

# Postgraduate Diploma Intestinal Microbiota



## Postgraduate Diploma Intestinal Microbiota

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

Website: [www.techtute.com/us/medicine/postgraduate-diploma/postgraduate-diploma-intestinal-microbiota](http://www.techtute.com/us/medicine/postgraduate-diploma/postgraduate-diploma-intestinal-microbiota)

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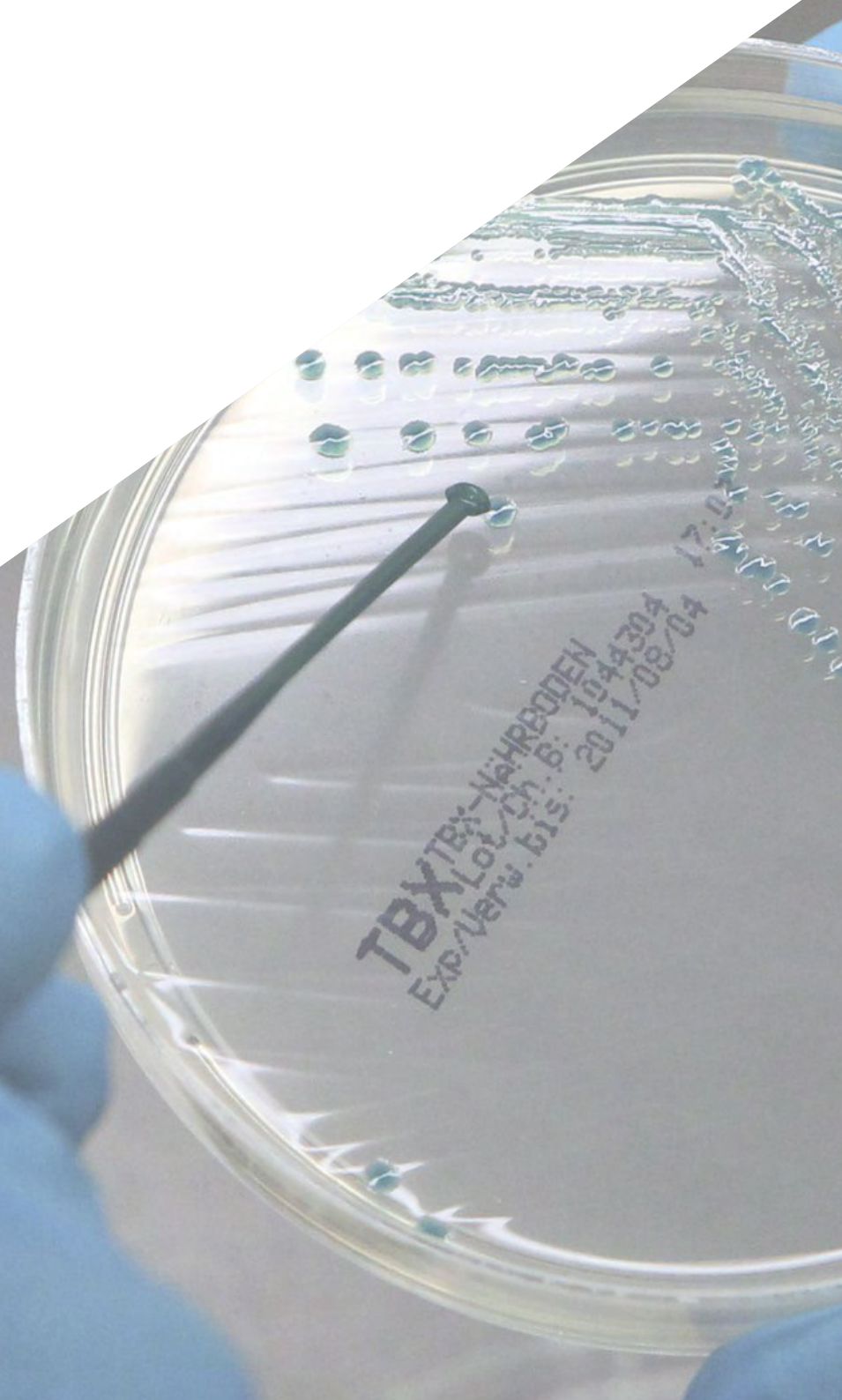
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# 01

# Introduction

The existence of microorganisms on the entire surface of the human body allows the different systems to develop immunological patterns against certain diseases. Among the most important is the Intestinal Microbiota, responsible for promoting physiological processes to achieve homeostasis and to prevent serious disorders like dysbiosis. This is an area that is subject to continuous study, so the advances that have been made in this area are extensive. In order that medical professionals can learn about them in detail, TECH has developed a program that includes the latest developments related to the integrity of the intestinal epithelium through the care of its microbiota. All this, in a 100% online way and through first level audiovisual resources designed by specialists in the field.





