



UNIVERSITY
OF MEDICINE
AND HEALTH
SCIENCES

RCSI BSc in ADVANCED THERAPEUTIC TECHNOLOGIES

RCSI.COM/DUBLIN



NFQ: **Level 8**

Award: **BSc Advanced Therapeutic
Technologies (Hons) (NUI & RCSI)**

Awarding Body:
National University of Ireland

Duration: **4 years**

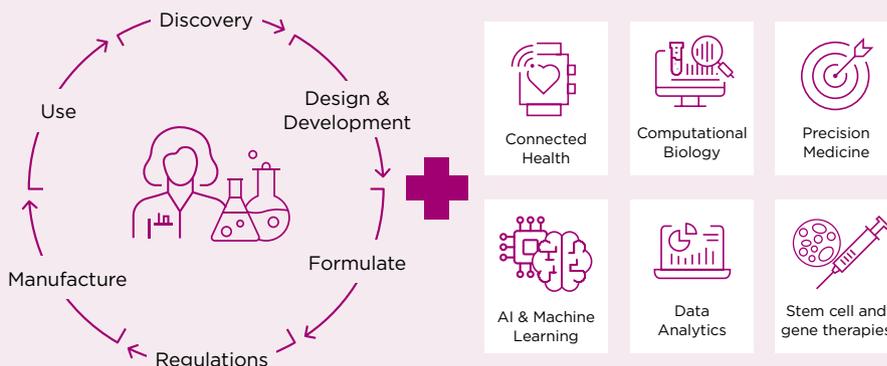
RCSI UNIVERSITY OF MEDICINE AND HEALTH SCIENCES

INTERNATIONAL APPLICANTS **RCSI** LEADING THE WORLD TO BETTER HEALTH

DO YOU WANT TO BECOME A SCIENCE INNOVATOR? AND A PIONEER IN STATE-OF-THE-ART THERAPIES AND MEDICAL TECHNOLOGIES?

Are you interested in biology and health science, love maths and technology and want to research and develop cutting edge medicines, treatments and health technologies? If so, this is the course for you.

BSc degree not only deep dives in each stage of the drug life-cycle, it also layers on cutting edge advanced therapeutic technologies



RCSI'S FOUR YEAR BSc ADVANCED THERAPEUTIC TECHNOLOGIES DEGREE SUPPORTS GRADUATES TO BECOME LEADERS IN HEALTHCARE INNOVATION AND TECHNOLOGY.

The programme has been designed in collaboration with a strong consortium of national and multinational bio pharma companies who provided their expertise to support the development of the BSc (ATT) curriculum which addresses critical skill gaps and maximizes future BioPharma related opportunities.

9 KEY AREAS COVERED IN THIS SCIENCE DEGREE

Fundamental Sciences: The science of how the body works -Physiology, Biochemistry, Chemistry, and Anatomy.

Genetics & Genomics: The role of genes in disease, patterns of inheritance, genetics for diagnosis and drug selection.

Pharmacology: The science of drugs and how they work in the body.

Computational Biology/ Data Analytics: Statistical analysis and interpretation of big datasets generated from healthcare settings using programming languages such as Python and statistical environments such as R.

Immunology: How the immune system works in health & disease. The immune system is an important target of therapeutic intervention.

Connected Health: Wearable devices, Artificial Intelligence (AI) and machine learning in the context of health e.g. blood sugar monitors linked to smartphone Apps to maximize effectiveness of diabetes treatments

Pharmaceutics: The science of drug delivery – ensuring medicines are delivered effectively to the correct body tissue.

Precision Medicine: Therapeutic treatments which are tailored to the individual – taking account of an individual’s genes, environment and lifestyle.

Power Skills: Critical personal skills in competencies such as leadership, management, and communication which enable success in the workplace.



YEAR 1

Year 1 is an introduction to the basic principles in the fundamental sciences and laboratory skills. You will gain a basic understanding of the anatomy, physiology and biochemistry of the human body and explore chemical concepts critical to human life.

YOU WILL DEVELOP AN APPRECIATION OF IMMUNOLOGY AND MICROBIOLOGY, ALONG WITH THE KEY PRINCIPLES OF DRUG DELIVERY.

