

# Postgraduate Diploma

Multidrug-Resistant Bacteria  
in Human Microbiology and  
Animal Health



## Postgraduate Diploma Multidrug-Resistant Bacteria in Human Microbiology and Animal Health

- » Modality: online
- » Duration: 6 months
- » Certificate: TECH Global University
- » Credits: 18 ECTS
- » Schedule: at your own pace
- » Exams: online

Website: [www.techitute.com/us/medicine/postgraduate-diploma/postgraduate-diploma-multidrug-resistant-bacteria-human-microbiology-animal-health](http://www.techitute.com/us/medicine/postgraduate-diploma/postgraduate-diploma-multidrug-resistant-bacteria-human-microbiology-animal-health)

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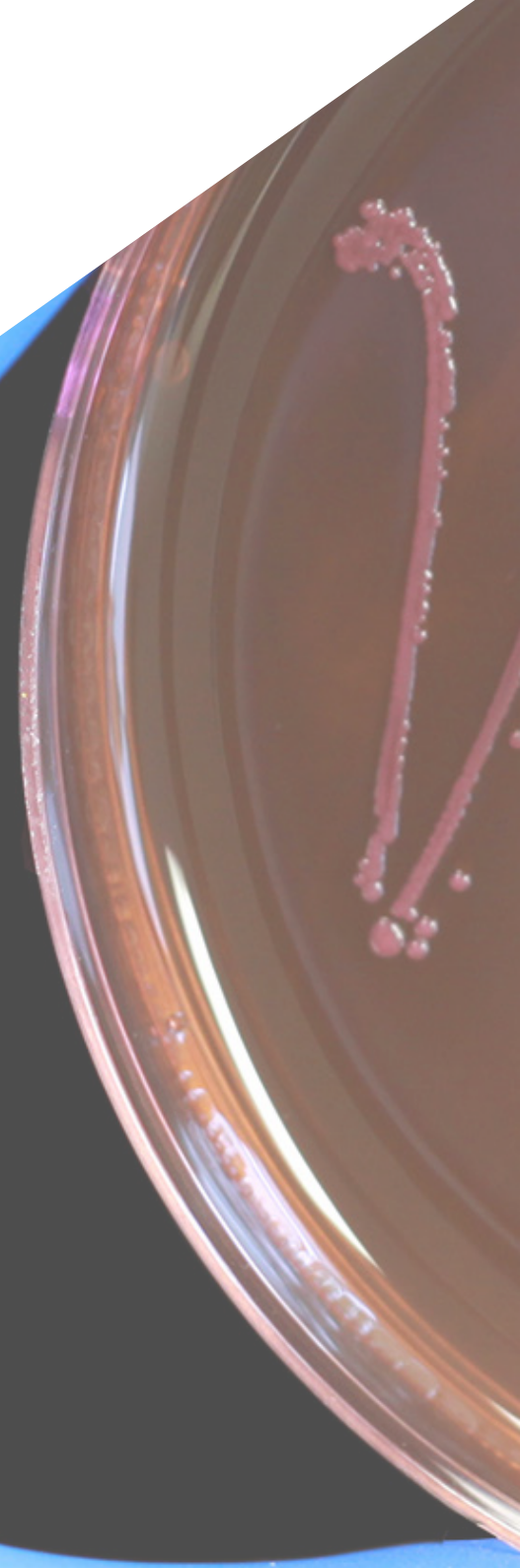
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# 01

# Introduction

Multidrug-resistant bacteria represent a significant threat in both human microbiology and animal health. In the field of human health, pathogens such as *Escherichia coli* and *Klebsiella pneumoniae* have shown resistance to last line antibiotics, such as carbapenemics. In parallel, in the veterinary field, bacteria such as *Salmonella* and methicillin-resistant *Staphylococcus aureus* (MRSA) are affecting farm animals, posing public health risks due to the potential transfer of these resistant bacteria to humans through the food chain. In this context, TECH has created a comprehensive, 100% online program that is totally flexible and customized according to the needs of the students. It is also based on the innovative learning methodology known as Relearning.



