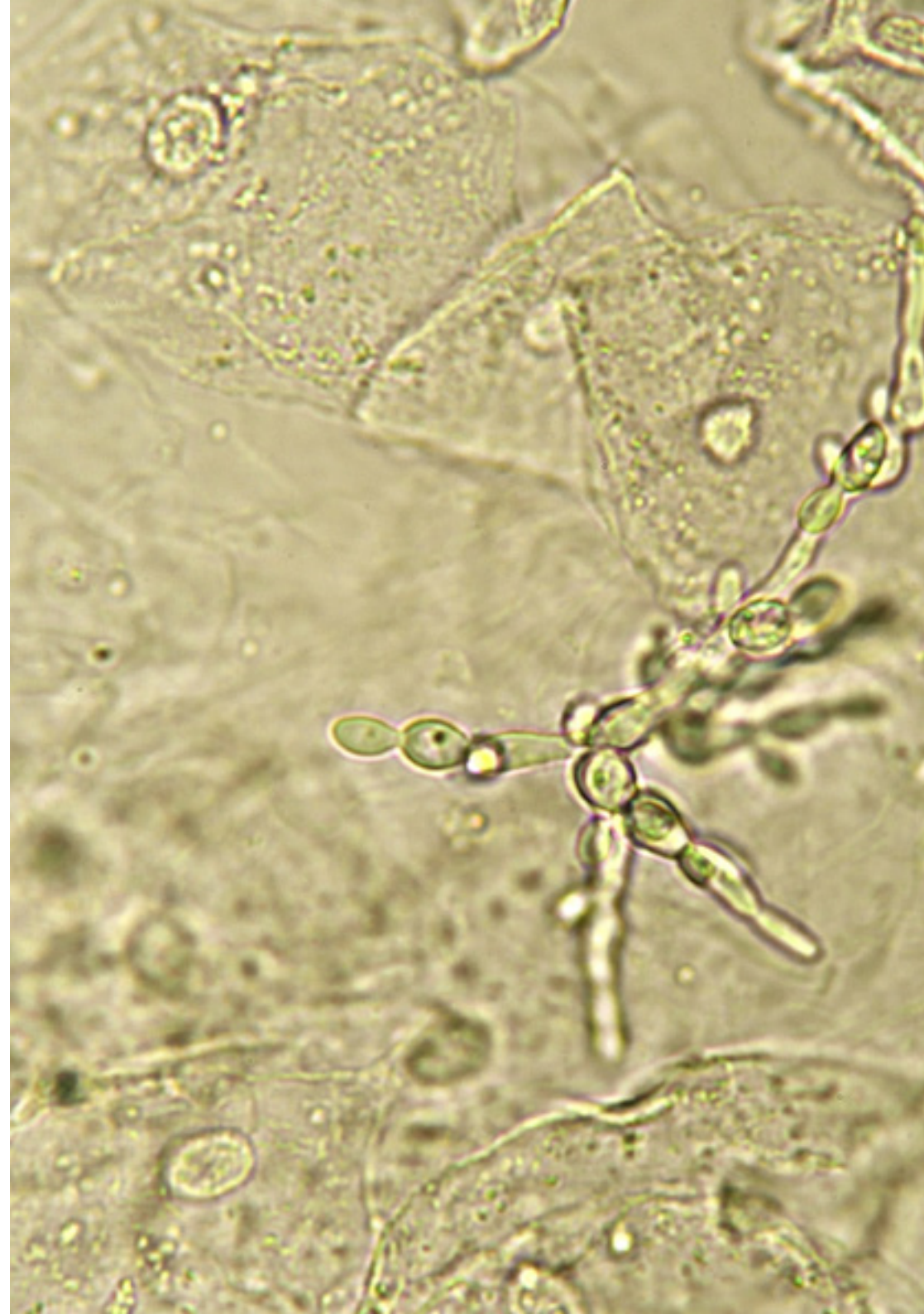
## General objectives

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- Provide rehabilitation professionals with up-to-date knowledge in the field of electrotherapy
- Promote work strategies based on a comprehensive approach to the patient as a standard model for achieving excellent care
- Encourage the acquisition of technical skills and abilities through a powerful audiovisual system, and the possibility of development through online simulation workshops and/or specific training
- Encourage professional stimulation through continuing education and research



*Video summaries of each topic in the specialization will help you gain an in-depth understanding of super-resistant microbe developments"*







## Specific objectives

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### Module 1. Overview of Microbiology

- ◆ Provide students with advanced, in-depth, up-to-date, and multidisciplinary information that allows them to comprehensively approach the process of health and infectious disease, the use of antibiotics, and antibiotic resistance
- ◆ Provide skills and practical/theoretical improvement that will allow students to carry out reliable clinical diagnoses through an efficient use of diagnostic methods, in order to indicate effective antimicrobial treatment

### Module 2. Introduction to Pharmacology and Treatment

- ◆ Develop skills in order to implement prophylactic plans for the prevention of these diseases
- ◆ Assess and interpret the epidemiological characteristics and conditions of countries that foster the emergence and development of antibiotic resistance

### Module 3. Antimicrobials: General Aspects

- ◆ Explain the complex interrelationships between the host, the microorganism, and the antibiotic to be used
- ◆ Address the important role of microbiology in the diagnosis and control of infectious diseases

### Module 4. Antivirals

- ◆ Describe the main mechanisms of antimicrobial resistance
- ◆ Highlight the importance of rational therapeutics in the rational use of antimicrobials

### Module 5. Antibiotics I

- ◆ Address the most important elements present in superbug mechanisms and that of other germs in general
- ◆ Study, in depth, the drug-use studies within pharmacoepidemiology, in order to facilitate antimicrobial selection in daily clinical practice

### Module 6. Antibiotics II

- ◆ Emphasize the role of interpretative reading with antibiograms in the identification of new resistance genotypes of clinical relevance
- ◆ Describe the major elements involved in antibiotic absorption, transportation, distribution, metabolism, and excretion

### Module 7. Antibiotics III

- ◆ Address, in detail, the most advanced scientific evidence on action mechanisms, adverse effects, dosage, and use of antimicrobials
- ◆ Explain the pathophysiologic and pathogenic interrelationships between antimicrobial use and the immune response

### Module 8. Antimycotics

- ◆ Explain the importance of controlling the use of antimicrobials as a means of reducing antibiotic resistance
- ◆ Emphasize the role of immunity and new alternatives for the treatment of infections







### **Module 9. Antiparasitics II**

- ♦ Explain the production process of new antibiotics
- ♦ Delve into the treatment of the most significant infectious diseases with the latest advances in scientific medical knowledge

### **Module 10. Antibiotic Resistance**

- ♦ Address the fundamental issue of super-resistant microbes and their relationship with antimicrobial use, based on latest advancements
- ♦ Emphasize the development of future antibiotics and other therapeutic modalities as applied with infectious diseases

### **Module 11. Monitoring and Controlling the Use of Antimicrobials**

- ♦ Emphasize the future challenges of infectious diseases in decreasing infectious diseases morbidity and mortality and antimicrobial treatment
- ♦ Develop normative or referential documents, such as clinical practice guidelines or antimicrobial usage policies, based on scientifically advanced concepts

### **Module 12. Antibiotics and Antimicrobial Treatments of the Future**

- ♦ Advise pharmaceutical and biotechnology industry teams in the process of research and production of new antimicrobials and alternative treatments for infectious diseases
- ♦ Master the most recent elements of studies on antimicrobial use

# 03 Skills

This university program has been designed by a management and teaching staff with extensive experience in the field of Antibiotic Therapy and Antibiotic Resistance, and is aimed at enhancing skills among medical professionals in the design of control plans and programs, so that they may contribute to reducing multidrug-resistant germ transmission in real situations. Students will be able to expand their skills through clinical cases and specialized readings found in the educational material of this Professional Master's Degree.



