QUEEN'S UNIVERSITY BELFAST

SCHOOL OF BIOLOGICAL SCIENCES

GENERATING VALUE FOR SOCIETY THROUGH BIOTECHNOLOGY

MSc

MOLECULAR BIOLOGY AND BIOTECHNOLOGY

Entrance Requirements
Normally a 2.2 Honours degree or above in a relevant area of science or equivalent qualification acceptable to the University. Applicants with qualifications below 2.2 Honours degree standard (or equivalent qualification acceptable to the University) will be considered on a case-by-case basis, if they can demonstrate appropriate experience, acceptable to the School.

International Qualifications
For information on international qualification equivalents, please see **go.qub.ac.uk/YourCountry**

Additional Information for International Students
International students wishing to apply to Queen's University Belfast (and for whom English is not their first language), must be able to demonstrate their proficiency in English in order to benefit fully from their course of study or research. Non-EEA nationals must also satisfy UK Visas and Immigration (UKVI) immigration requirements for English language for visa purposes.

Evidence of an IELTS* score of 6.0, with not less than 5.5 in any component, or an equivalent qualification acceptable to the University is required.

*Taken within the last 2 years.

For information on language requirements for EEA and non-EEA nationals see: **qub.ac.uk/EnglishLanguageReqs**

If you need to improve your English language skills before your study, our partner INTO Queen's University Belfast offers a range of English language courses; see **www.intohigher.com/qub**

Duration
1 year full-time or 2 years part-time

Teaching Times
We provide a range of learning experiences which enable our students to engage with subject experts, develop attributes and perspectives that will equip them for life and work in a global society and make use of innovative technologies and a world-class library that enhances their development as independent, lifelong learners.

Examples of the opportunities provided for learning on this course include; lectures, practical experiences, e-learning technologies, self-directed study and added value qualifications to enhance employability

Assessment
Awards are based on continuous assessment of coursework, examinations and assessment of modules based solely on submitted work related to private, individual study. An MSc with Distinction will be awarded to a student who achieves a dissertation and average mark both exceeding 70 per cent.

Contact Us
askmhls@qub.ac.uk

Find out more
www.qub.ac.uk

MSc
MOLECULAR BIOLOGY AND BIOTECHNOLOGY

Overview
Biotechnology is the exploitation of living systems or molecules from them for commercial gain. Modern biotechnologies rely on our increasing ability to manipulate organisms at the genetic level and include novel waste treatments and bioremediations, new pharmaceuticals, the exploitation of enzymes in 'green catalysis' and exciting new diagnostic techniques. In the 20th century our lives were transformed by information technology; the 21st century may see an equally great transformation, but this time led by biotechnology.

This Masters degree aims to teach the fundamental molecular bioscience underpinning biotechnology along with examples of its current applications.

Content

This MSc is taught by research-active staff members in the School of Biological Sciences. In addition, fundamental biological research skills are taught and students are given an understanding of bio-entrepreneurship. The degree culminates in a three-month, intensive research project in a laboratory in Queen's, thus preparing graduates for a career in research biotechnology.

Bio-entrepreneurship
This module is designed to provide realistic challenges that confront biologists, biotechnologists and food scientists during their day-to-day activities throughout their career.

We will introduce students to the field of bio-entrepreneurship and develop an insight into the overlap of biotechnology research and the successful development of related enterprises. Lectures take an interactive format, and students learn more about key aspects of Research & Development, Marketing and Finance through the development of their own business plans.

Biotechnology
Students will be given the opportunity to study Genomics and Metagenomics, Environmental technology, Plant development and Biotechnology, Gene Cloning, Immunoassays, Biocatalysis, and Aptamers and their applications (including therapeutic applications).

Foundations for Research in the Biosciences
The aim is to introduce students to the process of designing and planning a research project including all associated aspects such as: formulating hypothesis; designing experiments; budgeting; data analysis; ethical implications and the potential impact of research.

Literature Review
The aim of this module is to establish the knowledge and skills required to develop, plan and undertake a substantial piece of self-directed critical scientific writing/project work within the field of food safety.

Nucleic Acid Structure and Function:
Students will gain an insight into Structure-function relationships in DNA and RNA, various aspects of recombinant proteins, Bioinformatics, RNAi and Transcriptomics.

Protein Structure and Function
Students will study areas such as protein purifications, biological spectroscopy, protein structure, proteomics and protein–protein interactions.

Research Project
This programme is delivered by research-active staff and culminates in a three-month, full-time, intensive research project in a laboratory at Queen's.

Careers
This MSc will enable you to pursue a range of careers including commercial, industrial and healthcare applications of molecular biology. This course is also an excellent foundation for those wishing to pursue research at PhD level. Recent graduates have gone on to roles such as; Formulations Analyst, Norbrook; Right First Time Specialist, Pfizer; Research Associate at Zymergen, Inc; Technical Support, Qiagen; Validation Scientist, BD Bioscience; Quality Assurance, Baxter International; Associate Scientist, Abbott.

> There were many aspects of the course that I enjoyed; the material, the class dynamic, and above all, the interests the staff associated with the course had in their students. Since completing the master's program, my career has greatly progressed. I am employed in an environment that makes me use the skills I gained from the masters.

David Butler
MSc Molecular Biology and Biotechnology 2016
Systems Verification & Validation Scientist