# Postgraduate Certificate

## Multidrug-Resistant Bacteria in Human Pathology

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# Postgraduate Certificate
## Multidrug-Resistant Bacteria in Human Pathology

- Modality: **online**
- Duration: **6 weeks**
- Certificate: **TECH Global University**
- Accreditation: **6 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

Website: **www.techtitute.com/us/pharmacy/postgraduate-certificate/multidrug-resistant-bacteria-human-pathology**

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# Introduction

The fight against Multidrug-Resistant Bacteria is a critical priority in global public health. The World Health Organization (WHO) has updated its list of priority bacterial pathogens, identifying 15 families of antibiotic-resistant bacteria that pose a significant threat to human health. The excessive and improper use of antimicrobials is the cause of the emergence of these resistances, leading to more severe diseases and increased morbidity and mortality. In this context, TECH has developed a comprehensive program 100% online and adaptable to the individual needs of students, including their personal and work schedules. In addition, it is based on the innovative learning methodology, known as Relearning, which is a pioneer in the university.

*In this 100% online Postgraduate Certificate, you will delve into the mechanisms of bacterial resistance, both acquired and intrinsic, essential for the development of effective strategies against complex infections"*

The World Health Organization (WHO) continues its fight against Multidrug-Resistant Bacteria, highlighting the need to develop new treatments and promote international cooperation to curb the spread of these resistances, and emphasizing a comprehensive approach to Public Health that includes access to quality measures to prevent, diagnose and treat infections effectively.

This is how this Postgraduate Certificate is born, which will delve into the mechanisms of acquired resistance of Multidrug-Resistant Bacteria, such as the acquisition of resistance genes, mutations and plasmid acquisition. Mechanisms of intrinsic resistance will also be covered, including entry blockade, target modification, inactivation and antibiotic expulsion.

In addition, the study plan will include a detailed analysis of the chronology and evolution of antibiotic resistance, beginning with the initial discovery and moving through plasmid evolution and current trends. Therefore, the impact of resistance on human pathology will be discussed, highlighting the increased mortality and morbidity, the impact on Public Health and the associated economic cost. In addition, the list of highly dangerous bacteria according to WHO, classified into critical, high and medium priorities, will be updated.

Finally, the causes of antibiotic resistance will be addressed, considering the lack of new antibiotics, socioeconomic factors, health policies and the influence of international travel and global trade. Likewise, the use and abuse of antibiotics in the community will be analyzed, from prescription to misuse, and the global statistics of antibiotic resistance in different regions of the world will be reviewed.

In this way, TECH has implemented a complete and fully online university program, which only requires an electronic device with Internet connection to access all the didactic materials. Additionally, it is based on the revolutionary Relearning methodology, consisting of the reiteration of key concepts to ensure an optimal and organic assimilation of the contents.

This **Postgraduate Certificate in Multidrug-Resistant Bacteria in Human Pathology** contains the most complete and up-to-date scientific program on the market. The most important features include:

- The development of practical cases presented by experts in Microbiology, Medicine and Parasitology
- The graphic, schematic and eminently practical contents with which it is conceived gather scientific and practical information on those disciplines that are indispensable for professional practice
- Practical exercises where self-assessment can be used to improve learning.
- Its 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

*You will get an update on the most dangerous bacteria, according to the WHO list, equipping you with the latest scientific evidence on critical pathogens. With all TECH's quality guarantees!"*

*You will delve into future perspectives and strategies to mitigate the problem of Multidrug-Resistant Bacteria, including international actions to curb the spread of antibiotic resistance"*

*You will analyze how bacteria acquire resistance genes, undergo mutations, and obtain plasmids that contribute to acquired resistance, through the best teaching materials in the academic market.*

*You will examine the most critical multi-resistant human pathogens, such as Acinetobacter baumannii, Pseudomonas aeruginosa and Staphylococcus aureus, among others, thanks to an extensive library of multimedia resources.*

The program's teaching staff includes professionals from the sector who contribute their work experience to this specializing 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 during the course. For this purpose, students will be assisted by an innovative interactive video system created by renowned and experienced experts.

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# Objectives

The program will provide pharmacists with a thorough understanding of resistance mechanisms, both acquired and intrinsic, as well as their evolution over time. In addition, they will be updated on the most dangerous Multidrug-Resistant Bacteria and their clinical and Public Health implications.