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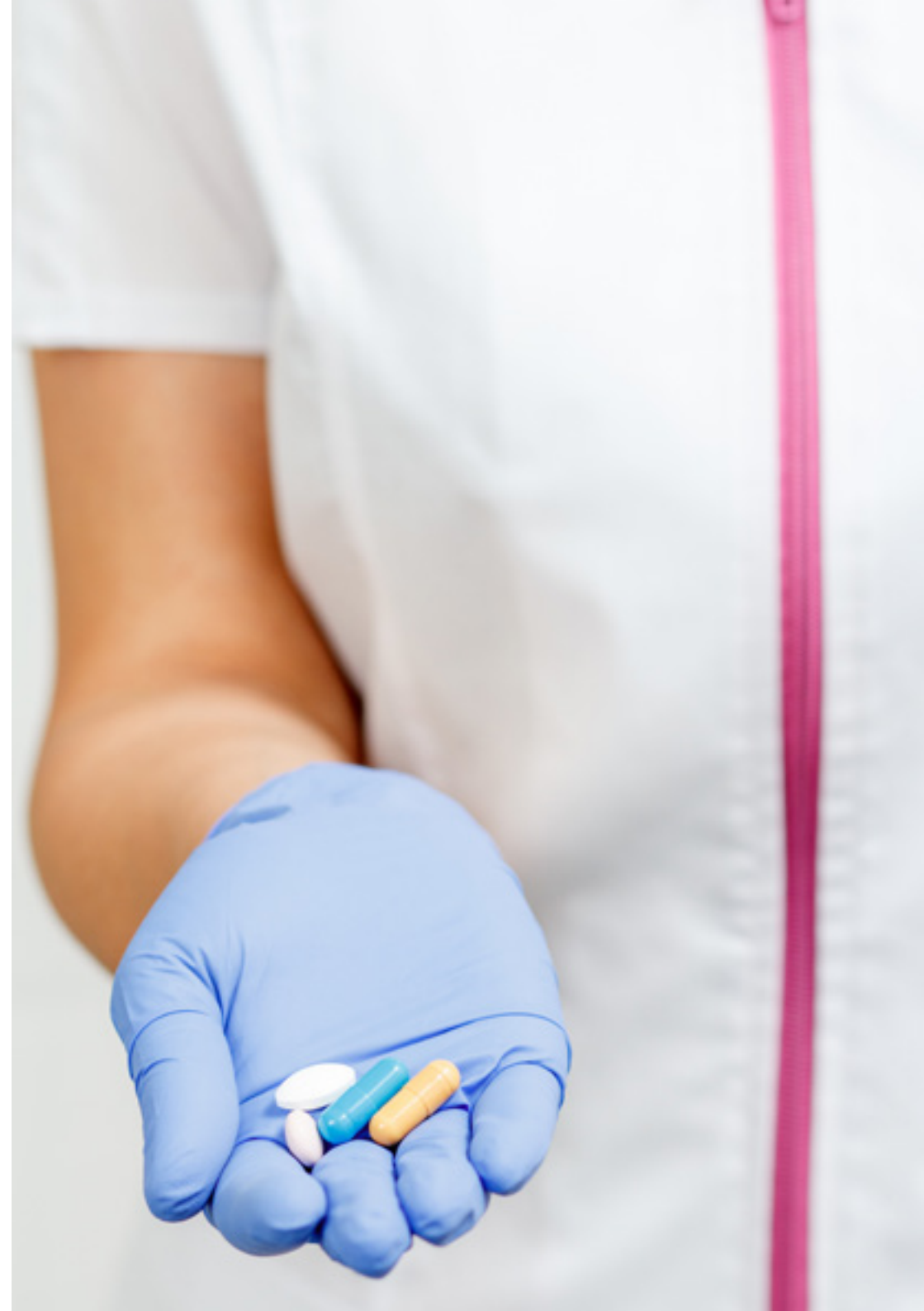
*Access to a program that highlights advances in diagnostics and appropriate treatments according to infection and patient"*



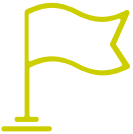
## General skills

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- ♦ Increase diagnostic and therapeutic capabilities, in order to address infectious diseases and the health care of patients generally, through an in-depth study of the latest scientific, epidemiological, clinical, pathophysiological, diagnostic, and therapeutic advances for these diseases
- ♦ Perfect skills to manage, advise, or lead multidisciplinary teams, as well as scientific research teams, that are studying the use of antibiotics and antibiotic resistance in communities or in individual patients
- ♦ Develop skills for self-improvement, in addition to being able to provide professional improvement and training activities for others, as a result of the high level of scientific and professional knowledge acquired through this program
- ♦ Educate the population in the use of antimicrobials, so that they may acquire and develop a culture of prevention that is based on healthy lifestyle choices







## Specific skills

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- ♦ Master host, antibiotic and germ determinants for antimicrobial prescription, and their impact on morbimortality rates as related to infectious diseases, based on the study of advances made and the future challenges in the field of antibiotic therapy and antibiotic resistance
- ♦ Identify and analyze the latest scientific information on antibiotic resistance in order to design plans and programs to control it
- ♦ Apply existing control measures to prevent the transmission of multiresistant germs in real and/or modeled situations
- ♦ Identify, in a timely manner, the appearance of resistant germs and the overuse of antibiotics, based on the application of the scientific method of the profession
- ♦ Carry out a timely diagnosis of the most frequent or new infections based on clinical manifestations for their correct treatment, rehabilitation, and control
- ♦ Justify the importance of clinical-therapeutic discussion as an important public health measure for the control of antimicrobial use and antibiotic resistance
- ♦ Identify the biological, social, economic, and medical risk factors that determine the incorrect use of antimicrobials
- ♦ Master the clinical, epidemiological, diagnostic, and therapeutic elements applied to counteract the main resistant bacterial threats
- ♦ Educate the community on the proper use of antibiotics
- ♦ Identify the fundamental aspects of pharmacokinetics and pharmacodynamics for the selection of antimicrobial therapeutics
- ♦ Stop the progression of antibiotic resistance, based on well-founded therapeutics and supported by compelling scientific evidence
- ♦ Correctly use and interpret all microbiological studies and other diagnostic resources in the care of patients
- ♦ Lead work teams in health institutions, such as pharmacotherapeutic and antimicrobe utilization committees



*This Professional Master's Degree will allow you to get up to date on the production of new antimicrobials and treatment alternatives for infectious diseases"*

# 04

# Course Management

TECH's philosophy is to offer students a quality education that responds to their demand for up-to-date knowledge. A commitment that is ensured not only by our in-house syllabus, but also by the careful selection of teachers that make up the programs. In this way, professionals benefit from a teaching staff specialized in Medicine, Microbiology and Epidemiology. A team that is close to, and knowledgeable on, the current reality in the field of antibiotics.





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*A specialized teaching team will answer any questions you may have on the advanced content of this Professional Master's Degree"*

## International Guest Director

Dr. Dominique Franco is a specialist in liver surgery and treatment of hepatocellular carcinoma, with an extensive background in the field of **regenerative medicine**. Throughout his career, he has focused his research on **cell therapy** for liver diseases and **organ bioconstruction**, areas in which he has made innovative contributions. His work focuses on developing new treatment techniques that not only seek to improve the effectiveness of surgical interventions, but also to optimize the quality of life of patients.

He has held leadership roles in several prestigious institutions. He was **Head of the Department of Liver Surgery and Transplantation at the Hôpital Antoine-Béclère**, where he participated in medical milestones such as the first liver transplant performed in Europe. His extensive experience in advanced surgery and transplantation has allowed him to acquire a deep knowledge in the management of complex liver pathologies, becoming a reference in the medical field both nationally and internationally. In addition, he has been **Director Emeritus of Digestive Surgery at the University Paris-Sud**, where he has contributed to the training of new generations of surgeons.

Internationally, he is recognized for his contributions to the development of Regenerative Medicine. In 2014, he founded CellSpace, an association dedicated to promoting **tissue and organ bioengineering** in France, with the aim of bringing together researchers from different disciplines to advance this field.

He has published more than 280 scientific articles in international journals, addressing topics such as Liver Surgery, **hepatocellular carcinoma** and Regenerative Medicine. In addition, he is a member of the U-1193 research unit at Inserm and a consultant at the Institut Pasteur, where he continues his work as a consultant on cutting-edge projects, contributing to expand the **boundaries of medical knowledge** in his area of expertise.