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*Working from wherever you want and with a schedule fully adapted to your availability on the latest news about the Intestinal Microbiota and its clinical importance is now possible thanks to this complete Postgraduate Diploma"*

The microorganisms that constitute the ecosystems of the human gut are key to the immune system. The intestinal microbiota acts as a very powerful defensive barrier, and in the antibody production for the identification and neutralization of pathogens that affect people's health. For this reason, achieving homeostasis through the care and production of these bacteria is fundamental for health, as it helps prevent a wide range of diseases, including dysbiosis, which alters the intestinal structure causing weakness and increasing the risk of suffering chronic pathologies such as diabetes, obesity or even different types of cancer.

Based on the importance of caring for these macroorganisms, TECH and its team of experts in Biology and Medicine, have developed a comprehensive program through which clinical specialists will be able to catch up on the latest developments in this field. This is the Postgraduate Diploma in Intestinal Microbiota, a 100% online program that will allow students to delve into the latest scientific advances related to the microbiome and metagenomics. In addition, they will work with the most innovative information related to homeostasis and dysbiosis, as well as the best treatments for each of them.

For this purpose, students will have 450 hours of diverse content: the syllabus, designed by a teaching team specialized in the field, clinical cases extracted from their consultations, research articles, complementary readings, self-knowledge exercises, news, dynamic summaries of each unit and much more. All this, compacted in a comfortable and flexible 100% online format, and whose Virtual Campus the student will be able to access from any device with internet connection. In this way, you will not depend on schedules or face-to-face classes to catch up, being able to combine the course of the degree in a guaranteed way with your clinical agenda.

This **Postgraduate Diploma in Intestinal Microbiota** contains the most complete and up-to-date scientific program on the market. Its most outstanding features are:

- The development of practical cases presented by experts in Intestinal Microbiota
- The graphic, schematic, and practical contents with which they are created, 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



*You will be able to get up to date on the factors that influence the balance and imbalance of the microbiota, 100% online"*



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*You will work with the most up-to-date information related to intestinal homeostasis and the most innovative guidelines to achieve it”*

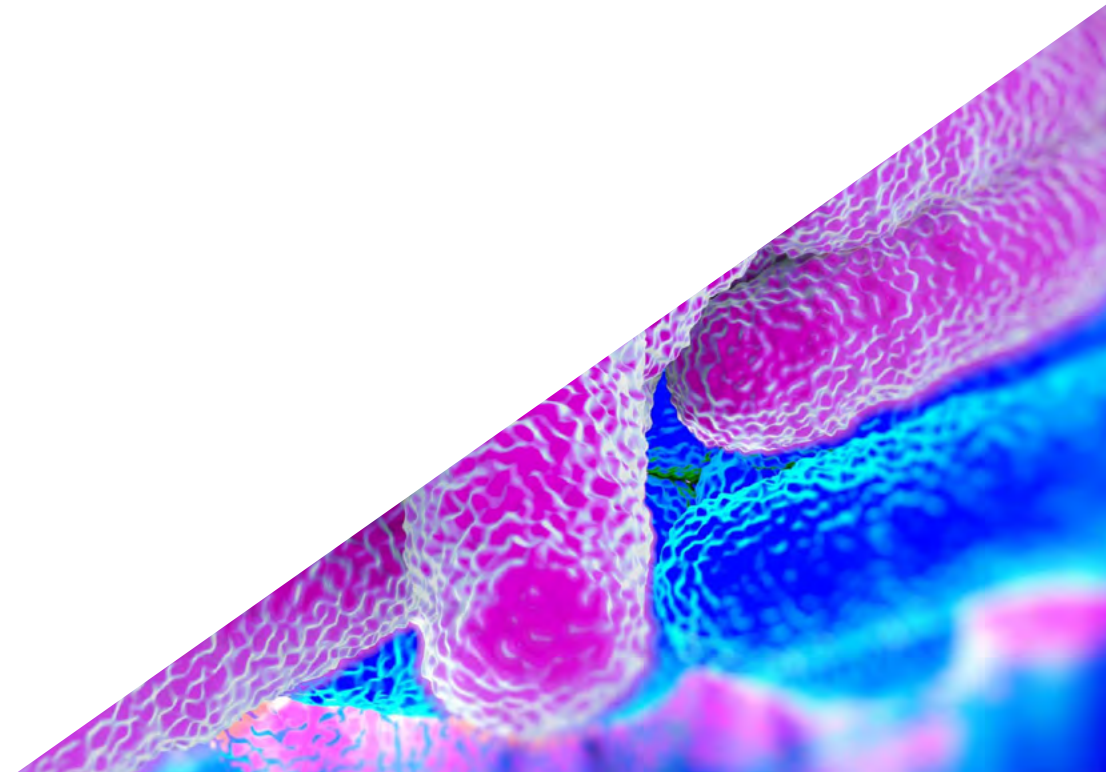
The program includes in its teaching staff professionals of the sector that pour into this program the experience of their work, as well as recognized specialists from reference societies and prestigious universities.

Its 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 an immersion education programmed to learn in real situations.

The design of this program focuses on Problem-Based Learning, by means of which the professional must try to solve the different professional practice situations that are presented throughout the academic course. For this purpose, the student will be assisted by an innovative interactive video system created by renowned experts.