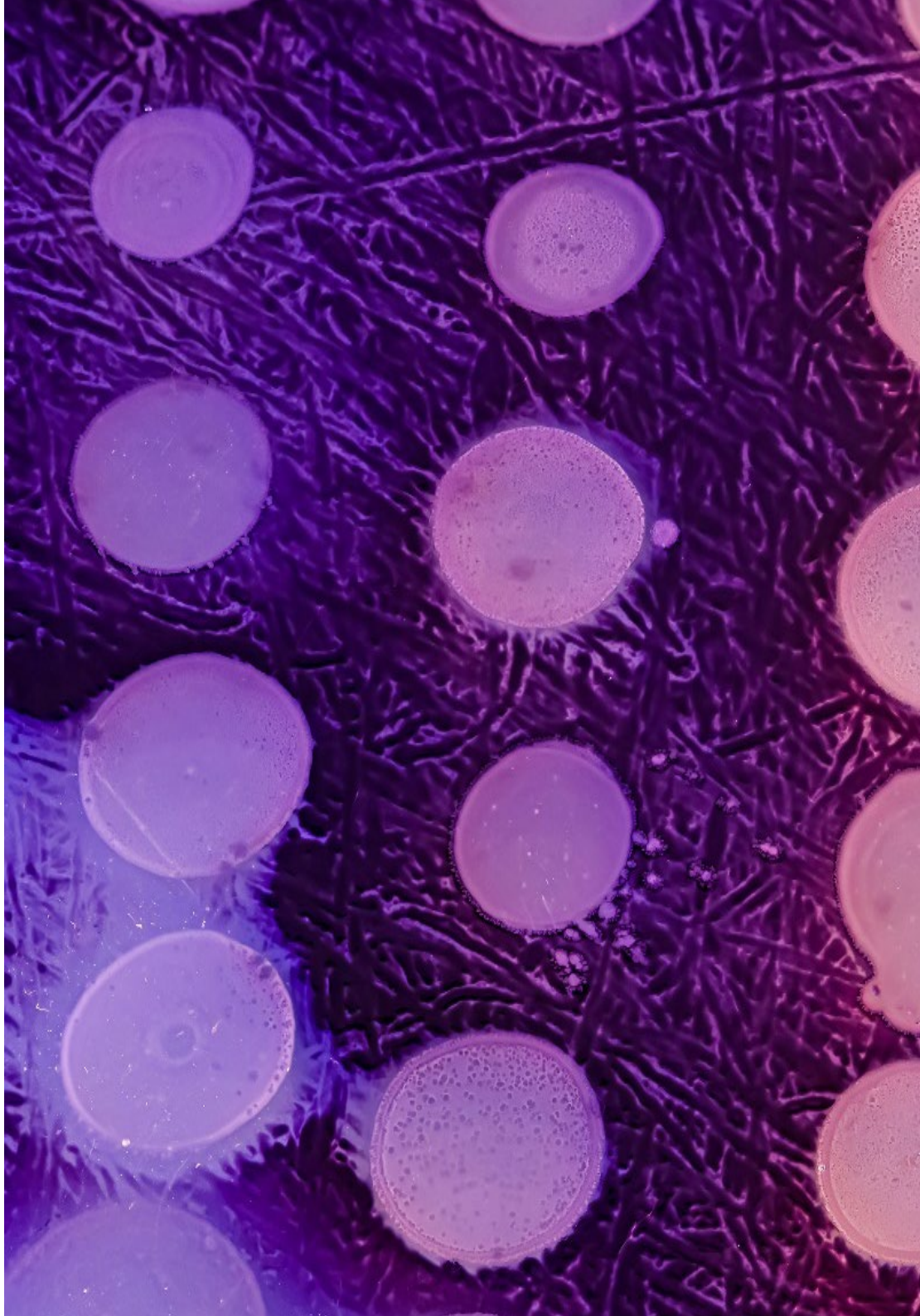
Therefore, at the end of the course, professionals will be better prepared to develop and implement effective strategies to prevent and control infections, improve the prescription and use of antibiotics, and contribute to formulate Public Health policies focused on the mitigation of antimicrobial resistance.

