

Division of Life Science
The Hong Kong University of Science & Technology
LIFS 3010
Molecular and Cellular Biology
(2022/23 Fall Semester)

Date/Time: Monday and Wednesday: 12:00-1:20 pm
Venue: Room 4619 (Lifts 31/32)
Instructors: Prof. **Zhenguo Wu** (E-mail: bczgwu@ust.hk, Tel: 2358-8704, Room 5527;
Course Coordinator)
Prof. **Chun Liang** (E-mail: bccliang@ust.hk, Tel: 2358-7296, Room 5524)

Course Description:

This is a core foundation course for students majored in Biochemistry and Cell Biology. The course aims to introduce to students the basic concepts and current knowledge of molecular biology with a focus on genes and their regulation. Key topics include genes, DNA, RNA, DNA replication, transcription and regulation in both prokaryotes and eukaryotes, protein synthesis, organization of chromosomes and nucleosomes, and epigenetic regulation of gene expression.

Intended Learning Outcomes:

On successful completion of this course, students are expected to be able to:

1. Describe the fundamental concepts and principles of genes and their expression and regulation.
2. Explain the principles of some key experimental techniques used in molecular and cellular biology.
3. Apply appropriate knowledge to analyze and interpret experimental data in molecular and cellular biology.
4. Utilize the knowledge learnt as the foundation to pursue further in-depth study or self-learning of the modern biology.

Text Book: Lewin's GENES XII (9th-12th Edition)
Authors: Jocelyn E. Krebs
Publisher: Jones & Bartlett Learning
ISBN: 1284104494S

Course Schedule:

Date	Lecture	Instructor
5 Sep.	Chapter 1: Genes are DNA	Prof. C. Liang
7, 14 Sep.	Chapters 2 & 4: Genes encode RNAs and polypeptides; The interrupted gene	Prof. C. Liang
19, 21, 26 Sep.	Chapters 11, 12, 13 & 14: Replication is connected to the cell cycle; The replicon: Initiation of replication; DNA replication; Extrachromosomal replicons	Prof. C. Liang
28 Sep, 3 Oct.	Chapters 19 & 22: Prokaryotic transcription; mRNA stability	Prof. C. Liang
5, 10 Oct.	Chapter 24: Translation	Prof. C. Liang
12, 17 Oct.	Chapter 26: The operon	Prof. C. Liang
19 Oct.	Review / Q&A	Prof. C. Liang
21 Oct. (7-9 pm; to be confirmed)	Mid-term exam (covers all Prof. C. Liang's lectures)	
24, 26 Oct.	Chapter 9 : Chromosomes	Prof. ZG Wu
31 Oct, 2 Nov.	Chapter 10: Chromatin/Nucleosomes	Prof. ZG Wu
7, 9 Nov.	Chapter 20: Promoters and enhancers	Prof. ZG Wu
14, 16 Nov.	Chapter 28. Eukaryotic transcription regulation	Prof. ZG Wu
21, 23, 28, Nov.	Chapter 29: Epigenetic effects and chromatin remodeling	Prof. ZG Wu
30 Nov.	Chapter 30: regulatory RNA	Prof. ZG Wu
Final exam	(time tbd; covers all Prof. ZG Wu's lectures)	Prof. ZG Wu

Exam formats and grading: Two written exams: one (mid-term exam) to cover Prof. Liang's part (50%, including essays that may be assigned), and the other (final exam) to cover Prof. Wu's part (50%).