*You will have unlimited access to the Virtual Campus, being able to use it from any device with internet connection.*

*Get qualified in the Intestinal Microbiota and its metabolic, nutritional and trophic functions in the face of the challenges and demands of the professional field.*



# 02 Objectives

The objective of this Postgraduate Diploma in Intestinal Microbiota is none other than to serve as a guide to the graduate in their update in relation to clinical and diagnostic developments that have been developed in this field. For this reason, TECH will provide graduates with the most innovative and exhaustive information related to homeostasis and dysbiosis, as well as the best therapeutic guidelines to promote and prevent them, respectively. In addition, you will have additional high quality material that will allow you to delve in a personalized way in the different sections of the syllabus.







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*A diploma designed for doctors to achieve even their most ambitious and demanding academic goals through the best program in the current academic panorama"*



## General Objectives

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- ♦ Offer a complete and broad vision of the current situation in the area of the Human Microbiota, in its widest sense, the importance of the balance of this microbiota as a direct effect on our health, with the multiple factors that influence it positively and negatively
- ♦ Argue with scientific evidence how the Microbiota and its interaction with many non-digestive pathologies, of autoimmune nature, or its relationship with the deregulation of the immune system, disease prevention and as a support to other medical treatments, are currently being given a privileged position
- ♦ Promote work strategies based on the integral approach of the patient as a reference model, not only focusing on the symptomatology of the specific pathology, but also on its interaction with the microbiota and how it may be influencing it
- ♦ Encourage professional stimulation through continued specialization and research



*Whatever your goals are, TECH will provide you with the best academic material for you to achieve them"*





## Specific Objectives

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### Module 1. Microbiota. Microbiome. Metagenomics

- ◆ Know the relationship between the microbiota and the microbiome, and its most accurate definitions
- ◆ Understand in depth the concepts of symbiosis, commensalism, mutualism and parasitism
- ◆ Delve into the different types of Human Microbiota and know their generalities
- ◆ Delve into the aspects that trigger the balance and imbalance of the Microbiota

### Module 2. Gut Microbiota I. Intestinal homeostasis

- ◆ Study the microbial communities that coexist in symbiosis with humans, learning more about their structure and functions and how these communities can be altered due to factors such as diet, lifestyle, etc
- ◆ Understand the relationship between intestinal pathologies: SIBO, Irritable Bowel Syndrome (IBS), Crohn's disease and intestinal dysbiosis

### Module 3. Gut Microbiota II. Intestinal Dysbiosis

- ◆ Deepen the knowledge of the Intestinal Microbiota as the main axis of the Human Microbiota and its interrelation with the rest of the body, its study methods and its applications in clinical practice to maintain a good state of health
- ◆ Learning to manage strategies in an updated way the different intestinal infections by viruses, bacteria, parasites, fungi modulating the altered Intestinal Microbiota



# 03

# Course Management

In its aim to offer the most comprehensive and beneficial program for updating students, TECH has selected a specialized faculty in the areas of Microbiology and Medicine, whose members have worked extensively with the Intestinal Microbiota, for this Postgraduate Diploma. It is a group of professionals backed by a long and extensive work experience in the sector, who will make use of their experience to provide specialists with the most effective techniques for the care of this important part of the body.



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*What happens if you have any questions during the course of the program? You will have the possibility of contacting the members of the teaching team through the Virtual Campus to solve them"*

## International Guest Director

Dr. Harry Sokol is internationally recognized in the field of **Gastroenterology** for his research on the **gut microbiota**. With more than 2 decades of experience, he has established himself as a true scientific authority thanks to his numerous studies on the role of **microorganisms in the human body** and their impact on **chronic inflammatory bowel diseases**. In particular, his work has revolutionized medical understanding of this organ, often referred to as the «**second brain**.»

Among Dr. Sokol's contributions, he and his team have opened a new line of advances on the bacterium **Faecalibacterium prausnitzii**. In turn, these studies have led to crucial discoveries about its **anti-inflammatory effects**, opening the door to **revolutionary treatments**.

In addition, the expert is distinguished by his **commitment to the dissemination of knowledge**, whether by teaching academic programs at the Sorbonne University or by publishing works such as the **comic book** *The Extraordinary Powers of the Belly*. His scientific publications appear continuously in **world-renowned journals** and he is invited to **specialized congresses**. At the same time, he carries out his clinical work at the **Saint-Antoine Hospital** (AP-HP/University Hospital Federation IMPEC/Sorbonne University), one of the most renowned hospitals in Europe.

On the other hand, Dr. Sokol began his **medical studies** at Paris Cité University, showing early on a strong interest in **health research**. A chance meeting with the eminent Professor Philippe Marteau led him to **Gastroenterology** and the enigmas of the **Intestinal Microbiota**. Throughout his career, he also broadened his horizons by training in the United States, at Harvard University, where he shared experiences with **leading scientists**. Upon his return to France, he founded his **own team** where he researches on **Fecal Transplantation**, offering state-of-the-art therapeutic innovations.