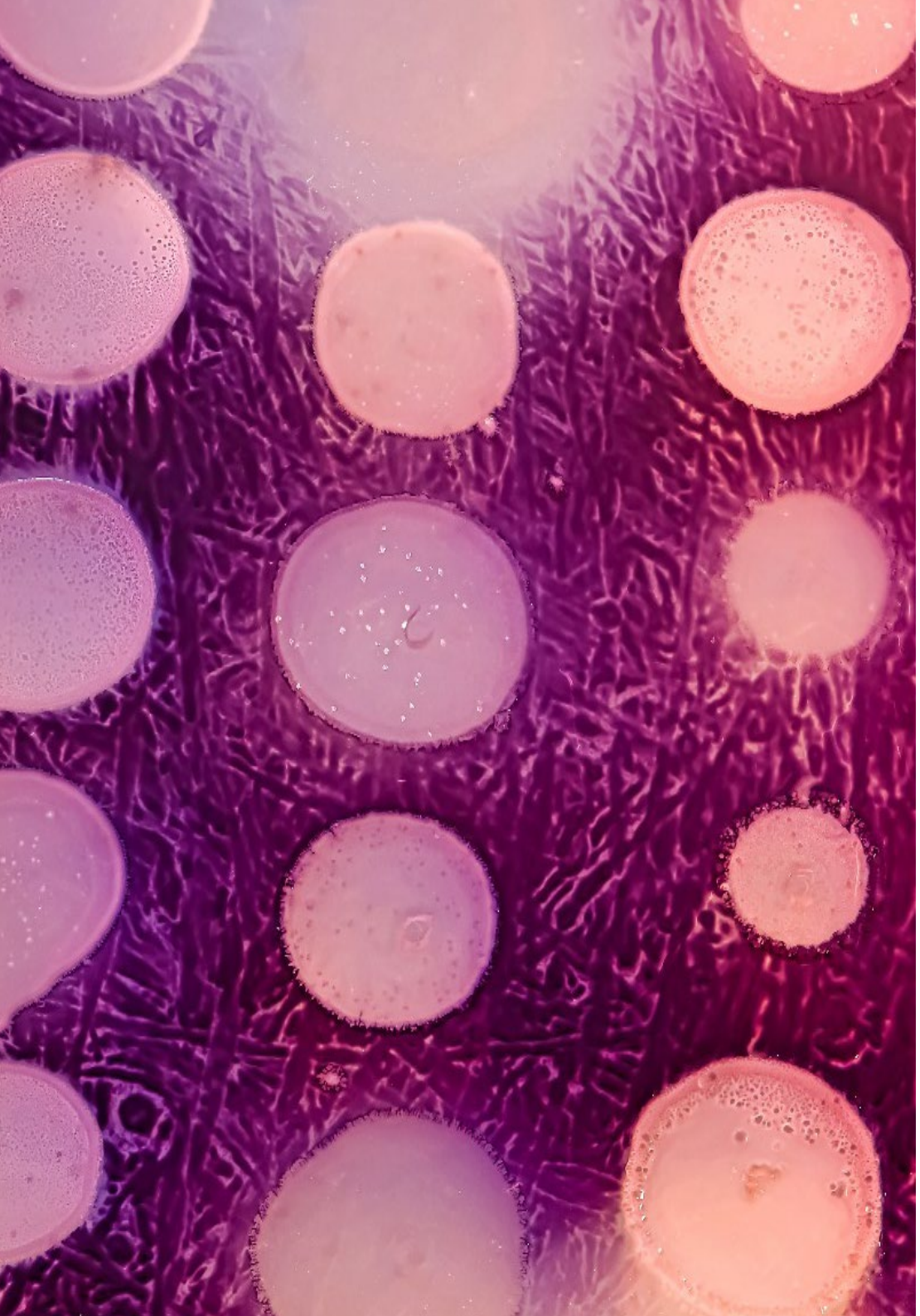
*The main objective of the Postgraduate Certificate will be to qualify you in the identification and management of infections caused by antibiotic resistant bacteria with the support of the revolutionary Relearning methodology"*

## General Objective

- Understand how bacterial resistance evolves as new antibiotics are introduced into clinical practice

*You will focus on promoting the rational use of antibiotics by raising awareness about health policies and the importance of hygiene and sanitation. What are you waiting for to enroll?"*







## Specific Objectives

- Evaluate the causes of antibiotic resistance, from the lack of new antibiotics, to socioeconomic factors and health policies
- Examine the current status of antibiotic resistance in the world, including global statistics and trends in different regions

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# Course Management

The faculty is composed of a group of highly qualified and recognized experts in the field of Microbiology and Parasitology. In fact, these professionals have published articles in high impact scientific journals and have participated in international projects on antimicrobial resistance. In addition, the diversity and prestige of this faculty will guarantee a high quality specialization, based on the latest scientific advances and best practices in the health field.

