Postgraduate Certificate

Proteomics in Clinical Microbiology

tech global university

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Postgraduate Certificate

Proteomics in Clinical Microbiology

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

Website: www.techtitute.com/us/medicine/postgraduate-certificate/proteomics-clinical-microbiology

Index

01

Introduction

Proteomics has emerged in recent years as a crucial tool in the field of clinical microbiology. With the increasing prevalence of antibiotic-resistant infections and the need for rapid and accurate diagnostics, this discipline offers innovative solutions to address these challenges. For example, mass spectrometry allows rapid identification of bacteria and fungi from clinical cultures. Faced with this, it is vital that physicians stay at the forefront of the latest advances in this field to optimize the management of infectious diseases. In this context, TECH implements a pioneering university program focused on Proteomics in Clinical Microbiology. Moreover, it is based on a convenient 100% online modality.

Thanks to this Postgraduate Certificate, supported by Relearning, you will effectively apply proteomic techniques in the identification of pathogens and biomarkers of infectious diseases"

According to a report by the World Health Organization, infectious diseases remain one of the leading causes of global mortality, causing approximately 10 million deaths per year. Faced with this reality, physicians play an important role in the diagnosis, treatment and management of these diseases. For this reason, these specialists must stay abreast of the most innovative proteomic techniques to significantly improve the accuracy and speed of diagnosing infections. However, this can be a challenge for physicians in the face of their heavy workload.

To facilitate this work, TECH presents a revolutionary Postgraduate Certificate in Proteomics in Clinical Microbiology. The academic itinerary will delve into both the evolution and development of proteins, enabling graduates to make highly informed clinical decisions. In addition, the syllabus will analyze the most advanced qualitative techniques for protein separation, including two-dimensional electrophoresis (2DE). In line with this, the program will equip clinicians with the necessary skills to effectively manage
bioinformatics tools used in proteomics. The study plan will also include an innovative topic that will explore the future of genomics in the clinical laboratory.

On the other hand, this syllabus is delivered through a 100% online modality, making it easy for practitioners to plan their own study schedules to experience a fully efficient update. In addition, specialists will enjoy a wide variety of multimedia resources designed to promote dynamic and natural teaching. To access the Virtual Campus, all professionals will need is a device with Internet access (including their own cell phone). Professionals will also be supported at all times by an experienced teaching staff, who will answer any questions that may arise during the course of the program.

This **Postgraduate Certificate in Proteomics in Clinical Microbiology** 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 Clinical Microbiology and Multidrug-Resistant Bacteria.
- 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 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.

A highly qualified specialization designed to boost your career as a doctor and put you at the forefront of competitiveness in the sector"

You will learn in depth the technique of Mass Spectrometry and use it to identify bacteria in clinical samples"

