

MED6062: "CHARACTERISATION OF BACTERIAL VIRULENCE DETERMINANTS" (19 lectures)

Module Leader: Mark Thomas

Lecture	Title	Lecturer	Venue	Duration (h)	Date	Day	Time
1	Microbial genomics I	JGS		1	8 April, 2021	Thu	09.30
2	Microbial genomics II	JGS		1	8 April, 2021	Thu	10.30
3	Bacterial variability	JGS		1	8 April, 2021	Thu	14.00
4	Bacterial gene regulation I	MST		1	8 April, 2021	Thu	15.00
5	Bacterial gene regulation II	MST		1	9 April, 2021	Fri	10.30
6	Bacterial gene regulation III	MST		1	9 April, 2021	Fri	14.00
7	Bacterial gene regulation IV	MST		1	9 April, 2021	Fri	15.00
8	Methods for studying gene regulation I	MST		1	12 April, 2021	Mon	10.30
9	Methods for studying gene regulation II	PH		1	12 April, 2021	Mon	11.30
10	Identification of virulence genes I	JGS		1	12 April, 2021	Mon	14.00
11	Identification of virulence genes II	JGS		1	12 April, 2021	Mon	15.00
12	Analysis of host-pathogen interactions I	PE		1	13 April, 2021	Tue	10.30
13	Analysis of host-pathogen interactions II	HM		1	13 April, 2021	Tue	11.30
14	Identification of secreted effectors	MST		1	13 April, 2021	Tue	14.00
15	Protein purification I - expression systems	MST		1	13 April, 2021	Tue	15.00
16	Protein purification II - downstream processing	JRS		1	14 April, 2021	Wed	10.30
17	Analysis of protein-protein interactions	MST		1	14 April, 2021	Wed	11.30
18 [#]	Protein structure determination I	PAB/PJB/MW		1	14 April, 2021	Wed	14.00
19 [#]	Protein structure determination II	PAB/PJB/MW		1	14 April, 2021	Wed	15.00

HM, Helen Marriott; JGS, Jon Shaw; JRS, Jon Sayers; MST, Mark Thomas; MW, Mike Williamson; PAB, Per Bullough; PE, Phil Elks; PH, Paul Heath; PJB, Patrick Baker.

Sessions 1-17 are 50 minutes each, although each session has been created with a 60 minute duration. You may enter the session up to 15 minutes before it is due to start. Please navigate to the session through MUSE>Blackboard>Courses>MEDT01 Molecular Medicine (ACADEMIC YEAR 2020-21)>Blackboard Collaborate. From here you should be able to find your session.

Where two consecutive sessions are to be given by the same presenter (indicated in red font), these have been created as a single two hour session, you may pause the recording if you offer the students a break between the two 50 minute sessions.

[#]Lectures 18 and 19 will be comprised of three separate presentations of approximately 40 minutes each. These will be available as recordings rather than as 'live' Blackboard Collaborate sessions. They will be uploaded on or before the afternoon of 14 April 2021.

Overview of Module

The overall aim of this module will be to raise awareness of, and convey, the principles underlying the expanding arsenal of experimental approaches that are currently being employed to (i) identify virulence genes, (ii) elucidate the molecular mechanisms underlying their genetic control, (iii) characterise their protein products both in terms of their structure and function at the molecular level, and (iv) unravel the molecular mechanisms by which virulence proteins are targeted to host cells or the extracellular milieu.

At the end of the module the student will be able to:

1. demonstrate a knowledge and understanding of the principles of virulence gene organisation and regulation in bacteria.
2. understand/have a knowledge of the methods used both to identify virulence genes and to investigate the mechanisms governing their regulation.
3. explain how these techniques can be applied to determine the repertoire of genes that confer a virulence phenotype on a pathogenic bacterium.
4. understand the experimental approaches that are available to investigate the interactions between pathogenic bacteria and host cells.
5. discuss the variety of methodologies that are at the disposal of today's molecular biologist for analysing the structure, function and mechanism of bacterial protein effectors of virulence.

The assessment will be in the form of a 2000 word open-book essay on topics presented in the module. The assessment will look for an understanding of core concepts such as the regulation of virulence gene expression as well as the methodology used to identify and analyse virulence genes and their products. As the aim of the module is to equip students with the ability to design a strategy for investigating the virulence mechanisms of a bacterial pathogen, questions will be largely problems-based, requiring the student to give careful consideration to a specific set of factors or conditions and designing a strategy appropriate to that situation, rather than simply demonstrating a knowledge of techniques but not knowing when or how to apply them. The use of appropriate and critical references in a well-judged bibliography will also be evaluated, which will reinforce key objectives of the MSc programme.