*Faculty members have hands-on experience in clinical and hospital settings, offering a comprehensive and applied perspective on the challenges and solutions in Multidrug-Resistant Bacteria Infection Management"*

## Management

### Dr. Ramos Vivas, José

- Director of the Banco Santander-Universidad Europea del Atlántico Chair in Innovation
- Researcher at the Center for Innovation and Technology of Cantabria (CITICAN)
- Academic of Microbiology and Parasitology at the European University of the Atlantic
- Founder and former director of the Cellular Microbiology Laboratory of the Valdecilla Research Institute (IDIVAL)
- PhD in Biology from the University of León
- Doctor in Sciences from the University of Las Palmas de Gran Canaria
- Degree in Biology from the University of Santiago de Compostela
- Master's Degree in Molecular Biology and Biomedicine from the University of Cantabria
- Member of: CIBERINFEC (MICINN-ISCIII), Member of the Spanish Society of Microbiology and Member of the Spanish Network of Research in Infectious Pathology

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# Structure and Content

This academic program will delve into the mechanisms of acquired and intrinsic resistance to antibiotics, such as the acquisition of resistance genes, mutations and plasmid acquisition, and antibiotic entry blockade and inactivation. In addition, historical and evolutionary aspects of resistance will be addressed, providing a chronological perspective, from the discovery of resistance, to current trends. A module will also be dedicated to the identification and management of multi-resistant pathogens, such as Acinetobacter baumannii and Pseudomonas aeruginosa, among others.

*The content of the Postgraduate Certificate has been carefully designed to provide pharmacists with a comprehensive and up-to-date understanding of the challenges associated with bacterial resistance"*

## **Module 1.** Multidrug-Resistant Bacteria in Human Pathology

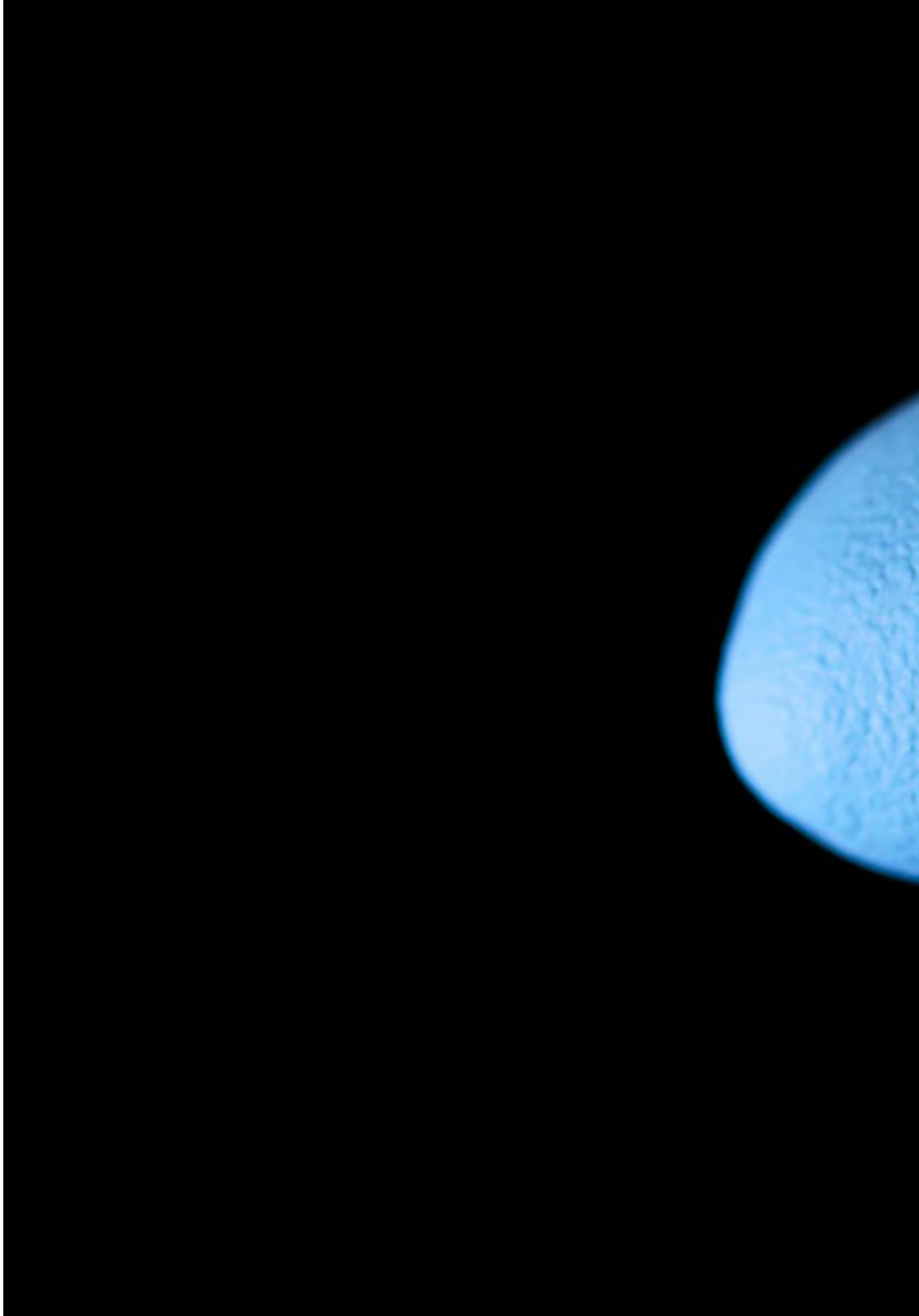
1.1. Mechanisms of Acquired Resistance to Antibiotics
- 1.1.1. Acquisition of Resistance Genes
- 1.1.2. Mutations.
- 1.1.3. Acquisition of Plasmids

