

**The Hong Kong University of Science & Technology**  
**Division of Life Science**

**LIFS3020 – Molecular and Cellular Biology II**  
**(Spring 2022)**

**1. Instructors**

<b>Instructors</b>	<b>Office</b>	<b>Extension</b>	<b>E-mail address</b>
Joyce P.Y. MAK (Course Coordinator)	Room 6279	x8718	<a href="mailto:jpymak@ust.hk">jpymak@ust.hk</a>
Pingbo HUANG	Room 5463	x7305	<a href="mailto:bohuangp@ust.hk">bohuangp@ust.hk</a>

**2. Teaching Assistant**

NA

**3. Meeting Time and Venue**

**Date/Time:** Monday : 16:30 – 17:50      Lecture

Friday : 12:00 – 13:20      Lecture

**Venue:** Room 4619

**4. Course Description**

Cellular regulation is at the heart of proper function of an organism. An understanding of the molecules and pathways that ensure proper cellular regulation is fundamental in comprehending the normal physiology of the cells and the causes of various disorders. This undergraduate core course provides backgrounds and principles in various fields of cellular regulation. In-depth discussion of selected topics is also provided to give students an appreciation of the complexity and state-of-the-art of current research. Through interactive lectures, topics including signal transduction, cell adhesions, cell differentiation, cell cycle control, checkpoints, apoptosis, aging, and cancer are covered. Moreover, timely special topics in biomedical sciences are included to increase the awareness of current trends in scientific research and application.

**5. Intended Learning Outcomes**

**Course goals:** This course provides students with the knowledge of topics in the molecular basis of cellular regulation.

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

1. Explain the fundamental principles, general approaches and complexities in the discoveries made in the field of cellular regulation.
2. Communicate effectively in writing the principles and details of the field of cellular regulation.
3. Evaluate the principles and applications of methodology and experimental design in cellular regulation and apply them to other similar areas of study.

## 6. Assessment Scheme

Students are assessed by written open-book examinations at mid-term and at the end of the course. Both short questions of analytical nature and long essay questions are included in the examination. Emphasis is placed on the genuine comprehension of the subject, organization, presentation, critical analysis, and be able to apply the principles learned to solve related problems. Effective written skills, organization, and critical analysis are expected from the students.

<u>Assessment</u>	<u>Assessing Course ILOs</u>
mid-term exam	1-3
final exam	1-3

## 7. Student Learning Resources

Lecture notes will be provided.

## 8. Teaching and Learning Activities

This course is primarily delivered through interactive lectures. Students are expected to read course materials, references, and ask questions in lectures. Through interactive discussion with the lecturers and each other, the students are able to understand the experimental approaches, methodologies, themes, and state-of-the-art development of topics in cellular regulation. Students are expected to think critically and ask questions on various aspects of the lectures. An essay-based written open-book examination at the end of the course further encourages the students to understand the principles of the subject and to apply them to solve related problems.

## 9. Course Schedule

### **Pingbo Huang:**

Feb 4	Overview of the molecular biology of cellular regulation
Feb 7	Signaling Transduction
Feb 11	Signaling Transduction
Feb 14	Signaling Transduction
Feb 18	Signaling Transduction
Feb 21	Signaling Transduction
Feb 25	Cell adhesions
Feb 28	Cell adhesions
Mar 4	Cell adhesions
Mar 7	Cell differentiation
Mar 11	Cell differentiation
Mar 14	Cell differentiation / <b>Mid-term exam</b>

### **Joyce P.Y. Mak:**

Mar 18	Cell cycle control
Mar 21	Cell cycle control
Mar 25	Cell cycle control
Mar 28	Maintenance of genome stability by checkpoints
Apr 1	Maintenance of genome stability by checkpoints
Apr 4	Mechanisms of cell division
Apr 8	Mechanisms of cell division
Apr 11	Programmed cell death - the functions of apoptosis
Apr 22	Molecular mechanisms of apoptosis
Apr 25	Molecular mechanisms of apoptosis
Apr 29	Telomere in normal replication, senescence, and cancer
May 6	Telomere in normal replication, senescence, and cancer

NB: Since the topics are highly integrated, all the estimated time and order are approximations.