

## PROGRAMME SPECIFICATION

*Awarding body/institution:* Queen Mary, University of London

*Teaching institution (if different from above):* Barts and the London (Queen Mary's School of Medicine and Dentistry)

*If accredited by a professional/statutory body, please give the name, date of last accreditation visit and approximate date of next visit:*

Not applicable

*Name of the final award:* **BSc in Infection and Immunity**

*Programme title:* Intercolated BSc in Infection and Immunity

*UCAS code:* n/a

### **Criteria for admission to the programme:**

The pathway (course) is of one academic year's duration, designed specifically for medical or dental students who have completed three or four years of the MBBS/BDS course, *i.e.* students who wish to intercalate a degree before entering the fourth or final year of the MBBS/BDS degree programme.

The course is open to all eligible students within the University of London, and also to students who have fulfilled the above entrance requirements at other UK or EU medical schools. The course is offered within the Institute of Cell and Molecular Science, Centre for Infectious Disease, and the successful candidates will receive a BSc degree of the University of London. The entrance requirements are:

- a. Completion of the first 3 years of a medical/dental course and satisfactory performance in the examinations prior to entering the BSc.
- b. The course is offered for a minimum of 5 students, with a possible maximum of 15. No candidate will be accepted without interview.
- c. Selection of internal students by the standardised intercalated degree ranking/interview procedure, as outlined in the intercalated degrees prospectus and web pages.

### **Aims of the programme:**

The teaching and study of infectious diseases is a young science, whose origin as an independent field of investigation can be traced back to the discovery of microorganisms. Even though infectious diseases have been known for thousands of years, the details of their causes and origins have been known for little more than a hundred years. The understanding of immune responses towards pathogens has increased considerably in the more recent past, now providing great challenges to develop effective vaccines for emerging diseases.

Today, the science of infection and immunity is an interdisciplinary subject situated at the interface between medicine and molecular and cell biology. This fact is taken into account by offering MBBS (or BDS) students the possibility of studying these subjects thoroughly in theory and practice in the form of an intercalated BSc in Infection and Immunity. Detailed knowledge of infectious disease and immunity is important for all doctors, especially with the likelihood of pandemic flu and the ubiquity of infectious diseases in all parts of medical practice. There is a growing need for scientifically trained doctors with an interest in infection, who will be in a position to carry out research to answer basic and translational research questions.

### **Learning outcomes for the programme:**

1. To understand the role of infectious pathogens in the natural history of disease.
2. To understand the basics of molecular and cell biology, and to become familiar with specific aspects of the replication of infectious pathogens and their interactions with their host.
3. To understand the impact of molecular and clinical diagnostics on improving disease management and therapy.
4. To study in depth a number of basic problems in molecular virology, molecular microbiology and immunology, and a variety of specialist topics not covered in the MBBS or BDS programmes.
5. To experience first-hand the process of experimental investigation into the study of a problem in experimental microbiology or immunology, and to acquire specialist laboratory or clinical expertise (as well as data, word processing and presentation skills) sufficient to interpret and report the results of these investigations.

### **Teaching, learning and assessment strategies:**

Lectures, group discussion, tutor-facilitated tutorials, oral presentations and practical workshops.

Assessment includes coursework, written unseen examinations, and project dissertation (the project will be presented orally and in the form of a written dissertation of between five and seven thousand words, independently marked by two examiners and moderated by an external examiner).

### **Programme structure(s) and requirements, levels and courses**

One academic year – 2 terms for the taught elements. Level 3 throughout.

Five compulsory modules, plus a research project:

Core Module 1: Laboratory Methods (shared with pre-existing intercalated pathways in Neuroscience and Experimental Pathology). Plus literature survey relating to chosen project. (1 course unit)

Module 2: Molecular Biology and Clinical Diagnostics. (1 course unit)

Module 3: Biology of Bacteria (1 course unit)

Module 4: Virology (1 course unit)

Module 5: Immunology (1 course unit)

Module 6: Project (3 course units)

Module description (aims, assessment, syllabus):

#### **Module 1: Laboratory Methods**

This core unit aims to provide an overview of basic research and laboratory skills. It covers basic topics such as safety, experimental design, statistics, use of literature, analysing and presenting data. It involves staff from several departments and course specific project supervisors.

Assessment: This unit is examined by in-course assessment of a project-specific literature workshop for each student, and an oral presentation at the end of the unit before project work in the laboratory starts.

## **Module 2: Molecular Biology and Clinical Diagnostics**

This unit aims to provide the student with an understanding of molecular approaches to diagnostics in pathology. The implications of molecular biology and clinical diagnostics in the different disciplines will be emphasised for disease diagnosis and clinical management and where relevant, treatment.