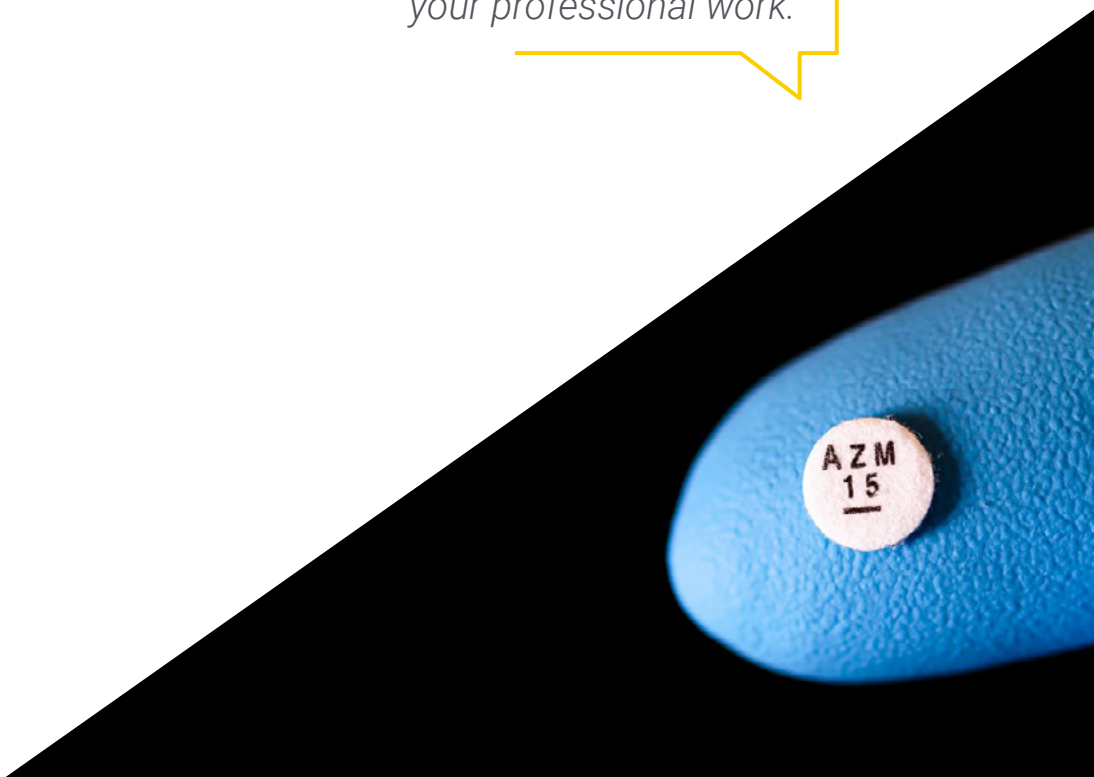
Do you want to develop the skills to apply proteomic techniques to identify pathogens and biomarkers of infectious diseases? Achieve it through this program.

TECH's online methodology will allow you to choose the time and place to study, without hindering your professional work.

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.

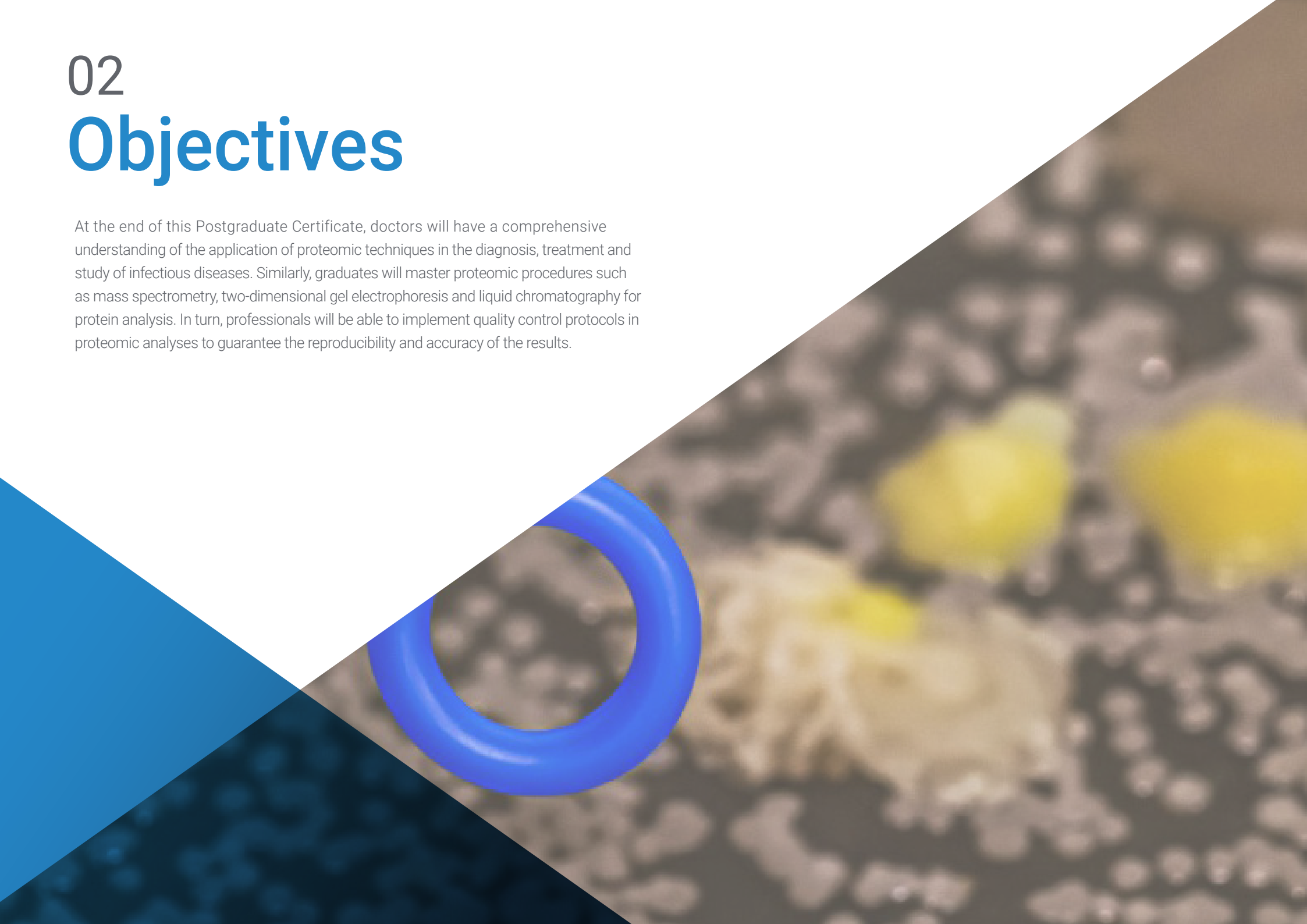
This program is designed around Problem-Based Learning, whereby the professional must try to solve the different professional practice situations that arise during the course. For this purpose, students will be assisted by an innovative interactive video system created by renowned and experienced experts.