## Dr. Sokol, Harry

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- Director of Microbiota, Gut and Inflammation at Sorbonne University, Paris, France
- Specialist Physician at the Gastroenterology Department of the Saint-Antoine Hospital (AP-HP), Paris, France
- Group Leader at the Institut Micalis (INRA)
- Coordinator of the Center of Microbiome Medicine of Paris FHU
- Founder of the pharmaceutical company Exeliom Biosciences (Nextbiotix)
- President of the Fecal Microbiota Transplantation Group
- Medical Specialist in different hospitals in Paris
- Doctorate in Microbiology at the Université Paris-Sud
- Postdoctoral Fellowship at the Massachusetts General Hospital, Harvard University Medical School
- Degree in Medicine, Hepatology and Gastroenterology at Université Paris Cité

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

## Guest Directors



### Dr. Sánchez Romero, María Isabel

- ♦ Area Specialist in the Microbiology Department of the Puerta de Hierro Majadahonda University Hospital, Madrid
- ♦ PhD in Medicine and Surgery from the University of Salamanca
- ♦ Medical Specialist in Clinical Microbiology and Parasitology
- ♦ Member of the Spanish Society of Infectious Diseases and Clinical Microbiology
- ♦ Technical Secretary of the Madrid Society of Clinical Microbiology



### Dr. Portero Azorín, MARÍA Francisca

- ♦ Acting Head of the Microbiology Service at the Puerta de Hierro Majadahonda University Hospital
- ♦ Specialist in Microbiology and Clinical Parasitology at the Puerta de Hierro University Hospital
- ♦ Doctorate in Medicine from the Autonomous University Madrid
- ♦ Postgraduate in Clinical Management by Gaspar Casal Foundation
- ♦ Research stay at the Presbyterian Hospital of Pittsburg through a FISS scholarship



### **Dr. Alarcón Cavero, Teresa**

- Biologist Specialist in Microbiology, Princesa University Hospital
- Head of Group 52 of the Research Institute of the La Princesa Hospital
- Degree in Biological Sciences with a major in Fundamental Biology from the Complutense University of Madrid
- Master's Degree in Medical Microbiology from the Complutense University of Madrid



### **Dr. Muñoz Algarra, María**

- Head of Patient Safety at the Microbiology Department of the Puerta de Hierro Majadahonda University Hospital
- Area Specialist in the Microbiology Department of the Puerta de Hierro Majadahonda University Hospital, Madrid
- Collaborator Department of Preventive Medicine and Public Health and Microbiology Autonomous University of Madrid
- Doctorate in Pharmacy from the Complutense University of Madrid





### Dr. López Dosil, Marcos

- Area Specialist in Microbiology and Parasitology at San Carlos Clinical University Hospital
- Specialist Physician of the Microbiology and Parasitology Department of the Hospital de Móstoles
- Master's Degree in Infectious Diseases and Antimicrobial Treatment from CEU Cardenal Herrera University
- Master's Degree in Tropical and Health Medicine from the Autonomous University of Madrid
- Expert in Tropical Medicine from the Autonomous University Madrid



### Anel Pedroche, Jorge

- Facultative Area Specialist. Microbiology Department, Puerta de Hierro University Hospital, Majadahonda, Spain
- Degree in Pharmacy from the Complutense University of Madrid
- Course in Interactive Sessions on Hospital Antibiotherapy by MSD
- Updating course on infection in hematologic patients by Puerta del Hierro Hospital
- Attendance at the XXII Congress of the Spanish Society of Infectious Diseases and Clinical Microbiology

## Management



### Ms. Fernández Montalvo, María Ángeles

- ◆ Head of Naintmed- Integrative Nutrition and Medicine
- ◆ Director of the Master's Degree in Human Microbiota at CEU University
- ◆ Parapharmacy Manager, Nutrition and Natural Medicine professional at Natural Life Parapharmacy
- ◆ Degree in Biochemistry from the University of Valencia
- ◆ Diploma in Natural and Orthomolecular Medicine
- ◆ Postgraduate in Food, Nutrition and Cancer: prevention and treatment
- ◆ Master's Degree in Integrative Medicine from CEU University
- ◆ Specialist Degree in Nutrition, Dietetics and Diet Therapy
- ◆ Expert in Vegetarian, Clinical, and Sports Nutrition
- ◆ Expert in the current use of Nutricosmetics and Nutraceuticals in general

## Professors

### Dr. Rioseras de Bustos, Beatriz

- ◆ Microbiologist and renowned researcher
- ◆ Resident in immunology at HUCA
- ◆ Member of the Biotechnology of Nutraceuticals and Bioactive Compounds Research Group (Bionuc) of the University of Oviedo
- ◆ Member of the Microbiology Area of the Department of Functional Biology
- ◆ Collaborator of the Southern Denmark University
- ◆ Doctorate in Microbiology from the University of Oviedo
- ◆ Master's Degree in Neuroscience Research from the University of Oviedo

