

Division of Life Science
The Hong Kong University of Science & Technology
LIFS 3010
Molecular and Cellular Biology
(2017/18 Fall Semester)

Date/Time: Mon: 10:30-11:50am; Wed: 10:30-11:50am
Venue: Room 1104 (Lifts 19)
Instructors: Prof. **Zhenguo Wu** (E-mail: bczgwu@ust.hk, Tel: 2358-8704,
Course Coordinator)
Prof. **Chun Liang** (E-mail: bccliang@ust.hk, Tel: 2358-7296)

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 DNA replication, gene 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: Genes (9th-11th Edition) by Benjamin Lewin
Publisher: Jones and Barlett Learning

Course Schedule:

| Date | Lecture | Instructor |
|---|--|-------------------|
| Sept 4 | Chapter 1: Genes are DNA | Prof. C. Liang |
| Sept 6, 11 | Chapters 2 & 4: Genes encode RNAs and polypeptides; The interrupted gene | Prof. C. Liang |
| Sept 13, 18, 20 | Chapters 11, 12, 13 & 14: Replication is connected to the cell cycle; The replicon: Initiation of replication; DNA replication; Extrachromosomal replicons | Prof. C. Liang |
| Sept 25, 27 | Chapters 19 & 22: Prokaryotic transcription; mRNA stability | Prof. C. Liang |
| Oct 4, 9 | Chapter 24: Translation | Prof. C. Liang |
| Oct 11, 16 | Chapter 26: The operon | Prof. C. Liang |
| Mid-term (Oct. 20, 7:30-9:30 pm) | | Prof. C. Liang |
| Oct. 23, 25 | Chapter 9 : Chromosomes | Prof. ZG Wu |
| Oct 30, Nov. 1 | Chapter 10: Chromatin/Nucleosomes | Prof. ZG Wu |
| Nov 6, 8 | Chapter 20: Promoters and enhancers | Prof. ZG Wu |
| Nov 13, 15 | Chapter 28. Eukaryotic transcription regulation | Prof. ZG Wu |
| Nov 20, 22, 27 | Chapter 29: Epigenetic effects and chromatin remodeling | Prof. ZG Wu |
| Nov 29 | Chapter 30: regulatory RNA | Prof. ZG Wu |
| Final exam | (tba) | Prof. ZG Wu |

Exam formats and grading: Two written exams (mid-term and final exams) possibly consisting of true-or-false statements, fill-in-the-blanks, multiple-choice questions, and short-essay questions: one (mid-term exam) to cover Prof. Liang's part (50%, including quizzes and essays that may be given before the mid-term exam), and the other (final exam) to cover Prof. Wu's part (50%).