

SEMESTER II

LSM4223 ADVANCES IN ANTIMICROBIAL STRATEGIES

Prerequisite: LSM3232 or LSM3225

Workload: 16 lecture hours + 8 team presentation hours + 28 practical hours

An advanced course in the study of infectious diseases of humans with emphasis on new and emerging infections as well as those of major clinical/economic importance. Core topics include understanding the principles and practice of Medical Microbiology, the nature and emergence of antimicrobial resistance, antimicrobial strategies, changing epidemiology of infections, and laboratory diagnosis using classical diagnostic techniques and current molecular approaches. Seminars will be conducted as team presentations to explore current topics on infectious diseases in depth. A strong practical component is included.

S/N	Topics	Lectures
1.	Introductory overview of contemporary Medical Microbiology.	1h
2.	Laboratory methods of diagnosis. The “classical” methods of diagnosis – microscopy, culture and serology. The contribution of molecular diagnostics to modern laboratory practice. Genomics and proteomics of microbial pathogens.	3h
3.	Immunology and infection. A brief overview of the immune defence mechanisms against infection, innate and adaptive. Detailed consideration of specific mechanisms by which microbes are recognized and killed.	2h
4.	Microbial pathogenesis. Attachment, invasion, toxins, immunopathogenesis and immune avoidance mechanisms. The molecular analysis of these phenomena will be emphasized.	2h
5.	Opportunistic infections. The broad range of opportunistic pathogens which infect immunocompromised patients, difficulties in their identification, and the interpretation of their significance.	2h
6.	Evolution and spread of antibiotic resistance genes. The mechanisms of action of antimicrobial agents, the molecular basis of resistance, and the genetics of resistance acquisition and spread.	2h
7.	New and “new” infections. Recently recognized pathogens, new variants of known pathogens (e.g. multiple-resistant variants), and the contribution of infectious agents to diseases not previously perceived as having any microbial cause.	2h
8.	Immunization. Old and new vaccines. New methodologies like DNA vaccines, novel methods of delivery and improved adjuvant design. Vaccine trials.	2h
Total Lectures:		16h
Team Presentations:		8h
Practicals:		28h
Total hours:		52h

TEXT BOOK:

- Fundamentals of Microbiology, 10th edition, Alcamo (Jones & Bartlett).
- Jawetz, Melnick & Adelberg's Medical Microbiology, Lange Medical Books.
- Medical Microbiology, 4th edition, Baron S (Editor), University of Texas Medical Branch
Available free on-line <http://www.ncbi.nlm.nih.gov/books/NBK7627/>

REFERENCE TEXTS:

- Bacterial Pathogenesis: A Molecular Approach, 3rd edition, Wilson, Salyers AA, Whitt DD and Winkler, ASM Press.
- Sherris Medical Microbiology, 6th edition, Ryan KJ, Ray CG, Ahmad N, Drew WL, Plorde JJ, McGraw Hill.

MODE OF ASSESSMENT:

50% - Continuous Assessment

50% - Final Examination

MODULE CO-ORDINATORS:

A/Prof Vincent Chow

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A/Prof Kevin Tan

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LECTURERS: (Teams I and II will teach in alternate Academic Years):**Team 1**

A/Prof Vincent Chow

A/Prof Tan Yee Joo

A/Prof Sylvie Alonso

Team 2

A/Prof Kevin Tan

A/Prof Tan Yee Joo

A/Prof Sylvie Alonso

Guest Lecturers

Dr. Chew Kean Lee (NUH)

Prof Laurent Renia (SIgN, A*STAR)

Dr. Thierry Diagana (NITD)

Dr. Ong Siew Hwa (Acumen Laboratories)

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