02

Objectives

At the end of this Postgraduate Certificate, doctors will have a comprehensive understanding of the application of proteomic techniques in the diagnosis, treatment and study of infectious diseases. Similarly, graduates will master proteomic procedures such as mass spectrometry, two-dimensional gel electrophoresis and liquid chromatography for protein analysis. In turn, professionals will be able to implement quality control protocols in proteomic analyses to guarantee the reproducibility and accuracy of the results.



You will use the most sophisticated proteomic techniques in the diagnosis and treatment of infections, therefore improving clinical outcomes"

General Objectives

- Understand how bacterial resistance evolves as new antibiotics are introduced into clinical practice
- Understand the colonization and infection of patients in Intensive Care Units (ICUs), the different types and risk factors associated with infection
- Evaluate the impact of Nosocomial Infections in the critically ill patient, including the importance of risk factors and their impact on length of stay in the ICU
- 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
- Examine the main infections by Gram Positive Bacteria, including their natural habitat, Nosocomial Infections and community-acquired infections
- Determine the clinical significance, resistance mechanisms and treatment options for different Gram-positive Bacteria
- Substantiate the importance of Proteomics and Genomics in the Microbiology laboratory including recent advances and technical and bioinformatics challenges
- Acquire knowledge on the dissemination of resistant bacteria in food production
- Study the presence of multidrug-resistant bacteria in the environment and wildlife, as well as to understand their potential impact on public health
- Acquire expertise on innovative antimicrobial molecules, including antimicrobial peptides and bacteriocins, bacteriophage enzymes and nanoparticles
- Develop expertise in the discovery methods for new antimicrobial molecules.
- Gain specialized knowledge on Artificial Intelligence (AI) in Microbiology, including current expectations, emerging areas and its cross-cutting nature
- Understand the role that AI will play in Clinical Microbiology, including the technical lines and challenges for its implementation and deployment in laboratories

Specific Objectives

- Delve into qualitative and quantitative techniques for protein separation and identification
- Apply bioinformatics tools for Proteomics and Genomics

Enjoy an effective update thanks to the didactic formats offered by this qualification, such as the explanatory video or the interactive summary"

03

Course Management

For the delivery of this Postgraduate Certificate, TECH has a first-class teaching staff made up of specialists in Proteomics in Clinical Microbiology. These experts have a vast professional background, which has led them to form part of distinguished health entities. In the same vein, they pour into the teaching materials both their solid knowledge of the subject and their years of professional experience. Therefore, graduates will gain access to a highly intensive experience that will fully optimize their daily practice.