## Dr. Franco, Dominique

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- Academic Director of the Institut Pasteur, Paris, France
- Vice President Health Cluster for Physician Competitiveness
- Head of the Digestive Surgery Department at Antoine-Béclère Hospital (APHP)
- Director Emeritus of Digestive Surgery at the University Paris-Sud
- Founder of CellSpace
- Member of the research unit U-1193 of Inserm
- President of the French National Academy of Surgery

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*Thanks to TECH, you will be able to learn with the best professionals in the world”*

## Management



### Dr. Quintero Casanova, Jesús

- ♦ Head of Infectious Diseases Department, Héroes del Baire Hospital
- ♦ Medical Specialist in Africa (Chad) and Venezuela
- ♦ Master's Degree in Tropical Diseases and Clinical Infectology, Pedro Kuori Institute (Havana, Cuba)
- ♦ Professor of Medicine and Internal Medicine Specialty, Faculty of Medical Science, Isla de la Juventud
- ♦ Leading Professor of the Professional Master's Degree in Infectious Diseases of the Faculty of Medical Sciences, Isla de la Juventud
- ♦ Member of the Cuban Society of Internal Medicine
- ♦ Degree in Medicine and Surgery, Medical University of Havana

## Professors

### Dr. Luís Dávila, Heenry

- ♦ Specialist in Gynecology and Obstetrics at the Heroes del Baire Hospital (Cuba).
- ♦ Head of Neck Pathology Service at Heroes del Baire Hospital
- ♦ Medical Specialist in Guatemala
- ♦ Master's Degree in Comprehensive Care for Women
- ♦ Member of the Cuban Society of Gynecology and Obstetrics
- ♦ Member of the Cuban Society of Paediatricians
- ♦ Professor of the B.Sc. Degree in Medicine at the Faculty of Medical Science, Isla de la Juventud
- ♦ Bachelor's Degree in Medicine and Surgery, University of Havana (Cuba)

### Dr. Jiménez Valdés, Erlivan

- ♦ Bachelor's Degree in Medicine and Surgery, University of Havana (Cuba)
- ♦ Pediatric Specialist, Héroes del Baire Hospital
- ♦ Master's Degree in Comprehensive Childcare
- ♦ Member of the Cuban Society of Pediatrics
- ♦ Professor of the B.Sc. Degree in Medicine and Pediatric Medicine Speciality at the Faculty of Medical Science, Isla de la Juventud
- ♦ Member of Tribunals for National Scientific Events, Cuba
- ♦ Medical Specialist in Venezuela in 2017

**Dr. Valle Vargas, Mariano**

- ♦ Head of the Internal Medicine Department, Héroes del Baire Hospital
- ♦ Specialist in Internal Medicine, Hospital "Héroes del Baire"
- ♦ Medical Specialist in Venezuela
- ♦ Master's Degree in Health Biostatistics
- ♦ Diploma in Epidemiology
- ♦ Member of the Cuban Society of Internal Medicine
- ♦ Member of the Cuban Society of Pediatricians
- ♦ Professor of the B.Sc. Degree in Medicine and Internal Medicine Speciality at the Faculty of Medical Sciences, Isla de la Juventud
- ♦ Professor of the Professional Master's Degree in Infectious Diseases, Faculty of Medical Science, Isla de la Juventud
- ♦ Bachelor's Degree in Medicine and Surgery, University of Havana (Cuba)

**Ms. Lawrence Carmenate, Araelis**

- ♦ Microbiology Specialist
- ♦ Master's Degree in Infectious Diseases
- ♦ Professor of Biological Agents, Faculty of Medical Science, Isla de la Juventud
- ♦ Member of the Cuban Society of Microbiology
- ♦ Member of the Association of Pedagogues
- ♦ Bachelor's Degree in Microbiology, University of Havana

**Dr. Dranguet Bouly, José Ismael**

- ♦ Specialist in Internal Medicine and Intensive Care, Héroes del Baire Hospital
- ♦ Master's Degree in Infectious Diseases from the Pedro Kouri Institute of Cuba
- ♦ Medical Specialist in Mozambique
- ♦ Professor of the B.Sc. Degree in Medicine and Internal Medicine Speciality at the Faculty of Medical Sciences, Isla de la Juventud
- ♦ Professor of the Professional Master's Degree in Infectious Diseases, Faculty of Medical Science, Isla de la Juventud
- ♦ Professor at the Catholic University of Santiago de Guayaquil, Ecuador
- ♦ Member of the Cuban Society of Paediatricians
- ♦ Member of the Cuban Society of Internal Medicine and the Cuban Society of Intensive Therapy
- ♦ Degree in Medicine and Surgery, University of Havana

**Dr. Cantalapedra Torres, Alejandro**

- ♦ Specialist in Pediatrics at Héroes del Baire Hospital
- ♦ Master's Degree in Infectious Diseases
- ♦ Certificate in Medical Teaching
- ♦ Certificate in Health Management
- ♦ Professor of the B.Sc. Degree in Medicine and Pediatrics Specialty at the Faculty of Medical Science, Isla de la Juventud
- ♦ Member of the Cuban Society of Pediatrics
- ♦ Medical Specialist in Haiti
- ♦ Medical Specialist in Antigua and Barbuda
- ♦ Bachelor's Degree in Medicine and Surgery, University of Havana (Cuba)

**Dr. Batista Valladares, Adrián**

- ♦ Bachelor's Degree in Medicine and Surgery, University of Havana (Cuba)
- ♦ Pediatric Specialist, Héroes del Baire Hospital
- ♦ Master's Degree in comprehensive childcare
- ♦ Member of the Cuban Society of Pediatrics
- ♦ Professor of the B.Sc. Degree in Medicine and Pediatrics Specialty at the Faculty of Medical Science, Isla de la Juventud
- ♦ Member of Tribunals for National Scientific Events, Cuba
- ♦ Medical Specialist in Venezuela in 2017

**Ms. González Fiallo, Sayli**

- ♦ Director of the Health Analysis, Biostatistics, and Surveillance Unit of the Municipal Health Directorate, Isla de la Juventud
- ♦ Professor of the Faculty of Medical Sciences, Isla de la Juventud
- ♦ Master's Degree in Epidemiology
- ♦ Bachelor's Degree in Hygiene and Epidemiology







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*Take the step to get up to date on the latest developments in Advances in Antibiotic Therapy and Antibiotic Resistance”*

# 05

## Structure and Content

This Professional Master's Degree is easy for medical professionals to study thanks to its multimedia-based content and the Relearning system, which enables, due to its fluidity, the reduction of the long study hours that are so common in other teaching methods. In this Professional Master's Degree, students will find a syllabus consisting of 12 modules, which will allow them to keep abreast of the latest developments in microbiology, antibiotics and a future look at the treatments that laboratories are already working on in order to address antibiotic resistance.





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*A syllabus that will immerse you more comprehensively in the field of antibiotics, microbiology and antivirals"*



## Module 1. Overview of Microbiology

- 1.1. General Elements of Microbiology
  - 1.1.1. The Role of Microbiology in the Study of Infectious Diseases
  - 1.1.2. Structure and Function of the Microbiology Laboratory
  - 1.1.3. Indication and Interpretation of Microbiological Studies
- 1.2. Virology
  - 1.2.1. General Characteristics of Viruses
  - 1.2.2. Classification and Main Viruses Affecting Humans
  - 1.2.3. Emerging Viruses
  - 1.2.4. Virological Studies
- 1.3. Bacteriology: Current Concepts for Antibiotic Therapeutics
  - 1.3.1. General Characteristics of Bacteria
  - 1.3.2. Classification and Main Bacteria Affecting Humans
  - 1.3.3. Microbiological Studies
- 1.4. Mycology
  - 1.4.1. General Characteristics of Fungi
  - 1.4.2. Classification and Main Fungi Affecting Humans
  - 1.4.3. Mycological Studies
- 1.5. Parasitology
  - 1.5.1. General Characteristics of Parasites
  - 1.5.2. Classification and Main Parasites Affecting Humans
  - 1.5.3. Parasitological Studies
- 1.6. The Microbiological Sample: Collection, Storage and Transport
  - 1.6.1. The Microbiological Sampling Process: Pre-Analytical, Analytical, and Post-Analytical Stages
  - 1.6.2. Sampling Requirements for the Main Microbiological Studies used in Daily Clinical Practice: Blood, Urine, Stool, Sputum
- 1.7. Antibigram: New Concepts for Interpretation and Utilization
  - 1.7.1. Traditional Antibigram Reading
  - 1.7.2. Interpreted Antibigram Reading and the Mechanisms of New Antimicrobial Resistance Phenotypes
  - 1.7.3. Antimicrobial Mapping and Resistance Patterns



