

# Postgraduate Certificate

## Multidrug-Resistant Gram Negative Bacteria





## Postgraduate Certificate Multidrug-Resistant Gram Negative Bacteria

- » Modality: online
- » Duration: 6 weeks
- » Certificate: TECH Technological University
- » Schedule: at your own pace
- » Exams: online

Website: [www.techtute.com/us/medicine/postgraduate-certificate/multidrug-resistant-gram-negative-bacteria](http://www.techtute.com/us/medicine/postgraduate-certificate/multidrug-resistant-gram-negative-bacteria)

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# 01

# Introduction

Multidrug-Resistant Gram-Negative Bacteria represent a growing concern in the global public health arena. These bacteria continue to challenge conventional treatments due to their ability to develop resistance to multiple classes of antibiotics. Therefore, this phenomenon hinders the management of hospital and community infections, increasing morbidity and mortality rates in vulnerable patients. It is therefore important for physicians to update their clinical practice on an ongoing basis, for a more effective fight against multidrug-resistant infections. In this context, TECH has developed a comprehensive 100% online program, fully adaptable to the individual needs of students, as well as to their personal and work schedules. It is also based on the innovative learning methodology known as Relearning.





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*Thanks to this 100% online Postgraduate Certificate, you will gain an in-depth understanding of the epidemiology, pathogenesis, clinical evaluation and treatment of Multidrug-Resistant Gram Negative Bacteria”*

With an inherent ability to develop resistance to multiple classes of antibiotics, Multidrug-Resistant Gram Negative Bacteria possess mechanisms such as the production of extended-spectrum beta-lactamases and carbapenemases, which severely limit available therapeutic options. This problem is of particular concern in hospital and intensive care settings, where nosocomial infections can be difficult to treat.

Therefore, this Postgraduate Certificate is born, which will delve into the epidemiology of these microorganisms, highlighting their increasing prevalence, both in community and nosocomial infections. It will also analyze the critical relevance of these infections due to their capacity for resistance to multiple antibiotics, which limits the therapeutic options available and increases the morbimortality of affected patients.

The pathogenesis of Multidrug-Resistant Gram-Negative Bacteria infections will also be discussed, examining virulence factors and host elements that may influence disease severity. In addition, other environmental and treatment-related factors that may modulate the progression of these infections will be explored.

Finally, the detailed clinical evaluation of patients affected by these bacteria will be covered, from the initial history taking, to the use of complementary tests such as blood tests, diagnostic imaging and advanced microbiological techniques. Current and emerging tools for estimating the severity of infections, as well as risk factors associated with the acquisition of Multidrug-Resistant Gram Negative Bacteria, will also be discussed.

In this way, TECH has designed a complete, fully online and flexible program, which will prevent students from problems such as the need to travel to a physical center or adapt to a pre-established schedule. In this sense, graduates will only need an electronic device with an Internet connection to access the teaching materials and multimedia resources. Additionally, the program is based on the revolutionary Relearning learning methodology, pioneer in the university, which consists of repeating key concepts for an optimal and organic assimilation of all contents.

This **Postgraduate Certificate on Multidrug-Resistant Gram Negative Bacteria** 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 become familiar with the latest research and technologies in microbiology and infectious diseases, developing critical competencies in the integrated management of affected patients. What are you waiting for to enroll?"*

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*You will address the comprehensive clinical evaluation of patients with Multidrug-Resistant Gram Negative Bacteria infections, emphasizing the importance of a detailed anamnesis and the application of complementary tests”*

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 analyze the epidemiological characteristics of Multidrug-Resistant Gram Negative Bacteria, highlighting their impact in both community and nosocomial settings. With all of TECH's quality guarantees!*

*You will delve into other elements contributing to the virulence and resistance of Multidrug-Resistant Gram Negative Bacteria, thanks to the best teaching materials, at the forefront of education and technology.*



# 02 Objectives

The program aims to update physicians on the epidemiology of infections caused by Multidrug-Resistant Gram-Negative Bacteria, both in community and nosocomial contexts. Therefore, the underlying pathogenesis of these infections will be analyzed, including bacterial virulence factors and host characteristics that contribute to their resistance. In addition, professionals will develop competencies in the clinical evaluation, microbiological diagnosis and adequate therapeutic management of these infections, preparing them to effectively face these challenges in the professional practice of medicine.