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*Thanks to this 100% online Postgraduate Diploma, you will delve into the microbiological and epidemiological aspects of Multidrug-Resistant Bacteria, promoting an integrated approach to One Health"*

Multidrug-resistant Bacteria represent a growing threat in the field of human microbiology and animal health, standing out as one of the main concerns in global public health. This phenomenon underlines the urgent need for more effective control and prevention strategies, including the reduction of antibiotic use, the development of new drugs and the promotion of sustainable agricultural practices.

This Postgraduate Diploma will examine the underlying causes of bacterial resistance in human pathology. It will examine everything from the lack of development of new antibiotics to socio-economic factors and health policies that influence the spread of multi-resistant bacteria. In addition, the current state of antibiotic resistance worldwide will be analyzed in detail.

The syllabus will also focus on antimicrobial resistance in animal health, identifying the causes and specific mechanisms that promote bacterial resistance in the veterinary setting. Effective preventive and control measures will also be proposed, including the proper management of antibiotics in livestock and aquaculture, as well as alternatives to these drugs to reduce the selective pressure on bacteria.

Finally, the crucial role of the food chain will be addressed, looking at how multi-resistant bacteria can spread through food of animal and plant origin, as well as through contaminated water. Therefore, we will understand how agricultural and food production practices can influence the emergence and dissemination of these bacteria, implementing mitigation and control strategies to minimize risks to public health.

In this way, TECH has developed a complete, fully online and flexible university program, which only requires a minimum of one computer and a minimum of two computers. In addition, it is based on the revolutionary Relearning methodology, based on the repetition of key concepts to ensure optimal and natural assimilation of the contents.

This **Postgraduate Diploma in Multidrug-Resistant Bacteria in Human Microbiology and Animal Health** 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
- ♦ Graphic, schematic, and practical contents which provide scientific and practical information on the disciplines that are essential for professional practice
- ♦ Practical exercises where the self-assessment process can be carried out 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



*This program will provide you with the indispensable tools and knowledge to address the global challenge of multi-resistant bacteria from multiple interrelated perspectives"*

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*You will examine how resistant bacteria can be transmitted through food of animal and plant origin, as well as through contaminated water, thanks to an extensive library of multimedia resources"*

The program's teaching staff includes professionals from the field who contribute their work experience to this educational 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.

*You will delve into the causes of bacterial resistance to antibiotics, from the shortage of new antimicrobial agents to the socioeconomic factors and health policies that influence their development.*

*You will analyze the most relevant bacterial species in animal health and evaluate their impact, identifying preventive and control measures, using the best teaching materials, at the forefront of technology and education.*



# 02

# Objectives

The main objective of this Postgraduate Diploma is to specialize professionals to understand, analyze and tackle the complex problems associated with bacterial resistance. Therefore, doctors will acquire in-depth knowledge of the causes and mechanisms of antibiotic resistance, both in human pathologies and in animal health. In addition, the implementation of effective preventive measures and control strategies will be encouraged, promoting an integrated approach under the One Health perspective to ensure public health, animal health and environmental sustainability





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*You will implement effective preventive measures and control strategies, promoting public health through integrated approaches, such as the One Health strategy, hand in hand with the best digital university in the world, according to Forbes"*



## General Objectives

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- ♦ Understand how bacterial resistance evolves as new antibiotics are introduced into clinical practice
- ♦ Study the presence of multidrug-resistant bacteria in the environment and wildlife, as well as to understand their potential impact on public health
- ♦ Acquire knowledge on the dissemination of resistant bacteria in food production



*Don't miss this unique opportunity that only TECH can offer you! You will acquire in-depth and specialized knowledge about bacterial resistance in two crucial contexts: human health and animal health"*





## Specific Objectives

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### Module 1. Multiresistant Bacteria in Human Pathology