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- 1.8. Rapid Diagnostic Methods: News about their Application
    - 1.8.1. Rapid Diagnostic Methods for Viruses
    - 1.8.2. Rapid Diagnostic Methods for Bacteria
    - 1.8.3. Rapid Diagnostic Methods for Fungi
    - 1.8.4. Rapid Diagnostic Methods for Parasites
  - 1.9. Molecular Biology in Microbiological Diagnostics: Its Role in the Future
    - 1.9.1. Development and Application of Molecular Biology in Microbiological Methods
  - 1.10. Microbiology: Challenges to Improve Antibiotic Usage and Control Antibiotic Resistance
    - 1.10.1. Challenges and Obstacles for Microbiological Diagnostics
    - 1.10.2. Future Challenges of Microbiology Laboratory Management in the Correct and Rational Use of Antibiotics
    - 1.10.3. Future Microbiological Techniques to Study Antibiotic Resistance

## Module 2. Introduction to Pharmacology and Treatment

- 2.1. Utility of Clinical Pharmacology
  - 2.1.1. Concept
  - 2.1.2. Object of Study
  - 2.1.3. Branches of Pharmacology
  - 2.1.4. Use of Clinical Pharmacology
- 2.2. Pharmacokinetics: Certainties and Contradictions in its Practical Use
  - 2.2.1. The Dynamics of Absorption, Distribution, Metabolism, and Elimination of Drugs, Especially Antimicrobials
- 2.3. Pharmacodynamics: Practical Use with New Antimicrobials
  - 2.3.1. Molecular Mechanisms of Action of Drugs, Especially Antimicrobials
  - 2.3.2. Drug-Drug Interactions of Antibiotics with Other Medications
  - 2.3.3. Pharmacokinetics/Pharmacodynamics Models in Antibiotic Use
- 2.4. Pharmacovigilance
  - 2.4.1. Concept
  - 2.4.2. Objectives
  - 2.4.3. Antibiotic Adverse Reactions
- 2.5. Pharmacoepidemiology: Update on Antimicrobial Research
  - 2.5.1. Concept
  - 2.5.2. Objectives
  - 2.5.3. Drug Usage Studies



- 2.6. Clinical Trials
  - 2.6.1. Concept
  - 2.6.2. Methodology
  - 2.6.3. Objectives
  - 2.6.4. The Stages of Clinical Trials
  - 2.6.5. Uses
- 2.7. Meta-Analysis
  - 2.7.1. Concept
  - 2.7.2. Methodology
  - 2.7.3. Objectives
  - 2.7.4. Uses
- 2.8. Rational Treatment: From Old to New and Evidence-Based Medicine
  - 2.8.1. Stages of Rational Treatment
  - 2.8.2. Use and Importance of Rational Treatment
- 2.9. Clinical Practice Guidelines: New Approaches to Practical Application
  - 2.9.1. Creating Clinical Practice Guidelines
  - 2.9.2. The Impact of Clinical Practice Guidelines
- 2.10. Clinical Pharmacology: Advances and Future Perspectives for the Improvement of Antibiotic Treatment
  - 2.10.1. Research Activities and Scientific Advances: Pharmacy Fiction?
  - 2.10.2. Molecular Pharmacology and its Role in Antibiotic Therapy

### Module 3. Antimicrobials: General Aspects

- 3.1. History and Development of Antimicrobials
  - 3.1.1. Emergence and Development of Antimicrobial Treatments
  - 3.1.2. Impact on Morbimortality of Infectious Diseases
- 3.2. Classifications: Practical and Future Use of Each One of Them
  - 3.2.1. Chemical Classification
  - 3.2.2. Classification by Antimicrobial Action
  - 3.2.3. Classification According to their Antimicrobial Spectrum
- 3.3. Update on the Mechanisms of Action of Antimicrobials
  - 3.3.1. Main Antimicrobial Mechanisms of Action
- 3.4. General and Latest Elements of Antimicrobial Treatments
  - 3.4.1. General and Recent Concepts in the Use of Antimicrobials
  - 3.4.2. New Developments in the Use of Antimicrobial Combinations
  - 3.4.3. Interactions between Antimicrobials
- 3.5. Antibiotic Prophylaxis: Its Current Role in Surgical Morbidity and Mortality
  - 3.5.1. Concept
  - 3.5.2. Objectives
  - 3.5.3. Types of Antibiotic Prophylaxis
  - 3.5.4. Perioperative Antibiotic Prophylaxis
- 3.6. Phased Antibiotic Treatment: Current Criteria
  - 3.6.1. Concept
  - 3.6.2. Principles
  - 3.6.3. Objectives
- 3.7. Latest Concepts in the Use of Antibiotics in Renal Failure
  - 3.7.1. Renal Excretion of Antibiotics
  - 3.7.2. Renal Toxicity of Antibiotics
  - 3.7.3. Dose Modification in Renal Failure
- 3.8. Antibiotics and the Blood-Brain Barrier: Recent Findings
  - 3.8.1. Passage of Antibiotics through the Blood-Brain Barrier
  - 3.8.2. Antibiotics in Central Nervous System Infections
- 3.9. Antibiotics and Liver Failure: Progress and Future Challenges
  - 3.9.1. Hepatic Metabolism of Antibiotics
  - 3.9.2. Hepatic Toxicity of Antimicrobials
  - 3.9.3. Dose Adjustment in Hepatic Insufficiency
- 3.10. Antibiotic Use in the Immunosuppressed: The New Paradigm
  - 3.10.1. Immune Response to Infection
  - 3.10.2. Main Opportunistic Germs in the Immunosuppressed
  - 3.10.3. Principles for the Choice and Duration of Antibiotic Therapy in the Immunosuppressed
- 3.11. Antibiotics in Pregnancy and Lactation: The Safety of their Use According to the Latest Scientific Findings
  - 3.11.1. The Passage of Antibiotics through the Placenta
  - 3.11.2. Antibiotics and Breast Milk
  - 3.11.3. Teratogenicity of Antibiotics

## Module 4. Antivirals

- 4.1. General Features of Antivirals
  - 4.1.1. Classification
  - 4.1.2. Main Indications of Antivirals
- 4.2. Mechanisms of Action
  - 4.2.1. Mechanisms of Action of Antivirals
- 4.3. Antivirals for Hepatitis: New Recommendations and Future Research Projections
  - 4.3.1. Specific Viral Hepatitis
  - 4.3.2. Hepatitis B Treatment
  - 4.3.3. Hepatitis C Treatment
- 4.4. Antivirals for Respiratory Infections: Current Scientific Evidence
  - 4.4.1. Main Respiratory Viruses
  - 4.4.2. Influenza Treatment
  - 4.4.3. Other Respiratory System Virus Treatments
- 4.5. Antivirals for Herpes Viruses: Recent Changes in Management
  - 4.5.1. Main Herpes Virus Infections
  - 4.5.2. Herpes Simplex Infection Treatment
  - 4.5.3. Treatment of Varicella Zoster Virus Infections
- 4.6. Antiretrovirals for HIV: Certainties and Controversies Future Challenges
  - 4.6.1. Classification of Antiretrovirals
  - 4.6.2. Mechanisms of Action of Antiretrovirals
  - 4.6.3. Antiretroviral Treatment of HIV Infection
  - 4.6.4. Adverse Reactions
  - 4.6.5. Antiretroviral Treatment Failure
- 4.7. Topical Antivirals
  - 4.7.1. Main Viral Infections of the Skin and Mucous Membranes
  - 4.7.2. Topical Antivirals
- 4.8. Update on Interferons: Their Use in Viral and Non-Infectious Diseases
  - 4.8.1. Classification and Action of Interferons
  - 4.8.2. Uses of Interferons
  - 4.8.3. Adverse Reactions of Interferons
- 4.9. New Areas of Antiviral Development
  - 4.9.1. Antibiotics in Viral Hemorrhagic Diseases
  - 4.9.2. Future Prospects for Antiviral Chemotherapy

