Programme Title: BSc Pharmacology and Innovative Therapeutics and extramural variants

Programme Specification (UG)

Awarding body / institution:	Queen Mary University of London
Teaching institution:	Queen Mary University of London
Name of final award and programme title:	BSc Pharmacology and Innovative Therapeutics
Name of interim award(s):	
Duration of study / period of registration:	3 years (4 year with year abroad variant)
QMUL programme code / UCAS code(s):	B211, B21Y and B2Y1
QAA Benchmark Group:	Biomedical Science
FHEQ Level of Award :	Level 6
Programme accredited by:	
Date Programme Specification approved:	
Responsible School / Institute:	William Harvey Research Institute

Schools / Institutes which will also be involved in teaching part of the programme:
School of Biological & Behavioural Sciences
Barts and The London School of Medicine and Dentistry

Collaborative institution(s) / organisation(s) involved in delivering the programme:
Member organisations of the Association of British Pharmaceutical Industry (as visiting lecturers)

Programme outline

Pharmacology is the study of how drugs and medicines work at the cellular and sub-cellular level to produce their useful (and sometimes derogatory) effects in man. Therapeutics is the use of of medicines to treat or prevent illness. In this full time 3 year Pharmacology and Innovative therapeutics BSc degree we aim to offer a curriculum which would give students a broad understanding of drug action through to the processes involved in the eventual translation of basic science into new medicines.

In the first year of the degree students will gain a solid foundation in all key areas of biomedical sciences to help understand how drugs work at the molecular and functional levels. Students will study topics such as, the human cell, chromosomes and gene function, tissue biology, biomolecules of life and biomedical physiology. The two Pharmacology specific modules, Introduction to pharmacology and essential skills for pharmacologists will be designed to introduce students to the principles and concepts of pharmacology and provide them with a set of key generic skills including practical, computer literacy and data handling skills to undertake further study into Pharmacology.

In the second year students study topics such as human molecular biology and essential biochemistry of life. They will then be

provided with an in-depth knowledge into pharmacology and therapeutics through specific modules that include drug discovery and development-identification and selection of novel drug targets, clinical pharmacology and assessment of drug safety and the business of pharmacology.

The final year consists of a research-oriented project, and a number of specialist topics in pharmacology such as drug design and medicinal chemistry, translational pharmacology and innovative therapeutics and clinical trials and the role of the regulator in therapeutic innovation.

The Pharmacology and innovative therapeutics degree programmes offered by Queen Mary's SMD and SBBS offer an excellent training for students to pursue careers in industry, a wide-range of medically-related fields, within academia, and in both the public-sector and private sectors.

Aims of the programme

The overall vision and aim of the BSc degree course in Pharmacology and innovative Therapeutics degree is to give students a multidimensional understanding of drug discovery right the way through from scientific advances in basic research to the processes involved in the development of new medicines, preclinical development tests as well as clinical trials, regulatory approval by the MHRA and post- licencing surveillance. This will be delivered through collaborative participation of academia, biotech companies and the pharmaceutical industry.

Students will gain a solid foundation in all key areas of biomedical sciences and an in-depth knowledge and understanding into the principles of therapeutics, drug design, target identification and validation. Students will gain an understanding into the many processes involved in drug development for therapeutic use.

The commercial collaborations will expose students to the novel breakthrough therapies in areas including vaccines, oncology, cardiovascular, metabolic diseases, pain and neuroscience, inflammation and immunology as well as rare disorders. Students will also gain an awareness into issues faced by the pharmaceutical industry such as drug shortages, targeted/personalised drugs, use of biomarkers, clinical trial design, drug safety, risk/benefit assessments, collaboration between patient, academia, industry and the regulatory community, international collaborations, policy and bioethics, novel tools for scientific/clinical communication and sustainability of innovation/financial models for product development/pricing, marketing and licencing.

This 3 year BSc programme in Pharmacology and Innovative therapeutics with a year in industry will help produce a new generation of future translational science leaders who have gained knowledge and training on the science of various aspects of innovative therapeutics. Students would gain exposure to methodologies, technologies and transferrable skills that are most appropriate for therapeutic innovation approaches. This degree will offer students the opportunity to further their studies at PhD level or pursue a career in the pharmaceutical industry, within a regulatory agency or in a wider biomedical area.

What will you be expected to achieve?

Students who successfully complete the programme will have knowledge and understanding of the topics outlined immediately below, as well as the skills and attributes described in the subsequent sections:

They also will be expected to learn any number of workplace disciplinary skills that again are difficult to obtain through learning solely in the classroom, such as working as part of a team, dealing with real-time problems or moving deadlines, receiving and responding to feedback, interpersonal communication, negotiating conflict, networking as well as organizational and management skills.