1.2. Mechanisms of Intrinsic Resistance to Antibiotics
- 1.2.1. Blockage of Antibiotic Entry
- 1.2.2. Modification of the Antibiotic Target
- 1.2.3. Inactivation of the Antibiotic
- 1.2.4. Antibiotic Expulsion

1.3. Chronology and Evolution of Antibiotic Resistance
- 1.3.1. Discovery of Antibiotic Resistance
- 1.3.2. Plasmids
- 1.3.3. Evolution of Resistance
- 1.3.4. Current Trends in the Evolution of Antibiotic Resistance

1.4. Antibiotic Resistance in Human Pathology
- 1.4.1. Increased Mortality and Morbidity
- 1.4.2. Impact of Resistance on Public Health
- 1.4.3. Economic Cost Associated with Antibiotic Resistance

1.5. Multidrug-Resistant Human Pathogens
- 1.5.1. Acinetobacter Baumannii
- 1.5.2. Pseudomonas Aeruginosa
- 1.5.3. Enterobacteriaceae
- 1.5.4. Enterococcus Faecium
- 1.5.5. Staphylococcus Aureus
- 1.5.6. Helicobacter Pylori
- 1.5.7. Campylobacter Spp
- 1.5.8. Salmonellae
- 1.5.9. Neisseria Gonorrhoeae
- 1.5.10 Streptococcus Pneumoniae
- 1.5.11. Hemophilus Influenzae
- 1.5.12. Shigella Spp






1.6. Bacteria Highly Dangerous to Human Health: Update of the WHO List
- 1.6.1. Critical Priority Pathogens
- 1.6.2. High Priority Pathogens
- 1.6.3. Pathogens with Medium Priority

1.7. Analysis of the Causes of Antibiotic Resistance
- 1.7.1. Lack of New Antibiotics
- 1.7.2. Socioeconomic Factors and Health Policies
- 1.7.3. Poor Hygiene and Sanitation
- 1.7.4. Health Policies and Antibiotic Resistance
- 1.7.5. International Travel and Global Trade
- 1.7.6. Dispersal of High-Risk Clones
- 1.7.7. Emerging Pathogens with Resistance to Multiple Antibiotics

1.8. Antibiotic Use and Abuse in the Community
- 1.8.1. Prescription
- 1.8.2. Acquisition
- 1.8.3. Misuse of Antibiotics

1.9. Current Status of Antibiotic Resistance in the World
- 1.9.1. Global Statistics
- 1.9.2. Central and South America
- 1.9.3. Africa
- 1.9.4. Europe
- 1.9.5. North America
- 1.9.6. Asia and Oceania

1.10. Perspectives on Antibiotic Resistance
- 1.10.1. Strategies to Mitigate the Problem of Multidrug-Resistance
- 1.10.2. International Actions
- 1.10.3. Actions at the Global Level