The lectures will reiterate basic concepts in molecular biology (DNA, RNS, Protein, Cell culture) and introduce state-of-the art diagnostic tools to study bacteria, viruses and the immune system (Microscopy, Flow Cytometry, qPCR).

Towards the end of the unit tutorials will be held to apply the newly gained knowledge to specific topics (such as HIV therapy management, MRSA and C diff, Recombineering).

Assessment: There will be a mark for the active participation in the tutorials which counts for 20% of the marks. There will also be a written examination after the project write-up which lasts three hours and counts for 80% of the marks.

### Syllabus:

Working with DNA, RNA, Proteins; Cell Culture Techniques; Flow Cytometry; Microscopy; virus diagnostic, bacterial infection diagnostic, fungal infections, M. tuberculosis; techniques in immunology

## **Module 3: Biology of Bacteria**

This unit aims to provide the student with an understanding of the biology and diversity of bacteria, with emphasis on bacteria of clinical importance. Lectures will outline the main groups of pathogenic bacteria, and address the ways in which these groups differ at the cell and molecular level from each other and from eukaryotic cells. Biological processes relevant to pathogenesis and anti-microbial chemotherapy will be covered. Tutorials will examine topical subjects with reference to scientific literature and current events.

Assessment: There will be a mark for the active participation in the tutorials which counts for 20% of the marks. There will also be a written examination after the project write-up which lasts three hours and counts for 80% of the marks.

### Syllabus:

Bacterial structure, metabolism, genetics and gene regulation, pathogenesis, anti-microbial chemotherapy and resistance, bacterial systematics.

## **Module 4: Virology**

This unit aims to provide the student with a molecular-based approach to understanding viral replication and hence viral pathogenesis (virus live cycle, virus host interaction). Throughout the unit, the implications of this understanding for the development of viral vaccines, antiviral chemotherapy (immune evasion, antivirals, vaccines) and its impact in the clinical management of viral diseases will be stressed. Tutorials at the end allow the application of new knowledge to understand 'hot-topics' in virology at the time (like MMR and autism, siRNA as antivirals).

Assessment: There will be a mark for the active participation in the tutorials which counts as 20% of the total marks. There will also be a written examination after the project write-up which lasts three hours and counts for 80% of the marks.

Syllabus:

Virus families; public health; virus replication; cytoplasmic transport strategies; expression strategies; translation strategies; virus evolution; immune evasion; antivirals; vaccines.

**Module 5: Immunology**

This unit aims to provide the student with a refresher in the basic understanding of immunology as a prelude to studying the subject in more depth. The unit starts by introducing key elements of the immune system, such as T cells, B cells, dendritic cells, NK cells *etc*, outlining specific mechanisms by which these elements contribute to an immune response. The middle section of the unit then discusses examples where these elements converge in immunologically relevant scenarios, such as autoimmunity, vaccination and allergy. Finally, various disease states are discussed, primarily focussing on pathogen/immune system interactions, demonstrating the immune system in its entirety.

Assessment: There will be a mark for the active participation in the tutorials which counts for 20% of the marks. There will also be a written examination after the project write-up which lasts three hours and counts for 80% of the marks.

Syllabus:

Development, T cells, B cells, NK cells, dendritic cells, tolerance, autoimmunity, allergy, vaccination, memory, HIV, anti-viral responses Hepatitis, Gut immunology.

**Methods of Evaluating and improving the Quality and Standards of Teaching and Learning**

Mechanisms for review and evaluation of teaching, learning, assessment, the curriculum and outcome standards:

1. Module system reviews (feedback questionnaires and staff reports).
2. Annual staff appraisal and peer observation and teaching.
3. Annual review of teaching considered by Medical School and College.
4. Reports by External Examiners.

Committees with responsibility for monitoring and evaluating quality and standards:

1. Quality Enhancement Committee (College)
2. Education Board (School)
3. Medical Education Committee
4. Senior Student-Staff Committee
5. Intercalated Degrees Committee

Staff development priorities include:

1. Staff appraisal scheme
2. Encouragement to attend CILT/SEDFACT workshops, or gain ILT membership
3. Regular course team meetings

**Student support and guidance**

1. Regular access to programme organiser and core teaching team

2. Regular meetings with project supervisor, and easy access to the course organiser and module convenors
3. Access to medical school and college support services, including student welfare officer, student counselling service, together with learning development and continuing education unit.

Date of completion of programme specification:	7 November 2007
Date of approval by Faculty Board/EB:	
Date of update/amendment:	