## Module 5. Antibiotics I

- 5.1. Advances in Knowledge of the Synthesis and Structure of the Beta-Lactam Ring
  - 5.1.1. Structure of the Beta-Lactam Ring
  - 5.1.2. Drugs that Act on the Synthesis of the Beta-Lactam Ring
- 5.2. Penicillin: New Drugs and their Future Role in Anti-Infection Treatments
  - 5.2.1. Classification
  - 5.2.2. Action Mechanism
  - 5.2.3. Antimicrobial Spectrum
  - 5.2.4. Pharmacokinetics and Pharmacodynamics
  - 5.2.5. Therapeutic Uses
  - 5.2.6. Adverse Effects
  - 5.2.7. Presentation and Dosage
- 5.3. Antistaphylococcal Penicillins: From Old to New and their Practical Implications
  - 5.3.1. Classification
  - 5.3.2. Action Mechanism
  - 5.3.3. Antimicrobial Spectrum
  - 5.3.4. Pharmacokinetics and Pharmacodynamics
  - 5.3.5. Therapeutic Uses
  - 5.3.6. Adverse Effects
  - 5.3.7. Presentation and Dosage
- 5.4. Antipseudomonal Penicillins: Current Resistance Challenge
  - 5.4.1. Classification
  - 5.4.2. Action Mechanism
  - 5.4.3. Antimicrobial Spectrum
  - 5.4.4. Pharmacokinetics and Pharmacodynamics
  - 5.4.5. Therapeutic Uses
  - 5.4.6. Adverse Effects
  - 5.4.7. Presentation and Dosage
- 5.5. Cephalosporins: Present and Future
  - 5.5.1. Classification
  - 5.5.2. Action Mechanism
  - 5.5.3. Antimicrobial Spectrum
  - 5.5.4. Pharmacokinetics and Pharmacodynamics
  - 5.5.5. Therapeutic Uses
  - 5.5.6. Adverse Effects
  - 5.5.7. Presentation and Dosage

- 5.6. Oral Cephalosporins: New Developments in their Outpatient Use
  - 5.6.1. Classification
  - 5.6.2. Action Mechanism
  - 5.6.3. Antimicrobial Spectrum
  - 5.6.4. Pharmacokinetics and Pharmacodynamics
  - 5.6.5. Therapeutic Uses
  - 5.6.6. Adverse Effects
  - 5.6.7. Presentation and Dosage
- 5.7. Monobactams
  - 5.7.1. Classification
  - 5.7.2. Action Mechanism
  - 5.7.3. Antimicrobial Spectrum
  - 5.7.4. Pharmacokinetics and Pharmacodynamics
  - 5.7.5. Therapeutic Uses
  - 5.7.6. Adverse Effects
  - 5.7.7. Presentation and Dosage
- 5.8. Carbapenemics
  - 5.8.1. Classification
  - 5.8.2. Action Mechanism
  - 5.8.3. Antimicrobial Spectrum
  - 5.8.4. Pharmacokinetics and Pharmacodynamics
  - 5.8.5. Therapeutic Uses
  - 5.8.6. Adverse Effects
  - 5.8.7. Presentation and Dosage
- 5.9. Beta-Lactamases: Recent Discovery of Strains and their Role in Resistance
  - 5.9.1. Classification
  - 5.9.2. Action on Beta-Lactams
- 5.10. Beta-Lactamase Inhibitors
  - 5.10.1. Classification
  - 5.10.2. Action Mechanism
  - 5.10.3. Antimicrobial Spectrum
  - 5.10.4. Pharmacokinetics and Pharmacodynamics
  - 5.10.5. Therapeutic Uses
  - 5.10.6. Adverse Effects
  - 5.10.7. Presentation and Dosage

## Module 6. Antibiotics II

- 6.1. Glycopeptides: The New Drugs for Gram-Positive Germs
  - 6.1.1. Classification
  - 6.1.2. Action Mechanism
  - 6.1.3. Antimicrobial Spectrum
  - 6.1.4. Pharmacokinetics and Pharmacodynamics
  - 6.1.5. Therapeutic Uses
  - 6.1.6. Adverse Effects
  - 6.1.7. Presentation and Dosage
- 6.2. Cyclic Lipopeptides: Recent Advances and its Future Role
  - 6.2.1. Classification
  - 6.2.2. Action Mechanism
  - 6.2.3. Antimicrobial Spectrum
  - 6.2.4. Pharmacokinetics and Pharmacodynamics
  - 6.2.5. Therapeutic Uses
  - 6.2.6. Adverse Effects
  - 6.2.7. Presentation and Dosage
- 6.3. Macrolides: Their Role as an Immunomodulator in the Respiratory System
  - 6.3.1. Classification
  - 6.3.2. Action Mechanism
  - 6.3.3. Antimicrobial Spectrum
  - 6.3.4. Pharmacokinetics and Pharmacodynamics
  - 6.3.5. Therapeutic Uses
  - 6.3.6. Adverse Effects
  - 6.3.7. Presentation and Dosage
- 6.4. Ketolides
  - 6.4.1. Classification
  - 6.4.2. Action Mechanism
  - 6.4.3. Antimicrobial Spectrum
  - 6.4.4. Pharmacokinetics and Pharmacodynamics
  - 6.4.5. Therapeutic Uses
  - 6.4.6. Adverse Effects
  - 6.4.7. Presentation and Dosage

- 6.5. Tetracyclines: Old and New Indications According to the Most Recent Advances in Emerging Diseases
  - 6.5.1. Classification
  - 6.5.2. Action Mechanism
  - 6.5.3. Antimicrobial Spectrum
  - 6.5.4. Pharmacokinetics and Pharmacodynamics
  - 6.5.5. Therapeutic Uses
  - 6.5.6. Adverse Effects
  - 6.5.7. Presentation and Dosage
- 6.6. Aminoglycosides: Facts and Realities of their Current and Future Utilization
  - 6.6.1. Classification
  - 6.6.2. Action Mechanism
  - 6.6.3. Antimicrobial Spectrum
  - 6.6.4. Pharmacokinetics and Pharmacodynamics
  - 6.6.5. Current Therapeutic Uses and Future Trends
  - 6.6.6. Adverse Effects
  - 6.6.7. Presentation and Dosage
- 6.7. Quinolones: All Generations and Practical Use
  - 6.7.1. Classification
  - 6.7.2. Action Mechanism
  - 6.7.3. Antimicrobial Spectrum
  - 6.7.4. Pharmacokinetics and Pharmacodynamics
  - 6.7.5. Therapeutic Uses
  - 6.7.6. Adverse Effects
  - 6.7.7. Presentation and Dosage
- 6.8. Respiratory Quinolones: Latest Recommendations on their Use
  - 6.8.1. Classification
  - 6.8.2. Action Mechanism
  - 6.8.3. Antimicrobial Spectrum
  - 6.8.4. Pharmacokinetics and Pharmacodynamics
  - 6.8.5. Therapeutic Uses
  - 6.8.6. Adverse Effects
  - 6.8.7. Presentation and Dosage

- 6.9. Streptogramins
  - 6.9.1. Classification
  - 6.9.2. Action Mechanism
  - 6.9.3. Antimicrobial Spectrum
  - 6.9.4. Pharmacokinetics and Pharmacodynamics
  - 6.9.5. Therapeutic Uses
  - 6.9.6. Adverse Effects
  - 6.9.7. Presentation and Dosage

## Module 7. Antibiotics III

- 7.1. Oxazolidinones
  - 7.1.1. Classification
  - 7.1.2. Action Mechanism
  - 7.1.3. Antimicrobial Spectrum
  - 7.1.4. Pharmacokinetics and Pharmacodynamics
  - 7.1.5. Therapeutic Uses
  - 7.1.6. Adverse Effects
  - 7.1.7. Presentation and Dosage
- 7.2. Sulfas
  - 7.2.1. Classification
  - 7.2.2. Action Mechanism
  - 7.2.3. Antimicrobial Spectrum
  - 7.2.4. Pharmacokinetics and Pharmacodynamics
  - 7.2.5. Therapeutic Uses
  - 7.2.6. Adverse Effects
  - 7.2.7. Presentation and Dosage
- 7.3. Lincosamides
  - 7.3.1. Classification
  - 7.3.2. Action Mechanism
  - 7.3.3. Antimicrobial Spectrum
  - 7.3.4. Pharmacokinetics and Pharmacodynamics
  - 7.3.5. Therapeutic Uses
  - 7.3.6. Adverse Effects
  - 7.3.7. Presentation and Dosage