A university program with a multidisciplinary approach given by the experts in Proteomics in Clinical Microbiology who participate in it"

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

Professors

Dr. Ruiz de Alegría Puig, Carlos

- FEA at the University Hospital Marqués de Valdecilla, Cantabria
- Rotation in the Area of Molecular Biology and Fungi, Hospital de Basurto, Bilbao
- Specialist in Microbiology and Immunology by the Marqués de Valdecilla University Hospital
- PhD in Molecular Biology and Biomedicine by the University of Cantabria
- Degree in Medicine and Surgery from the University of the Basque Country
- Member of: Spanish Society of Microbiology (SEM) and Center for Biomedical Research in Infectious Diseases Network CIBERINFEC (MICINN-ISCIII)

A unique, crucial and decisive learning experience to boost your professional development"

04

Structure and Content

Through this Postgraduate Certificate, clinicians will have a comprehensive understanding of Proteomics methods and their application in Clinical Microbiology. The syllabus will provide an in-depth analysis of the main quantitative techniques for protein separation, including isotopic labeling and high-performance liquid chromatography. In addition, professionals will acquire skills to efficiently handle the most sophisticated bioinformatics tools in the field of Proteomics. In this way, practitioners will use these models to predict the three-dimensional structure of proteins from amino acid sequences, providing valuable information about their possible interactions.

You will be qualified to perform analysis and interpret proteomic data using the most advanced bioinformatics tools"

Module 1. Proteomics in Clinical Microbiology

1.1. Proteomics in the Microbiology Laboratory
- 1.1.1. Evolution and Development of Proteomics
- 1.1.2. Importance in Microbiological Diagnosis
- 1.1.3. Proteomics of Multi-Resistant Bacteria

1.2. Qualitative Protein Separation Techniques
- 1.2.1. Two-Dimensional Electrophoresis (2DE)
- 1.2.2. DIGE Technology
- 1.2.3. Applications in Microbiology

1.3. Quantitative Protein Separation Techniques
- 1.3.1. Isotopic Labelling
- 1.3.2. High Performance Liquid Chromatography (HPLC)
- 1.3.3. Mass Spectrometry (MS)
  - 1.3.3.1. MALDI-TOF Technologies in the Clinical Microbiology Laboratory
    - 1.3.3.1.1. VITEK®MS System
    - 1.3.3.1.2. MALDI Biotyper® System

1.4. MALDI-TOF Applications in Clinical Microbiology
- 1.4.1. Identification of Microorganisms
- 1.4.2. Characterization of Antibiotic Resistance
- 1.4.3. Bacterial Typing

1.5. Bioinformatics Tools for Proteomics
- 1.5.1. Proteomic Databases
- 1.5.2. Protein Sequence Analysis Tools
- 1.5.3. Visualization of Proteomic Data

1.6. Genomics in the Microbiology Laboratory
- 1.6.1. Evolution and Development of Genomics
- 1.6.2. Importance in Microbiological Diagnosis
- 1.6.3. Genomics of Multi-Resistant Bacteria

1.7. Types of Sequencing
- 1.7.1. Sequencing of Genes with Taxonomic Value
- 1.7.2. Sequencing of Genes of Taxonomic Value
- 1.7.3. Bulk Sequencing

1.8. Applications of Massive Sequencing in Clinical Microbiology
- 1.8.1. Whole Bacterial Genome Sequencing
- 1.8.2. Comparative Genomics
- 1.8.3. Epidemiological Monitoring
- 1.8.4. Microbial Diversity and Evolution Studies

1.9. Bioinformatics Tools for Genomics
- 1.9.1. Genomic Databases
- 1.9.2. Sequence Analysis Tools
- 1.9.3. Visualization of Genomic Data

1.10. Future of Genomics and Proteomics in the Clinical Laboratory
- 1.10.1. Recent and Future Developments in Genomics and Proteomics
- 1.10.2. Development of New Therapeutic Strategies
- 1.10.3. Technical and Bioinformatics Challenges
- 1.10.4. Ethical and Regulatory Implications

TECH offers you the most complete and up-to-date university program on the market so that you can achieve excellence as a Doctor. Enroll now!"

