Masters Degree in Molecular Cell Biology with Bioinnovation

Overview of Programme
The MSc in Molecular Cell Biology with Bioinnovation is a new 12-month course that aims to recruit highly motivated students with an interest in research and entrepreneurial thinking.

This Masters is a unique full-time programme that provides graduates with a truly interdisciplinary educational experience and includes:

* Taught programme-specific modules focused on molecular cell biology, genetics and clinical perspectives of disease
* Entrepreneurship and innovation training offered by the College of Business and Law
* A six-month research project that gives students a hands-on experience in theoretical and technical approaches to research with internationally recognised principal investigators
* Practical skills development in laboratory techniques and scientific communication

With three primary research themes: Cancer Biology, Infection/Immunity, and Molecular Neuroscience; students will be offered projects by internationally renowned research groups in UCC’s College of Science, Engineering and Food Science as well as select industrial partners. Students may also travel abroad to carry out their project through our partnership with the European Molecular Biology Laboratory (EMBL).

Innovation and Entrepreneurship Training
A unique feature of this MSc programme is that all students will receive formal innovation and technology commercialisation training through the College of Business and Law at UCC. Graduates will therefore not only possess excellent research and technical skills, but will also have the necessary business development and commercialisation skills in life science innovation.

Entry and Eligibility
The MSc Programme in Molecular Cell Biology with Bioinnovation welcomes applications from EU or non-EU countries. Successful applicants must possess a primary degree (minimum 2:1 honours or equivalent) in Biochemistry, Biology, Microbiology, Neuroscience, Pharmaceutical Science or a similar science-based subject. Graduates with a Second Class Honours Grade II degree will be considered on a case-by-case basis provided there is substantial and relevant experience and subject to the approval of the Director of the MSc Programme in Molecular Cell Biology with Bioinnovation. The number of places is limited, and decisions on entry to the programme, will be made on the basis of the candidate’s performance in his/her primary degree, personal statement, and academic references.

Career Opportunities
Potential graduates will be highly trained to enter into PhD studies, but could also pursue a number of career paths including the following: technology transfer officer within higher education institutes and national agencies, R&D institute project manager, commercialisation manager within life science start-up, or development manager within the pharmaceutical sector. The programme will also equip graduates with the skills required to develop their own start-up ventures.

University College Cork
University College Cork (UCC) is one of Ireland’s oldest institutions of higher education. UCC was originally founded in 1845, and more than 160 years later, the University is internationally acclaimed as Ireland’s foremost research institution.

University College Cork’s internationally recognised science schools, biomedical research laboratories, and proximity to the largest concentration of pharmaceutical and biotechnology facilities in Ireland, place this programme at the forefront of biopharmaceutical and biotechnology education in Ireland.
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Programme Structure
This is a unique inter-disciplinary MSc programme in UCC that combines advanced discipline-specific training with core research, technical and business skills. This Masters programme will be delivered by a multidisciplinary team of academics from the College of Science, Engineering and Food Science; College of Medicine and Health; and the College of Business and Law, in UCC. The programme will consist of lectures, tutorials, hands-on workshops, and a research dissertation based on individual research.

Students study the following modules and complete a six-month research project:

Cell and Molecular Biology. This module has an emphasis on analysis of research articles to provide an overview of cell and molecular biology that governs normal and neoplastic cell growth, proliferation, function and death and to explore the systems used by cells to sense and respond to their environment.

Human Molecular Genetics and Genetic Engineering Techniques. The aim of this module is to achieve an overview of advanced principles and techniques of human molecular genetics and genetic engineering relating to cancer, inflammation and neurodegeneration. An overview of therapeutic advances and the potential of pharmacogenomics in human medicine will also be provided.

Biological and Clinical Perspectives of Human Disease. This course will provide an overview of human disease that links fundamental cell and molecular biology to clinical relevance and outcomes. The focus will primarily on cancer, infection/immunity and neurological disorders, but will also include other areas of disease including diabetes and cardiovascular disease that may have etiological connections.

Biotechniques. The aim of this module is to give students a broad overview of the range of techniques that are applied in cellular and molecular life science research. It is comprised of a combination of lectures/seminars and hands-on workshops.

Scientific Communication of Current Topics in Molecular Cell Biology. This module will be in journal club format to allow for discussion and critical evaluation of current discoveries. Emphasis will be placed on improving critical literature appraisal participation in discussions and presentations of current scientific articles in molecular cell biology with particular emphasis on mechanisms underlying cancer biology, neurodegeneration and infection/immunity.

Technology and Business Planning. The aim of this module is to examine, critique and apply the main elements of business planning as it applies to technology focused ventures. It will also give students practical experience of business start-up and entrepreneurial behaviour.

Marketing for High Technology Entrepreneurs. The module provides the student with a detailed foundation of marketing theory, principles and practice. The module facilitates students in developing a comprehensive understanding and appreciation of the role of marketing in the successful operation of the Technology enterprise.

And one of the following business electives:

Creativity and Opportunity Recognition. This module will utilise business cases and draw on the experience of Irish entrepreneurs. It will also give students practical experience of identifying and validating unmet needs, leading to new products and services in the biopharmaceutical and biotechnology sectors.

Innovation Finance. This course examines the finance of innovation, focusing on technology-based start-up ventures, and the early stages of company development. The subject aims to prepare students, as innovators and entrepreneurs, for these decisions.

Intellectual Property Law for High-Tech Entrepreneurs. This course provides students with an introduction to and understanding of the intellectual property issues arising in the protection and commercialisation of research.

Research Project
The core of the MSc in Molecular Cell Biology is a six-month research project, within one of three disciplinary strands – cancer biology, infection/immunity, or molecular neuroscience – offered with established research investigators through the Schools of Biochemistry and Cell Biology, Microbiology and Anatomy/Neuroscience or select industrial partners. Through our partnership with EMBL, students may also complete their 6-month project in any of their 5 sites across Europe. On completion, results will be compiled in a research dissertation. Students will not only gain invaluable hands-on, practical experience in experimental design, implementation, and interpretation but also develop a wide array of transferable skills including written and verbal communication; data recording, analysis and presentation; critical evaluation of published material; ability to work in collaboration with others, as well as independently; and project and time-management.

Further Information
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Fees
Finance Office

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