Statistical and mathematical competencies to interrogate large data sets will also be introduced. You will also recognise and appreciate ethical and legal concepts which apply to professional scientific practice.

FIRST SEMESTER

The Cellular Basis of Life
 Health - Body and Function
 Fundamentals of Medicinal and Pharmaceutical Chemistry
 Medicines - Pharmaceutics 1
 Foundations of Data Analytics
 The Scientist: Professional Formation 1

SECOND SEMESTER

Fundamentals of Pharmacology & Immunology
 Fundamentals of Microbiology and Infection
 Medicinal and Pharmaceutical Chemistry
 Medicines - Pharmaceutics 2
 Gastrointestinal Health - Medicines and Patient care
 The Scientist: Professional Formation 2



The labs where we work are fascinating and really help to further explain the content that is taught in the lectures. I never thought I'd enjoy learning how to code - I love how I was given independence within the workshops to analyse the data myself.

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 Advanced Therapeutic Technologies



YEAR 2

Year 2 will explore the discipline of genomics and its application in precision medicine. You will study the pharmacological management of the major disease states across multiple body systems. Students will learn how to programme using Python to develop skills in data analytics.

You will study each stage of the drug life cycle process and learn how to bring a new medicine to market, including the different regulatory frameworks across geographies.

YOUR PROFESSIONAL POWER SKILLS WILL BE FURTHER DEVELOPED IN THE PROJECT MANAGEMENT MODULE, ENABLING YOU TO EFFECTIVELY ORGANISE, PLAN, AND DELIVER A PROJECT.

FIRST SEMESTER

Human Genetics & Genomics
Pharmacology & Theranostics
Bioinformatics and Biostatistics
Project Management

SECOND SEMESTER

Computational Biology: 1
Regulatory Science
Biologic & Immuno-therapeutics
Medicines - Drug Life Cycle



DURING YOUR EIGHT MONTHS INDUSTRY WORK PLACEMENT IN YEAR 3, YOU WILL GET TO DEMONSTRATE AND APPLY THE TECHNICAL KNOWLEDGE AND POWER SKILLS AND COMPETENCIES YOU HAVE GAINED.

YEAR 3

In Year 3 you will study advanced genetics and cell biology as well as Biopharmaceutical manufacturing to gain an appreciation of the complex manufacturing processes required for biological therapeutics such as vaccines.

Further Power Skills will be developed through the Professional Formation and Enterprise & Innovation modules.

FIRST SEMESTER

Biopharmaceutical Manufacturing
Advanced Genetics & Cell Biology
Enterprise & Innovation
The Scientist: Professional Formation 3

SECOND SEMESTER

8 months industry work placement

YEAR 4

The first semester focuses on the delivery of a research project, either in Ireland or abroad, and the submission of a thesis based on your research project. This module equips you with advanced laboratory skills to be career ready for research in academia or industry. In the final semester you will study cutting-edge therapies and technologies in the Frontiers of Therapeutic Technologies and Connected Health modules.

YOU WILL FURTHER DEVELOP SKILLS IN DATA ANALYTICS AND PROGRAMMING WHILE DEVELOPING YOUR MANAGEMENT SKILLS AND ROLE AS A LEADER.

FIRST SEMESTER

Scientific Research Skills

SECOND SEMESTER

Frontiers of Therapeutic Technologies

Computational Biology: 2

Connected Health

Leadership & Management

**AFTER GRADUATION**

BScATT equips graduates with the technical knowledge and power skills to become future leaders in healthcare innovation and technology. Graduates are in a position to apply for a range of varied roles in the pharmaceutical industry and related areas, including: Drug design and development, Data analytics, Design/management/analysis of clinical trials, Scientific Research in Industry or academia, Roles in Biopharmaceutical Industry, Project management, Digital health device design and development, Quality assurance, Regulatory affairs, Medical writing, Management consultancy, Start-ups, Research funding agencies and Patient advocacy.



What I have enjoyed most is the diverse range of modules taught, from human anatomy and physiology to data analysis. This has given me the opportunity to explore many disciplines and opens doors to many opportunities in the future.

AISHA BETRO

BSc Advanced Therapeutic Technologies



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