- ♦ 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

### Module 2. Antimicrobial Resistance in Animal Health

- ♦ Analyze the causes and mechanisms of bacterial resistance in the veterinary field, including the dissemination of antibiotic resistance genes
- ♦ Identify the species of multi-resistant bacteria of major veterinary importance, and understand their impact on animal health
- ♦ Establish preventive and control measures against bacterial resistance in animals, including systems and processes for the appropriate use of antibiotics, and alternatives to antibiotics in livestock and aquaculture
- ♦ Determine the objectives of the One Health strategy and its application in the study and control of multidrug-resistant bacteria

### Module 3. Multiresistant Bacteria in the Food Chain

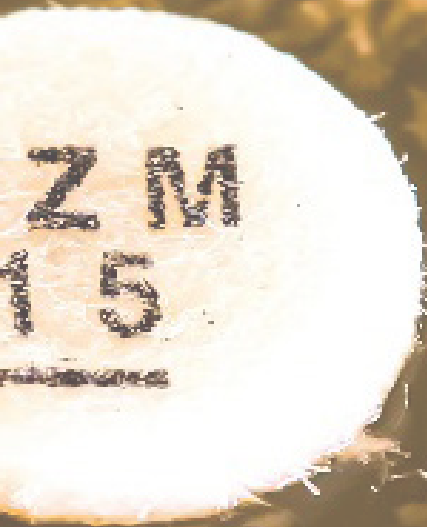
- ♦ Analyze the role of the food chain in the spread of bacterial resistance to antibiotics through food of animal and plant origin, as well as through water

# 03

# Course Management

The teaching staff behind this Postgraduate Diploma in Multidrug-Resistant Bacteria in Human Microbiology and Animal Health are highly qualified experts with extensive experience in the fields of Microbiology, Veterinary Medicine and Public Health. In fact, these professionals not only possess in-depth theoretical and practical knowledge of bacterial resistance, but are also committed to research and innovation in the development of strategies to address this global challenge.





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*The lecturers will guide you in the implementation of preventive and control measures in human and animal health, promoting a comprehensive and collaborative approach under the framework of the One Health strategy"*

## Management



### Dr. Ramos Vivas, José

- ♦ 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, Member of the Spanish Network of Research in Infectious Pathology

## Professors

### Dr. Acosta Arbelo, Félix

- ♦ Academician in the Area of Animal Health, Infectious Diseases in the Faculty of Veterinary Medicine, ULPGC.
- ♦ European Specialist in Aquatic Animal Health by the European Committee of Veterinary Specialization
- ♦ Specialist in Microbiology and Immunology, Marqués de Valdecilla University Hospital, Cantabria
- ♦ Doctor in Veterinary Medicine, University of Las Palmas de Gran Canaria (ULPGC).
- ♦ Degree in Veterinary Medicine, University of Las Palmas de Gran Canaria (ULPGC).

### Dr. Alegría González, Ángel

- ♦ Researcher in 9 projects funded by public competitive calls
- ♦ Principal Investigator as beneficiary of an Intra-European Marie Curie Fellowship (IEF-FP7) in a project associated to the University of Groningen (The Netherlands)
- ♦ PhD in Food Biotechnology from the University of Oviedo - CSIC.
- ♦ Degree in Biology from the University of Oviedo
- ♦ Master's Degree in Food Biotechnology from the University of Oviedo



# 04

## Structure and Content

The content of the university program will cover a wide range of topics that are fundamental to understanding and addressing the issue of bacterial resistance in two vital contexts. Therefore, the causes and mechanisms leading to antimicrobial resistance in both humans and animals will be explored in depth, examining bacterial genetics, as well as the environmental and socio-economic factors that contribute to this phenomenon. In addition, the most relevant bacterial species in each sector, their epidemiology and their impact on public and animal health will be analyzed.