### Dr. Gabaldon Estevani, Toni

- ◆ IRB and BSC senior group leader
- ◆ Co-founder and Scientific Advisor (CSO) of Microomics SL
- ◆ ICREA Research Professor and Group Leader of the Comparative Genomics Laboratory
- ◆ Doctor of Medical Sciences, Radboud University Nijmegen
- ◆ Corresponding Member of the Royal National Academy of Pharmacy of Spain
- ◆ Member of the Spanish Young Academy

**Dr. Uberos, José**

- ♦ Head of section in the Neonatology area of the San Cecilio Clinical Hospital of Granada
- ♦ Specialist in Pediatrics and Child Care
- ♦ Associate Professor of Pediatrics, University of Granada
- ♦ Vocal Bioethics Research Committee of the Province of Granada (Spain)
- ♦ Coeditor of the Signs and Symptoms Journal
- ♦ Professor Antonio Galdo Award. Society of Pediatrics of Eastern Andalucía
- ♦ Editor of the Journal of the Pediatric Society of Eastern Andalusia (Bol. SPAO)
- ♦ Doctor of Medicine and Surgery
- ♦ Degree in Medicine from the University of Santiago de Compostela
- ♦ Member of the Board of the Pediatric Society of Eastern Andalusia

**Dr. López Martínez, Rocío**

- ♦ Physician in the area of Immunology at the Vall d'Hebron Hospital
- ♦ Internal Biologist in Immunology at Central University Hospital of Asturias
- ♦ Master in Biostatistics and Bioinformatics, Universidad Oberta of Catalunya

**Ms. Bueno García, Eva**

- ♦ Predoctoral researcher in Immunosenescence at the Immunology Service of the Central University Hospital of Asturias (HUCA)
- ♦ Degree in Biology from the University of Oviedo
- ♦ Master's Degree in Biomedicine and Molecular Oncology from the University of Oviedo
- ♦ Molecular biology and immunology courses

**Dr. Verdú López, Patricia**

- ♦ Medical Specialist in Allergology at the Beata María Ana Hospital of Hermanas Hospitalarias
- ♦ Physician specializing in Allergology at Inmunomet Health and Integral Wellness Center
- ♦ Research physician in Allergology at San Carlos Hospital
- ♦ Specialist in Allergology at the University Hospital Dr. Negrín in Las Palmas of Gran Canaria
- ♦ Degree in Medicine from the University of Oviedo
- ♦ Master's Degree in Aesthetics and Antiaging Medicine at Complutense La University of Madrid