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# Methodology

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

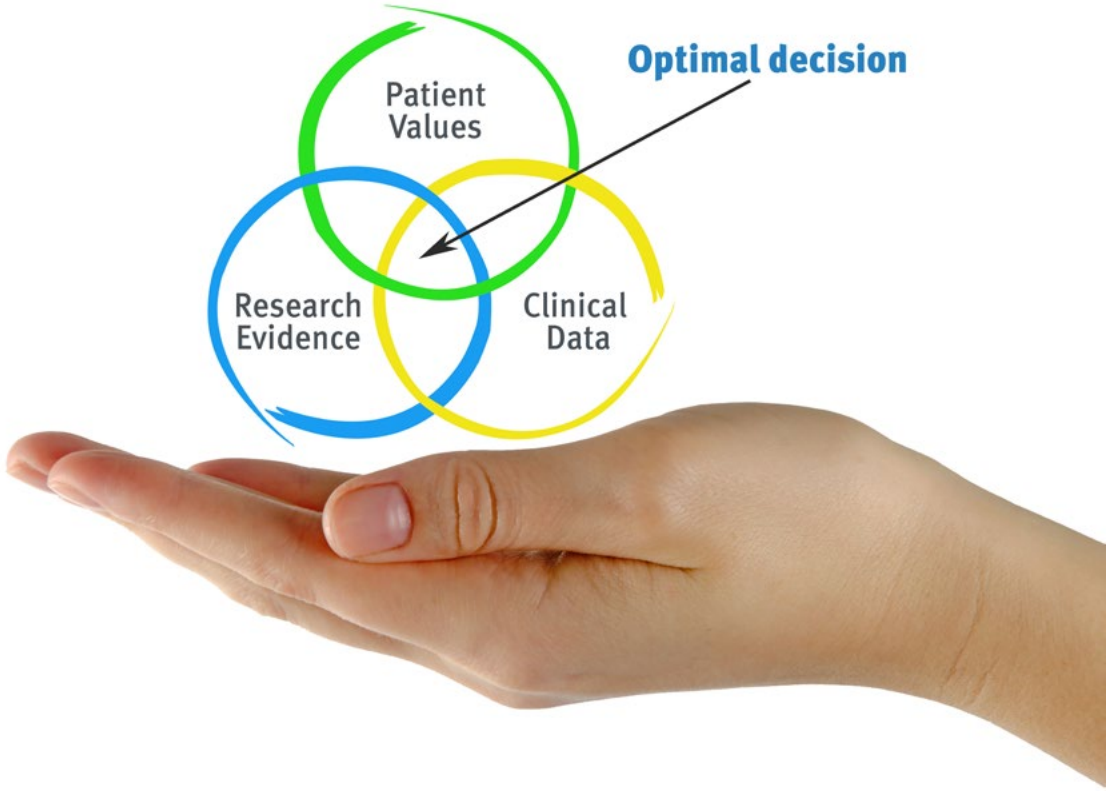
This teaching system is used, for example, in the most prestigious medical schools in the world, and major publications such as the **New England Journal of Medicine** have considered it to be one of the most effective.

*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 be confronted with multiple simulated clinical cases based on real patients, in which they will have to investigate, establish hypotheses and ultimately, resolve the situation. There is an abundance of scientific evidence on the effectiveness of the method. Pharmacists learn better, more quickly 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, attempting to recreate the actual conditions in a pharmacist'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:**

