

# Postgraduate Certificate

## Molecular Biology Tools for the Agnostic Approach to Rare Cancer



## Postgraduate Certificate

### Molecular Biology Tools for the Agnostic Approach to Rare Cancer

Course Modality: Online

Duration: 6 weeks

Certificate: TECH Technological University

Official N° of hours: 150 h.

Website: [www.techtute.com/us/medicine/postgraduate-certificate/molecular-biology-tools-agnostic-approach-rare-cancer](http://www.techtute.com/us/medicine/postgraduate-certificate/molecular-biology-tools-agnostic-approach-rare-cancer)

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# 01

# Introduction

This program offers the specialist the chance to delve into the concepts of molecular oncology in relation to genetics, epigenetics, ctDN and RNA, as well as in the study of tumor DNA, both in its collection by solid biopsy and by liquid biopsy. Therefore, the student has a complete and up-to-date learning on molecular biology and its application to low incidence tumors, which have been a privileged context for the development of these technologies. It will also delve into aspects of the genome, the exome and sequencing panels, in addition to developing skills in germline DNA, becoming familiar with the concepts of variants and polymorphisms in order to be able to delve into germline alterations.





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*Get up to speed on the main molecular biology tools used in the approach to rare cancers and give your profession a boost”*

The Postgraduate Certificate in Molecular Biology Tools for the Agnostic Approach to Rare Cancer will give the student the opportunity to start from scratch, reviewing concepts of molecular oncology in relation to genetics, epigenetics, ctDNA and RNA. Once these aspects are known, students will have in-depth knowledge of the study of tumor DNA, both in solid biopsy and liquid biopsy. The student will be able to study aspects of the genome, the exome and sequencing panels; and will be familiar with the available platforms and current applications. In addition, students will also be able to develop skills in germline DNA, becoming familiar with the concepts of variants and polymorphisms, delving into germline alterations.

Likewise, knowledge in the study of messenger RNA will be provided, developing in-depth content about the transcriptome, RNA sequencing panels (Nanostring) and Single cell RNA. All this will be completed with epigenetic concepts: methylome and methylation panels, as well as non-coding RNA and chromatin modifications.

In this program, the experts, all of them referents in each area of knowledge, will develop aspects related to the context of this spectrum of pathologies, will present the clinical and molecular vision, will show their diagnostic and therapeutic approaches and will explain complementary aspects such as their research and institutional environment or the global reality of the patients who suffer from them.

In addition, students will be able to complete the program at their own pace, without being subject to fixed schedules or the travel involved in classroom teaching, so they can combine it with the rest of their daily obligations.

This **Postgraduate Certificate in Molecular Biology Tools for the Agnostic Approach to Rare Cancer** contains the most complete and up-to-date scientific program on the market. Its most notable features are:

- ◆ Case studies presented by experts in oncology
- ◆ The graphic, schematic, and practical contents with which they are created, provide scientific and practical information on the disciplines that are essential for professional development
- ◆ News on Molecular Biology Tools for the Agnostic Approach to Rare Cancer
- ◆ Practical exercises where the self-assessment process can be carried out to improve learning
- ◆ Special emphasis on innovative methodologies in the Agnostic Approach to Rare Cancer
- ◆ Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection work
- ◆ Content that is accessible from any fixed or portable device with an Internet connection



*Learn about the latest developments in this type of rare pathologies with the molecular biology tools used for this purpose"*

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*This Postgraduate Certificate is the best investment you can make in the selection of a refresher program for two reasons: in addition to updating your knowledge in Molecular Biology Tools for the Agnostic Approach to Rare Cancer, you will obtain a qualification from the leading online university: TECH”*

The teaching staff includes professionals from the Oncology sector, who bring their 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 an immersive program designed to learn in real situations.