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*Bet on TECH! You will investigate the current situation of bacterial resistance at a global level, analyzing statistics and regional trends in order to elaborate and develop effective prevention and control strategies"*

## Module 1. Multiresistant Bacteria in Human Pathology

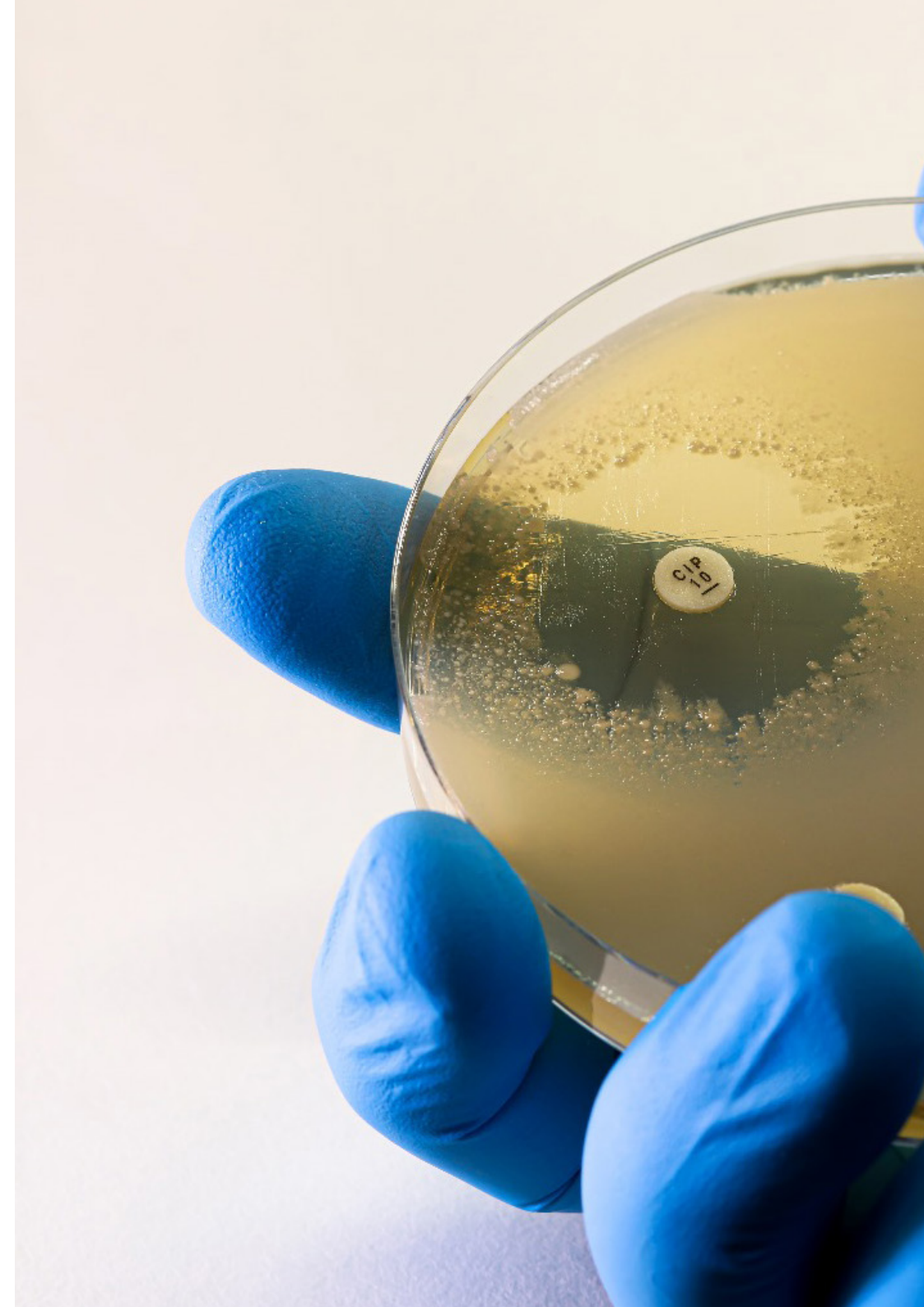
- 1.1. Mechanisms of Acquired Resistance to Antibiotics
  - 1.1.1. Acquisition of Resistance Genes
  - 1.1.2. Mutations
  - 1.1.3. Acquisition of Plasmids
- 1.2. Mechanisms of Intrinsic Resistance to Antibiotics
  - 1.2.1. Blockage of Antibiotic Entry
  - 1.2.2. Modification of the Antibiotic Target
  - 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. North America
  - 1.9.5. 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