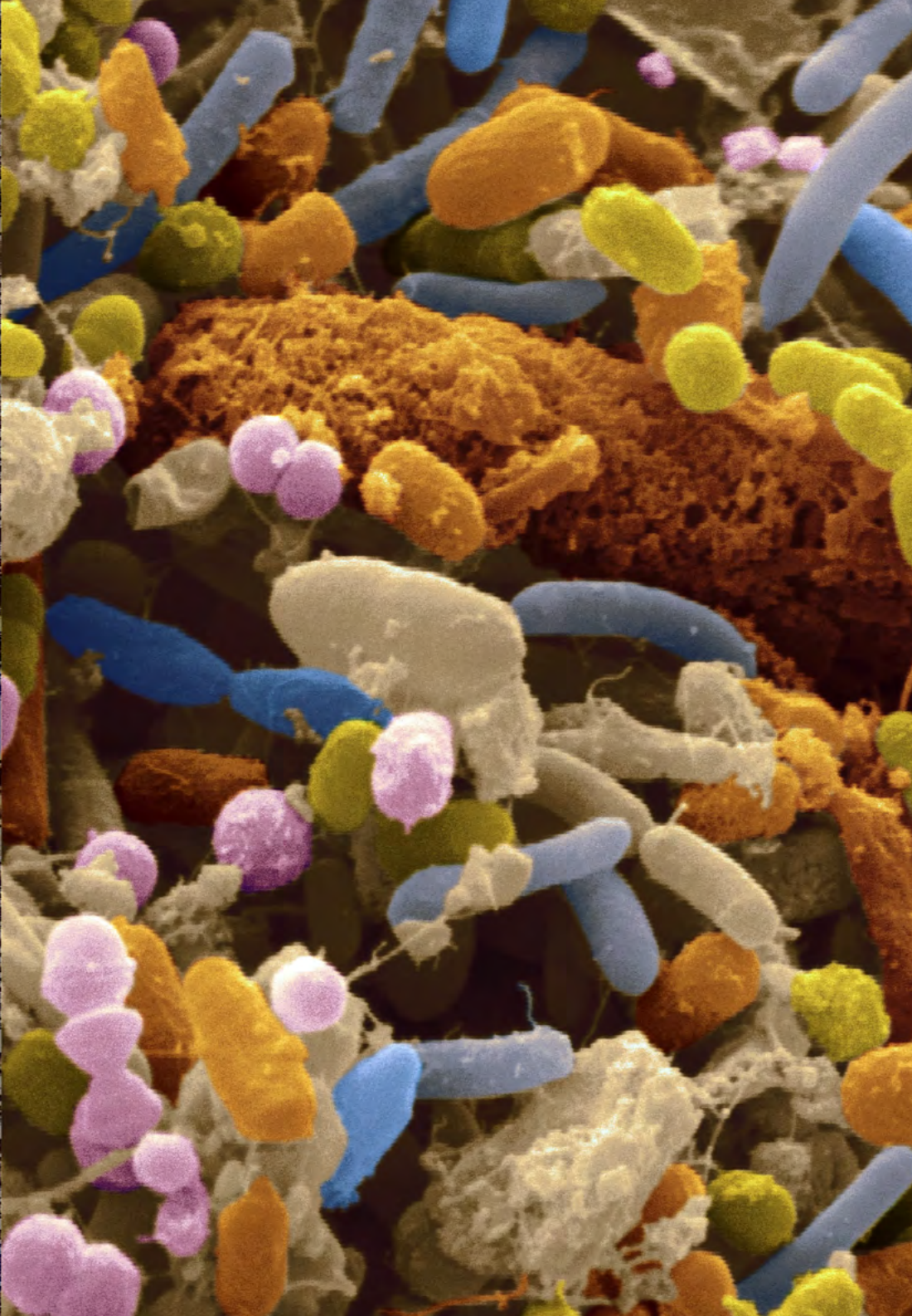
**Ms. Rodríguez Fernández, Carolina**

- ♦ Biotechnology Researcher at Adknoma Health Research
- ♦ Researcher at Adknoma Health Research
- ♦ Master in Clinical Trials Monitoring by ESAME Pharmaceutical Business School
- ♦ Master's Degree in Food Biotechnology from the University of Oviedo
- ♦ University Expert in Digital Teaching in Medicine and Health by CEU Cardenal Herrera University

**Dr. Alonso Arias, Rebeca**

- ♦ Director of the Immunosenescence research group of the HUCA Immunology Service
- ♦ Specialist Immunology Physician at the Central University Hospital of Asturias
- ♦ Numerous publications in international scientific journals
- ♦ Research work on the association between the microbiota and the immune system
- ♦ 1st National Award for Research in Sports Medicine, 2 occasions



**Dr. Gonzalez Rodríguez, Silvia Pilar**

- ◆ Medical Subdirector, Research Coordinator and Clinical Chief of the Menopause and Osteoporosis Unit at the Velázquez Medical Cabinet
- ◆ Specialist in Gynecology and Obstetrics at HM Gabinete Velázquez
- ◆ Medical Expert at Bypass Comunicación en Salud, SL
- ◆ Key Opinion Leader of several international pharmaceutical laboratories
- ◆ Doctor in Medicine and Surgery from the University of Alcalá de Henares, specializing in Gynecology
- ◆ Specialist in Mastology by the Autonomous University of Madrid
- ◆ Master's Degree in Sexual Orientation and Therapy from the Sexological Society of Madrid
- ◆ Master's Degree in Climacteric and Menopause from the International Menopause Society
- ◆ Postgraduate Diploma in Epidemiology and New Applied Technologies from the UNED (Spanish Distance Learning University)
- ◆ University Diploma in Research Methodology from the Foundation for the Training of the Medical Association and the National School of Health of the Carlos III Health Institute

**Dr. Fernández Madera, Juan Jesus**

- ◆ Allergologist at HUCA
- ◆ Former Head of the Allergology Unit, Monte Naranco Hospital, Oviedo
- ◆ Allergology Service, Central University Hospital of Asturias
- ◆ Member of: Alergonorte Board of Directors, SEAIC Rhinoconjunctivitis Scientific Committee, Medicinatv.com Advisory Committee

**Dr. Méndez García, Celia**

- ◆ Biomedical Researcher at Novartis Laboratories in Boston, USA
- ◆ Doctorate in Microbiology from the University of Oviedo
- ◆ Member of the North American Society for Microbiology



**Dr. Lombó Burgos, Felipe**

- ◆ PhD in Biology
- ◆ Head of the BIONUC Research Group, University of Oviedo
- ◆ Former Director of the Research Support Area of the AEI Project
- ◆ Member of the Microbiology Area of the University of Oviedo
- ◆ Co-author of the research *Biocidal nanoporous membranes with inhibitory activity of biofilm formation at critical points in the production process of the dairy industry*
- ◆ Head of the study on 100% natural acorn-fed ham against inflammatory bowel diseases
- ◆ Speaker III Congress of Industrial Microbiology and Microbial Biotechnology

**Dr. Álvarez García, Verónica**

- ◆ Assistant Physician of the Digestive Area at the Río Hortega University Hospital
- ◆ Specialist in Digestive System at the Central Hospital of Asturias
- ◆ Speaker at the XLVII Congress SCLECARTO
- ◆ Degree in Medicine and Surgery
- ◆ Digestive System Specialist

**Dr. Narbona López, Eduardo**

- ◆ Speciality Neonatal Unit, San Cecilio University Hospital
- ◆ Advisor to the Department of Pediatrics, University of Granada
- ◆ Member of: Pediatric Society of Western Andalusia and Extremadura, Andalusian Association of Primary Care Pediatrics