05

Methodology

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

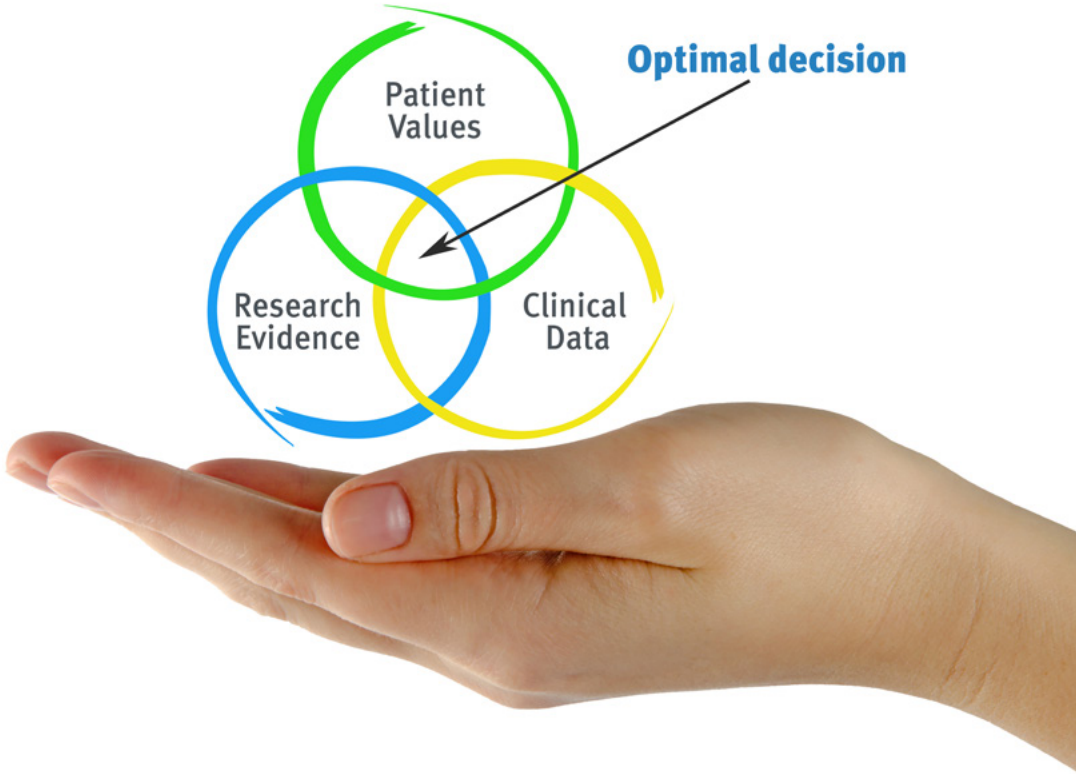
This teaching system is used, for example, in the most prestigious medical schools in the world, and major publications such as the **New England Journal of Medicine** have considered it to be one of the most effective.

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:

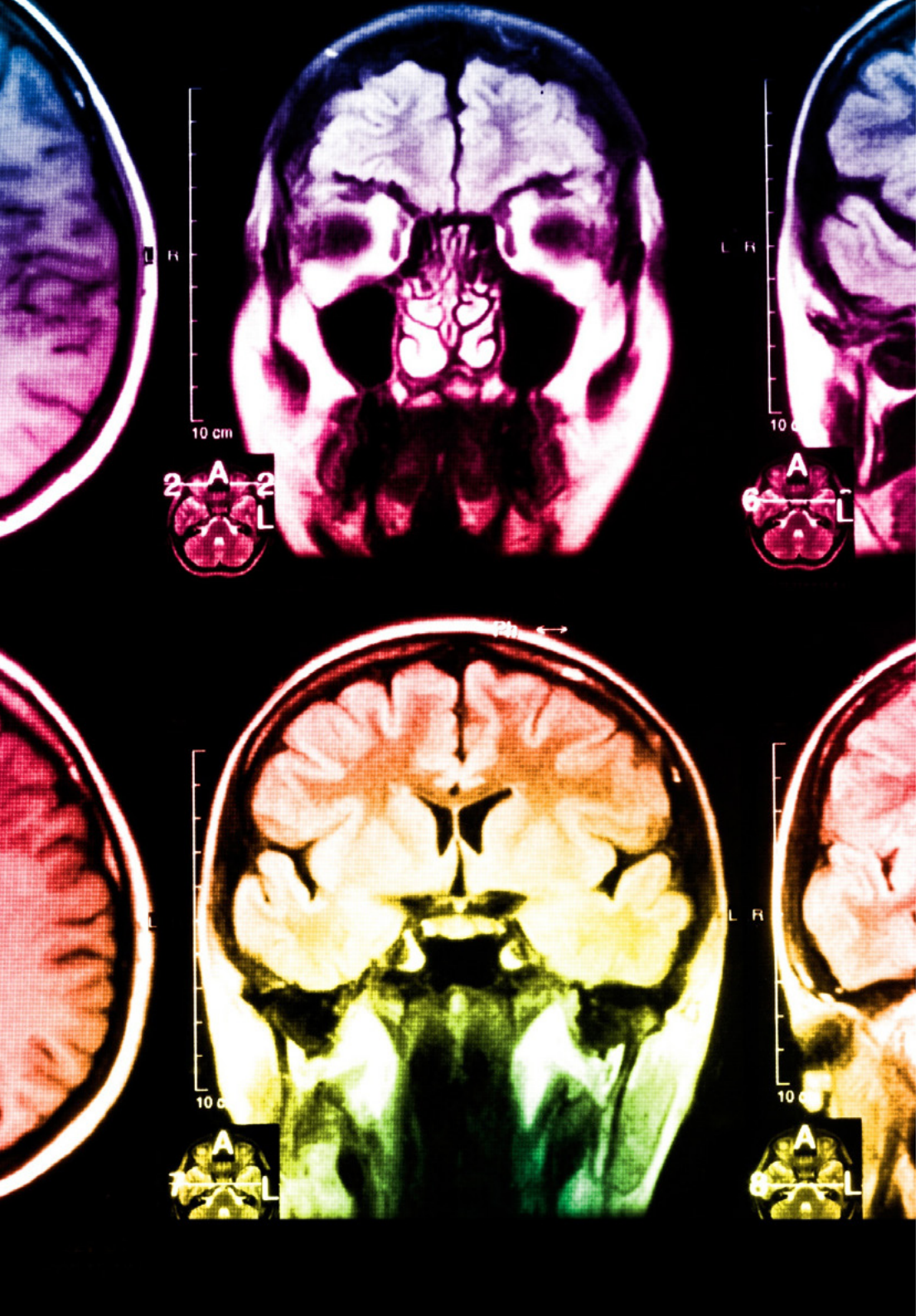
1. Students who follow this method not only achieve the assimilation of concepts, but also a development of their mental capacity, through exercises that evaluate real situations and the application of knowledge.
2. Learning is solidly translated into practical skills that allow the student to better 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.