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

*Incorporate new technologies into daily practice, knowing their advances, limitations and future potential.*

*You will acquire the knowledge you need about molecular biology tools for the study of rare tumors through quality content.*



# 02 Objectives

The program design of this Postgraduate Certificate in Molecular Biology Tools for the Agnostic Approach to Rare Cancer will allow students to delve into a field of medicine that is under constant research. This way, you will update your professional profile and boost your career in a field of study that is scarce of specialists. The program has been designed by a team of experts with contents that will enable the future graduate to reach the proposed objectives. However, you will be fully empowered to deal with the latest advances and the newest treatments currently being applied. For this reason, TECH has established a series of general and specific objectives for the satisfaction of future graduates, as follows:



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*You will learn in depth about the operation of tumor registries and face-to-face or virtual molecular committees”*



## General Objectives

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- ◆ Acquire concepts and knowledge regarding the epidemiology, clinical, diagnosis and treatment of infrequent tumors, agnostic diagnoses and cancers of unknown origin
- ◆ Know how to apply the diagnostic algorithms and evaluate the prognosis of this pathology
- ◆ Be able to integrate knowledge and face the complexity of formulating clinical and diagnostic judgments based on the available clinical information
- ◆ Know how to apply acquired knowledge and problem-solving skills in new or unfamiliar environments within broader (or multidisciplinary) contexts related to the area of study
- ◆ Know how to establish complex therapeutic plans in the context of the pathology in question Have a deeper knowledge of specific treatment networks, reference centers, clinical trials
- ◆ Incorporate new technologies into daily practice, knowing their advances, limitations and future potential
- ◆ Acquire knowledge about molecular biology tools for the study of these tumors
- ◆ Have thorough knowledge and use Tumor Registries
- ◆ Know and use the face-to-face or virtual Molecular Committees
- ◆ Understand fundamental aspects of biobank operation
- ◆ Specialize in interprofessional relationship tools for the treatment of orphan, agnostic and cancer of unknown origin and to access expert networks in the different pathology groups
- ◆ Know how to apply knowledge to solve clinical and research problems in the area of rare pathology
- ◆ Know how to communicate conclusions, knowledge, and supporting arguments to specialized and non-specialized audiences in a clear and unambiguous way
- ◆ Acquire the learning skills to enable further studying in a largely self-directed or autonomous manner
- ◆ Possess and understand knowledge that provides a basis or opportunity to be original in the development and/or application of ideas, often in a research context
- ◆ Understand the social responsibility due to rare diseases



*Take the opportunity and take the step to get up to date on the latest developments in Molecular Biology Tools for the Agnostic Approach to Rare Cancer"*



## Specific Objectives

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- ◆ Acquire the ability to use molecular biology tools for an agnostic approach to rare cancers
- ◆ Deepen the knowledge of the study of tumor DNA, both in solid biopsy and liquid biopsy
- ◆ Study aspects of the genome, the exome and sequencing panels; and to learn about the available platforms and current applications
- ◆ Develop skills in germline DNA, becoming familiar with the concepts of variants and polymorphisms and being able to study germline alterations in depth
- ◆ Provide the necessary knowledge in the study of messenger RNA, developing content about the transcriptome, RNA sequencing panels (Nanostring) and Single Cell RNA
- ◆ Know in depth the development, present and future of drug sensing in primary cell culture and organoids
- ◆ Complete the training in immunotherapy with its aspects related to molecular biology, knowing concepts such as mutational load, neoantigens, microbiota or adoptive cell therapy

# 03

# Course Management

In its commitment to offer an elite education for all, TECH counts on renowned professionals so that the student acquires a solid knowledge in the health specialty of this study. Therefore, this program has a highly qualified team with extensive experience in the sector, which will offer the best tools for the student in the development of their skills during the program. Additionally, other recognized experts participate in its design and preparation, completing the program in an interdisciplinary manner. In this way, the student has the guarantees required to specialize in a field of molecular biology applied to the agnostic approach to rare cancers.