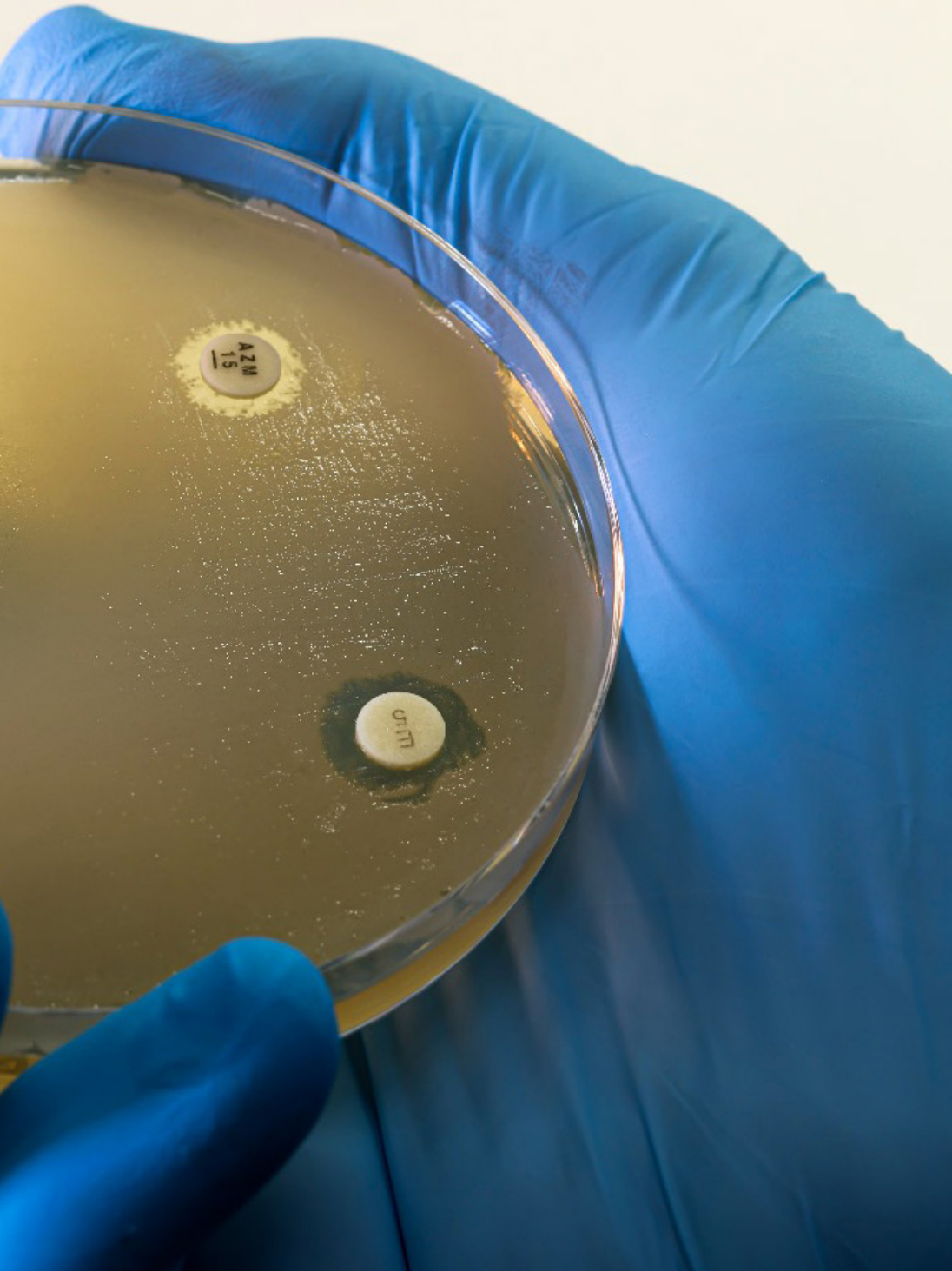
**Module 2. Antimicrobial Resistance in Animal Health**