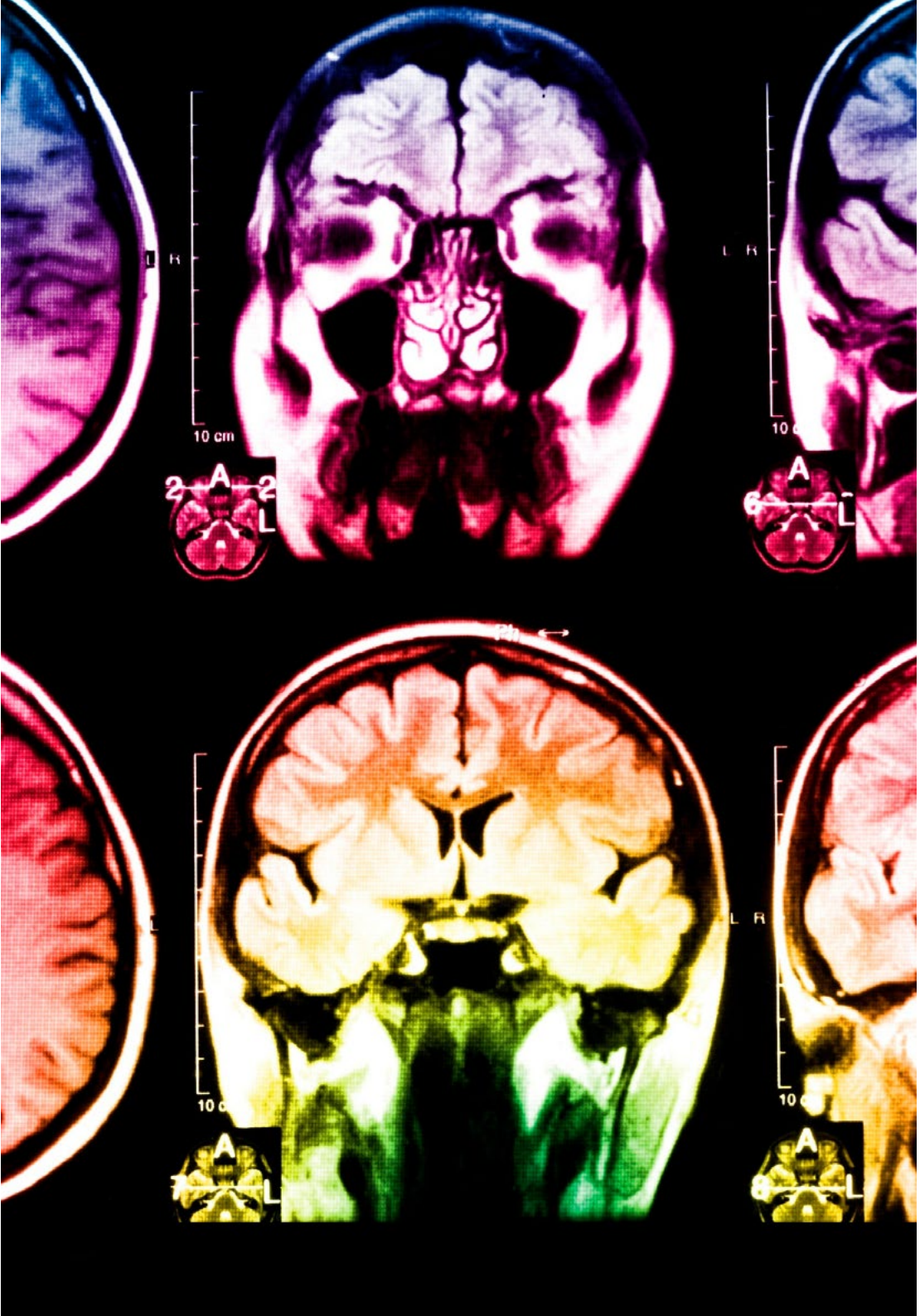
1. Pharmacists who follow this method not only grasp concepts, but also develop their mental capacity, by evaluating real situations and applying their knowledge.
2. Learning is solidly translated into practical skills that allow the student to better integrate into the real world.
3. Ideas and concepts 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.

Our 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, which represent a real revolution with respect to simply studying and analyzing cases.

*Pharmacists will learn through real cases and by solving 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 115,000 pharmacists have been trained with unprecedented success in all clinical specialties, regardless of the surgical load. This pedagogical methodology is developed in a highly demanding environment, with a university student body with a high socioeconomic profile and an average age of 43.5 years.

*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 created specifically for the course by specialist pharmacists who will be teaching the course, so that the didactic development is highly specific and accurate.

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.

### Video Techniques and Procedures

TECH introduces students to the latest techniques, to the latest educational advances, to the forefront of current pharmaceutical care procedures. All of this, first hand, and explained and detailed with precision to contribute to assimilation and a better understanding. And best of all, you can watch them as many times as you want.