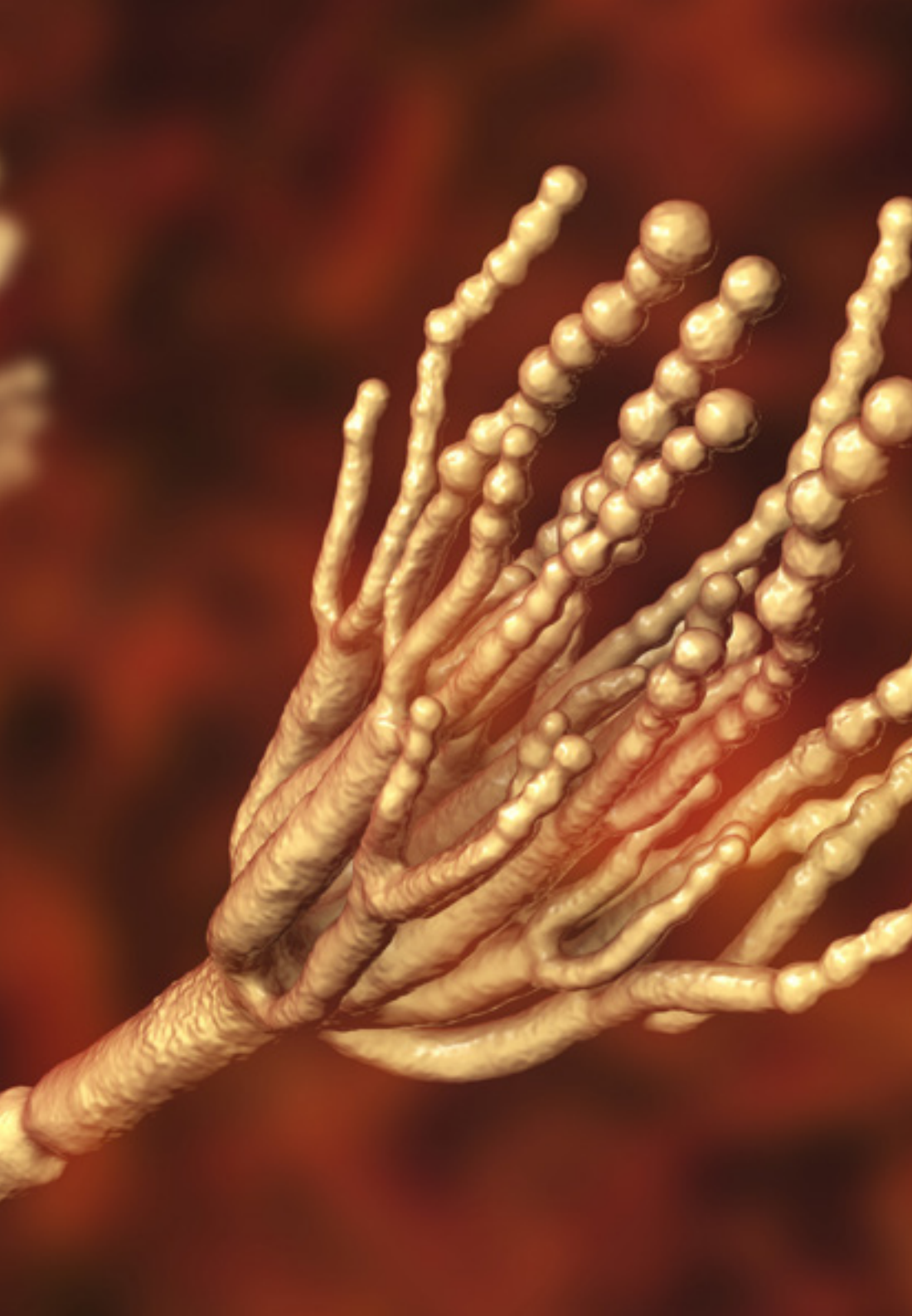
- 7.4. Rifamycins: Practical Use in TB and Other Infections Today
  - 7.4.1. Classification
  - 7.4.2. Action Mechanism
  - 7.4.3. Antimicrobial Spectrum
  - 7.4.4. Pharmacokinetics and Pharmacodynamics
  - 7.4.5. Therapeutic Uses
  - 7.4.6. Adverse Effects
  - 7.4.7. Presentation and Dosage
- 7.5. Antifolates
  - 7.5.1. Classification
  - 7.5.2. Action Mechanism
  - 7.5.3. Antimicrobial Spectrum
  - 7.5.4. Pharmacokinetics and Pharmacodynamics
  - 7.5.5. Therapeutic Uses
  - 7.5.6. Adverse Effects
  - 7.5.7. Presentation and Dosage
- 7.6. Antibiotics for Leprosy: Recent Advances
  - 7.6.1. Classification
  - 7.6.2. Action Mechanism
  - 7.6.3. Antimicrobial Spectrum
  - 7.6.4. Pharmacokinetics and Pharmacodynamics
  - 7.6.5. Therapeutic Uses
  - 7.6.6. Adverse Effects
  - 7.6.7. Presentation and Dosage
- 7.7. Antituberculosis Drugs: Latest Recommendations for their Use
  - 7.7.1. Classification
  - 7.7.2. Action Mechanism
  - 7.7.3. Antimicrobial Spectrum
  - 7.7.4. Pharmacokinetics and Pharmacodynamics
  - 7.7.5. Therapeutic Uses
  - 7.7.6. Adverse Effects
  - 7.7.7. Presentation and Dosage

- 7.8. Parenteral Antibiotic Use in Outpatients: Latest Recommendations
  - 7.8.1. Main Indications for Parenteral Antibiotics in Outpatients
  - 7.8.2. Monitoring Outpatients Receiving Parenteral Antibiotic Treatment
- 7.9. Latest Advances on Antibiotics for Multidrug Resistant Bacteria
  - 7.9.1. Antibiotics for Multidrug-Resistant Gram-Positive Bacteria
  - 7.9.2. Antibiotics for Multidrug-Resistant Gram-Negative Bacteria

## Module 8. Antimycotics

- 8.1. General Elements
  - 8.1.1. Concept
  - 8.1.2. Origins and Development
- 8.2. Classification
  - 8.2.1. Classification According to Chemical Structure
  - 8.2.2. Classification According to Action: Local and Systemic
- 8.3. Mechanisms of Action
  - 8.3.1. Mechanisms of Action of Antifungal Agents
- 8.4. Systemic Antifungal Agents: News on their Toxicity and their Present and Future Indications
  - 8.4.1. Antimicrobial Spectrum
  - 8.4.2. Pharmacokinetics and Pharmacodynamics
  - 8.4.3. Therapeutic Uses
  - 8.4.4. Adverse Effects
  - 8.4.5. Presentation and Dosage
- 8.5. Amphotericin B: Novel Concepts in its Use
  - 8.5.1. Action Mechanism
  - 8.5.2. Antimicrobial Spectrum
  - 8.5.3. Pharmacokinetics and Pharmacodynamics
  - 8.5.4. Therapeutic Uses
  - 8.5.5. Adverse Effects
  - 8.5.6. Presentation and Dosage
- 8.6. Deep Mycosis Treatment: Current Events and Future Perspectives
  - 8.6.1. Aspergillosis
  - 8.6.2. Coccidioidomycosis
  - 8.6.3. Cryptococcosis
  - 8.6.4. Histoplasmosis





- 8.7. Local Antifungals
  - 8.7.1. Antimicrobial Spectrum
  - 8.7.2. Pharmacokinetics and Pharmacodynamics
  - 8.7.3. Therapeutic Uses
  - 8.7.4. Adverse Effects
  - 8.7.5. Presentation and Dosage
- 8.8. Treatment of Skin and Mucous Mycosis
  - 8.8.1. Tinea Capitis
  - 8.8.2. Skin Tinea
  - 8.8.3. Onychomycosis
- 8.9. Liver Toxicity of Systemic Antifungal Agents: Future Challenges
  - 8.9.1. Liver Metabolism of Antifungal Agents
  - 8.9.2. Hepatotoxicity of Antifungal Agents