**Dr. López Vázquez, Antonio**

- ◆ Immunology at the Central University Hospital of Asturias
- ◆ Area Specialist in Immunology, Central University Hospital of Asturias, Spain
- ◆ Collaborator of the Carlos III Health Institute
- ◆ Advisor of Aspen Medical
- ◆ Doctor of Medicine, University of Oviedo

**Dr. Losa Domínguez, Fernando**

- ◆ Gynecologist at the Sagrada Familia Clinic of HM Hospitals
- ◆ Doctor in private practice in Obstetrics and Gynecology in Barcelona
- ◆ Expert in Gynecoesthetics by the Autonomous University of Barcelona
- ◆ Member of: Spanish Association for the Study of Menopause, Spanish Society of Phytotherapeutic Gynecology, Spanish Society of Obstetrics and Gynecology, Board of the Menopause Section of the Catalan Society of Obstetrics and Gynecology

**Dr. López López, Aranzazu**

- ◆ Specialist in Biological Sciences Researcher
- ◆ Researcher at Fisabio Foundation
- ◆ Assistant Researcher at the University of the Balearic Islands
- ◆ PhD in Biological Sciences from the University of the Balearic Islands

**Ms. Suárez Rodríguez, Marta**

- ◆ Gynecologist specialized in Senology and Breast Pathology
- ◆ Researcher and University Professor
- ◆ PhD in Medicine and Surgery from the Complutense University of Madrid
- ◆ Degree in Medicine and Surgery from the Complutense University of Madrid
- ◆ Master's Degree in Senology and Breast Pathology from the Autonomous University of Barcelona



# 04

## Structure and Content

The content of this Postgraduate Diploma has been developed following the guidelines of the teaching team, as well as the requirements of the effective and prestigious *Relearning* methodology. As a result, students will not have to spend extra hours memorizing, but will see a natural and progressive updating of their knowledge thanks to the continuous reiteration of the most important concepts throughout the syllabus. Moreover, this pedagogical strategy is also based on the resolution of real clinical cases, so that the graduate can perfect his skills based on the practical resolution of day-to-day practice contexts.





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*In the Virtual Campus you will find real clinical cases to work on their resolution in a practical way, as well as complementary readings, research articles and self-knowledge exercises"*

## Module 1. Microbiota. Microbiome. Metagenomics

- 1.1. Definition and Relationship Between Them
- 1.2. Composition of the Microbiota: Types, Species and Strains
  - 1.2.1. Groups of Microorganisms that Interact with Humans: Bacteria, Fungi, Viruses, and Protozoa
  - 1.2.2. Key Concepts: Symbiosis, Commensalism, Mutualism, Parasitism
  - 1.2.3. Autochthonous Microbiota
- 1.3. Different Human Microbiota. General Overview of Eubiosis and Dysbiosis
  - 1.3.1. Gastrointestinal Microbiota
  - 1.3.2. Oral Microbiota
  - 1.3.3. Skin Microbiota
  - 1.3.4. Respiratory Tract Microbiota
  - 1.3.5. Urinary Tract Microbiota
  - 1.3.6. Reproductive System Microbiota
- 1.4. Factors that Influence Microbiota Balance and Imbalance
  - 1.4.1. Diet and Lifestyle. Gut-Brain Axis
  - 1.4.2. Antibiotic Therapy
  - 1.4.3. Epigenetic-Microbiota Interaction. Endocrine Disruptors
  - 1.4.4. Probiotics, Prebiotics, Symbiotics. Concepts and Overviews
  - 1.4.5. Fecal Transplant, Latest Advances

## Module 2. Gut Microbiota I. Intestinal Homeostasis

- 2.1. Gut Microbiota Studies
  - 2.1.1. Projects MetaHIT, Meta-Biomed, *MyNewGut*, *Human Microbiome Project*
- 2.2. Microbiota Composition
  - 2.2.1. Protective Microbiota (*Lactobacillus*, *Bifidobacterium*, *Bacteroides*)
  - 2.2.2. Immunomodulatory Microbiota (*Enterococcus faecalis* and *Escherichia coli*)
  - 2.2.3. Mucoprotective or Muconutritive Microbiota (*Faecalibacterium prausnitzii* and *Akkermansia muciniphila*)
  - 2.2.4. Microbiota with Proteolytic or Proinflammatory Activities (*E. coli* Biovare, *Clostridium*, *Proteus*, *Pseudomonas*, *Enterobacter*, *Citrobacter*, *Klebsiella*, *Desulfovibrio*, *Bilophila*)
  - 2.2.5. Fungal Microbiota (*Candida*, *Geotrichum*)