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*The best teachers are at the best university: TECH. Think no more and specialize with the best”*

## Management



### Dr. Beato, Carmen

- ◆ Medical Oncologist at University Hospital Virgen Macarena. Unit of Urological Tumors, Infrequent and of Unknown Origin
- ◆ Expert in Immuno-Oncology
- ◆ Master's Degree in Palliative Care
- ◆ Expert in Clinical Trials
- ◆ Member of the Spanish Group on Orphan and Infrequent Tumors (GETHI)
- ◆ Secretary Spanish Group for Cancer of Unknown Origin (GECOD)

## Professors

### Dr. Barquín, Aránzazu

- ◆ Oncologist Urological, Gynecological and Dermatological Tumors Unit. Clara Campal Comprehensive Oncology Center
- ◆ Treasurer of the Spanish Group of Orphan and Infrequent Tumors (GETHI)

### Dr. García-Donas Jiménez, Jesús

- ◆ Oncologist Urological, Gynecological and Dermatological Tumors Unit.
- ◆ Director of the Translational Oncology Laboratory
- ◆ Expert in Immuno-Oncology
- ◆ Clara Campal Comprehensive Oncology Center
- ◆ Treasurer of the Spanish Group of Orphan and Infrequent Tumors (GETHI)

### Dr. Fernández Pérez, Isaura

- ◆ Oncologist Breast, Gynecologic, Gynecologic, Cancer of Unknown Origin and Central Nervous System Unit. University Hospital Complex in Vigo-Hospital Álvaro Cunqueiro
- ◆ Member of the Spanish Group for Cancer of Unknown Origin (GECOD)

### Dr. Navarro Alcaraz, Paloma

- ◆ Doctor of Pharmacy
- ◆ Translational Oncology Laboratory and Innovation in Oncology Laboratory
- ◆ HM Hospitals-CIOCC Research Foundation

### Dr. Ruiz Llorente, Sergio

- ◆ D. in Biology
- ◆ Translational Oncology Laboratory and Innovation in Oncology Laboratory
- ◆ HM Hospitals-CIOCC Research Foundation



# 04

# Structure and Content

The syllabus of this program has been designed based on the requirements of molecular biology applied to the approach of low frequency cancers, a specialization that is scarce on the educational market and of vital importance. For this reason, it is essential that medical professionals delve deeper into the subject, contributing to the investigation of the conditions that give rise to these cases. Therefore, the content of the program has been structured in ten topics that include all the necessary information for the student, incorporating all the necessary tools for their mastery in molecular oncology.