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Please note that the following information is only applicable to students who commenced their Level 4 studies in 2017/18, or 2018/19

In each year of undergraduate study, students are required to study modules to the value of at least 10 credits, which align to one or more of the following themes:

- networking
- multi- and inter-disciplinarity
- international perspectives
- enterprising perspectives.

These modules will be identified through the Module Directory, and / or by your School or Institute as your studies progress.

Academic Content:	
A1	Demonstrate Knowledge of a broad range of topics including biochemistry, genetics, cell biology and human molecular biology to help facilitate understanding of how drugs work at molecular and functional levels.
A2	Demonstrate knowledge and understanding of pharmacological facts, terms, methods, concepts, principles and relationships and to appreciate their importance.
A3	Demonstrate knowledge into innovative breakthrough therapies and understanding of the processes involved in translation of scientific discoveries through basic research into new medicines including knowledge in preclinical development tests, clinical trial design and governance and regulatory approval.
A4	Demonstrate awareness into issues faced by the pharmaceutical industry in the innovative drug development process.
A5	Apply cutting edge knowledge and acquired scientific skills as a precursor to research in pharmacology, a career in the pharmaceutical industry, work within a clinical healthcare environment or at a government regulatory body.

Disciplinary Skills - able to:	
B1	Apply pharmacology knowledge and principles together with problem solving skills in a wide range of theoritical and practical situations
B2	Conduct practical work with good laboratory practice efficiently and with due regard for safety to acquire sound scientific data
B3	Critically evaluate scientific data including the methodology by which they were obtained, statistical analysis used and evaluate and interpret the results of controlled experiments.
B4	Retrieve, filter and collate pharmacological data from a variety of information sources
B5	Prepare scientific/technical reports
B6	develop effective interpersonal communication, navigating workplace conflict, multi-tasking abilities and self-motivation or working as part of a team

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Attributes:	
C 1	Communicate effectively by written and verbal means.
C 2	Capacity for independent learning, and to work independently.
C 3	Able to participate constructively as a member of a group/team, with skills to influence, negotiate and lead.
C 4	Assess the relevance, importance and reliability of the ideas of others and of different sources of information.
C 5	Competent in the use of computer-based technology, and in the manipulation and analysis of quantitative data.
C 6	Awareness of the role and impact of science in society, including the global perspective.
C 7	Use information for evidence-based decision-making and creative thinking.

How will you learn?

Knowledge and skills are developed in a progressive way throughout the programme.

Academic Content
The programme includes scheduled lectures, practical classes, workshops, seminars, tutorials and practical demonstrations, and will incorporate the use of e-learning.
Students are also expected to use independent and self-directed learning to consolidate the lecture material, for completion of coursework and in-preparation for follow-on sessions. Support for learning is provided through the Library, Queen Mary's online learning environment (QMplus) and the facilities of the QMUL Student PC Service.

Practical and Problem-oriented Disciplinary Skills
Practical skills will be taught as part of organised practical classes, during the early stages of the programme. Workshops reinforce knowledge acquired in lectures and provide opportunities for application of such knowledge to the solution of real problems.

Graduate Attributes
Queen Mary's graduate attributes are developed in a progressive fashion. The project module provides further opportunities for the development of transferable skills and other aspects of graduate attribute development.

How will you be assessed?

Assessment of knowledge is through a combination of unseen written examinations and assessed coursework. The exact nature of the coursework varies from module to module and may include mini-tests, essays and problem sheets. The coursework mark may also include a contribution from online and computer-based assessments. Specific modules may include assessed oral examinations, oral presentations and extended reports/dissertations. Prompt feedback is provided on elements of coursework to provide an iterative learning experience, in which both knowledge and skills can be gradually developed and strengthened.

Transferable skills are developed in a contextual manner throughout the teaching and learning programme, and are indirectly assessed as part of the normal assessment processes for the programme. For example, the assessment of the projects includes consideration of data-retrieval skills, report-writing skills and presentational skills.

Practical skills are assessed through in-class observation and through written laboratory reports, which often include attention to quantitative accuracy. The assessment of the final year practical research project also addresses the majority of the professional disciplinary skills that students of this programme are expected to acquire.

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How is the programme structured?

Please specify the structure of the programme diets for all variants of the programme (e.g. full-time, part-time - if applicable). The description should be sufficiently detailed to fully define the structure of the diet.