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*The objectives of this Postgraduate Certificate have been designed to provide you with an update on pathogens that represent a significant challenge in contemporary medical practice”*



## General Objectives

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- ♦ Analyze the effectiveness of infection prevention strategies, including the use of quality indicators, evaluation tools and continuous improvement tools
- ♦ Understand the pathogenesis of Gram-Negative Infections, including the factors related to these Bacteria and patients themselves





## Specific Objectives

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- Select the appropriate empirical antibiotic treatment for suspected infections with Multidrug-resistant Gram-negative Microorganisms
- Determine the importance of PROA (Program for Optimization of Antimicrobial Agents) teams in infections by Multidrug-resistant Gram-negative Microorganisms

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*You will apply advanced diagnostic methods and rational selection of antimicrobial treatments, promoting effective infection management, through an extensive library of multimedia resources”*

# 03

# Course Management

The lecturers behind this Postgraduate Certificate on Multidrug-Resistant Gram Negative Bacteria are highly qualified and experienced experts in Microbiology, Parasitology and Infectious Diseases. In fact, these professionals have a deep theoretical and practical knowledge about these microorganisms, and are dedicated to teaching advanced diagnostic methods, antimicrobial treatment strategies, as well as to apply updated protocols in the management of these complex infections.



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*The clinical experience and dedication to research of the faculty will allow you to obtain comprehensive and up-to-date specialization in the field of Multidrug-Resistant Gram Negative Bacteria”*

## Management



### 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, Member of the Spanish Network of Research in Infectious Pathology

## Professors

### Dr. Armiñanzas Castillo, Carlos

- ♦ FEA at the University Hospital Marqués de Valdecilla, Cantabria
- ♦ Researcher at the Valdecilla Research Institute (IDIVAL), Cantabria
- ♦ Doctor in Medicine by the University of Cantabria
- ♦ Master's Degree in Human Immunodeficiency Virus Infection, Rey Juan Carlos University
- ♦ Master's Degree in Graphic Medicine from the International University of Andalusia
- ♦ Degree in Medicine from the University of Cantabria
- ♦ Member of: Center for Biomedical Research in the Infectious Diseases Network CIBERINFEC (MICINN-ISCIII), Society of Infectious Diseases and Clinical Microbiology (SEIMC)



# 04

## Structure and Content

This academic program will include a detailed exploration of the epidemiology of infections caused by Multidrug-Resistant Gram-Negative Bacteria, both in community and nosocomial settings. It will also delve into the pathogenesis of these bacteria, analyzing key factors related to their virulence and antibiotic resistance. In addition, the contents will cover the comprehensive clinical evaluation of affected patients, advanced diagnostic techniques, empirical and targeted therapeutic strategies, as well as the management of the risk of acquisition and spread of these resistant infections.







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*The Postgraduate Certificate on Multidrug-Resistant Gram Negative Bacteria will cover a broad range of topics fundamental to understanding and effectively managing these critical pathogens in the healthcare setting”*