- 2.1. Antibiotics in the Veterinary Field
  - 2.1.1. Prescription
  - 2.1.2. Acquisition
  - 2.1.3. Misuse of Antibiotics
- 2.2. Multidrug-Resistant Bacteria in the Veterinary Field
  - 2.2.1. Causes of Bacterial Resistance in the Veterinary Field
  - 2.2.2. Dissemination of Antibiotic Resistance Genes (ARGs), Especially through Horizontal Transmission Mediated by Plasmids
  - 2.2.3. Mobile Colistin Resistance Gene (mcr)
- 2.3. Multidrug-Resistant Bacterial Species of Veterinary Importance
  - 2.3.1. Pet Pathogens
  - 2.3.2. Cattle Pathogens
  - 2.3.3. Pig Pathogens
  - 2.3.4. Poultry Pathogens
  - 2.3.5. Goat and Sheep Pathogens
  - 2.3.6. Fish and Aquatic Animal Pathogens
- 2.4. Impact of Multi-Resistant Bacteria in Animal Health
  - 2.4.1. Animal Suffering and Losses
  - 2.4.2. Impact on Household Livelihoods
  - 2.4.3. Generation of "Superbugs"
- 2.5. Multidrug-Resistant Bacteria in the Environment and Wildlife
  - 2.5.1. Antibiotic Resistant Bacteria in the Environment
  - 2.5.2. Antibiotic Resistant Bacteria in Wildlife
  - 2.5.3. Antimicrobial Resistant Bacteria in Marine and Inland Waters
- 2.6. Impact of Resistances Detected in Animals and in the Environment on Public Health
  - 2.6.1. Shared Antibiotics in Veterinary Medicine and Human Medicine
  - 2.6.2. Transmission of Resistance from Animals to Humans
  - 2.6.3. Transmission of Resistance from the Environment to Humans
- 2.7. Prevention and Control
  - 2.7.1. Preventive Measures Against Bacterial Resistance in Animals
  - 2.7.2. Systems and Processes for the Effective Use of Antibiotics
  - 2.7.3. Role of Veterinarians and Pet Owners in the Prevention of Bacterial Resistance
  - 2.7.4. Treatments and Alternatives to Antibiotics in Animals
  - 2.7.5. Tools for Limiting the Emergence of Antimicrobial Resistance and its Spread in the Environment
- 2.8. Strategic Plans to Reduce the Risk of Selection and Spread of Antimicrobial Resistance
  - 2.8.1. Monitoring and Surveillance of the Use of Critical Antibiotics
  - 2.8.2. Training and Research
  - 2.8.3. Communication and Prevention
- 2.9. One Health Strategy
  - 2.9.1. Definition and Objectives of the One Health Strategy
  - 2.9.2. Application of the One Health Strategy in the Control of Multidrug-Resistant Bacteria
  - 2.9.3. Success Stories Using the One Health Strategy
- 2.10. Climate Change and Antibiotic Resistance
  - 2.10.1. Increase in Infectious Diseases
  - 2.10.2. Extreme Climatic Conditions
  - 2.10.3. Displacement of Populations