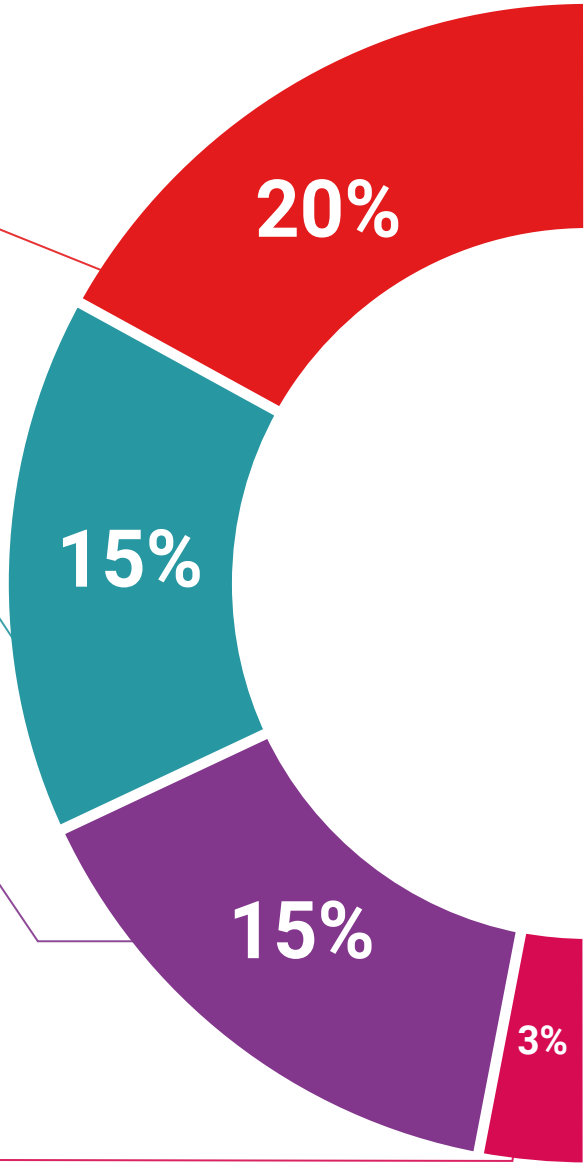
Interactive Summaries

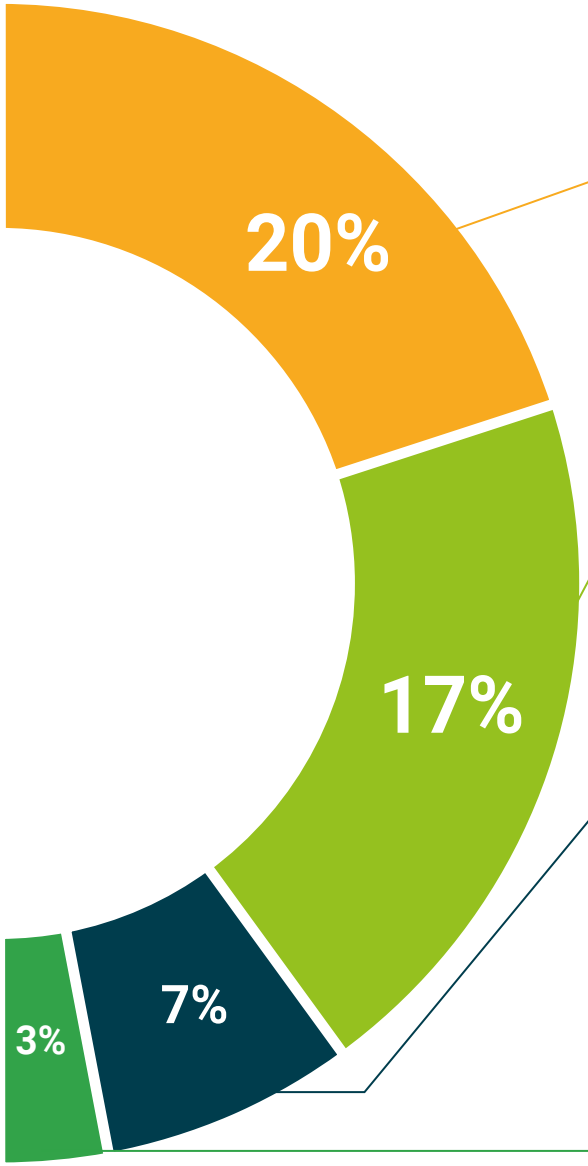
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

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.

06

Certificate

The Postgraduate Certificate in Proteomics in Clinical Microbiology guarantees, in addition to the most rigorous and updated knowledge, 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 Proteomics in Clinical Microbiology** 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 Proteomics in Clinical Microbiology**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**


tech global university

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

Postgraduate Certificate in Proteomics in Clinical Microbiology

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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Postgraduate Certificate

Proteomics in Clinical Microbiology

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Postgraduate Certificate

Proteomics in Clinical Microbiology

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