MODULE SPECIFICATION

Academic Year (student cohort covered by specification)	2020-21
Module Code	3160
Module Title	Molecular Research in Infectious Diseases
Module Organiser(s)	Dr Michael Lewis and Professor David Baker (Deputy Module Organiser)
Faculty	Infectious and Tropical Diseases
FHEQ Level	Level 7
Credit Value	**CATS:** 15 **ECTS:** 7.5
HECoS Code	100265:100948 (1:1)
Term of Delivery	Term 2
Mode of Delivery	For 2020-21 this module is delivered online. Teaching will comprise a combination of live and interactive activities (synchronous learning) as well as recorded or self-directed study (asynchronous learning).
Mode of Study	Full-time
Language of Study	English
Pre-Requisites	Preferably the Molecular Biology (3333) and Molecular Biology & Recombinant DNA Techniques (3131) modules. Alternatively, students who have an equivalent level of prior knowledge of molecular biology will be admitted at the Module Organiser's discretion.
Accreditation by Professional Statutory and Regulatory Body	None
Module Cap (Maximum number of students)	Approx. 12 (numbers may be capped due to limitations in facilities or staffing)
Target Audience	This module is aimed at students who wish to be thoroughly familiar with latest advances in the molecular biology of infectious diseases and who wish to develop a better understanding of how different techniques and technologies are applied in this area of research.
Module Description	The module focuses on the tools, techniques and general methodological approaches being used at the forefront of research on the molecular biology of infectious diseases.

	Applications are explored across the spectrum of pathogens, from bacteria and viruses to protozoa, helminths and fungi. The breadth of topics enables students to view individual diseases and pathogen species in a wider context and to appreciate the inter-disciplinarity of research in this area.
Duration	5 weeks at 2.5 days per week
Timetabling slot	Slot D2
Last Revised (e.g. year changes approved)	October 2020

Programme(s) This module is linked to the following programme(s)	**Status**
MSc Medical Parasitology	Recommended Option
MSc Immunology of Infectious Diseases	Recommended Option
MSc Medical Microbiology	Recommended Option

Module Aim and Intended Learning Outcomes

Overall aim of the module
The overall module aim is to help students develop the knowledge and experience required to evaluate and to keep pace with rapidly advancing research frontiers in the molecular biology of infectious diseases.

Module Intended Learning Outcomes
Upon successful completion of the module a student will be able to: 1. Demonstrate knowledge and understanding of recent research advances and future prospects for selected topics in the molecular biology of infectious diseases; 2. Appreciate the range of molecular biology techniques and technologies applied to the following key areas of infectious disease research: molecular epidemiology, taxonomy and evolutionary history of disease agents; diagnostics; genomics; cell biology; virulence and pathogenesis; analysis of chemotherapeutic targets; and vaccine development; 3. Critically assess the design of molecular biological strategies as applied to epidemiological investigations, clinical diagnosis or fundamental research on infectious diseases; 4. Demonstrate the knowledge and skills required to understand, evaluate and keep up to date with scientific literature on molecular biology and infectious diseases.

Indicative Syllabus

Session Content
The module is expected to cover the following topics: • Phylogenetics, including computer based practical; • Molecular epidemiology, with dedicated sessions on malaria, trypanosomatids, bacteria, viruses and fungi; • Genomics methods and dedicated sessions on applications in malaria and bacterial pathogens; • Genetic engineering methods and applications; • Proteomics; • Immunology techniques and applications in infectious disease research; • Imaging methods in infectious disease research; • Advanced molecular diagnostic tools. The module is designed to give students a broad exposure to active research in the Department of Infection Biology at the LSHTM as well as other institutions (e.g. Imperial College London, the Francis Crick Institute, University of Oxford) through participation of external lecturers. There is a strong focus on experimental techniques and technologies with examples of applications across viral, bacterial, parasitic and fungal pathogens.

Teaching and Learning

Notional Learning Hours

Type of Learning Time	Number of Hours	Expressed as Percentage (%)
Contact time	40	27
Directed self-study	24	16
Self-directed learning	26	17
Assessment, review and revision	60	40
Total	**150**	**100**

Student contact time refers to the tutor-mediated time allocated to teaching, provision of guidance and feedback to students. This time includes activities that take place in face-to-face contexts such as lectures, seminars, demonstrations, tutorials, supervised laboratory workshops, practical classes, project supervision as well as where tutors are available for one-to-one discussions and interaction by email. Student contact time also includes tutor-mediated activities that take place in online environments, which may be synchronous (using real-time digital tools such as Zoom or Blackboard Collaborate Ultra) or asynchronous (using digital tools such as tutor-

moderated discussion forums or blogs often delivered through the School's virtual learning environment, Moodle).

The division of notional learning hours listed above is indicative and is designed to inform students as to the relative split between interactive (online or on-campus) and self-directed study.

Teaching and Learning Strategy
This module is built around research seminars but incorporates a range of other teaching methods, including reviews of relevant publications, lectures on research methods and a computer based practical.

Assessment

Assessment Strategy
The assessment for this module has been designed to measure student learning against the module intended learning outcomes (ILOs) as listed above. Formative assessment methods may be used to measure students' progress. The grade for summative assessment(s) only will go towards the overall award GPA. The assessment for this module will be online. Assessment will be by: 1. **A written assignment**, consisting of three short (500 word) essays (50%) 2. **An individual 10-minute oral presentation, plus a 200 word abstract** (50%). Both assignments test students' understanding of and ability to critically evaluate authentic pieces of research relevant to the molecular biology of infectious diseases. The structure of options for topics ensures the assessment covers the breadth of the module content and scope of the intended module learning outcomes.

Summative Assessment

Assessment Type	**Assessment Length (i.e. Word Count, Length of presentation in minutes)**	**Weighting** (%)	**Intended Module Learning Outcomes Tested**
Coursework	500 words x 3	50	1-4
Individual Presentation	10 minutes, plus 200-word abstract	50	1-4

Resitting assessment
Resits will accord with the LSHTM's Resits Policy

Resitting assessment
Resit/deferred/new attempts - The task will be to provide answers on the remaining options that were not answered in the original written assessment and make corrections to the original oral presentation and present it to examiners.

Resources

Indicative reading list

Textbooks:

- *Mims' Medical Microbiology and Immunology, 6th Edition*
- *Molecular Biology of the Cell, 6th Edition*

Review Journals:

- *Nature Reviews Microbiology*
- *Current Opinion in Infectious Diseases*
- *Microbiology and Molecular Biology Reviews*

Journals:

- *Cell Host and Microbe*
- *mBio*
- *Nature Microbiology*
- *PLoS Pathogens*
- *Molecular Microbiology*
- *Cellular Microbiology*

Other resources

Resources specific to individual teaching sessions will be provided via Moodle.

Teaching for Disabilities and Learning Differences

The module-specific site on Moodle gives students access to lecture notes and copies of the slides used during the lecture. Where appropriate, lectures are recorded and made available on Moodle. All materials posted on Moodle, including computer-based sessions, have been made accessible where possible.

LSHTM Moodle is accessible to the widest possible audience, regardless of specific needs or disabilities. More detail can be found in the Moodle Accessibility Statement which can also be found within the footer of the Moodle pages. All students have access to "SensusAccess" software which allows conversion of files into alternative formats.

Student Support Services can arrange learning or assessment adjustments for students where needed. Details and how to request support can be found on the LSHTM Disability Support pages.