The Pharmacology & Innovative Therapeutics programme is studied full-time over three years.

Students are required to register for modules to a value of 120 credits in each academic year. These modules are chosen from those offered in the Pharmacology & Innovative Therapeutics programme diet, as detailed below.

In the first year, you will study 120 credits, comprising 8 x 15 credit compulsory modules (totalling 120 credits, across Semesters A & B).

In the second year, you will study 120 credits, comprising the following:
- 6 x 15 credit compulsory modules (totalling 90 credits, across Semesters A & B)
- 2 x 15 credit elective module from the discipline elective group (totalling 30 credits, across Semesters A & B)

To be eligible for the award of BSc (Hons) Pharmacology & Innovative Therapeutics with a year abroad, students must take SBC5000 after the 2nd year and then return to QMUL the following year to complete the Year 3 diet in their 4th Year of study.

In the third year, you will study 120 credits comprising the following:
- 1 x elective module from the Research Project group: either BMD670, BIO603 or BMD606 (totalling 30 credits, across Semesters A & B)
- 4 x 15 credit compulsory modules (totalling 60 credits across Semesters A & B):
  BMD377 Classic Papers & Current Topics in Pharmacology and BMD375 Translational Pharmacology & Innovative Therapeutics (both Semester 1), and BMD358 Drug Design and BMD378 Clinical Trials & Regulatory Affairs (both Semester 2)
- 2 x 15 credit elective modules from the discipline elective group (totalling 30 credits, across Semester A & B).

Choice between electives is generally unrestricted, but with the exceptions that:
- you must not register for more than 75 credits in total in any given semester
- you must check that you satisfy the prerequisites before registering for any elective module
- you must register for one of BMD670, BIO603 or BMD606 in the final year.

Academic Year of Study FT - Year 1

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester
Genetics	BMD164	15	4	Compulsory	1	Semester 1
Cells	BMD116	15	4	Compulsory	1	Semester 1
Research Skills for Pharmacologists	BMD175	15	4	Compulsory	1	Semester 1
Human Anatomy	BMD113	15	4	Compulsory	1	Semester 1
Tissue Biology	BMD181	15	4	Compulsory	1	Semester 2
Biomolecules of Life	BMD123	15	4	Compulsory	1	Semester 2

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Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester
Biomedical Physiology I - Exchange, Movement and Integration	BMD121	15	4	Compulsory	1	Semester 2
Introduction to Pharmacology	BMD171	15	4	Compulsory	1	Semester 2

Academic Year of Study FT - Year 2

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester
Human Molecular Biology	BMD211	15	5	Compulsory	2	Semester 1
Biomedical Physiology II	BMD221	15	5	Compulsory	2	Semester 1
Drug Target Identification	BMD275	15	5	Compulsory	2	Semester 1
Human Genetic Disorders	BIO227	15	5	Elective	2	Semester 1
Cellular and Molecular Neuroscience	BMD261	15	5	Elective	2	Semester 1
Basic Immunology	BMD251	15	5	Compulsory	2	Semester 2
Business of Pharmacology	BMD271	15	5	Compulsory	2	Semester 2
Clinical Pharmacology & Assessment of Drug Safety	BMD273	15	5	Compulsory	2	Semester 2
Membrane and Cellular Biochemistry	BIO263	15	5	Elective	2	Semester 2
Essential biochemistry for Human Life	BMD223	15	5	Elective	2	Semester 2

Academic Year of Study FT - Year 3

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester

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Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester
Research Project in Pharmacology (Project elective)	BMD670	30	6	Elective	3	Semesters 1 & 2
Project Skills in the Life Sciences (Project elective)	BIO603	30	6	Elective	3	Semesters 1 & 2
Engaging the Public with Science (Project elective)	BMD606	30	6	Elective	3	Semesters 1 & 2
Classic Papers and Current Topics in Pharmacology	BMD377	15	6	Compulsory	3	Semester 1
Translational Pharmacology and Innovative Therapeutics	BMD375	15	6	Compulsory	3	Semester 1
Cancer Biology	BMD381	15	6	Elective	3	Semester 1
Advanced Immunology	BMD351	15	6	Elective	3	Semester 1
Stem Cells and Regenerative Medicine	BMD363	15	6	Elective	3	Semester 1
Drug Design	BMD358	15	6	Compulsory	3	Semester 2
Clinical Trials and Regulatory Affairs	BMD378	15	6	Compulsory	3	Semester 2
Advanced Human Genetic Disorders	BIO324	15	6	Elective	3	Semester 2
Molecular Basis of Personalised Medicine	BMD383	15	6	Elective	3	Semester 2
Biomarkers in Neuroscience	BMD365	15	6	Elective	3	Semester 2

Academic Year of Study

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester
The following modules must be taken to qualify for the degree 'with a year abroad'						
SBCS Study Abroad Year	SBC5000	120	5	Core	3	Semesters 1 & 2

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Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester
Year in Industry Placement	BMD5555	120	5	Core	3	Semesters 1-3

What are the entry requirements?