Structures  
Compounds  
Literature

**properties**  
Structure  
Biological activities

**classification**  
Family  
Class

**HYMINE**

C5H5N5O

C5H6N2O2

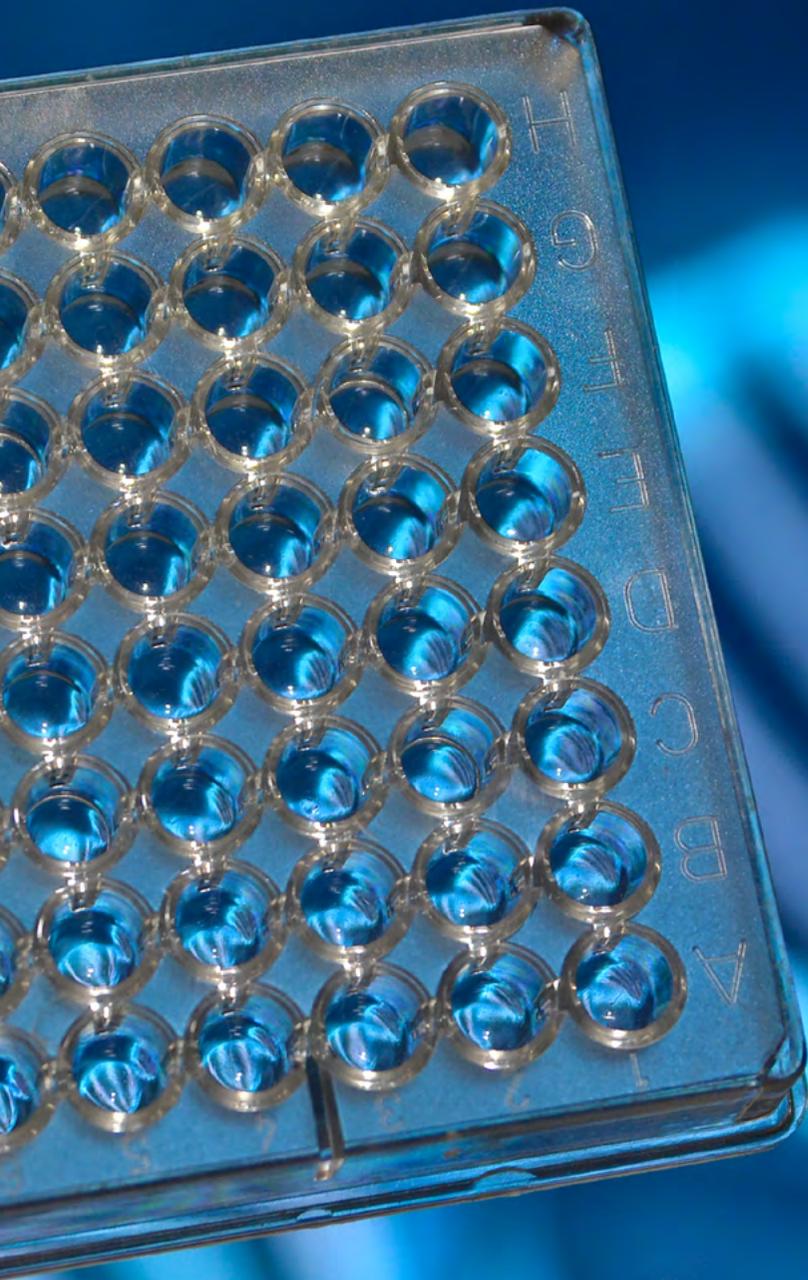
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*Learn tumor DNA studies from solid and liquid biopsies, as well as successful germline alterations”*

## Module 1. Molecular Biology Tools for the Agnostic Approach to Rare Cancer

- 1.1. Concepts of Molecular Oncology
  - 1.1.1. Genetic Concepts
  - 1.1.2. Epigenetic Concepts
  - 1.1.3. crDNA Concepts
  - 1.1.4. RNA Concepts
- 1.2. Tumor DNA Study I. Solid Biopsy
  - 1.2.1. Genome
  - 1.2.2. Exome
  - 1.2.3. Sequencing Panels
- 1.3. Study of Tumor DNA II Fluid Biopsy
  - 1.3.1. Available Platforms
  - 1.3.2. Current Applications
- 1.4. Study of Germline DNA
  - 1.4.1. Variants and Polymorphisms
  - 1.4.2. Germline Alterations
- 1.5. Study of Messenger RNA
  - 1.5.1. Transcriptome
  - 1.5.2. Sequencing Panels (Nanostring)
  - 1.5.3. Single Cell RNA
- 1.6. Epigenetics I. Methylome and Methylation Panels
  - 1.6.1. Methyloma
  - 1.6.2. Methylation Panels
- 1.7. Epigenetics II Non-Coding RNA, Chromatin Modifications
  - 1.7.1. Long Non-Coding RNA
  - 1.7.2. MicroRNA
  - 1.7.3. Chromatin Remodeling
- 1.8. Functional Models I. Drug Sensing in Primary Cell Culture and Organoids





- 1.9. Molecular Biology in Immuno-Oncology I
  - 1.9.1. Tumor Mutation Burden
  - 1.9.2. Neoantigens
  - 1.9.3. Microbiota
  - 1.9.4. Adoptive Cell Therapy
- 1.10. Molecular Biology in Immuno-Oncology II. Functional Models
  - 1.10.1.. Coculture of Lymphocytes
  - 1.10.2. Humanized Murine Methods

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*This program will allow you to investigate molecular biology in immuno-oncology, as well as to learn more about adoptive cell therapy”*