### Module 3. Multiresistant Bacteria in the Food Chain

- 3.1. Multiresistant Bacteria in the Food Chain
  - 3.1.1. The Role of the Food Chain in the Spread of Antimicrobial Resistance
  - 3.1.2. Antimicrobial Resistances in Food (ESBL, MRSA, and Colistin)
  - 3.1.3. The Food Chain within the One Health Approach
- 3.2. Dissemination of Antimicrobial Resistance through Food
  - 3.2.1. Food of Animal Origin
  - 3.2.2. Food of Plant Origin
  - 3.2.3. Dissemination of Resistant Bacteria through Water
- 3.3. Spread of Resistant Bacteria in Food Production
  - 3.3.1. Spread of Resistant Bacteria in Food Production Environments
  - 3.3.2. Spread of Resistant Bacteria through Food Handlers
  - 3.3.3. Cross-Resistance between Biocides and Antibiotics
- 3.4. Antimicrobial Resistance in Salmonella Spp
  - 3.4.1. AmpC-, ESBL- and Carbapenemase-Producing Salmonella Spp
  - 3.4.2. Resistant Salmonella Spp in Humans
  - 3.4.3. Antibiotic Resistant Salmonella Spp in Farm and Meat Animals
  - 3.4.4. Multidrug-Resistant Salmonella Spp
- 3.5. Antimicrobial Resistance in Campylobacter Spp
  - 3.5.1. Antimicrobial Resistance in Campylobacter Spp
  - 3.5.2. Antimicrobial Resistant Campylobacter Spp in Foods
  - 3.5.3. Multidrug-Resistant Campylobacter Spp
- 3.6. Antimicrobial Resistances in Escherichia Coli
  - 3.6.1. AmpC-, ESBL- and Carbapenemase-Producing E. Coli
  - 3.6.2. Antimicrobial Resistant E. Coli in Farm Animals
  - 3.6.3. Antimicrobial Resistant E. Coli in Food
  - 3.6.4. Multidrug-Resistant E. Coli
- 3.7. Antimicrobial Resistance in Staphylococci
  - 3.7.1. Methicillin-Resistant S. Aureus (MRSA)
  - 3.7.2. MRSA in Food and Farm Animals
  - 3.7.3. Methicillin-Resistant Staphylococcus Epidermidis (MRSE)
  - 3.7.4. Multidrug-Resistant Staphylococcus Spp





- 3.8. Antimicrobial Resistance in Enterobacteria
  - 3.8.1. Shigella Spp
  - 3.8.2. Enterobacter Spp
  - 3.8.3. Other Environmental Enterobacteriaceae
- 3.9. Antimicrobial Resistance in Other Food-Borne Pathogens
  - 3.9.1. *Listeria Monocytogenes*
  - 3.9.2. Enterococcus Spp
  - 3.9.3. Pseudomona Spp
  - 3.9.4. Aeromonas Spp and Plesiomonas Spp
- 3.10. Strategies to Prevent and Control the Spread of Microbial Resistance in the Food Chain
  - 3.10.1. Preventive and Control Measures in Primary Production
  - 3.10.2. Preventive and Control Measures in Slaughterhouses
  - 3.10.3. Preventive and Control Measures in Food Industries

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*You will be immersed in prevention and control strategies, with an emphasis on the responsible use of antibiotics, the implementation of biosecurity measures and the development of sustainable therapeutic alternatives”*

05

# 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.



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*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.



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*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.



# 06 Certificate

The Postgraduate Diploma in Multidrug-Resistant Bacteria in Human Microbiology and Animal Health guarantees, in addition to the most accurate 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 Diploma in Multidrug-Resistant Bacteria in Human Microbiology and Animal Health** 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 Diploma in Multidrug-Resistant Bacteria in Human Microbiology and Animal Health**

Modality: **online**

Duration: **6 months**

Accreditation: **18 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

personalized service innovation

knowledge present

online training

development languages

virtual classroom

**tech** global  
university

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