For direct entry to the degree programme, candidates must usually possess a minimum total of 320 points at A2 level on the UCAS points tariff system, including Biology or Chemistry and a second science subject (biology, chemistry, maths or physics) or via Admission to the QMUL Science and Engineering Foundation Programme (SEFP), and successful completion of the foundation year (defined by achievement of the minimum requirements for progression defined in the SEFP programme regulations, and the criteria specified in the SEFP Student Handbook for progression to this particular degree programme).

International students should be offering IELTS 6.5 (with a minimum of 6.0 in writing), or equivalent.

BTEC: We do not accept BTEC qualifications
Access to HE Diploma: We do nto accept to Access qualifications for this programme.

How will the quality of the programme be managed and enhanced? How do we listen to and act on your feedback?

The Staff-Student Liaison Committee provides a formal means of communication and discussion between schools/institutes and its students. The committee consists of student representatives from each year in the school/institute together with appropriate representation from staff within the school/institute. It is designed to respond to the needs of students, as well as act as a forum for discussing programme and module developments. Staff-Student Liaison Committees meet regularly throughout the year.

Each school/institute operates a Learning and Teaching Committee, or equivalent, which advises the School/Institute Director of Taught Programmes on all matters relating to the delivery of taught programmes at school level including monitoring the application of relevant QM policies and reviewing all proposals for module and programme approval and amendment before submission to Taught Programmes Board. Student views are incorporated in the committee's work in a number of ways, such as through student membership, or consideration of student surveys.

All schools/institutes operate an Annual Programme Review of their taught undergraduate and postgraduate provision. APR is a continuous process of reflection and action planning which is owned by those responsible for programme delivery; the main document of reference for this process is the Taught Programmes Action Plan (TPAP) which is the summary of the school/institute's work throughout the year to monitor academic standards and to improve the student experience. Students' views are considered in this process through analysis of the NSS and module evaluations.

What academic support is available?

Each student is provided with a personal academic guidance tutor (or "advisor") who is a member of SMD or SBBS academic staff. This person is your main point of contact for advice regarding academic matters and for assistance with pastoral concerns, throughout their whole programme. Students can see their advisors in their office hours or arrange an appointment via email. Moreover, if and when advisors are unavailable or cannot help with a specific problem, SMD and SBBS have several Senior Advisors to assist with student concerns. The School also operates a PASS programme for peer guidance.

Programme-specific rules and facts

None

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Specific support for disabled students

Queen Mary has a central Disability and Dyslexia Service (DDS) that offers support for all students with disabilities, specific learning difficulties and mental health issues. The DDS supports all Queen Mary students: full-time, part-time, undergraduate, postgraduate, UK and international at all campuses and all sites.

Students can access advice, guidance and support in the following areas:
• Finding out if you have a specific learning difficulty like dyslexia
• Applying for funding through the Disabled Students' Allowance (DSA)
• Arranging DSA assessments of need
• Special arrangements in examinations
• Accessing loaned equipment (e.g. digital recorders)
• Specialist one-to-one "study skills" tuition
• Ensuring access to course materials in alternative formats (e.g. Braille)
• Providing educational support workers (e.g. note-takers, readers, library assistants)
• Mentoring support for students with mental health issues and conditions on the autistic spectrum.

Links with employers, placement opportunities and transferable skills

A degree in Pharmacology & Innovative Therapeutics allows graduates to apply to study medicine, to undertake and manage research or to teach, or to gain employment in the pharmaceutical and biotechnology industries, or other fields allied to medicine.
Employers include:
-Pharmaceutical and biotechnology industry
- University research laboratories
- NHS laboratories
- Public Health Laboratory Service (PHLS)/microbiology laboratories
- private pathology laboratories

Programme Specification Approval

Person completing Programme Specification:	Chris Bray
Person responsible for management of programme:	Sadani Cooray
Date Programme Specification produced / amended by School / Institute Learning and Teaching Committee:	12 Jan 2021
Date Programme Specification approved by Taught Programmes Board:	

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