06

# 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.



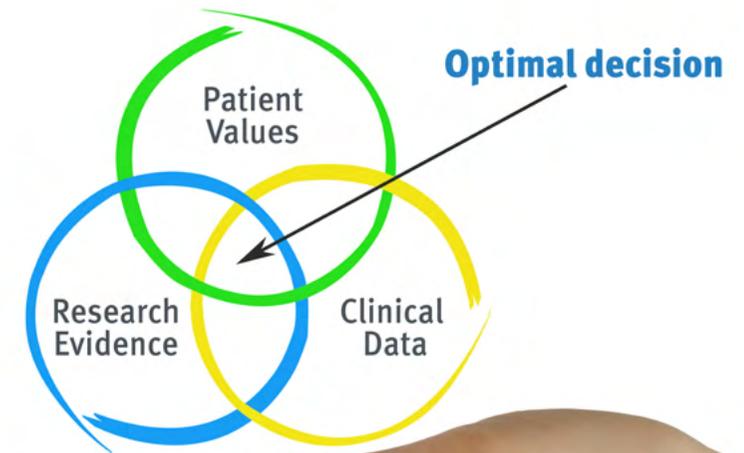
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*Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"*

## 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. Gervas, 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 Certificate in Molecular Biology Tools for the Agnostic Approach to Rare Cancer guarantees you, in addition to the most rigorous and updated education, access to a Postgraduate Certificate issued by TECH Technological University.





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*Successfully complete this program  
and receive your university degree  
without travel or laborious paperwork”*

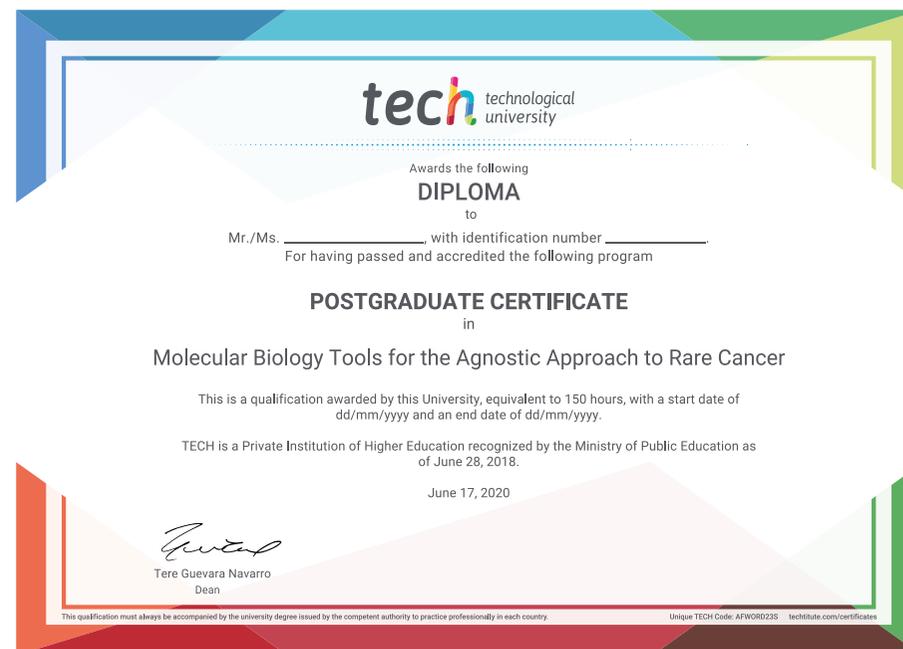
This **Postgraduate Certificate in Molecular Biology Tools for the Agnostic Approach to Rare Cancer** contains the most complete and up-to-date scientific program on the market.

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 Molecular Biology Tools for the Agnostic Approach to Rare Cancer**

Official N° of hours: **150 h.**



\*Apostille Convention. In the event that the student wishes to have their paper diploma issued with an apostille, TECH EDUCATION 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

online training

development languages

virtual classroom



**Postgraduate Certificate**  
Molecular Biology Tools  
for the Agnostic Approach  
to Rare Cancer

Course Modality: Online

Duration: 6 weeks

Certificate: TECH Technological University

Official N° of hours: 150 h.

# Postgraduate Certificate

## Molecular Biology Tools for the Agnostic Approach to Rare Cancer