

# PHARMACEUTICAL BIOTECHNOLOGY

The pharmaceutical industry in the UK has a greater impact on the UK economy than any other high-tech industry. Employing 73,000 people, of whom around 27,000 are directly involved in research and development (R&D), the pharmaceutical industry offers graduates a chance to play an important role in the development of new medicines with employment opportunities existing at all stages of the drug development process. The BSc in Pharmaceutical Biotechnology degree is designed to create students who are the next generation of pharmaceutical scientists, able to work in all stages of the drug development process as part of a multi-disciplinary research team.

## COURSE CONTENT

During your course of study, you will develop breadth and depth in the skills, knowledge and experiences required for success in your future career. The BSc in Pharmaceutical Biotechnology has been developed by a team of academic experts in consultation with industry and involves a broad syllabus founded on the principles underlying health and disease. It encompasses an understanding of therapeutic targets and the fundamental mechanisms and applications of biomolecules and novel drug delivery systems. It is the application of this knowledge which enables the discovery, development and manufacture of innovative products that have the potential to improve and extend life.

### Level 1

The first year of the degree teaches students foundational knowledge and skills in chemistry, maths, physiology and microbiology. This helps students to make the transition from secondary education and prepares them for more complex concepts in levels 2 and 3.

All students take five modules: The first module provides an introduction to pharmaceutical microbiology, including aspects of disinfection and sterilisation, with a second module providing an introduction to the principles of physical and analytical chemistry which are of importance to pharmaceutical systems. The third module

addresses the mathematical and statistical skills that are needed by pharmaceutical scientists to work effectively in the industrial sector, and other related areas.

A chemistry module covers important aspects of organic and bio-organic chemistry, including structure determination, chemical reactivity and the chemical mechanisms involved in making molecules.

Finally, a physiology module covers the principles of general physiology and histology as well as an introduction to systematic pathophysiology.

### Level 2

This year provides further development and understanding of the basic/fundamental sciences related to pharmaceutical sciences and pharmaceutical biotechnology.

Students are introduced to medicinal chemistry, analytical techniques and formulation. Further knowledge and practical expertise is developed across several other key subjects, including biochemistry, immunology and molecular biology. This training prepares students both for their placement\* and their Level 3 research project.

\*In the sandwich programme, the third year will be spent on a work placement in industry, during which you will participate in a real-world project in the working environment for a minimum of 48 weeks.

## BSc Honours

Pharmaceutical Biotechnology 3 yrs (B212)

Pharmaceutical Biotechnology (Sandwich) 4 yrs (B213)

See also Pharmaceutical Sciences and Pharmacy

## Entrance Requirements

### A-level

BBB including Biology and Chemistry + GCSE Mathematics grade C/4

OR

BBB including Biology and at least one from Mathematics or Physics + GCSE Chemistry grade C/4 or GCSE Double Award Science grades CC/44 + GCSE Mathematics grade C/4

OR

BBB including Chemistry and at least one from Mathematics or Physics + GCSE Biology grade C/4 or GCSE Double Award Science grades CC/44 + GCSE Mathematics grade C/4.

### For students whose first language is not English

An IELTS score of 6.5 with a minimum of 6.0 in each test component or an equivalent acceptable qualification, details of which are available at: [go.qub.ac.uk/EnglishLanguageReqs](http://go.qub.ac.uk/EnglishLanguageReqs)

### Level 3

The final year of the degree covers a range of areas in biotechnology, including therapeutic proteins and molecular and cellular engineering for the development of a range of biotherapeutics, nanomedicines and advanced delivery systems. Students will become familiar with recombinant DNA technology, microarrays, genomics and proteomics. Teaching will also focus on the development of biological approaches to disease treatment and prevention, such as gene therapy and stem cells, highlighting opportunities for precision medicine. In addition, students will develop an understanding of scale up and manufacturing processes, and other industry-relevant skills such as a knowledge of quality control and regulatory affairs.

Students also carry out a research project in Pharmaceutical Biotechnology which provides the students with a valuable opportunity to work within one of our research laboratories.

### WHY QUEEN'S?

#### Global Opportunities

The School of Pharmacy has world-leading academics that are fully engaged with leading industrial partners tackling global

health problems. This programme offers graduates an opportunity to be involved across a range of disciplines in drug product and technology platform development.

#### Industry Links

Academics teaching on our BSc degree programmes are leading subject experts and work with major multinational pharmaceutical companies. These include GSK, Eli Lilly, Teva, Astra Zeneca, Reckitt Benckiser, Almac, Capsugel, and many others.

#### World-Class Facilities

The McClay Research Centre for Pharmaceutical Sciences provides extensive state-of-the-art facilities for research, supported by well-equipped pharmaceutical engineering, analytical, molecular biology, advanced microscopy, tissue culture and microbiology laboratories.

#### Internationally Renowned Experts

The BSc degrees in Pharmaceutical Biotechnology are taught by world leading academics. Research within the School is both fundamental and applied and is supported by a broad range of funders including government, charitable and multi-national industry sources.

### CAREERS/FURTHER STUDY

Studying for a BSc in Pharmaceutical Biotechnology degree at Queen's will assist students in developing the core skills and employment-related experiences that are valued by employers, professional organisations and academic institutions.

#### Placements

Placements provide an opportunity to supplement formal university education with invaluable industrial experience and present an opportunity to form strong links with potential employers. Moreover, this will help students develop vital skills, improve their employability.

#### Employability

The School of Pharmacy have also introduced a range of other activities to support successful employability post degree. These include industrial visits to local pharmaceutical and biotech companies, employability workshops, writing CVs and job applications, psychometric tests and interview preparation techniques.

#### Graduate Opportunities

The prospects of employment for a graduate with a BSc in Pharmaceutical Biotechnology degree in the UK are high. Graduates can pursue careers in the Pharmaceutical and Medical devices industry. Opportunities also exist in areas relating to Research and Development, Manufacturing and supply, commercial or support functions. Further information may be found at the Association of the British Pharmaceutical Industry careers website: [careers.abpi.org.uk](http://careers.abpi.org.uk)

#### Further Study

Graduates can choose from a wide range of Master's programmes as well as a comprehensive list of research topics for study at PhD level (PhD); see [qub.ac.uk/pha](http://qub.ac.uk/pha) for further information.



#### Entrance requirements

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#### Course information

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