

Course Title: **Molecular Epidemiology: Microbial Genetics and Evolution**

Department offering the course: School of Public Health

Course co-ordinator: Dr. Maria H.C. Zhu, Dr. Tommy T.Y. Lam

Will the course be offered to RPG students from other Faculties at HKU: Yes No

Will the course be offered to RPG students of other tertiary institutions: Yes No

Quota for Outside Students (if any): None

Objective: This course aims to:

- introduce the basic principle and approaches for molecular epidemiology
- introduce the genetics and evolutionary biology of pathogenic microorganisms
- explore the impacts of the pathogen evolution to vaccination and drug administration
- review public health policy and clinical management to counteract pathogen evolution
- demonstrate the modern molecular biology and analysis methods for studying pathogen evolution and outbreak
- help the students to establish capacities in basic genomic and evolutionary analyses

Content: Topics include:

- Molecular epidemiology: Basic principle and approaches
- Genetics, evolution and pathogenesis of virus and prion
- Genetics, evolution and pathogenesis of prokaryotic and eukaryotic pathogens
- Mechanisms of microorganism evolution
- Arms race between human and pathogens
- Modern molecular biological methods to study pathogens and their genomes
- Evolutionary analysis of pathogens: Basic principles and applications
- Real case study with hands-on experiential learning

Learning Outcomes:	<p>On completion of the module, the students are expected to:</p> <ul style="list-style-type: none"> • appraise the basic principles, methodologies and applications of molecular epidemiology in the study of infectious diseases • understand genome organizations and origins of various microorganisms that caused diseases • appraise important concepts, determinants, and human counteraction for evolution of microbial pathogens • identify experimental approaches for the study of microbial genomes and evolution • apply principles and methods for the basic evolutionary analyses of microorganisms to study disease origins, outbreaks and transmissions • recognize the potential importance and applications of genomic and evolutionary analyses in the development of health policy and clinical practice
Prerequisite:	None
Duration:	<p>1 semester; 3 hours/week; 95 learning hours: 30 contact hours (<i>Lectures/Tutorials</i>), and 65 other learning activities hours (<i>Reading/Assessment/Final Exam</i>)</p>
Continuous Assessment:	<p>5 written tasks in the form of short essays or analytical exercises that address the topics of the corresponding sessions (50%); Group tutorial discussions with short essays summarizing the discussion contents (20%)</p>
Examination method/ duration:	Written examination/ 2 hours (30%)
Remarks:	Also offered to RPs from other Faculties at HKU