QUEEN'S UNIVERSITY BELFAST

SCHOOL OF **MEDICINE, DENTISTRY AND BIOMEDICAL SCIENCES**

FROM DISCOVERY TO CLINICAL TRANSLATION

MSc

EXPERIMENTAL MEDICINE

Entrance Requirements
A minimum 2.1 Honours degree or equivalent qualification acceptable to the University in a relevant biological subject is required. Evidence of equivalent professional qualifications (MBBS, BDS or BVSc) or experience will be considered an individual basis. Intercalating students are encouraged.

International Qualifications
For information on international qualification equivalents please select Your Country from the list on our International Students website.

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 6.5, with not less than 6.0 in any component, or an equivalent qualification acceptable to the University is required.

*Taken within the last 2 years.

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

Fees and Funding
For specific funding opportunities, please review the course information at www.qub.ac.uk

Duration
1 year full time

Teaching Times
Morning/Afternoon

Assessment
Assessment is by a combination of oral presentations and written assignments. The research project is written up as a dissertation.

Contact Us
askmhls@qub.ac.uk

Further Information
www.qub.ac.uk

MSc
EXPERIMENTAL MEDICINE

In this MSc program the students will be exposed to theoretical and practical training of Experimental Medicine skills with a strong emphasis towards clinical translation. The modules will focus on State-Of-The-Art Experimental Medicine Skills on the research and clinical translation related to vascular, respiratory and infection/immunity related diseases, which will be linked to a full spectrum of research projects based on translational experimental medicine covered from animal and human models of disease through to the design and implementation of clinical trials.
Experimental Medicine also aims to identify mechanisms of pathophysiology of disease and demonstrate proof-of-concept evidence of the efficacy and importance of new discoveries or treatments. It spans fundamental research in the biosciences to the application of new strategies towards clinical translation that will improve delivery of healthcare. There is an increasing need for graduates who can undertake basic and clinical research and translate it into improved medical treatments for patients.
This research-intensive MSc programme in Experimental Medicine will equip the students with the rigorous research skills and the innovative mentality required to tackle the major medical and therapeutic challenges of the 21st century.

Content

Semester 1

The MSc comprises 3 months of intensive teaching in Semester 1 followed by an extensive research project, which is undertaken in Semester 2 and Semester 3.

Fundamental Research Skills in Experimental Medicine
This module will provide comprehensive training in systematic literature reviews, laboratory and clinical research experimental design, data analysis and management, scientific writing and presentation, research integrity and ethics and intellectual property and commercialization.

Advanced Research Skills in Experimental Medicine
This module provides a detailed theoretical and practical introduction to advanced research skills in Experimental Medicine. This will be a 'state-of-the-art' Module. It will provide in-depth knowledge of the research process and practical skills for the design and conduct of research studies, including data collection and analysis.

Topics to be covered in this Module:
- Advanced Imaging Training
- Animal Models
- Single Cell Sequencing and Analysis
- Bioinformatics
- Statistics
- Organoids / 3D Culture Systems
- 3D Printing
- Microfluidics
- Proteomics and Metabolomics/visits

Experimental Medicine towards Clinical Translation
This Module provides detailed theoretical and practical introduction to the translation of Experimental Medicine research towards clinical trials. It focusses on state-of-the-art methods on the research and clinical translation related to vascular, respiratory and infection/immunity related diseases.
Current therapeutic approaches are also covered, together with potential future strategies based on cutting edge translational research.

Topics to be covered in this Module:
- Gene Therapy /CRISP/CAS9
- Drug development / repurposing
- Stem Cells / Reprogramming- Cell based Therapies
- Harnessing the immune system for therapeutics
- Pharmacokinetics / *Pharmacodynamic* studies
- Vaccine Development
- Developing new ways to tackle Antimicrobial Resistance
- Exploiting omics for therapeutics
- Harnessing the Microbiome
- High throughput drug screening
- Biomarker discovery
- Commercialisation
- Clinical Trials

Semester 2 and Semester 3

This 9-month period will be dedicated to a comprehensive research project based on a large range of research topics ranging from diabetes, cardiovascular diseases, to infection and immunity, respiratory diseases, cancer, brain development. The research project will provide a unique opportunity to focus for 9 months on an extensive research project chosen from a large panel of projects offered by Principal Investigators in the Wellcome Wolfson Institute of Experimental Medicine (WWIEM): This period will be interspersed with monthly training to develop project-specific transferable skills, such as oral and poster presentations, and scientific writing.

Why Queen's
You will be taught and mentored within the WWIEM: a brand new, purpose-built institute at the heart of the Health Sciences Campus, boasting state-of-the-art research facilities.

The programme offers comprehensive research training with access to over 50 research groups and the state-of-the-art research facilities at the WWIEM. Research facilities include Central Technology Units for Imaging and Genomics that are leading the way in research excellence and innovative healthcare.

The strong links between the WWIEM and the biotech or biopharmaceutical sectors provide a stimulating experimental and translational environment, while also expanding your career opportunities.

Careers
The programme is designed for students wishing to pursue a career in experimental medicine, whether it is in academia, clinical practice, industry or government. The programme will also provide an excellent platform for progression to PhD programmes either in Queen's or worldwide.