

**Division of Life Science**  
**The Hong Kong University of Science & Technology**  
**LIFS 3010**  
**Molecular and Cellular Biology**  
**(2018/19 Fall Semester)**

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**Date/Time:** Mon and Wed: 9:00-10:20am;  
**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 (9<sup>th</sup>-12<sup>th</sup> Edition) by Benjamin Lewin  
Publisher: Jones and Barlett Learning

**Course Schedule:**

<b>Date</b>	<b>Lecture</b>	<b>Instructor</b>
Sept 3	Chapter 1: Genes are DNA	Prof. C. Liang
Sept 5, 10	Chapters 2 & 4: Genes encode RNAs and polypeptides; The interrupted gene	Prof. C. Liang
Sept 12, 17, 19	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 24, 26	Chapters 19 & 22: Prokaryotic transcription; mRNA stability	Prof. C. Liang
Oct 3, 8	Chapter 24: Translation	Prof. C. Liang
Oct 10, 15	Chapter 26: The operon	Prof. C. Liang
<b>Mid-term (TBD)</b>		Prof. C. Liang
Oct. 22, 24	Chapter 9 : Chromosomes	Prof. ZG Wu
Oct 29, 31	Chapter 10: Chromatin/Nucleosomes	Prof. ZG Wu
Nov 5, 7	Chapter 20: Promoters and enhancers	Prof. ZG Wu
Nov 12, 14	Chapter 28. Eukaryotic transcription regulation	Prof. ZG Wu
Nov 19, 21, 26	Chapter 29: Epigenetic effects and chromatin remodeling	Prof. ZG Wu
Nov 28	Chapter 30: regulatory RNA	Prof. ZG Wu
<b>Final exam</b>	<b>(tbd)</b>	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%).