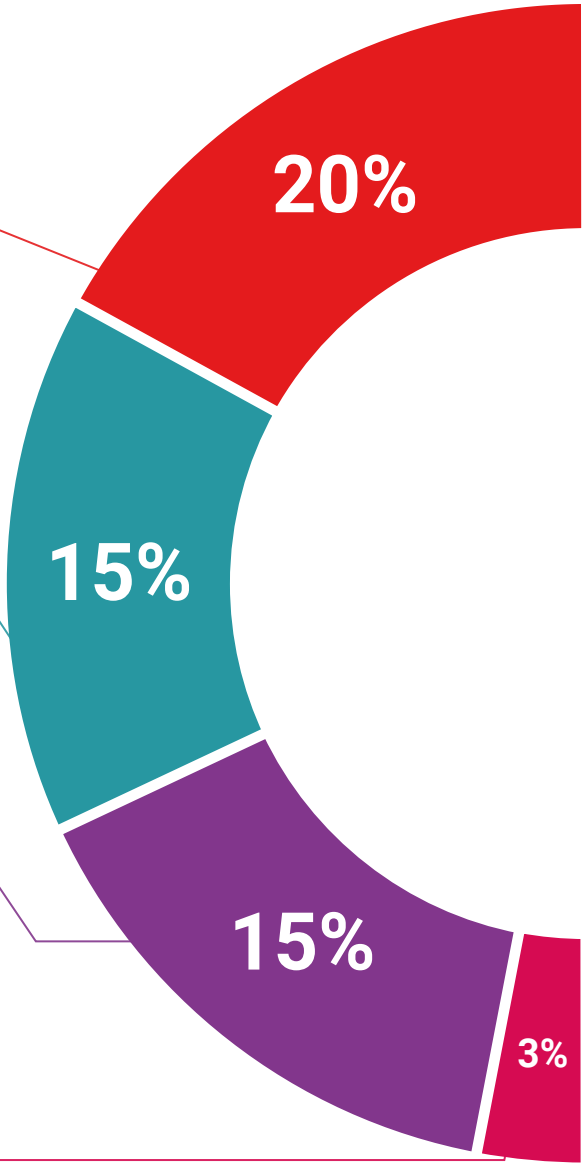
### Interactive Summaries

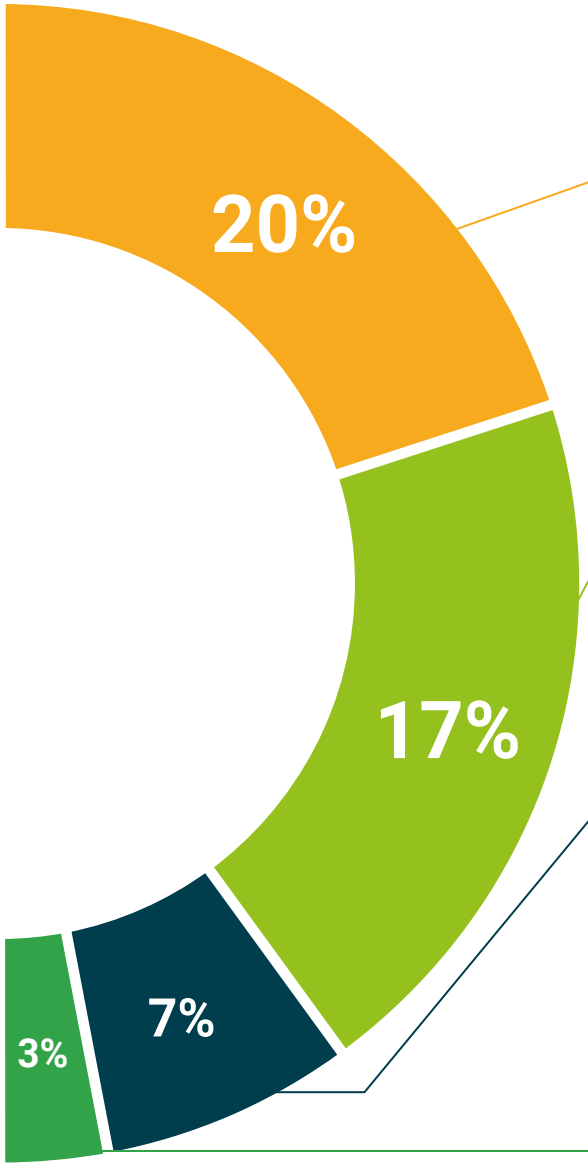
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

This unique multimedia content presentation training system 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, we will present you with real case developments in which the expert will guide you through 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.

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# Certificate

The Postgraduate Certificate in Multidrug-Resistant Bacteria in Human Pathology guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Global University.

*Successfully complete this program and receive your university qualification without having to travel or fill out laborious paperwork"*

This private qualification will allow you to obtain a **Postgraduate Certificate in Multidrug-Resistant Bacteria in Human Pathology** 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** private qualification, 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: **Postgraduate Certificate in Multidrug-Resistant Bacteria in Human Pathology**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**


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Mr./Ms. _____, with identification document _____
has successfully passed and obtained the title of:

**Postgraduate Certificate in Multidrug-Resistant Bacteria in Human Pathology**

This is a private qualification of 180 hours of duration equivalent to 6 ECTS, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH Global University is a university officially recognized by the Government of Andorra on the 31st of January of 2024, which belongs to the European Higher Education Area (EHEA).

In Andorra la Vella, on the 28th of February of 2024

Dr. Pedro Navarro Illana
Dean

This qualification must always be accompanied by the university degree issued by the competent authority to practice professionally in each country.

Unique TECH Code: AFWORD23S techtitute.com/certificates

*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.

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