## Module 9. Antiparasitics II

- 9.1. General Elements
  - 9.1.1. Concept
  - 9.1.2. Origins and Development
- 9.2. Classification
  - 9.2.1. Classification by Chemical Structure
  - 9.2.2. Classification by Action Against Different Parasites
- 9.3. Mechanisms of Action
  - 9.3.1. Action Mechanisms of Antiparasitics
- 9.4. Antiparasitics for Intestinal Parasitism: New Advances
  - 9.4.1. Classification
  - 9.4.2. Action Mechanism
  - 9.4.3. Antimicrobial Spectrum
  - 9.4.4. Pharmacokinetics and Pharmacodynamics
  - 9.4.5. Therapeutic Uses
  - 9.4.6. Adverse Effects
  - 9.4.7. Presentation and Dosage

- 9.5. Antimalarials: Latest WHO Recommendations
  - 9.5.1. Classification
  - 9.5.2. Action Mechanism
  - 9.5.3. Antimicrobial Spectrum
  - 9.5.4. Pharmacokinetics and Pharmacodynamics
  - 9.5.5. Therapeutic Uses
  - 9.5.6. Adverse Effects
  - 9.5.7. Presentation and Dosage
- 9.6. Update on Antiparasitics for Filariasis
  - 9.6.1. Classification
  - 9.6.2. Action Mechanism
  - 9.6.3. Antimicrobial Spectrum
  - 9.6.4. Pharmacokinetics and Pharmacodynamics
  - 9.6.5. Therapeutic Uses
  - 9.6.6. Adverse Effects
  - 9.6.7. Presentation and Dosage
- 9.7. Latest Advances in Antiparasitics for Trypanosomiasis
  - 9.7.1. Classification
  - 9.7.2. Action Mechanism
  - 9.7.3. Antimicrobial Spectrum
  - 9.7.4. Pharmacokinetics and Pharmacodynamics
  - 9.7.5. Therapeutic Uses
  - 9.7.6. Adverse Effects
  - 9.7.7. Presentation and Dosage
- 9.8. Antiparasitics for Schistosomiasis
  - 9.8.1. Classification
  - 9.8.2. Action Mechanism
  - 9.8.3. Antimicrobial Spectrum
  - 9.8.4. Pharmacokinetics and Pharmacodynamics
  - 9.8.5. Therapeutic Uses
  - 9.8.6. Adverse Effects
  - 9.8.7. Presentation and Dosage

- 9.9. Antiparasitics for Leishmaniasis
  - 9.9.1. Classification
  - 9.9.2. Action Mechanism
  - 9.9.3. Antimicrobial Spectrum
  - 9.9.4. Pharmacokinetics and Pharmacodynamics
  - 9.9.5. Therapeutic Uses
  - 9.9.6. Adverse Effects
  - 9.9.7. Presentation and Dosage
- 9.10. Treatment of Other Less Common Parasitosis
  - 9.10.1. Dracunculiasis
  - 9.10.2. Hydatid Cyst
  - 9.10.3. Other Tissue Parasites

## Module 10. Antibiotic Resistance

- 10.1. Emergence and Development of Antibiotic Resistance
  - 10.1.1. Concept
  - 10.1.2. Classification
  - 10.1.3. Origins and Development
- 10.2. Mechanisms of Antibiotic Resistance: An Update
  - 10.2.1. Mechanisms of Antimicrobial Resistance
  - 10.2.2. New Resistance Mechanisms
- 10.3. Staphylococcal Resistance: Yesterday, Today, and Tomorrow
  - 10.3.1. Evolution of Staphylococcal Resistance
  - 10.3.2. Mechanisms of Staphylococcal Resistance
- 10.4. Resistance of Gram-Positive Germs: Latest Figure 2. Principles of Corporate Governance.
  - 10.4.1. Evolution and Resistance of Gram-Positive Germs
  - 10.4.2. Resistance Mechanisms of Gram-Positive Germs
- 10.5. Resistance of Gram-Negative Germs: Current Clinical Implications
  - 10.5.1. Evolution of Gram-Negative Germ Resistance
  - 10.5.2. Resistance Mechanisms of Gram-Negative Germs

- 10.6. Virus Resistance
  - 10.6.1. Evolution of Virus Resistance
  - 10.6.2. Virus Resistance Mechanisms
- 10.7. Fungal Resistance
  - 10.7.1. Evolution of Fungal Resistance
  - 10.7.2. Mechanisms of Fungal Resistance
- 10.8. Parasite Resistance: An Emerging Problem
  - 10.8.1. Evolution of Parasite Resistance
  - 10.8.2. Mechanisms of Parasite Resistance
  - 10.8.3. Resistance to Antimalarials
- 10.9. New Mechanisms of Antibiotic Resistance and Superbugs
  - 10.9.1. Emergence and Progression of Superbugs
  - 10.9.2. New Resistance Mechanisms of Superbugs
- 10.10. Antibiotic Resistance Control Mechanisms and Programs
  - 10.10.1. Antibiotic Resistance Control Strategies
  - 10.10.2. Global Program and International Experiences in the Control of Antibiotic Resistance

## Module 11. Monitoring and Controlling the Use of Antimicrobials

- 11.1. Antibiotic Treatment Duration in the Treatment of Infections: New Role of Biomarkers
  - 11.1.1. Update on the Adequate Duration of the Most Frequent Infections
  - 11.1.2. Clinical and Laboratory Parameters to Determine the Duration of Treatment
- 11.2. Antimicrobial Usage Studies: Most Recent Impacts
  - 11.2.1. The Significance of Antimicrobial Usage Studies
  - 11.2.2. Results of Greater Impact in Recent Years by Antimicrobial Usage Studies
- 11.3. Antibiotic Committees in Hospitals: Their Role in the Future
  - 11.3.1. Structure and Operation
  - 11.3.2. Objectives
  - 11.3.3. Activities
  - 11.3.4. Impacts

- 11.4. Antimicrobial Use Policies: Current Impact on Antimicrobial Use
  - 11.4.1. Concepts
  - 11.4.2. Types of Policies
  - 11.4.3. Objectives
  - 11.4.4. Impacts
- 11.5. Pharmacotherapeutic Committees: Practical Importance
  - 11.5.1. Structure and Function
  - 11.5.2. Objectives
  - 11.5.3. Activities
  - 11.5.4. Impacts
- 11.6. Infectious Disease Specialists and their Role in the Rational Use of Antimicrobials
  - 11.6.1. Functions and Activities of Infectious Disease Specialists to Promote and Encourage the Rational Use of Antimicrobials
- 11.7. Impact of Training and Professional Development on Antimicrobial Usage
  - 11.7.1. Importance of Training and Professional Development
  - 11.7.2. Types
  - 11.7.3. Impacts
- 11.8. Hospital Strategies for Rational Antimicrobial Use: What the Evidence Says
  - 11.8.1. Hospital Strategies for the Control of the Rational Use of Antimicrobials
  - 11.8.2. Impacts
- 11.9. Scientific Research for the Future Control and Monitoring of Antibiotic Therapy in Patients with Sepsis
  - 11.9.1. Search for New Parameters and Markers for Monitoring and Control of Antibiotic Therapeutics

## Module 12. Antibiotics and Antimicrobial Treatments of the Future

- 12.1. Research, Approval, and Commercialization of New Antibiotics
  - 12.1.1. Antimicrobial Research
  - 12.1.2. Antimicrobial Approval Process
  - 12.1.3. Antimicrobial Marketing and Large Pharmaceutical Companies
- 12.2. Ongoing Clinical Trials for the Approval of New Antibiotics
  - 12.2.1. New Clinical Trials on Antimicrobials
- 12.3. Old Antibiotics with New Uses
  - 12.3.1. The Role of Old Antibiotics with New Uses
  - 12.3.2. Antimicrobial Withdrawal
  - 12.3.3. Chemical Alterations of Old Antimicrobials
- 12.4. Treatment Goals and New Ways to Fight Infections: What's New in Research
  - 12.4.1. New Treatment Goals
  - 12.4.2. New Ways to Treat Sepsis
- 12.5. Monoclonal Antibodies in Infections: Present and Future
  - 12.5.1. Origin and Emergence of Monoclonal Antibodies
  - 12.5.2. Classification
  - 12.5.3. Clinical Uses
  - 12.5.4. Impact Results in Infectious Diseases
- 12.6. Other Drugs to Regulate and Stimulate Immune Response against Infection
  - 12.6.1. Drugs to Regulate and Control the Immune Response
- 12.7. Futuristic Antibiotics
  - 12.7.1. The Future of Antimicrobials
  - 12.7.2. Antibiotics of the Future







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*We provide you with a university program that will give you insight into the work being undertaken today for the antibiotics of the future”*



06

# Methodology

This academic program offers students a different way of learning. Our methodology uses a cyclical learning approach: **Relearning**.