## Module 1. Multidrug-Resistant Gram Negative Bacteria

- 1.1. Infections Due to Gram-Negative Microorganisms
  - 1.1.1. Epidemiology of Gram-Negative Microorganisms
  - 1.1.2. Community and Nosocomial Infections by Gram-Negative Microorganisms
  - 1.1.3. Relevance of Infections by Multidrug-Resistant Gram-Negative Microorganisms
- 1.2. Pathogenesis of Infections by Gram-Negative Microorganisms
  - 1.2.1. Factors Related to Gram-Negative Microorganisms
  - 1.2.2. Patient Factors in Gram-Negative Infections
  - 1.2.3. Other Factors in Gram-Negative Infections
- 1.3. Clinical Evaluation of Patients with Multidrug-Resistant Gram-Negative Infections
  - 1.3.1. Medical History
  - 1.3.2. Clinical Evaluation of Patients
  - 1.3.3. Other Data of Interest
- 1.4. Complementary Tests in Infections by Multidrug-Resistant Gram-Negative Microorganisms
  - 1.4.1. Blood Tests
  - 1.4.2. Imaging Tests
  - 1.4.3. Microbiological Techniques
- 1.5. Estimation of Severity in Patients with Infections by Multidrug-Resistant Gram-Negative Microorganisms
  - 1.5.1. Gram-Negative Multidrug-Resistant Microorganisms
  - 1.5.2. Traditional Approach to Severity Estimation
  - 1.5.3. Practical Conclusions
- 1.6. Risk of Acquiring Infections by Multidrug-Resistant Gram-Negative Microorganisms
  - 1.6.1. Clinical Factors in the Acquisition of Infections by Multidrug-Resistant Gram-Negative Microorganisms
  - 1.6.2. Other Factors in the Acquisition of Infections by Multidrug-Resistant Gram-Negative Microorganisms
  - 1.6.3. Tools to Calculate the Risk of Presence of Multidrug-Resistant Gram-Negative Microorganisms
- 1.7. Empirical Treatment in the Suspicion of Infections by Multidrug-Resistant Gram-Negative Microorganisms
  - 1.7.1. Microorganisms Involved According to Localization
  - 1.7.2. Comprehensive Assessment of Patients with Suspected Infections by Multidrug-Resistant Gram-Negative Microorganisms
  - 1.7.3. Selection of Empirical Antibiotic Treatment





- 1.8. Targeted Therapy in Infections by Multidrug-Resistant Gram-Negative Microorganisms
  - 1.8.1. Adjustment of Antibiotic Therapy According to Microbiological Results
  - 1.8.2. Follow-up of Multidrug-Resistant Gram-Negative Microorganism Infection
  - 1.8.3. Most Relevant Side Effects of Antibiotherapy
- 1.9. Duration of Antibiotherapy in Infections by Multidrug-Resistant Gram-Negative Microorganisms
  - 1.9.1. Estimation of the Duration of Antibiotic Treatment in Infections by Multidrug-Resistant Gram-Negative Microorganisms
  - 1.9.2. Relevance of Focus Control in Infections by Multidrug-Resistant Gram-Negative Microorganisms
  - 1.9.3. Special Considerations Related to Antibiotic Therapy in These Infections
- 1.10. PROA Teams in Infections Caused by Multidrug-Resistant Gram-Negative Microorganisms
  - 1.10.1. PROA Teams: History
  - 1.10.2. Impact of PROA Teams on the Correct Use of Antibiotic Treatments
  - 1.10.3. Challenge of PROA Teams in the Treatment of Infections Caused by Multiresistant Gram-Negative Microorganisms

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*This comprehensive approach will prepare you to meet current and future challenges in the clinical and epidemiological management of Multidrug-Resistant Gram Negative Bacteria, supported by the revolutionary Relearning methodology”*

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

This Postgraduate Certificate in Multidrug-Resistant Gram Negative Bacteria guarantees, in addition to the most rigorous and updated training, access to a Postgraduate Certificate issued by TECH Technological University.





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

This **Postgraduate Certificate in Multidrug-Resistant Gram Negative Bacteria** contains the most complete and updated Scientific program in the market.

After the student has passed the assessments, they will receive their corresponding **Postgraduate Certificate** issued by **TECH Technological University** via tracked delivery.

The diploma issued by **TECH Technological University** will reflect the qualification obtained in the Postgraduate Certificate, and meets the requirements commonly demanded by labor exchanges, competitive examinations, and professional career evaluation committees.

Title: **Postgraduate Certificate in Multidrug-Resistant Gram Negative Bacteria**

Modality: **online**

Duration: **6 weeks**



future

health confidence people

education information tutors

guarantee accreditation teaching

institutions technology learning

community commitment

**tech** technological  
university

personalized service innovation

knowledge present  
online training

development languages

virtual classroom

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