- 2.3. Digestive System Physiology. Composition of the Microbiota in the Different Parts of the Digestive Tract. Resident Flora and Transient or Colonizing Flora. Sterile Areas in the Digestive Tract
  - 2.3.1. Esophageal Microbiota
    - 2.3.1.1. Healthy Individuals
    - 2.3.1.2. Patients (Gastric Reflux, Barrett's Esophagus, etc.)
  - 2.3.2. Gastric Microbiota
    - 2.3.2.1. Healthy Individuals
    - 2.3.2.2. Patients (Gastric Ulcer, Gastric Cancer, MALT, etc)
  - 2.3.3. Gallbladder Microbiota
    - 2.3.3.1. Healthy Individuals
    - 2.3.3.2. Patients (Cholecystitis, Cholelithiasis, etc.)
  - 2.3.4. Small Intestine Microbiota
    - 2.3.4.1. Healthy Individuals
    - 2.3.4.2. Patients (Inflammatory Bowel Disease, Irritable Bowel Syndrome, etc.)
  - 2.3.5. Colon Microbiota
    - 2.3.5.1. Healthy Individuals. Enterotypes
    - 2.3.5.2. Patients (Inflammatory Bowel Disease, Crohn's Disease, Colon Carcinoma, Appendicitis, etc)
- 2.4. Gut Microbiota Functions: Metabolic. Nutritional and Trophic. Protective and Barrier. Immunological
  - 2.4.1. Interrelationships Between the Intestinal Microbiota and Distant Organs (Brain, Lung, Heart, Liver, Pancreas, etc.)
- 2.5. Intestinal Mucosa and Mucosal Immune System
  - 2.5.1. Anatomy, Characteristics, and Functions (MALT, GALT, and BALT System)
- 2.6. What is Intestinal Homeostasis? Role of Bacteria in Intestinal Homeostasis
  - 2.6.1. Effects on Digestion and Nutrition
  - 2.6.2. Defence Stimulation, Hindering Colonization by Pathogenic Microorganisms
  - 2.6.3. Production of Vitamin B and K
  - 2.6.4. Production of Short Chain Fatty Acids (Butyric, Propionic, Acetic, etc.)
  - 2.6.5. Production of Gases (Methane, Carbon Dioxide, Molecular Hydrogen). Properties and Functions
  - 2.6.6. Lactic Acid

### Module 3. Gut Microbiota II. Intestinal Dysbiosis

- 3.1. What is Intestinal Dysbiosis? Consequences
- 3.2. Intestinal Barrier. Physiology. Function. Intestinal Permeability and Hyperpermeability. Relationship between Intestinal Dysbiosis and Intestinal Hyperpermeability
- 3.3. Relationship of Intestinal Dysbiosis and Other Types of Disorders: Immunological, Metabolic, Neurological and Gastric (*Helicobacter Pylori*)
- 3.4. Consequences of the Alteration of the Intestinal Ecosystem and its Relationship to Functional Digestive Disorders
  - 3.4.1. Inflammatory Bowel Disease IBD
  - 3.4.2. Chronic Inflammatory Bowel Diseases: Crohn's Disease  
Ulcerative Colitis
  - 3.4.3. Irritable Bowel Syndrome (IBS) and Diverticulitis
  - 3.4.4. Intestinal Motility Disorders. Diarrhea. Diarrhea Caused by *Clostridium Difficile*. Constipation
  - 3.4.5. Digestive Disorders and Nutrient Malabsorption Problems: Carbohydrates, Proteins, and Fats
  - 3.4.6. Markers of Intestinal Inflammation: Calprotectin. Eosinophil Cationic Protein (ECP). Lactoferrin. Lysozyme
  - 3.4.7. Leaky Gut Syndrome. Permeability Markers: Alpha-1 Antitrypsin. Zonulin. Tight Junctions and their Main Function
- 3.5. Alteration of the Intestinal Ecosystem and its Relationship with Intestinal Infections
  - 3.5.1. Viral Intestinal Infections
  - 3.5.2. Bacterial Intestinal Infections
  - 3.5.3. Intestinal Infections due to Parasites
  - 3.5.4. Fungal Intestinal Infections. Intestinal Candidiasis
- 3.6. Composition of the Intestinal Microbiota in the Different Stages of Life
  - 3.6.1. Variation in Gut Microbiota Composition from the Neonatal-Early Childhood Stage to Adolescence. "Unstable Period"
  - 3.6.2. Composition of the Intestinal Microbiota in Adulthood. "Stable Period"
  - 3.6.3. Composition of Microbiota Intestinal in the Elderly. "Unstable Period". Aging and Microbiota
- 3.7. Nutritional Modulation of Intestinal Dysbiosis and Hyperpermeability: Glutamine, Zinc, Vitamins, Probiotics, Prebiotics
- 3.8. Techniques for Quantitative Analysis of Microorganisms in Feces
- 3.9. Current Lines of Research



# 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 assess 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

TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines 8 different teaching elements in each lesson.

We enhance the Case Study with the best 100% online teaching method: Relearning.

*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 prepared with unprecedented success in all clinical specialties regardless of surgical load. Our educational 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 adapted in 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 assess and re-assess 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 Intestinal Microbiota guarantees, in addition to the most rigorous and up-to-date education, access to a Postgraduate Diploma certificate issued by TECH Global University.



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*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 Intestinal Microbiota** 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 Intestinal Microbiota**

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 quality  
development language  
virtual classroom



## Postgraduate Diploma Intestinal Microbiota

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

# Postgraduate Diploma

## Intestinal Microbiota