This teaching system is used, for example, in the most prestigious medical schools in the world, and major publications such as the **New England Journal of Medicine** have considered it to be one of the most effective.



“

*Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"*

## At TECH we use the Case Method

What should a professional do in a given situation? Throughout the program, students will face multiple simulated clinical cases, based on real patients, in which they will have to do research, establish hypotheses, and ultimately resolve the situation. There is an abundance of scientific evidence on the effectiveness of the method. Specialists learn better, faster, and more sustainably over time.

*With TECH you will experience a way of learning that is shaking the foundations of traditional universities around the world.*



According to Dr. Gérvas, the clinical case is the annotated presentation of a patient, or group of patients, which becomes a "case", an example or model that illustrates some peculiar clinical component, either because of its teaching power or because of its uniqueness or rarity. It is essential that the case is based on current professional life, trying to recreate the real conditions in the physician's professional practice.



“

*Did you know that this method was developed in 1912, at Harvard, for law students? The case method consisted of presenting students with real-life, complex situations for them to make decisions and justify their decisions on how to solve them. In 1924, Harvard adopted it as a standard teaching method”*

The effectiveness of the method is justified by four fundamental achievements:

1. Students who follow this method not only achieve the assimilation of concepts, but also a development of their mental capacity, through exercises that evaluate real situations and the application of knowledge.
2. Learning is solidly translated into practical skills that allow the student to better integrate into the real world.
3. Ideas and concepts are understood more efficiently, given that the example situations are based on real-life.
4. Students like to feel that the effort they put into their studies is worthwhile. This then translates into a greater interest in learning and more time dedicated to working on the course.





## Relearning Methodology

At TECH we enhance the case method with the best 100% online teaching methodology available: Relearning.

This university is the first in the world to combine the study of clinical cases with a 100% online learning system based on repetition, combining a minimum of 8 different elements in each lesson, a real revolution with respect to the mere study and analysis of cases.

*Professionals will learn through real cases and by resolving complex situations in simulated learning environments. These simulations are developed using state-of-the-art software to facilitate immersive learning.*



At the forefront of world teaching, the Relearning method has managed to improve the overall satisfaction levels of professionals who complete their studies, with respect to the quality indicators of the best online university (Columbia University).

With this methodology, more than 250,000 physicians have been trained with unprecedented success in all clinical specialties regardless of surgical load. Our pedagogical methodology is developed in a highly competitive environment, with a university student body with a strong socioeconomic profile and an average age of 43.5 years old.

*Relearning will allow you to learn with less effort and better performance, involving you more in your specialization, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation to success.*

In our program, learning is not a linear process, but rather a spiral (learn, unlearn, forget, and re-learn). Therefore, we combine each of these elements concentrically.

The overall score obtained by TECH's learning system is 8.01, according to the highest international standards.



This program offers the best educational material, prepared with professionals in mind:



#### Study Material

All teaching material is produced by the specialists who teach the course, specifically for the course, so that the teaching content is highly specific and precise.

These contents are then applied to the audiovisual format, to create the TECH online working method. All this, with the latest techniques that offer high quality pieces in each and every one of the materials that are made available to the student.



#### Surgical Techniques and Procedures on Video

TECH introduces students to the latest techniques, the latest educational advances and to the forefront of current medical techniques. All of this in direct contact with students and explained in detail so as to aid their assimilation and understanding. And best of all, you can watch the videos as many times as you like.



#### Interactive Summaries

The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".



#### Additional Reading

Recent articles, consensus documents and international guidelines, among others. In TECH's virtual library, students will have access to everything they need to complete their course.





**Expert-Led Case Studies and Case Analysis**

Effective learning ought to be contextual. Therefore, TECH presents real cases in which the expert will guide students, focusing on and solving the different situations: a clear and direct way to achieve the highest degree of understanding.



**Testing & Retesting**

We periodically evaluate and re-evaluate students' knowledge throughout the program, through assessment and self-assessment activities and exercises, so that they can see how they are achieving their goals.



**Classes**

There is scientific evidence on the usefulness of learning by observing experts. The system known as Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.



**Quick Action Guides**

TECH offers the most relevant contents of the course in the form of worksheets or quick action guides. A synthetic, practical, and effective way to help students progress in their learning.





# 07 Certificate

The Professional Master's Degree in Advances in Antibiotic Therapy and Antibiotic Resistance guarantees you, in addition to the most rigorous and up-to-date training, access to a Professional Master's Degree issued by TECH Global University.



“

*Successfully complete this program  
and receive your university degree  
without travel or laborious paperwork”*

This program will allow you to obtain your **Professional Master's Degree diploma in Advances in Antibiotic Therapy and Antibiotic Resistance** endorsed by **TECH Global University**, the world's largest online university.

**TECH Global University** is an official European University publicly recognized by the Government of Andorra ([official bulletin](#)). Andorra is part of the European Higher Education Area (EHEA) since 2003. The EHEA is an initiative promoted by the European Union that aims to organize the international training framework and harmonize the higher education systems of the member countries of this space. The project promotes common values, the implementation of collaborative tools and strengthening its quality assurance mechanisms to enhance collaboration and mobility among students, researchers and academics.

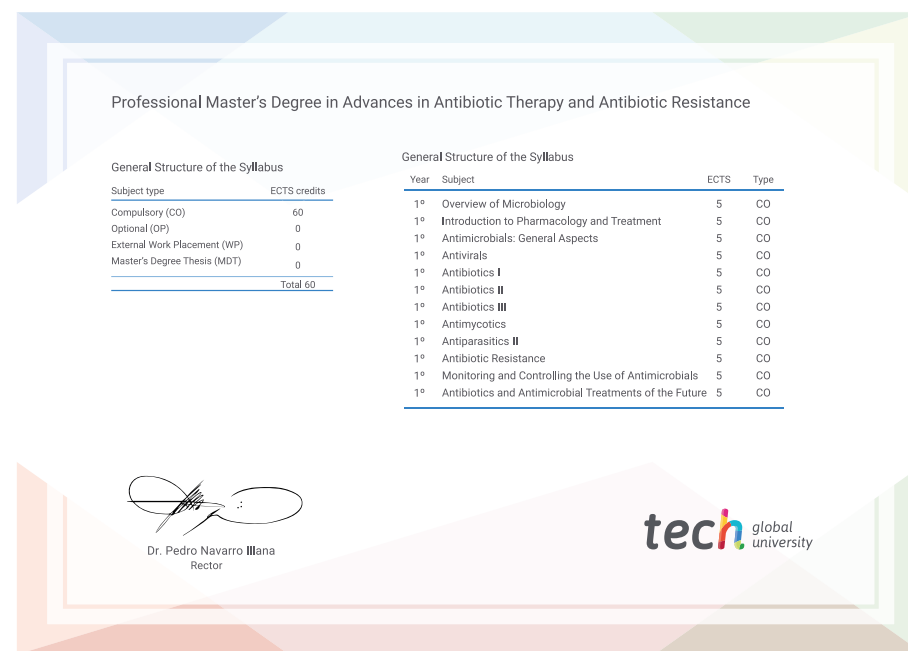
This **TECH Global University** title is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Professional Master's Degree in Advances in Antibiotic Therapy and Antibiotic Resistance**

Modality: **online**

Duration: **12 months**

Accreditation: **60 ECTS**



\*Apostille Convention. In the event that the student wishes to have their paper diploma issued with an apostille, TECH Global University will make the necessary arrangements to obtain it, at an additional cost.

future

health confidence people

education information tutors

guarantee accreditation teaching

institutions technology learning

community commitment

**tech** global  
university

personalized service innovation

knowledge presentation  
online teaching

development languages

virtual classroom

## Professional Master's Degree Advances in Antibiotic Therapy and Antibiotic Resistance

- » Modality: online
- » Duration: 12 months
- » Certificate: TECH Global University
- » Credits: 60 ECTS
- » Schedule: at your own pace
- » Exams: online



# Professional Master's Degree

Advances in Antibiotic Therapy  
and Antibiotic Resistance